

Founding Editors

Gerhard Goos

Karlsruhe Institute of Technology, Karlsruhe, Germany

Juris Hartmanis

Cornell University, Ithaca, NY, USA


Editorial Board Members

Elisa Bertino

Purdue University, West Lafayette, IN, USA

Wen Gao

Peking University, Beijing, China

Bernhard Steffen 

TU Dortmund University, Dortmund, Germany

Gerhard Woeginger 

RWTH Aachen, Aachen, Germany

Moti Yung

Columbia University, New York, NY, USA


More information about this series at <http://www.springer.com/series/7409>


Marié Hattingh · Machdel Matthee ·
Hanlie Smuts · Ilias Pappas ·
Yogesh K. Dwivedi · Matti Mäntymäki (Eds.)


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 II


Editors


Marié Hattingh 
University of Pretoria
Pretoria, South Africa

Hanlie Smuts 
University of Pretoria
Pretoria, South Africa

Yogesh K. Dwivedi 
Swansea University
Swansea, UK

Machdel Matthee 
University of Pretoria
Pretoria, South Africa

Ilias Pappas 
University of Agder
Kristiansand, Norway

Matti Mäntymäki 
University of Turku
Turku, Finland

ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-030-45001-4 ISBN 978-3-030-45002-1 (eBook)
<https://doi.org/10.1007/978-3-030-45002-1>

LNCS Sublibrary: SL3 – Information Systems and Applications, incl. Internet/Web, and HCI

© IFIP International Federation for Information Processing 2020, corrected publication 2021

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

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 of 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 Es¹.

February 2020

Marié Hattingsh
Machdel Matthee
Hanlie Smuts
Ilias Pappas
Yogesh K. Dwivedi
Matti Mäntymäki

¹ 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

Conference Chairs

Marié (M. J.) Hattingh	University of Pretoria, South Africa
Machdel Matthee	University of Pretoria, South Africa
Hanlie Smuts	University of Pretoria, South Africa
Ilias Pappas	University of Adger and Norwegian University of Science and Technology (NTNU), Norway
Yogesh K. Dwivedi	Swansea University, UK
Matti Mäntymäki	University of Turku, Finland

Program Committee Chairs

Marié (M. J.) Hattingh	University of Pretoria, South Africa
Machdel Matthee	University of Pretoria, South Africa
Hanlie Smuts	University of Pretoria, South Africa
Ilias Pappas	University of Adger and Norwegian University of Science and Technology, Norway
Yogesh K. Dwivedi	Swansea University, UK
Matti Mäntymäki	University of Turku, Finland

Keynote Speakers

Irwin Brown	University of Cape Town, South Africa
James van der Westhuizen	KnowHouse, South Africa
Shirish C. Srivastava	HEC Paris, France

Program Committee

Rami Abu Wadi	Ahlia University, Bahrain
Funmi Adebesein	University of Pretoria, South Africa
Kayode Ibrahim Adenuga	Universiti Teknologi, Malaysia
Michael Adu Kwarteng	Tomas Bata University, Czech Republic
Augustus Barnnet Anderson	University of Ghana, Ghana
Bokolo Anthony Jnr.	Norwegian University of Science and Technology, Norway
Oluwasefunmi Arogundade	Chinese Academy of Science, China
Lynette Barnard	Nelson Mandela University, South Africa
Clara Benac Earle	Polytechnic University of Madrid, Spain
Khalid Benali	University of Lorraine, France
Djamal Benslimane	Claude Bernard University Lyon 1, France
Edward Bernroider	Vienna University of Economic and Business, Austria

Elmi Bester	UNISA, South Africa
Dzifa Bibi	University of Ghana, Ghana
Katja Bley	Dresden University of Technology, Germany
Deonie Botha	Deloitte, South Africa
Jacques Brosens	University of Pretoria, South Africa
Paul Brous	Delft University of Technology, The Netherlands
Peter André Busch	University of Agder, Norway
Andre Calitz	Nelson Mandela University, South Africa
Sunil Choenni	Research and Documentation Centre (WODC), Ministry of Justice, The Netherlands
Mahdieh Darvish	ESCP Business School, Germany
Dinara Davlembayeva	Newcastle University, UK
Carina De Villiers	University of Pretoria, South Africa
Marne de Vries	University of Pretoria, South Africa
Jules Degila	Institute of Mathematics and Physics, Benin
Denis Dennehy	National University of Ireland, Ireland
Vipin Deval	Tallinn University of Technology, Estonia
Christos Douligeris	University of Piraeus, Greece
Dirk Draheim	Software Competence Center Hagenberg, Austria
Alena Droit	Osnabrueck University, Germany
Jacobus Du Preez	University of Pretoria, South Africa
Edward Entee	University of Ghana, Ghana
Sunet Eybers	University of Pretoria, South Africa
Olakumbi Fadiran	UNISA, South Africa
Sam February	Accenture, South Africa
Jennifer Ferreira	Victoria University of Wellington, New Zealand
Blanka Frydrychova Klimova	University of Hradec Kralove, Czech Republic
Shang Gao	Örebro University, Sweden
Ping Gao	The University of Manchester, UK
Aurona Gerber	University of Pretoria, South Africa
Claude Godart	University of Lorraine, France
Javier Gomez	Autonomous University of Madrid, Spain
Anastasia Griva	Athens University of Economics and Business, Greece
Sara Grobbelaar	Stellenbosch University, South Africa
Lucas Gumbi	UNISA, South Africa
Hong Guo	Anhui University, China
Remko Helms	The Open University, The Netherlands
Raoul Hentschel	Dresden University of Technology, Germany
Grant Royd Howard	UNISA, South Africa
Vigneswara Ilavarasan	Indian Institute of Technology, India
Marijn Janssen	Delft University of Technology, The Netherlands
Debora Jeske	University College Cork, Ireland
Arpan Kar	Indian Institute of Technology, India
Caroline Khene	Rhodes University, South Africa
Eija Koskivaara	University of Turku, Finland

Paula Kotzé	University of Pretoria, South Africa
Jan H. Kroeze	UNISA, South Africa
Rendani Kruger	University of Pretoria, South Africa
Abhinav Kumar	The National Institute of Technology Patna, India
Amit Kumar	Kushwaha GAP, India
Andreas D. Landmark	SINTEF, Norway
Sven Laumer	Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Daniel Le Roux	Stellenbosch University, South Africa
Hongxiu Li	Turku School of Economics, Finland
Lieb Liebenberg	University of Pretoria, South Africa
Marianne Looock	UNISA, South Africa
Hugo Lotriet	UNISA, South Africa
Mario Marais	CSIR Meraka Institute, South Africa
Emanuele Gabriel	Tuscia University, Italy
Margherita	
Davit Marikyan	Newcastle University, UK
Linda Marshall	University of Pretoria, South Africa
Tendani Mawela	University of Pretoria, South Africa
Nita Mennega	University of Pretoria, South Africa
Jan Mentz	UNISA, South Africa
Patrick Mikalef	Norwegian University of Science and Technology, Norway
Tshepiso Mokoena	CSIR, South Africa
Mathias Mujinga	UNISA, South Africa
Matthias Murawski	ESCP Europe Business School, Germany
Mohammed Khaled	Bangladesh University of Professionals, Bangladesh
Mustafa	
Mpho Mzingelwa	University of KwaZulu Natal, South Africa
Rennie Naidoo	University of Pretoria, South Africa
Alex Norta	Tallinn University of Technology, Estonia
Kayode Odusanya	Loughborough University, UK
Kwame Simpe Ofori	University of Electronic Science and Technology of China, China
Kingsley Oforu-Ampong	University of Ghana, Ghana
Olabode Ogunbodede	Newcastle University, UK
Leif Erik Opland	Norwegian University of Science and Technology, Norway
Makoto Oya	Computer Institute of Japan, Japan
Niki Panteli	Royal Holloway University of London, UK
Savvas Papagiannidis	Newcastle University, UK
Zacharoula Papamitsiou	Norwegian University of Science and Technology, Norway
Sofia Papavlasopoulou	Norwegian University of Science and Technology, Norway

Elena Parmiggiani	Norwegian University of Science and Technology, Norway
Douglas Parry	Stellenbosch University, South Africa
Marcel Pikhart	University of Hradec Kralove, Czech Republic
Colin Pilkington	UNISA, South Africa
Komla Pillay	University of Pretoria, South Africa
Henk Pretorius	University of Pretoria, South Africa
Tania Prinsloo	University of Pretoria, South Africa
Maciel Queiroz	Paulista University, Brazil
Van Raj	UNISA, South Africa
Nripendra Rana	Swansea University, UK
Anthony Renner-Micah	University of Ghana, Ghana
Suzanne Sackstein	WITS University, South Africa
Brenda Scholtz	Nelson Mandela University, South Africa
Lisa Seymour	University of Cape Town, South Africa
Anuragini Shirish	University of Paris-Saclay, France
Djofack Sidonie	University of Yaounde II, Cameroon
Ivana Simonova	University of Jan Evangelista Purkyne, Czech Republic
Konstantina Spanaki	Loughborough University, UK
Ruan Spies	Stellenbosch University, South Africa
Riana Steyn	University of Pretoria, South Africa
Ilse Struweg	University of Johannesburg, South Africa
Zhaohao Sun	Federation University Australia, Australia
Reima Vesa Suomi	University of Turku, Finland
Libuse Svobodova	University of Hradec Kralove, Czechia
Kuttimani Tamilmani	Swansea University, UK
Maureen Tanner	University of Cape Town, South Africa
Ali Tarhini	Sultan Qaboos University, Oman
Temitope Oluwaseyi Tokosi	Nelson Mandela University, South Africa
Cathrine Tømte	University of Adger, Norway
Juan Carlos Torrado Vidal	Autonomous University of Madrid, Spain
Pieter Toussaint	Norwegian University of Science and Technology, Norway
Rakhi Tripathi	FORE School of Management, India
Valentyna Tsp	Tallinn University of Technology, Estonia
Pitso Tsibolane	Stellenbosch University, South Africa
Marita Turpin	University of Pretoria, South Africa
Parijat Upadhyay	IMT Nagpur, India
Jean-Paul Van Belle	University of Cape Town, South Africa
Judy van Biljon	UNISA, South Africa
Rogier Van de Wetering	Open University, The Netherlands
Thomas van der Merwe	UNISA, South Africa
Alta Van der Merwe	University of Pretoria, South Africa
J. P. van Deventer	University of Pretoria, South Africa

Corné Van Staden	UNISA, South Africa
Izak Van Zyl	Cape Peninsula University of Technology, South Africa
Polyxeni Vassilakopoulou	University of Agder, Norway
Jari Veijalainen	University of Jyväskylä, Finland
Hans Weigand	Tilburg University, The Netherlands
Lizette Weilbach	University of Pretoria, South Africa
Ted White	UNISA, South Africa
Michael Williams	Swansea University, UK
Milla Wiren	University of Turku, Finland
Khulekani Yakobi	Nelson Mandela University, South Africa
Hiroshi Yoshiura	The University of Electro-Communications, Japan
Hans-Dieter Zimmermann	FHS St. Gallen University of Applied Sciences, Switzerland

Contents – Part II

eGovernment

Enterprise Architectures in E-Governments Studies: Why, What and How? . . .	3
<i>Hong Guo and Shang Gao</i>	
An e-Government Implementation Framework: A Developing Country Case Study.	15
<i>Anele Apleni and Hanlie Smuts</i>	
Institutional Effects on National Health Insurance Digital Platform Development and Use: The Case of Ghana.	28
<i>Anthony Renner-Micah, John Effah, and Richard Boateng</i>	
Toward Employee-Driven Digital Innovation in Public Organizations Through the Use of Action Design Research	39
<i>Leif Erik Opland, Letizia Jaccheri, Jostein Engesmo, and Ilias O. Pappas</i>	
A Systematic Review of Implementation Challenges in Public E-Procurement	46
<i>Idah Mohungoo, Irwin Brown, and Salah Kabanda</i>	

eHealth

Barriers for User Acceptance of Mobile Health Applications for Diabetic Patients: Applying the UTAUT Model.	61
<i>Fazlyn Petersen, Mariam Jacobs, and Shaun Pather</i>	
Impact of Socio-Demographic Factors on the Acceptance of Information Communication and Technology (ICT) for Diabetes Self-care.	73
<i>Fazlyn Petersen, Adiel Baker, Shaun Pather, and William D. Tucker</i>	
Categorization of Factors Influencing Community Health Workers from a Socio-Technical Systems Perspective.	84
<i>Lilies Ratshidi, Sara Grobbelaar, and Adele Botha</i>	
A Systematic Literature Review of the Factors that Influence the Accuracy of Consumer Wearable Health Device Data	96
<i>Lerato Mahloko and Funmi Adebisin</i>	
Gamification in Healthcare: Motivating South Africans to Exercise	108
<i>Thaverson Devar and Marie Hattingh</i>	

A Twitter Social Network Analysis: The South African Health Insurance Bill Case 120
Ilse Struweg

Security

Cyber-Harassment Victimization Among South African LGBTQIA+ Youth 135
Kayla Hendricks, Pitso Tsibolane, and Jean-Paul van Belle

Online Identity Theft on Consumer Purchase Intention: A Mediating Role of Online Security and Privacy Concern. 147
Abdul Bashiru Jibril, Michael Adu Kwarteng, Fortune Nwaiwu, Christina Appiah-Nimo, Michal Pilik, and Miloslava Chovancova

On the Ethics of Using Publicly-Available Data 159
Antony K. Cooper and Serena Coetzee

Social Media

Introducing the Media Use Behaviour Conceptual Framework 175
Douglas A. Parry and Daniel B. le Roux

The Town Square in Your Pocket: Exploring Four Metaphors of Social Media 187
Daniel B. le Roux and Douglas A. Parry

How Can Critical Thinking Be Used to Assess the Credibility of Online Information? 199
Albie van Zyl, Marita Turpin, and Machdel Matthee

An Analysis of Problematic Media Use and Technology Use Addiction Scales – What Are They Actually Assessing?. 211
Adrian Abendroth, Douglas A. Parry, Daniel B. le Roux, and Jana Gundlach

A Systematic Review on Fake News Themes Reported in Literature 223
Marlie Celliers and Marie Hattingh

The Use of Critical Thinking to Identify Fake News: A Systematic Literature Review 235
Paul Machete and Marita Turpin

A Conceptual Model of the Challenges of Social Media Big Data for Citizen e-Participation: A Systematic Review 247
Khulekani Yakobi, Brenda Scholtz, and Benjamin vom Berg

Knowledge and Knowledge Management

- Knowledge Transfer in Science Education: The Case for Usability-Based Knowledge Visualization Guidelines 263
Olakumbi A. Fadiran, Judy van Biljon, and Marthie A. Schoeman
- A Knowledge Asset Management Implementation Framework for Information Systems Outsourcing Projects. 274
Hanlie Smuts and George Maramba
- A Conceptual Knowledge Visualisation Framework for Transfer of Knowledge: An Organisational Context 287
Hanlie Smuts and Iddo-Imri Scholtz

ICT and Gender Equality and Development

- Can Technology Be Leveraged for Bridging the Rural-Urban Divide? 301
Anuragini Shirish, Shirish C. Srivastava, and G. Shainesh
- Exploring the Determinants of Internet Usage in Nigeria: A Micro-spatial Approach 307
Kayode Odusanya and Morakinyo Adetutu
- Enablers and Barriers for Mobile Commerce and Banking Services Among the Elderly in Developing Countries: A Systematic Review. 319
Nkosikhona Theoren Msweli and Tendani Mawela
- A Methodology for Addressing the Second-Level Digital Divide: A Practical Experience. 331
Susana Muñoz Hernández, Clara Benac Earle, and Lars-Åke Fredlund
- Investigating Aid Effectiveness in Developing Countries: The Case of Nepal 338
Yashoda Karki and Ilias O. Pappas
- The Influence of Culture on Women’s IT Career Choices 345
Andre P. Calitz, Margaret Cullen, and Dudu Fani
- Exploring Digital Competence Requirements for Junior Financial Analysts in the UK Banking Industry 358
Matthias Murawski, Mahdieh Darvish, Charlotte Marie Prinz, and Markus Bick
- Conceptualizations of E-recruitment: A Literature Review and Analysis. 370
Mike Abia and Irwin Brown
- Alumni Reflections on Gender Equality in the ICT Context 380
Eija Koskivaara and Brita Somerkoski

Information Systems for Governance

An Ordinance-Tweet Mining App to Disseminate Urban Policy Knowledge for Smart Governance	389
--	-----

Christina Varghese, Aparna S. Varde, and Xu Du

A Multistakeholder-Centric Data Analytics Governance Framework for Medication Adherence and Improvement in Rural Settings	402
---	-----

Olawande Daramola and Peter Nyasulu

Experimental Application of Machine Learning on Financial Inclusion Data for Governance in Eswatini.	414
--	-----

Boluwaji A. Akinnuwesi, Stephen G. Fashoto, Andile S. Metfula, and Adetutu N. Akinnuwesi

User Experience and Usability

How Quickly Can We Predict Users' Ratings on Aesthetic Evaluations of Websites? Employing Machine Learning on Eye-Tracking Data	429
---	-----

Ilias O. Pappas, Kshitij Sharma, Patrick Mikalef, and Michail N. Giannakos

Designing for Positive Emotional Responses in Users of Interactive Digital Technologies: A Systematic Literature Review	441
---	-----

Nabeel Makkan, Jacques Brosens, and Rendani Kruger

A Methodology to Compare the Usability of Information Systems	452
---	-----

Rendani Kruger, Jacques Brosens, and Marie Hattingh

Correction to: An Analysis of Problematic Media Use and Technology Use Addiction Scales – What Are They Actually Assessing?	C1
---	----

Adrian Abendroth, Douglas A. Parry, Daniel B. le Roux, and Jana Gundlach

Author Index	465
-------------------------------	------------

Contents – Part I

Block Chain

A Framework for the Adoption of Blockchain-Based e-Procurement Systems in the Public Sector: A Case Study of Nigeria	3
<i>Temofe Isaac Akaba, Alex Norta, Chibuzor Udokwu, and Dirk Draheim</i>	
Blockchain Technology for Empowering Patient-Centred Healthcare: A Pilot Study	15
<i>Themba Makubalo, Brenda Scholtz, and Temitope Oluwaseyi Tokosi</i>	
Exploring the Disruptiveness of Cryptocurrencies: A Causal Layered Analysis-Based Approach.	27
<i>Matti Mäntymäki, Milla Wirén, and A. K. M. Najmul Islam</i>	

Fourth Industrial Revolution

SMME Readiness for Smart Manufacturing (4IR) Adoption: A Systematic Review	41
<i>Lucas Gumbi and Hossana Twinomurinzi</i>	
Using Theories to Design a Value Alignment Model for Smart City Initiatives	55
<i>Anthea van der Hoogen, Brenda Scholtz, and Andre P. Calitz</i>	
Complementary Partnerships for SMEs: A Relational Capability Maturity Model from an Ecosystem Perspective.	67
<i>Caro Els, Sara Grobbelaar, and Denzil Kennon</i>	
The Role of Digital Connectivity in Supply Chain and Logistics Systems: A Proposed SIMPLE Framework	79
<i>Maciel M. Queiroz and Samuel Fosso Wamba</i>	
A Strategic Organisational Perspective of Industry 4.0: A Conceptual Model	89
<i>Stefan Smuts, Alta van der Merwe, and Hanlie Smuts</i>	
SMART City and Economy: Bibliographic Coupling and Co-occurrence	102
<i>Libuše Svobodová and Dorota Bednarska-Olejniczak</i>	
Robotic Process Automation and Consequences for Knowledge Workers; a Mixed-Method Study	114
<i>Tom Roar Eikebrokk and Dag Håkon Olsen</i>	

Co-creation for Digitalization: A Study of Co-creation in Norwegian Business Clusters	126
<i>Dag H. Olsen, Tom Roar Eikebrokk, Kristian Aspø, and Elaine Sajets</i>	
A Framework for Industrial Internet of Things	138
<i>Jacques Jansen and Alta van der Merwe</i>	
eBusiness	
Cybersecurity Readiness of E-tail Organisations: A Technical Perspective . . .	153
<i>Mahmood Hussain Shah, Raza Muhammad, and Nisreen Ameen</i>	
Consumer Mobile Shopping Acceptance Predictors and Linkages: A Systematic Review and Weight Analysis	161
<i>Kuttimani Tamilmani, Nripendra P. Rana, Yogesh K. Dwivedi, and Hatice Kizgin</i>	
Social Commerce Adoption Predictors: A Review and Weight Analysis.	176
<i>Prianka Sarker, Laurie Hughe, Yogesh K. Dwivedi, and Nripendra P. Rana</i>	
Digital Entrepreneurship in Business Enterprises: A Systematic Review	192
<i>Samuel Anim-Yeboah, Richard Boateng, Emmanuel Awuni Kolog, Acheampong Owusu, and Ibrahim Bedi</i>	
Assessing the Role of Trust in Merchant Adoption of Mobile Payments in Ghana	204
<i>Eunice Yeboah, Richard Boateng, Acheampong Owusu, Eric Afful-Dadzie, and Joshua Ofori-Amanfo</i>	
The Influence of Price Comparison Websites on Online Switching Behavior: A Consumer Empowerment Perspective	216
<i>Michael Adu Kwarteng, Abdul Bashiru Jibril, Elsamari Botha, and Christian Nedu Osakwe</i>	
Online Banking Service Quality: A South African E-S-QUAL Analysis.	228
<i>Mathias Mujinga</i>	
The Characteristics of Digital Entrepreneurship and Digital Transformation: A Systematic Literature Review	239
<i>Joshua Antonizzi and Hanlie Smuts</i>	
Mapping the Intellectual Progress in e-Business, e-Services and e-Society from 2001 to 2019	252
<i>Zacharoula Papamitsiou and Patrick Mikalef</i>	

Weight Analysis of the Factors Affecting eWOM Providing Behavior	266
<i>Elvira Ismagilova, Yogesh K. Dwivedi, Nripendra P. Rana, Uthayasankar Sivarajah, and Vishanth Weerakkody</i>	
An Intelligent Marketspace Mobile Application for Marketing Organic Products.	276
<i>Oluwasefunmi Tale Arogundade, Adebayo Abayomi-Alli, Kayode Adesemowo, Taiwo Bamigbade, Modupe Odusami, and Victor Olowe</i>	
How Corporates in South Africa Are Using Serious Games in Business.	288
<i>Shiraz Amod and Sumarie Roodt</i>	
Business Processes	
A Theoretical Framework for IT-Enabled and IT-Enforced Corporate Governance Compliance Utilizing BPMs	301
<i>Hendrik Willem Pretorius and Alta van der Merwe</i>	
The Role of Information Technology in Fintech Innovation: Insights from the New York City Ecosystem	313
<i>Stanislav Mamonov</i>	
Governance Challenges Constraining Business Process Management: The Case of a Large South African Financial Services Corporate	325
<i>Carmen Doyle and Lisa F. Seymour</i>	
Overcoming the Ivory Tower: A Meta Model for Staged Maturity Models	337
<i>Katja Bley, Hendrik Schön, and Susanne Strahringer</i>	
Towards a Strategic Model for Safeguarding the Preservation of Business Value During Human Interactions with Information Systems	350
<i>Chris D. Grobler and Thomas M. van der Merwe</i>	
How to Measure Digitalization? A Critical Evaluation of Digital Maturity Models	358
<i>Tristan Thorsen, Matthias Murawski, and Markus Bick</i>	
Business Process Re-engineering and Agile Software Development: Applying the Story-Card Method	370
<i>Elijah Djan and Marné de Vries</i>	
The Zachman Framework for Enterprise Architecture: An Explanatory IS Theory	383
<i>Aurona Gerber, Pierre le Roux, Carike Kearney, and Alta van der Merwe</i>	

A Scoping Review of the Application of the Task-Technology Fit Theory . . . 397
Ruan Spies, Sara Grobbelaar, and Adele Botha

A Broker-Based Framework for the Recommendation of Cloud Services:
A Research Proposal 409
Raoul Hentschel and Susanne Strahringer

Big Data and Machine Learning

Unsupervised Anomaly Detection of Healthcare Providers Using
Generative Adversarial Networks 419
Krishnan Naidoo and Vukosi Marivate

Data Governance as Success Factor for Data Science. 431
Paul Brous, Marijn Janssen, and Rutger Krans

Happiness and Big Data – Theoretical Foundation and Empirical Insights
for Africa. 443
Anke Joubert, Matthias Murawski, Julian Bühler, and Markus Bick

Predicting Information Diffusion on Twitter a Deep Learning Neural
Network Model Using Custom Weighted Word Features 456
*Amit Kumar Kushwaha, Arpan Kumar Kar,
and P. Vigneswara Ilavarasan*

Requirements of Data Visualisation Tools to Analyse Big Data:
A Structured Literature Review. 469
Joy Lowe and Machdel Mathee

Implementation Considerations for Big Data Analytics (BDA):
A Benefit Dependency Network Approach. 481
Juane Maritz, Sunet Eybers, and Marie Hattingh

A Model for Evaluating Big Data Analytics Tools
for Organisation Purposes 493
Phaphama Kangelani and Tiko Iyamu

ICT and Education

Development of a Quantitative Instrument to Measure Mobile Collaborative
Learning (MCL) Using WhatsApp: The Conceptual Steps 507
Bangisisi Zamuxolo Mathews Nyembe and Grant Royd Howard

Understanding Rural Parents’ Behavioral Intention to Allow Their Children
to Use Mobile Learning. 520
David Mutambara and Anass Bayaga

May the Change Be with You: The Need for New Roles to Support Flipped Classroom Development	532
<i>Linda Blömer, Alena Droit, and Kristin Vogelsang</i>	
Preliminary Insights into the Nature of Graduate IS Programmes in Sub-Saharan Africa	545
<i>Mark-Oliver Kevor, Richard Boateng, Emmanuel Awuni Kolog, Acheampong Owusu, and Anthony Afful-Dadzie</i>	
Requirements for an eModeration System in Private Schools in South Africa	557
<i>Vanitha Rajamany, Corne J. Van Staden, and Judy van Biljon</i>	
Ready to Go? Schools' Preparedness for Teaching and Learning Within a One-to-One Program	569
<i>Cathrine E. Tømte, Markus M. Bugge, Sabine Wollscheid, and Frida F. Vennerød-Diesen</i>	
Agile Development of a Flipped Classroom Course	581
<i>Linda Blömer, Christin Voigt, Alena Droit, and Uwe Hoppe</i>	
Author Index	593