



**18<sup>th</sup>** Conference of the  
**International Federation for  
Information Processing**  
(IFIP WG 9.4)

**2024**

20 -22 MAY

Cape Town, South Africa



**PROGRAMME**

Host: University of Cape Town, South Africa

# PREFACE

In a world where digital technologies have become the linchpin of global progress, a stark reality has emerged: a society characterised by inequalities and injustice. South African President Cyril Ramaphosa underscored the glaring inequality in the distribution of essential resources, as exemplified by the unequal access to COVID-19 vaccines, during the New Global Financing Pact summit in Paris, France, in June 2023. It serves as a reminder of the enduring disparities that define our world.

Digital technologies remain a force with the potential to disrupt existing power structures and democratise access to opportunities. They have empowered communities to engage in social, political, and economic spheres that were once out of reach. The impact of digital technologies has extended to catalysing global social justice movements and creating platforms for marginalised voices. Yet, the transformative potential of technology is nuanced and replete with complexities.

The 18th Working Group 9.4 Conference of the International Federation for Information Processing (IFIP WG 9.4) gathered scholars and practitioners dealing with how ICT affects social development. The conference theme, **“Reshaping an Unequal World Through Social Justice and Digital Technologies,”** aimed to initiate the journey to explore digital technology’s multifaceted role in forging a more equitable and just world. The conference provided a platform for rigorous discourse, innovative solutions, and collaborative endeavors that leverage the potential of digital technologies to tackle global inequalities and champion social justice. The conference invited submissions of full research papers and short papers to the following 15 tracks:

1. Artificial Intelligence, Inequalities, and Human Rights
2. Technology & Social Justice
3. Diverse and Inclusive Digital Transformation
4. ICT in Displacement and Conflict Zones: Ideas, Disconnects, & Innovations
5. Giving Voice to Marginalised Perspectives in IS Research
6. Human-Computer Interaction for Ethical Value Exchange and Social Inclusion
7. Smart Collaborations & Crowdsourcing
8. Philosophical, Theoretical and Methodological Approaches to Researching ICT4D
9. ICT Curriculum and Education
10. Information and Computer Security
11. Digital Inclusion through e-Government
12. Research in Indigenous African Languages
13. Digitalisation for Indigenous Emancipation
14. Digital Platforms in the Global South
15. General Track

One hundred seven (107) full papers were submitted by the deadline. Full-paper submissions were subjected to double-blind reviews by at least three reviewers, of which 58 full papers and six (6) short papers were accepted for publication after revisions were made as suggested by reviewers. Accepted papers were published in the Springer conference proceedings and made available in SpringerLink after the conference, with authors receiving personal access links.

## **Programme Committee**

**Chigona Wallace**, University of Cape Town, South Africa

**Kabanda Salah**, University of Cape Town, South Africa

**Seymour Lisa**, University of Cape Town, South Africa

# ORGANISATION

The 18<sup>th</sup> Working Group 9.4 Conference of the International Federation for Information Processing (IFIP WG 9.4) 2024 took place during May 20–22, 2024, at the UCT GSB Academic Conference Centre, Portwood Road, Victoria and Alfred Waterfront, Cape Town, South Africa.

## Conference Chairs

### Brown Irwin

University of Cape Town, South Africa

### Tsibolane Pitso

University of Cape Town, South Africa

## Programme Chairs

### Chigona Wallace

University of Cape Town, South Africa

### Kabanda Salah

University of Cape Town, South Africa

### Seymour Lisa

University of Cape Town, South Africa

## Local Arrangements Chairs

### Budree Adheesh

University of Cape Town, South Africa

### Chimboza Tendani

University of Cape Town, South Africa

### Densmore Melissa

University of Cape Town, South Africa

### Desi Portia

University of Cape Town, South Africa

### Kapepo Meke

University of Cape Town, South Africa

### Kyobe Mike

University of Cape Town, South Africa

### Mwalemba Gwamaka

University of Cape Town, South Africa

### Oosterwyk Grant

University of Cape Town, South Africa

### Pekana Ayanda

University of Cape Town, South Africa

### Poggenpoel Gilah

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### Ruhwanya Zainab

University of Cape Town, South Africa

### Snyman Dirk

University of Cape Town, South Africa

### Uys Walter

University of Cape Town, South Africa

### van Belle Jean-Paul

University of Cape Town, South Africa

### Yvonne Brown

University of Cape Town, South Africa

## Track Chairs

### Pal Abhips

Indian Institute of Management Calcutta, India

### De' Rahul

Indian Institute of Management Bangalore, India

### Okai George Essah Yaw

University of Mines and Technology, Ghana

### Agangiba Millicent

University of Professional Studies, Accra, Ghana

### Hussain Faheem

The State University of New York, USA

### Brown Suzana

The State University of New York, USA

### Mooketsi Bojelo

University of Botswana, Botswana

### Tope Samuel Adeyelure

Tswane University of Technology, South Africa

### Chikumba Patrick

Malawi University of Business and Applied Sciences, Malawi

### Segooa Mmatshuene Anna

Tswane University of Technology, South Africa

### Cilliers Liezel

Fort Hare University, South Africa

### Budree Adheesh

University of Cape Town, South Africa

### Renken Jaco

The University of Manchester, UK

### Oredo John Otieno

University of Nairobi, Kenya

### Tanner Maureen

University of Cape Town, South Africa

### Mamello Thinyane

University of South Australia, Australia

### Singh Harminder

Auckland University of Technology, New Zealand

### Chigona Wallace

University of Cape Town, South Africa

### Tsibolane Pitso

University of Cape Town, South Africa

### Zimba Michael

Malawi University of Science and Technology, Malawi

### Shaun Pather

University of the Western Cape, South Africa

### Ricardo Gómez

University of Washington, USA

## PhD Forum Chairs

### Dirk Snyman

University of Cape Town, South Africa

### Densmore Melissa

University of Cape Town, South Africa

## Review Committee

### Addo Atta

University of Surrey, UK

### Adebesin Funmi

University of Pretoria, South Africa

### Adeyelure Tope Samuel

Tswane University of Technology, South Africa

### Agangiba Millicent

University of Professional Studies, Accra, Ghana

### Angsana Techatassanasoontorn

Auckland University of Technology, New Zealand

### Badie Farshad

Aalborg University, Denmark

### Bailey Arlene

University of the West Indies, Jamaica

### Bojelo Mooketsi

University of Botswana, Botswana

### Bonina Carla

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**Brown Irwin**

University of Cape Town, South Africa

**Brown Suzana**

The State University of New York, US

**Budree Adheesh**

University of Cape Town

**Buxton Samantha**

Swansea University, UK

**Cataldo Alejandro**

Universidad de Talca, Chile

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Fort Hare University, South Africa

**Cisneros Andrea Jiménez**

Sheffield University, UK

**Cranfield Desirée**

Swansea University, UK

**Diaz Andrade, Antonio**

University of Agder, Norway

**Diniz Eduardo**

Fundação Getúlio Vargas – Escola de Administração de Empresas de São Paulo, Brazil

**Dlodlo Nomusa**

Rhodes University, South Africa

**Effah John**

University of Ghana, Ghana

**Faith Becky**

Institute of Development Studies, UK

**Foster Christopher**

The University of Manchester, UK

**Gamel Wiredu**

Ghana Institute of Management and Public Administration, Ghana

**Gcora Nozibele**

University of Pretoria, South Africa

**Graeml Alexandre**

Universidade Tecnológica Federal do Paraná, Brazil

**Hatakka Mathias**

Örebro University, Sweden

**Hugo Lotriet**

University of South Africa, South Africa

**Hussain Faheem**

The State University of New York, USA

**Ilavarasan Vigneswara**

Indian Institute of Technology- Delhi, India

**Inuwa Ibrahim**

American University of Nigeria, Nigeria

**Jere Joseph Ntabeni**

University of KwaZulu-Natal, South Africa

**Jere Nobert**

Walter Sisulu University

**John Dobson**

Clark University, USA

**Kabanda Salah**

University of Cape Town, South Africa

**Kankuzi Bennett**

Malawi University of Science & Technology, Malawi

**Kowal Jolanta**

University of Wrocław, Poland

**Kritzinger Elmarie**

University of South Africa, South Africa

**Mamello Thinyane**

University of South Australia, Australia

**Maravanyika Munyaradzi**

Namibia University, Namibia

**Mawela Tendani**

University of Pretoria, South Africa

**Mujinga Mathias**

University of South Africa, South Africa

**Mukherjee Arunima Sehgal**

University of Oslo, Norway

**Mulyata John**

Swansea University, Wales, UK

**Nicholson Brian**

The University of Manchester, UK

**Nielsen Petter**

University of Oslo, Norway

**Nwankpa Joseph**

University, Oxford, Ohio, USA

**Okai George Essah Yaw**

University of Mines and Technology, Ghana

**Ononiwu Chidi**

American University of Nigeria, Nigeria

**Oredo John Otieno**

University of Nairobi, Kenya

**Ortiz Aurora Sánchez**

Universidad Católica del Norte, Chile

**Pekane Ayanda**

University of Cape Town

**Peter Meso**

Florida Gulf State University, USA

**Pitso Tsibolane**

University of Cape Town, South Africa

**Rahul Dé**

Indian Institute of Management Bangalore, India

**Renken Jaco**

The University of Manchester, UK

**Ricardo Gómez**

University of Washington, USA

**Roberts Tony**

Institute of Development Studies, UK

**Sæbø Øystein**

University of Agder, Norway

**Safila Aslam**

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**Segooa Mmatshuene Anna**

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**Seymour Lisa**

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**Shaun Pather**

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**Singh Harminder**

Auckland University of Technology, New Zealand

**Siyabonga Mhlongo**

University of Johannesburg, South Africa

**Smuts Hanlie**

University of Pretoria, South Africa

**Tanner Maureen**

University of Cape Town, South Africa

**Thapa Devendra**

University of Agder, Norway

**Twinomurinzi Hossana**

University of Johannesburg, South Africa

**Uys Walter**

University of Cape Town, South Africa

**Van Belle Jean-Paul**

University of Cape Town, South Africa

**Van Biljon Judy**

University of South Africa, South Africa

**Zimba Michael**

Malawi University of Science and Technology, Malawi

# SCHEDULE

## DAY 1 | MONDAY 20 MAY

08:00 - 17:00	<b>DOCTORAL CONSORTIUM</b> – by invitation only	Co-Chairs: <b>Dirk Snyman and Melissa Densmore</b> University of Cape Town Presenters: <b>Devinder Thapa and Antonio Diaz-Andrade</b> University of Agder DC Mentorship Teams: <b>Richard Heeks</b> University of Manchester, <b>Dirk Snyman</b> University of Cape Town <b>Sundeeep Sahay</b> University of Oslo, <b>Walter Uys</b> University of Cape Town <b>Sajda Qureshi</b> University of Nebraska Omaha, <b>Tendani Chimboza</b> University of Cape Town <b>Caroline Khene</b> Institute of Development Studies, UK, <b>Luzuko Tekeni</b> University of Cape Town <b>Silvia Masiero</b> University of Oslo, <b>Adheera Kabanda</b> University of Cape Town <b>Antonio Diaz-Andrade</b> (University of Agder), <b>Salah Kabanda</b> (University of Cape Town) <b>Devinder Thapa</b> (University of Agder), <b>Maureen Tanner</b> (University of Cape Town)
18:00 - 20:00	<b>CONFERENCE WELCOME RECEPTION</b> all conference delegates	
20:30	<b>Close</b>	

## DAY 2 | TUESDAY 21 MAY

08:00 - 17:00	REGISTRATION									
08:30	TEA /COFFEE									
09:00	Conference Welcome and Opening Address   Conference Co-Chair: <b>Pitso Tsibolane</b>   Auditorium Keynote address   <b>Prof Francis Nyamnjoh</b> (Professor of Social Anthropology, UCT)									
10:30	TEA /COFFEE									
11:00	PANEL DISCUSSION A   Auditorium Gender, Technology, and Theory: The Intersectionality We Need <b>Priyanka Pandey, Silvia Masiero, Tony Roberts, Katherine Wyers</b>					PANEL DISCUSSION B   Faculty Room - B Block Artificial Intelligence and Ethics in the Global South <b>Suzana Brown, Michael Zimba, PJ Wall, Faheem Hussain, Hossana Twinomurizi</b>				
	Topic	Presenters	Topic	Presenters	Topic	Presenters	Topic	Presenters	Topic	Presenters
	<b>SESSION 1A</b> Auditorium <b>Track: Technology &amp; Social Justice</b> Session Chair: <b>George Okai</b>		<b>SESSION 1B</b> Venue 4 - Floor 1 <b>Track: Information and Computer Security</b> Session Chair: <b>Elmarie Kritzinger</b>		<b>SESSION 1C</b> Venue 5 - Floor 1 <b>Track: ICTs and Ethics</b> Session Chair: <b>Tendani Chimboza</b>		<b>SESSION 1D</b> Faculty Room - B Block <b>Track: Big Data</b> Session Chair: <b>Peter Meso</b>		<b>SESSION 1E</b> Executive Room - B Block <b>Track: General Track</b> Session Chair: <b>R. Gómez</b>	
12:00	Understanding chilling effects in digital spaces – a study of Ugandan LGBT+ advocacy in the wake of the draconian 2023 Anti-homosexuality Act (52)	<b>C. Strand</b> Uppsala University, Sweden	Schoolteacher demographic characteristics and the intention to promote cyber-safety awareness (25)	<b>K. Mabitle, E. Kritzinger</b> University of South Africa, South Africa	Information Ethics in Knowledge Sharing, Transfer, and Translation (13)	<b>M. Thomas, D. Hovorka</b> University of Sydney <b>V. Sistenich</b> St. George Hospital <b>Yan Li</b> Claremont Graduate University	The contributions of business intelligence and big data to public healthcare in South Africa (76)	<b>N. Makhaye, S. Mwapwele</b> University of the Witwatersrand, South Africa	Contextual usability of Fintech by African Caribbean Micro-Business Owners in the UK (51)	<b>A. Owoseni, C. Khene, A. Adedigba, M. Adisa</b> De Montfort University, United Kingdom
12:30	Social Inclusion and public participation in the Digital Era: A Critical Discourse Analysis of the 2016 World Bank Report (72)	<b>C. Kondowe</b> University of Cape Town, South Africa	Factors Influencing Generation Z's Cybersecurity Practices: An Empirical Analysis (103)	<b>E. Slamet, Z. Ruhwanya</b> University of Cape Town, South Africa	Drawing a Map in the Sand: Locating an Ethics of Care in the ICT-Related Migration Practices of Older Volunteers in the US Southwest (36)	<b>S. Vannini</b> University of Sheffield <b>R. Gomez</b> University of Washington <b>B. Newell</b> University of Oregon	Harnessing the Unseen: A Case Study on the Barriers to Big Data Analytics in a Major South African Retailer (101)	<b>S. Moloi, G. Oosterwyk, A. Budree</b> University of Cape Town, South Africa	Situational analyses of Climate Data Infrastructure in Mozambique (85)	<b>J. J. Uache, J. A. Malauene</b> Universidade Eduardo Mondlane
13:00	LUNCH									
	<b>SESSION 2A</b> Auditorium <b>Track: Smart Technology</b> Session Chair: <b>Samwel Mwapwele</b>		<b>SESSION 2B</b> Venue 4 - Floor 1 <b>Track: Information and Computer Security</b> Session Chair: <b>Katazo Amunkete</b>		<b>SESSION 2C</b> Venue 5 - Floor 1 <b>Track: Social Media</b> Session Chair: <b>Grant Oosterwyk</b>		<b>SESSION 2D</b> Faculty Room - B Block <b>Track: Health IS</b> Session Chair: <b>Walter Uys</b>		<b>SESSION 2E</b> Executive Room - B Block <b>Workshop</b> Chair: <b>Richard Heeks et al</b>	
14:00	Unveiling the smart vision guiding ICT-enabled rural development (93)	<b>P. Thapa</b> University of Agder, Norway	Educators' Perspectives on Cybersecurity: Case of resource-constrained Schools in South Africa (104)	<b>C. Magunje, W. Chigona</b> University of Cape Town, South Africa	Fake News in Developing Countries: Drivers, Mechanisms and Consequences (26)	<b>V. Mwendwa Masavah, M. Turpin</b>	Digital Mental Health in Humanitarian Crisis in Bangladesh (29)	<b>H. Ahsan, L. Christensen</b> IT University of Copenhagen, Denmark	Reworking the Principles for Digital-Transformation-for-Development (DX4D) Research	
14:30	Smart City for Civic Participation: A Conceptual Framework (15)	<b>M. Lorenzo, L. A. J. Luiz</b> FGV EBAPE, Brazil	Bridging the Digital Divide: Securing Information and Computer Systems in an Unequal World (68)	<b>P. Meso, D. Acheampong, J. Brito-Mieses, I. O. Agyemang</b> Florida Gulf Coast University; China University of Electronic Science and Technology	Exploring COVID-19 Vaccine Misinformation on Twitter (x): A case of #Vaccine RollOutSA (56)	<b>S. Manene, L. Cilliers</b> University of Fort Hare, South Africa	Assessing Factors Affecting Doctors Access to Medical Knowledge at Point-of-care in the Context of Evidence-based medicine (34)	<b>E. C. Kungwalo</b> University of Malawi <b>G. Kunyenje</b> Catholic University Chiladzuru, Malawi <b>C. Kanjo</b> University of Malawi		

	Topic	Presenters	Topic	Presenters	Topic	Presenters	Topic	Presenters	
15:00	Smart Cities for Whom? Exploring the Role of Gunshot Detection Systems in Marginalized Communities (53)	<b>S. Pastor, G. Oosterwyk, P. Tsiolane, I. Kinnes</b> University of Cape Town, South Africa	Making our digital world a better place: Spiritual Leadership and Digital Transformation (44)	<b>A. Mphahlele, H. Twinomurinzi, C. Hoole</b> University of Johannesburg, South Africa	Lessons Learned from EdTech Integration during the COVID-19 Pandemic	<b>T. Kano</b> Kanazawa Institute of Technology, Japan <b>K. Ishikawa</b> Koei Research & Consulting Inc., Tokyo, Japan			Reworking the Principles for Digital-Transformation-for-Development (DX4D) Research
15:30	<b>TEA /COFFEE</b>								
	<b>SESSION 3A Auditorium</b> <b>Track: Artificial Intelligence and Human Rights</b> Session Chair: <b>Sharon Geeling</b>		<b>SESSION 3B Venue 4 - Floor 1</b> <b>Track: Design and Development</b> Session Chair: <b>Zainab Ruhwanya</b>		<b>SESSION 3C Venue 5 - Floor 1</b> <b>Track: ICT4D Projects and Social Justice</b> Session Chair: <b>Millicent Agangiba</b>		<b>SESSION 3D Faculty Room - B Block</b> <b>Track: Philosophical, Theoretical and Methodological Approaches</b> Session Chair: <b>Shirin Madon</b>		<b>SESSION 3E Executive Room - B Block</b> <b>WORKSHOP</b> Chair: <b>Richard Heeks et al</b>
16:00	The Application of Artificial Intelligence in Diabetes Prediction: A Bibliometric Analysis (89)	<b>E. Mbuya, T. Mokheleli, T. Bokaba, P. Ndayizigamiye</b> University of Johannesburg, South Africa	Designing a health assessment system for the quality of Napier leaves for animal feeding in Rwanda (62)	<b>R. Said Omar, J. Rigwema, R. Musabe, M. Ogore</b> Rwanda University	A Social Justice Analysis of Competing Tensions in a Pan-African Open Science Initiative (81)	<b>P. Abbott</b> The University of Sheffield, United Kingdom	ICT4D Research: The Lame Duck of the Brazilian Academy of Management (14)	<b>Luiz Antonio Joia</b> Getulio Vargas Foundation, Rio de Janeiro	Reworking the Principles for Digital-Transformation-for-Development (DX4D) Research
16:30	Appropriation of Artificial Intelligence in an E-learning Institution to Enhance Tuition (100)	<b>S. Mncube</b> University of South Africa, South Africa	A Pilot Mobile App to Collect South African Child Language Data (71)	<b>T. Malan, B. Tucker</b> Stellenbosch University, South Africa <b>Sefela L. Yalala</b> Northwestern University, South Africa	Challenges of ICT4D solutions in Somalia: A Case study of Land Management (75)	<b>M. Nuh, M. Ruohonen</b> Tampere University <b>S. Pekkola</b> Jyväskylä University	A multi-method text analysis approach for studying ICT4D projects in developing countries: A case of agricultural commissioning in India (37)	<b>Ranjan Vaidya</b> Auckland University of Technology, New Zealand	
17:00	Using AI to Support Home Language Education in Conflict Zones: Lessons Learned (3)	<b>L. Butgereit</b> Nelson Mandela University, South Africa	Tailoring Agile for Medical Software Development: Global South Perspective (82)	<b>Y. Salihu, J. Bass, G. Iyawa</b> University of Salford, United Kingdom	Organisational support for ICT4D practitioner performance: a new pathway for enhancing ICT4D project outcomes (17)	<b>E. Kimaro, J. Renken, N. Cunningham, R. Heeks</b> The University of Manchester, United Kingdom	Surveillance of antimicrobial resistance in the environment: Imperatives for ICT4D research (107)	<b>S. Sahay</b> University of Oslo <b>A. Mukherjee</b> HISP India	
17:30	<b>Close</b>								

## DAY 3 | WEDNESDAY 22 MAY

08:00 - 13:00	REGISTRATION									
08:30	TEA /COFFEE									
09:00	Conference Chair Reports   Conference Co-Chair: <b>Prof. Irwin Brown</b> Keynote address   <b>Marlon Parker</b> (Director and Founder of RLabs, Cape Town)									
10:30	TEA /COFFEE									
11:00	<b>PANEL DISCUSSION C   Auditorium</b> Digital Rights and Social Justice in Africa and beyond <b>Tanja Bosch, Tony Roberts, Anand Sheombar, George Karekwaivanane</b>				<b>PANEL DISCUSSION D   Faculty Room - B Block</b> Ethical Dilemmas in Digital Governance: Balancing Accountability, Environmental Impact, Health Equity, and Digital Divide in Navigating Social Justice Through Digital Technologies <b>Daniel Acheampong, Peter Meso, Johane Dikgang, Joshua Olowoyo</b>					
	Topic	Presenters	Topic	Presenters	Topic	Presenters	Topic	Presenters	Topic	Presenters
	<b>SESSION 4A Auditorium</b> <b>Track: ICT in Displacement and Conflict Zones</b> Session Chair: <b>Devinder Thapa</b>		<b>SESSION 4B Venue 4 - Floor 1</b> <b>Track: Smart Collaborations &amp; Crowdsourcing</b> Session Chair: <b>Bill Tucker</b>		<b>SESSION 4C Venue 5 - Floor 1</b> <b>Track: Adoption of IS/IT Systems</b> Session Chair: <b>Ayanda Pekane</b>		<b>SESSION 4D Faculty Room - B Block</b> <b>Track 14: Digital Platforms in the Global South- MHealth</b> Session Chair: <b>M. Zimba</b>		<b>SESSION 4E Executive Room - B Block</b> <b>Track: ICT Curriculum and Education</b> Session Chair: <b>Maureen Tanner</b>	
12:00	Climate Change and Displacement: Emerging ICT Innovations from the World's Largest Refugee Camp (48)	<b>F. Hussain</b> Arizona State University, USA <b>S. Brown</b> SUNY Korea, South Korea	Facilitating Gig Work Opportunities for Youth in Developing Countries: A Systematic Literature Review (33)	<b>K. Molema, M. Turpin</b> University of Pretoria <b>Jean-Paul Van Belle</b> University of Cape Town, South Africa	Utilisation of Digital Farm Technologies towards Enhancing Agriculture Productivity in low-income countries: A case of National Agriculture Management Information System in Malawi. (84)	<b>Eddons Munthali</b> Lilongwe University of Agriculture and Natural Resources <b>Chomora Mikeka</b> University of Malawi	Involving heterogeneous user groups in developing innovations on digital platforms in healthcare (40)	<b>M. Mahundi, H. Kimaro</b> University of Dar es Salaam <b>Petter Nielsen</b> University of Oslo, Norway	Factors Influencing Learning Management Systems Use among Lecturers in Ghanaian Higher Education Institutions (5)	<b>Adolph Sedem Yaw Adu</b> Ho Technical University, Ho, Ghana <b>Judy Van Biljon</b> University of South Africa, South Africa

	Topic	Presenters	Topic	Presenters	Topic	Presenters	Topic	Presenters	Topic	Presenters
12:30	Connectivity Amidst Chaos: ICT Strategies for Displaced Populations in Conflict Zones (31)	<b>J. Bhanye</b> University of the Free State, South Africa <b>R. Shayamunda</b> University of Zimbabwe, Zimbabwe	An Understanding of How Learning Takes Place Amongst Crowdworkers Based in Nigeria Tech Hubs (67)	<b>M. Adetu</b> University of Sheffield, United Kingdom	Overcoming Marginalization: Mobile Payment Domestication by Underserved South African Micro-entrepreneurs (45)	<b>P. Mavela, P. Tsiolane</b> University of Cape Town, South Africa	Complexity and Distress in Open-Source Health Information System Implementations in Countries with Developing Economies – The Case of Lesotho (99)	<b>K. Moeketsi, I. Brown</b> University of Cape Town, South Africa	Digital Technology enabled Education for Sustainable Development in South Africa: a case study of a University of Technology (38)	<b>Margaretha Mhlabathi, Mourine Achieng</b> University of South Africa, South Africa
13:00	<b>LUNCH</b>									
	<b>SESSION 5A</b> Auditorium <b>Track: ICT in Displacement and Conflict Zones</b> Session Chairs: <b>F. Hussain, S. Brown</b>		<b>SESSION 5B</b> Venue 4 - Floor 1 <b>Track: General Track</b> Session Chairs: <b>J. Renken, R. Gómez</b>		<b>SESSION 5C</b> Venue 5 - Floor 1 <b>Track: Adoption of IS/IT systems</b> Session Chair: <b>Sarah Mulaji</b>		<b>SESSION 5D</b> Faculty Room - B Block <b>Track: Digital Platforms in the Global South - MHealth</b> Session Chair: <b>S. Pather</b>		<b>SESSION 5E</b> Executive Room - B Block <b>Track: ICT Curriculum and Education</b> Session Chair: <b>Gwamaka Mwalemba</b>	
14:00	The Interoperability Governance Challenge for Humanitarian Cash Transfer Programmes: Learning from the IFRC (46)	<b>S. Madon</b> London School of Economics, United Kingdom <b>E. Schoemaker</b> Switzerland	Exploring the Digital Readiness of Underprivileged Secondary Schools in South Africa (94)	<b>B. Flowers, M. Tanner</b> University of Cape Town, South Africa	Postcolonial 4IR Environmental Scanning for IS Education: A Transformative Mixed-Methods Approach for Decolonization and Inclusivity (55)	<b>Rennie Naidoo</b> University of the Witwatersrand, South Africa	Digital health, development and social exclusion: DHIS2 and HIV prevention among Adolescent Girls, Young Women and Key Populations in Zimbabwe (86)	<b>R. Matavire</b> HISP/Iltinordic AS <b>J. Braa</b> University of Oslo, Norway	Integration of Mathematical Internet Memes a Multimedia Resource into Kenya Secondary Mathematics Education (39)	<b>Dominic Mutua, Waweru Mwangi</b> Jomo Kenyatta University of Agriculture and Technology
14:30	The Unequal World of Migrant Domestic Workers in the Middle East: The Paradoxical Role of Technology (73)	<b>A. Idowu</b> University of Sussex, United Kingdom	The perspectives of marginalized South African youth on a pre-university outreach program: a photovoice study (7)	<b>M. Jordaan, N. Mennega</b> University of Pretoria, South Africa	Rationalising Effects of Mobile Applications: A Systematic Review of Literature (58)	<b>M. Chemisto</b> Islamic University in Uganda <b>G Amoako, N Tunzine, J. Azaki</b> University of Cape Town, South Africa	A Socialized affordance perspective of a mobile application for patients' assessment and referrals at the community level in Malawi (61)	<b>F. Matewere, J. Kaasbøll</b> University of Oslo <b>C. Kanjo</b> University of Malawi	Partners in Design: Insights from an Innovative Education for Sustainable Development Module Design Process (54)	<b>Timothy Savage</b> Trinity College Dublin, Ireland <b>P. J. Wall</b> Technological University Dublin, Ireland <b>Deepak Saxena</b> Indian Institute of Technology Jodhpur, Rajasthan, India
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16:30	"A bunch of sheep running towards somewhere" - Implications of digital transformation on the workforce (35)	<b>Catherine Seletedi, Gwamaka Mwalemba</b> University of Cape Town, South Africa <b>Kenneth Mashingaidze</b> University of Witwatersrand, South Africa	Fostering Diversity and Inclusion within Women Entrepreneurs: Strategies for Equitable Digital Transformation (28)	<b>N. Sarah J., O. Okolo</b> American University of Nigeria, Nigeria	Community and large-scale digital transformation for poverty eradication and economic growth in Africa: A rapid review of existing research for the period 2013-2023 (79)	<b>Hugo Lotriet</b> University of South Africa, South Africa				
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## **Using AI to Support Home Language Education in Conflict Zones: Lessons Learned**

*Laurie Butgereit (Nelson Mandela University, South Africa)*

According to the Secretary-General of the United Nations, nearly one quarter of the world's population is living in a conflict zone. That equates to nearly two billion people. According to Save the Children, nearly five hundred million children are living in a conflict zone. This paper presents lessons learned in deploying artificially intelligent tutoring artifacts in conflict areas to assist students in continuing their education during these difficult periods. This is not to trivialize the horrors of war. Rather it is to show that in less turbulent conflicts, education can continue despite the hardships.

## **Factors Influencing Learning Management Systems Use among Lecturers in Ghanaian Higher Education Institutions**

*Adolph Sedem Yaw Adu (Ho Technical University, Ho, Ghana)*

*Judy Van Biljon (University of South Africa, South Africa)*

The Covid-19 destruction cannot be undone but the pandemic also created novel opportunities. Digitization of teaching and learning in Higher Education Institutions (HEIs) through the introduction of digital platforms like Learning Management Systems (LMS) received unprecedented attention and funding. However, the developmental gains depend on the LMS's continued use by both lecturers and students. The utilization of LMSs for teaching and learning by lecturers in Ghanaian HEIs is low and related research is limited. Therefore, this paper reports on an investigation into the factors influencing the usage of LMSs by lecturers in Ghana using a qualitative interpretive approach to improve LMS adoption. Data was collected through focus group discussions with lecturers across four HEIs and analyzed thematically using Atlas.ti. When compared with LMS adoption factors from literature the findings revealed previously unidentified contextual factors affecting the use of LMSs among lecturers. This study contributes to addressing the gap in LMS studies on Ghana and makes a novel contribution by highlighting the influence of environmental and financial factors on LMS usage and the implications of students' financial status, physical location, classroom infrastructure, and accommodating diversity in religious traditions as factors influencing LMS use. These findings highlight digital technology's potential to distribute access more equitably but also to increase inequality. Therefore, an understanding of contextual factors and policy implications' impact on the inclusiveness of digital transformation in the Global South is critical. Attention to these factors could improve the use of LMSs towards harnessing the developmental benefits as intended.

## **The perspectives of marginalized South African youth on a pre-university outreach program: a photovoice study**

*Martina Jordaan and Nita Mennega (University of Pretoria, South Africa)*

As part of its mission to reach out to and support students from disadvantaged backgrounds, the University of Pretoria established a programme called the Pre-University Academy (PUA) on its Mamelodi Campus. The PUA hosts courses to complement learners' school-based learning and further develop their skills so that they can prepare effectively for their tertiary studies. This paper describes how the learners of the PUA utilised the photovoice process, which involves photography, writing and group discussions, to identify the value the programme holds for them. The research used photovoice as a visual data collection method and analysed the qualitative data using reflective thematic analysis. This approach aims to identify patterns of meaning in a dataset and address questions related to peoples' experiences, views and perceptions. The learners articulated that the PUA held great value for them, both in the present and for their future prospects. They recognised the importance of being part of an academic environment, as the community college setting grants them benefits in terms of both academic and social development.

## **Perceptions on the Adoption of Blockchain for FinTech Applications in the Banking Industry in Developing Countries**

*Natasha Oates, Sumarie Roodt and Sarah Mulaji (University of Cape Town, South Africa)*

This study explores the adoption of blockchain for Fintech applications in the banking industry in developing countries to understand the perceptions and identify use cases and factors affecting the adoption. Thematic analysis was performed on data collected through semi-structured interviews across four banking-related firms. Results suggest a lack of understanding and Fintech perceptions negatively associated with Bitcoin. It is proposed that through further education and implementation of working production-grade use cases, the perception will improve. Several use cases were identified, with Real-Time Gross Settlement as the most prevalent. Based on the Technology-Organisation-Environment (TOE) model particularised, 13 factors were found to affect the adoption positively or negatively. Theoretical insights gained about TOE suggest the issue of similar factors designated using different terminologies across different related studies.

## **Information Ethics in Knowledge Sharing, Transfer, and Translation**

*Manoj Thomas, Dirk Hovorka (University of Sydney), Vera Sistenich (St. George Hospital), Yan Li (Claremont)*

*Graduate University)*

Technology development practices in many low-income countries result in less-than-optimal outcomes for their intended beneficiaries. Information and Communication Technologies for Development projects aim to mitigate such inefficiencies and inequities. One means is through knowledge sharing, and its encompassing functions: knowledge transfer and knowledge translation. The practices may have unintended detrimental consequences, which we scrutinize through the lens of information ethics. We present examples from an Emergency Medicine project in the Democratic Republic of Congo to explore the ethical imperatives associated with enabling access to information and the need for knowledge translation. Findings from three focus group discussions are presented that draw attention to moral obligations of agents engaging in knowledge sharing, and the importance of addressing information ethics in related initiatives.

### **ICT4D Research: The Lame Duck of the Brazilian Academy of Management**

*Luiz A.Joia (Getulio Vargas Foundation, Rio de Janeiro, Brazil)*

Recent surveys indicate that about 80% of the world population resides in developing economies. This number reveals the huge importance of this region. However, nearly 50% of people in developing economies suffer from extreme poverty, struggling with issues such as inadequate access to clean water, substandard housing, and a disappointing education. Consequently, for some time now, a debate has emerged about the potential of Information and Communication Technology (ICT) to improve socio-economic conditions prevailing in impoverished nations. This discussion has given rise to a burgeoning field of research known as ICT for Development (ICT4D), which has attracted increasing attention from both academics and policy makers. However, it is intriguing to note that a notable feature of this field is that most academics in the ICT4D arena do not come from developing economies, nor do they reside in these regions, the main beneficiaries of ICT4D initiatives. This is the case of Brazil, a country characterized by significant socio-economic disparities, in which this field of study remains largely overlooked and under-researched. As a result, most of the ICT4D knowledge base has been generated either by academics who are not originally from developing economies or by academics native to them who currently reside in developed economies. Consequently, this article seeks to raise and discuss an important issue: Why don't Brazilian scholars prioritize research in the area of ICT4D, thus preventing the generation of knowledge that could lead to improvements in Brazilian society?

### **Smart City for Civic Participation: A Conceptual Framework**

*Manuela Lorenzo and Luiz Antonio Joia (FGV EBAPE, Brazil)*

The emergence of Information and Communication Technology has allowed the transformation of urban governance into smart governance, leading cities to fulfill their mission and develop their processes more efficiently and effectively. In this context, civic participation has become fundamental to the success of smart city initiatives. In this vein, this article aims to investigate how smart city initiatives promote civic participation through smart governance. After a systematic review of the literature, the antecedents, moderators and mechanisms associated with this relationship were identified. The antecedents or structural factors are: technological, political & socio-economic and local government contexts. Furthermore, digital exclusion and citizens' educational background are proposed as instrumental factors. This research concludes that to increase civic participation it is essential to address issues like the digital divide and provide citizen education. Lastly, it is concluded that smart governance is a key mechanism through which smart city initiatives can enable civic participation.

### **Organisational support for ICT4D practitioner performance: a new pathway for enhancing ICT4D project outcomes.**

*Epiphania Kimaro, Jaco Renken, Natalie Cunningham and Richard Heeks (The University of Manchester, UK)*

Organisational literature shows that outcomes such as project success are significantly influenced by how organisational practices influence actions and behaviours of organisation actors, but the mechanisms through which this happens in ICT4D are unknown. This article describes a two-phase research study involving multiple case studies and action research, conducted with 33 ICT4D practitioners from five ICT4D implementing organisations in East Africa. The concept of Organisational Support was used to understand how practices in these organisations influence practitioner performance, revealing eight key mechanisms: (1) Reinforcing Mission-Congruence; (2) Skills Hybridisation; (3) Supervisory Mentorship; (4) Socioemotional Support; (5) Support for Personal Aspirations; (6) Balancing Monetary with Non-monetary Rewards; (7) Involvement in Reward Decisions; and (8) Autonomy Support. The mechanisms were developed iteratively, beginning with a largely inductive approach in Phase One, then validated as part of the action research study in Phase Two. The findings provide a new and practical pathway for enhancing ICT4D project outcomes and establishes a foundation for future ICT4D organisational studies.

### **A framework for promoting digital transformation and the adoption of enterprise architecture in South Africa's public sector.**

*Gugu Tshuma, Elmarie Kritzingler and Shawren Singh (University of South Africa, South Africa)*

The digital transformation of the public sector, which has become a critical aspect of modern public administration, involves using modern technologies, like cloud computing, data analytics, the internet of things (IoT), artificial intelligence (AI) and social media platforms to improve governmental efficiency, transparency and effectiveness [1]. Enterprise architecture (EA), which has emerged as a valuable tool for planning and deploying DT complexities, is widely used in the private sector, with its application in the public sector being, as yet, relatively limited [2-3]. The

current researchers performed a systematic literature review to identify barriers to EA implementation in the public sector, and to suggest effective best practice frameworks that can promote its acceptance and accelerate digitalisation. The barriers identified in this study include the lack of support from higher-level management, the limited organisational capacity, the insufficient shared understanding of EA and the required policies, and the lack of skills. The present study presents a framework for overcoming such constraints and for accelerating both DT and EA adoption within the public sector. The framework contains seven key elements: leadership and political commitment; organisational capability; EA governance; a national digital coordination centre; regulation and policy; technical skills; implementation guidelines; and maturity framework.

### **Schoolteacher demographic characteristics and the intention to promote cyber-safety awareness.**

*Kagisho Mabitle and Elmarie Kritzinger (University of South Africa, South Africa)*

School learners have convenient access to the Internet through their handy mobile phones. Consequently, they are vulnerable to cyber-risks such as cyber-bullying and human trafficking. Therefore, school learners need to be made aware of cyber-safety measures. This study examines 7 demographic characteristics (i.e. age, experience, gender, type of school, location of school, school district, and highest qualification), and their role in predicting the schoolteachers' intention of raising cyber-safety awareness at their schools in the next 12 months. This insight is particularly important as it unveils the predictive power of the respective demographic variables, with regards to teachers' cyber-safety awareness intentions at schools. A survey of 109 schoolteachers across 18 schools in 2 districts was conducted. Independent sample t-tests were used to analyse the differences between two groups of teachers in terms of age, teaching experience, gender, school type, school location, and school district. One-way ANOVA was used to analyse the differences in teachers' highest qualifications. The study found that teachers from the Sedibeng East school district, and those in private schools, had higher intentions of raising cyber-safety awareness at their schools in the next 12 months. Irrespective of their age, teaching experience, gender, school location, and highest qualification, the surveyed schoolteachers had similar intentions of raising or promoting cyber-safety awareness at their schools in the next 12 months.

### **Fake News in Developing Countries: Drivers, Mechanisms and Consequences**

*Vincent Mwendwa Masavah and S. Marita Turpin (University of Pretoria)*

Fake news has become a global problem. Drivers in the spread of fake news include the growth of the world wide web and the growth in the use of smartphones and social media. In the field of ICT4D, access to mobile phones and the internet has strongly been promoted in developing countries, for the sake of socio-economic development. However along with the availability and use of mobile technology, the Internet and social media in developing countries, the prevalence and risk of fake news have also increased. While many studies have been performed on fake news, most of these have been done in the Global North. This study attempts to address this gap by investigating the state of knowledge of fake news in the Global South. A systematic literature review is performed that focuses on the spreading and consequences of fake news in developing countries. A thematic analysis found that, like in the Global North, fake news in the Global South is predominantly spread by means of social media. The consequences of the spreading of fake news in developing countries include an increased mistrust in mainstream media, as well as a mistrust in various vaccines which leads to a health risk. Further, fake news has been shown to contribute to violent unrest and to worsen religious crises. Fake news poses the risk of undermining the benefits associated with increased connectivity in developing countries. This is a call for the ICT4D community to consider ways to address the risk of fake news.

### **Fostering Diversity and Inclusion within Women Entrepreneurs: Strategies for Equitable Digital Transformation**

*Nankyer Joseph and Omachi Okolo (American University of Nigeria, Nigeria)*

The digital transformation era presents both unprecedented opportunities and challenges for entrepreneurs. This digital ecosystem is construed as a leveler for diversity and inclusion in entrepreneurship. This paper addresses the critical intersection of gender diversity, entrepreneurship, and the digital landscape. The paper explores the multifaceted role of women entrepreneurs as catalysts for digital transformation and investigates the barriers and challenges they encounter in this dynamic ecosystem. By drawing from relevant literature review, empirical research, and theories, it offers practical strategies and best practices to foster diversity and inclusion, empowering women entrepreneurs to not only survive but thrive in the digital business environment. The impacts and benefits of promoting diversity and inclusion within women-led digital businesses are rigorously examined, underscoring the advantages that such a paradigm shift can bring to organizations and society as a whole. Furthermore, this paper provides actionable recommendations for policymakers, business leaders, and women entrepreneurs themselves, paving the way for a more equitable and innovative digital future. This paper contributes to this vital discourse, highlighting the transformative and mediating power of cyberfeminism to galvanize strategic steps and activism required to create a digital ecosystem that drives diversity and inclusion for women entrepreneurship.

### **Digital Mental Health in Humanitarian Crisis in Bangladesh**

*Hasib Ahsan and Lars Rune Christensen (IT University of Copenhagen, Denmark)*

The mental health issues of refugees displaced by violence and affected by humanitarian crises are significant but may be underestimated by healthcare providers. This paper reports on a five-month field trial of a digital screening tool in the Kutupalong refugee camp in Bangladesh. The screening tool is based on the WHO SRQ-20 standard with twenty

questions to identify people showing symptoms of mental health issues. The paper demonstrates that not only can digital mental health interventions identify people with symptoms of mental health issues in a refugee camp, but the approach can also identify predictors of mental health issues. First, findings show that of 1630 persons screened, 20.1 % exhibited indications of significant mental health issues. Second, a binary logistic regression analysis finds that three of the questions or variables have high 'odds ratios' and are, therefore, significant in their ability to predict mental health issues. These predictors are substantiated through semi-structured interviews with the refugees that highlight particular issues of concern.

### **Empowerment of health managers through digitalization in Bangladesh**

*Abu Sadat Mohammad Sayem and Jens Johan Kaasbøll (University of Oslo, Norway)*

There is little empirical research on digitalization in health information systems and its impacts on health managers using the concept of empowerment. In developing countries, health managers are often perceived as weak, leading to a need for more data utilization. In this qualitative study, empowerment was used as a concept from Alsop, an opportunity to make choices, effectively use choices, and convert choices into desired actions. The concept was operationalized through three thematic areas of the health manager's role in decisions, analysis, and action in health management. An interpretative study was designed using qualitative methods, and thematic analysis of the interviews revealed new subthemes to explain empowerment among health managers. The health managers significantly improved their management capacity by accessing data efficiently, making competent decisions, performing better, and having the authority to act. The manager demonstrated a commendable ability to analyze data and was highly motivated to take systematic action. This is in contrast to some studies that have shown a tendency towards underutilization of data after digitalization. Digitalization encouraged managers to predict, take leading roles, and compete to achieve set targets. They could also identify the challenges of digitalization and continue developing and improving their performances. In conclusion, the study showed how the empowerment lens could be applied to measure a health manager's capacity in decisions, analysis, and actions. The positive outcome of empowerment can be attributed to the productive interaction between digitalization and health managers in a specific context.

### **Connectivity Amidst Chaos: ICT Strategies for Displaced Populations in Conflict Zones**

*Johannes Bhanye (University of the Free State, South Africa)*

*Ruvimbo Shayamunda (University of Zimbabwe, Zimbabwe).*

Conflict-induced displacement poses a complex global challenge, disrupting the lives of millions and straining the provision of essential services. Amidst this chaos, Information and Communication Technologies (ICT) have emerged as critical tools to address the challenges faced by displaced populations. This paper explores the pivotal role of ICT in offering solutions and fostering connectivity for individuals and communities affected by conflict-induced displacement. The paper is based on a qualitative desktop review methodology encompassing an extensive literature review, case studies, and an analysis of emerging technologies. The review examines seminal works on forced migration, while case studies highlight successful ICT interventions, such as mobile connectivity initiatives and cash transfer programs. Challenges, including digital divides, are critically examined, leading to actionable recommendations for policymakers, humanitarian organisations, and technology developers. The paper concludes by envisioning future directions and emphasising the transformative potential of Information and Communication Technologies on the lives of those affected by conflict-induced displacement.

### **Facilitating Gig Work Opportunities for Youth in Developing Countries: A Systematic Literature Review**

*Kagiso Molema, Marita Turpin (University of Pretoria)*

*Jean-Paul Van Belle (University of Cape Town)*

Gig work presents a promising prospect for youth in developing countries by offering a flexible and economically viable alternative in the face of high unemployment rates. This Systematic Literature Review (SLR) looks to uncover practical strategies and best practices to facilitate the creation of gig work opportunities for youth in developing countries. It poses two research questions, namely: What gig work opportunities exist for youth in a developing country context, and what practices and strategies facilitate the creation of these opportunities? The SLR identifies a number of gig work jobs and groups them into five categories including online consulting, gig work, online micro-tasking, and social media content production. Eleven strategies and two practices for fostering the creation of gig work opportunities in developing countries are identified from the 20 articles included in the study. The strategies range from providing training, improving infrastructure, enacting legislation, raising awareness, to governments creating gig work opportunities by putting tasks on these platforms or creating their own platforms. Consequently, the SLR calls for future research to evaluate the outcomes of strategies and practices implemented to unlock gig work opportunities for youth in developing countries. The SLR also suggests further research into better mapping the exact type of skills necessary to take advantage of the promising gig work opportunities available.

### **Assessing Factors Affecting Doctors Access to Medical Knowledge at Point-of-care in the Context of Evidence-based medicine**

*Edmond C. Kungwalo (University of Malawi),*

*Gregory Kunyenje (Catholic University, Chiladzuru, Malawi) and*

*Chipo Kanjo (University of Malawi)*

Studies show that despite the abundance of research to inform clinical practice, many patients do not receive Evidence-based healthcare, especially in Low-income countries. This study assessed factors that doctors consider important with respect to therapeutical information and medical knowledge when making decisions about patient treatment in the context of Evidence-based medicine (EBM). EBM emphasizes the importance of integrating patients' values and current research findings when formulating care strategies to enhance efficiency and reduce medical errors. Following an interpretive paradigm through Information behavior lens, the study utilized interviews and examination of artifacts to gather data from purposively selected participants at a tertiary public hospital in Malawi. Findings revealed significant challenges, including; absence of Hospital-wide information systems, lack of time, high disease burden, insufficient tools, and political factors. There are opportunities however, such as online medical libraries and state-of-the-art medical schools that can contribute to the development and implementation of EBM.

### **"A bunch of sheep running towards somewhere" - Implications of digital transformation on the workforce**

*Catherine Seletedi, Gwamaka Mwalemba (University of Cape Town)*

*Kenneth Mashingaidze (University of Witwatersrand)*

Digital transformation affects workers as well as organisations. However, research regarding the impact of digital transformation on the workforce is limited. To address this gap, a case study was conducted on a telecommunications firm that has embarked on a digital transformation journey. The aim is to explore the implications of digital transformation on the workforce. Data was collected through interviews and analysed using thematic analysis. The findings showed that the workforce experienced a lack of communication and clear leadership from management, changes to the organisational structure, and a lack of opportunities for training and development. One of the respondents summarised the experience as "A bunch of sheep running towards somewhere ". Despite these experiences, the workforce demonstrated remarkable resilience in their approach to their work. The study contributes to the growing body of knowledge on digital transformation, specifically on the consideration of the role of employees when formulating digital transformation strategies.

### **Drawing a Map in the Sand: Locating an Ethics of Care in the ICT-Related Migration Practices of Older Volunteers in the US Southwest**

*Sara Vannini (University of Sheffield),*

*Ricardo Gomez (University of Washington),*

*Bryce Newell (University of Oregon)*

Critical migration studies have highlighted the risks of using digital technologies in the space of migration, underlying its implication for migrants' privacy rights, government surveillance, and information capitalism. In U.S. Customs and Border Protection's Tucson sector, stretching across Arizona, one of the busiest and most dangerous borders in the USA, volunteer organizations work to prevent the death of unauthorized migrants undertaking the journey through the Sonoran Desert. Volunteers, typically elderly, study and map migratory trails to provide water where it is likely to be found by migrants. They employ a combination of paper-based and dated, yet sophisticated technologies for gathering essential data to support this potentially life-saving work. In this article, we discuss their information and data practices, and we argue that their approach is an example of the application of an ethics of care to an informational space. Based on interviews and participant observations, we suggest that volunteers' general refusal to adopt more efficient data practices indicate both a resistance to change from already ingrained practices, as well as an application of caring ethics within the field of migration and information for the pursuit of social justice.

### **A multi-method text analysis approach for studying ICT4D projects in developing countries: A case of agricultural commissioning in India.**

*Ranjan Vaidya (Auckland University of Technology, New Zealand)*

The current farmer protests in India involve different power groups. Commission agents are essential stakeholder groups in these protests. The critical research approach is suited to situations characterised by power differences. This research studies the implementation of the Indian government's agricultural marketing information systems project. It uses two methods to analyse the interview data. The interview data were collected from four stakeholder groups: farmers, traders, government officers, and private vendors implementing the information systems project. First, I analyse the data using thematic analysis, followed by an n-gram word cloud analysis. While the thematic analysis does not identify commissioning as a core theme, the n-gram analysis identifies the commission agent as a dominant word in the data corpus. The findings suggest that using two different text analytical methods on the same data corpus enhances knowledge and reveals otherwise hidden aspects.

### **Digital Technology enabled Education for Sustainable Development in South Africa: a case study of a University of Technology**

*Margaretha Mhlabathi and Mourine Achieng (University of South Africa, South Africa)*

South Africa is confronted with various social development challenges, and the higher education sector is well-positioned to address these challenges by developing and implementing appropriate solutions. Furthermore, as technology becomes more prominent in the global development agenda, its adoption in higher education holds great promise for advancing education by overcoming some traditional barriers and transforming pedagogical practices and learning outcomes. This study seeks to understand how digital technologies can facilitate education for sustainable

development (ESD) in the context of a university of technology to enhance students' learning outcomes and competencies needed in today's job market. The research design adopted a qualitative case study approach. Semi-structured interviews were conducted with purposively selected participants at a university of technology. The data analysis was guided by the Unified theory of acceptance and use technology (UTAUT) as a theoretical lens to identify patterns and interpretations of digital technology enabled ESD. Data analysis suggests that facilitating conditions such as educator training, adequate policies and strategies, and reliable digital infrastructure are important determinants of the behavioral intentions to use digital technology to facilitate ESD. It is also determined that social factors such as digital divide can impede the use of technology in ESD. The study contributes towards understanding factors that enable effective integration of digital technologies to facilitate ESD in higher education.

### **Integration of Mathematical Internet Memes a Multimedia Resource into Kenya Secondary Mathematics Education**

*Dominic Mutua and Waweru Mwangi (Jomo Kenyatta University of Agriculture and Technology)*

Mathematics education is compulsory in most secondary curriculums around the globe and is a critical discipline among the STEM subjects. Therefore, as a subject that is highly practical in multiple fields and curriculum subjects, developing mathematical instructional approaches that enhance mathematics education is necessary. This study investigated the influence of mathematical internet memes in secondary mathematics education. The mixed method research approach was applied, and data collection techniques used were observation, achievement tests, questionnaires, and focus groups. The results revealed that integrating mathematical internet memes in mathematics classrooms enhances students' motivation and engagement. Moreover, the study revealed that mathematical internet memes provide similar feedback as traditional formative assessment and, therefore, a viable alternative tool for formative assessment. The study further showed that integrating mathematical internet memes has no significant impact on learners' performance in mathematics. However, results from the focus group indicate that students believe that integrating mathematical internet memes in mathematics classrooms can potentially improve their performance in mathematics.

### **Involving heterogeneous user groups in developing innovations on digital platforms in healthcare**

*Masoud Mahundi, Honest Kimaro (University of Dar es Salaam)*

*Petter Nielsen (University of Oslo)*

This study investigates how diverse users can be involved in developing innovations on existing digital platforms. While user participation is emphasized in the design and development of digital platforms, little is known about how heterogeneous user groups can be involved in the design and development of large-scale information systems. The current knowledge base is confined to the context of small-scale information systems with homogenous groups of users. We conducted a qualitative case study where we studied the process of developing innovations on a health digital platform in Tanzania between 2017 and 2019. We investigated three innovations; the mobile application for data management, a case-based TB and leprosy system, and the development of a scorecard system. We found that heterogeneous user groups in digital platforms exist in a continuum of roles, including *end-users*, *use mediators*, *facilitators*, *technology mediators*, and *platform owners*, without strict boundaries. Further, we identified three methods of engaging users in these roles depending on the nature of the requirements: participation for policy-level needs, participation for organisational requirements, and participation for technical requirements. We recommend that information systems development adopts this classification of users and their methods of participation from as early as project conceptualisation.

### **Understanding the role of student library anxiety and attitude as determinants of the intention to use the digital library system**

*Niki Kunjuzwa, Liezel Cilliers and Willie Chinyamurindi (University of Fort Hare, South Africa)*

There are growing calls to understand the determinants that can enhance the use of digital library systems within universities. Addressing factors related to library anxiety can potentially enhance the end-user experience of using digital library systems. The study aimed to understand the role of library anxiety and attitudes as determinants of the intention to use a digital library system. A quantitative research approach using a survey method was used to collect data from 316 students at a public university in South Africa. Inferential statistical analysis was used to test associations between variables. The findings showed that impediments such as a) barriers with staff, b) affective barriers, c) comfort library barriers, d) knowledge of the library, e) mechanical barriers, and f) resource barriers affect attitudes towards usage of digital library systems. Further, these identified impediments not only affected attitudes but also intention to use digital library systems. Based on the findings, implications are made with suggestions on enhancing end-user experiences towards digital library systems usage. A precursor to this, as shown by the study's findings, is to address especially library anxiety barriers.

### **Making our digital world a better place: Spiritual Leadership and Digital Transformation**

*Adelaide Mphahlele, Hossana Twinomurinzi and Crystal Hoole (University of Johannesburg, South Africa)*

In the dynamic and rapidly advancing digital era, leaders bear a crucial responsibility to steer our worlds to a better place. Spiritual leadership (SL) is today gaining prominence as an alternative approach in an increasingly digital world, particularly for its ability to align ethical values and human-centric principles with the technological and strategic demands of digital transformation (DT) in the Fourth Industrial Revolution (4IR). In this study, we extend the

traditional focus of ICT4D from business, social and organisational models to include the role of leadership practices to leverage digital technology. The study, therefore, performed a bibliometric scoping review on the confluence between SL and DT. The key results from 188 publications reveal that DT is primarily studied through a technocentric lens and much less from the leadership view. The continents of Africa, North and South America have not engaged much with SL/DT. There is limited collaboration between countries. DT necessitates reevaluating organisational leadership, moving from classical models to approaches that emphasize human and ethical dimensions. This shift aligns with a growing focus on SL and behavioural psychology in management. The pervasive impact of DT across various sectors underscores its role as a global trend, necessitating adaptive strategies across industries. The study contributes to ICT for Development (ICT4D) and DT literature in charting an alternative approach to the role of digital technology in human and social development. The study also makes recommendations for further research.

### **Overcoming Marginalization: Mobile Payment Domestication by Underserved South African Microentrepreneurs**

*Phakamani Mavela and Pitso Tsibolane  
University of Cape Town, South Africa*

Mobile payment technology has become widespread among businesses globally, offering an alternative to traditional payment systems. However, existing literature does not adequately explore the underlying factors influencing how underserved microentrepreneurs appropriate, objectify and incorporate mobile payments into their business processes and lives. This study, guided by Technology Domestication and Actor-Network Theory, qualitatively examines the motivations, contextual factors, and design features that enable mobile payment domestication among twenty ( $N=20$ ) underserved South African microentrepreneurs. Thematic analysis of the in-depth interviews revealed persisting financial exclusion, growth optimism, and risk reduction as primary motives for long-term mobile payment use, while the spider network community practices, payment service provider and consumer culture dynamics, infrastructural and regulatory landscape are influential contextual conditions. Inclusive and flexible design, affordability, and trust emerged as key mobile payment design considerations impacting overall mobile payment domestication. Policymakers and payment platforms can contribute positively by participating directly in local microenterprise-centered development initiatives. Further research is needed to explore the evolving needs and expectations of microentrepreneurs and understand the developmental impacts of these technologies.

### **The Interoperability Governance Challenge for Humanitarian Cash Transfer Programmes: Learning from the IFRC**

*Shirin Madon (LSE, United Kingdom)  
Emrys Schoemaker (Switzerland)*

Interoperability is of increasing concern within the humanitarian sector as new actors, systems and technologies combine to provide solutions to disaster victims while addressing the sector's reform objectives in a joined-up way. A significant area of innovation assumed to work towards achieving these two reform objectives is CVA (Cash & Voucher Assistance) delivered through financial service providers. The digital technologies that enable CVA are widely perceived to enable interoperability and advance these reform objectives. As CVA is rapidly becoming the preferred modality of delivering humanitarian assistance, the sector is very much at the early stages of understanding and developing an approach to interoperability. Drawing on information systems literature, we seek to advance theoretical understanding of interoperability and its relation to the infrastructure discourse. Going beyond the current policy narrative, we recognise that for different actors to interoperate to provide CVA to affected individuals requires the development and sharing of an information infrastructure. We study how CVA interoperability is currently being strategized and operationalised through a qualitative case study of the International Federation of Red Cross and Red Crescent Societies (IFRC). Our analysis provides a greater understanding of the key mechanisms for increasing interoperability, contextual barriers for its achievement and the implications of the current focus on interoperability for humanitarian governance.

### **Experiences of Visually Impaired South African Government Employees with E-Government Services**

*Juliet Ramadimetja, Salah Kabanda and Millicent Agangiba (University of Cape Town, South Africa)*

Most governments have integrated digital technologies into all facets of their operations to improve internal government operations and enhance effective and efficient service delivery to the citizenry. As a result, accessibility of e-government services is important for all citizens, especially for persons with disabilities (PWDs). Government plays a crucial role in addressing accessibility challenges internally before services can be cascaded to all citizens. While several studies have evaluated the accessibility of e-government services to PWDs, these studies have not explored the perspective of visually impaired government employees. With this gap in mind, the purpose of the study is to explore the experiences of visually impaired government employees with e-government services. The study is inductive and uses qualitative semi-structured interviews to collect data from ten visually impaired government workers. The findings identified six themes that shape employees' experiences with e-government services. The findings contribute to the gap in literature on the accessibility of e-government services for PWDs employed in the government sector. The study also underpins directions for management in government workplaces regarding the

needs of PWDs.

### **Climate Change and Displacement: Emerging ICT Innovations from the World's Largest Refugee Camp**

*Faheem Hussain (Arizona State University, USA)*

*Suzana Brown (SUNY Korea, South Korea)*

This paper investigates the potential of Information and Communication Technology (ICT) in aiding Rohingya refugees in Cox's Bazar, Bangladesh, affected by climate change-induced disasters. Focusing on creating tailored solutions, the study highlights challenges faced by refugees and the limited use of ICTs in providing effective support. Collaborating with Young Power in Social Action (YPSA) and their Voice of Palong (VoP) project, the research emphasizes the need for localized early warning systems and communication strategies. VoP's initiatives, including radio programs and audio-visual content, empower refugees and host communities, enhancing resilience and cohesion. The review examines the concept of climate refugees, ICT's role in resilience, and vulnerabilities of Rohingya refugees. It stresses the importance of ICTs in monitoring climate change and underscores challenges faced by refugees in vulnerable areas. Discussing emerging themes like communication challenges, mistrust due to misinformation, and ICTs for localized content, the paper concludes by advocating collaborative efforts to utilize ICTs for climate change adaptation and disaster risk reduction. It suggests scaling similar initiatives globally to revolutionize disaster response approaches in various humanitarian settings.

### **Contextual usability of Fintech by African Caribbean Micro-Business Owners in the UK**

*Adebowale Owoseni, Caroline Khene, Adeola Adedigba and Moshood Adisa (De Montfort University, UK)*

This research assessed in context, the usability of two widely used fintech platforms, with a focus on identifying gaps that exclude African Caribbean micro-businesses in Leicester from maximizing the affordances of the platforms. Drawing from an integrated perspective of Affordance and Activity Theories, the study involved collecting data from 12 microbusiness entrepreneurs through semi-structured usability interviews, observations, and competitive benchmarks. Data was analyzed using user journey maps, thematic analysis of observation notes, and transcribed interviews. The analysis revealed significant contextual issues that the fintech platforms have failed to address, which include community-driven needs and trust-related concerns with how data could be used for surveillance among African-Caribbean community. Additionally, platform-specific challenges such as disparities in features across iOS and Android platforms, as well as web interfaces, posed challenges for a seamless user experience. The research also pointed out the redundancy in requesting certain information that was not relevant to all business types, highlighting the need for more tailored and context-sensitive platform designs. These findings have significant implications for inclusivity in fintech platform design and other digital platforms that could enhance inclusivity, development, and growth of minority businesses in the UK and the Global North by extension.

### **Understanding chilling effects in digital spaces– a study of Ugandan LGBT+ advocacy in the wake of the draconian 2023 Anti-homosexuality Act**

*Cecilia Strand (Uppsala university, Sweden)*

Against the backdrop of the recently passed Ugandan Anti-homosexuality Act 2023 (AHA2023), which directly targets LGBT+ activist and their rights advocacy, this paper seeks to explore if the AHA2023 had a chilling effect on Ugandan LGBT+ activism in their key online social platform, Twitter. By comparing Twitter data sets from 2022 and 2023 quantitatively and analyzing a post-AHA corpus comprising of 611 tweets qualitatively, the results indicate that AHA 2023 produced a chilling effect on the content level but not on the activity level. The AHA2023 did thus not silence Ugandan LGBT+ activists' digital activism but appears to have impacted the content in some critical ways. Most concerning, Ugandan LGBT+ activists' explicit self-penned demands for equal human rights almost disappear. Rights demands did not disappear from the Uganda LGBT+ Twittersphere but were primarily promoted and kept alive by international development, Western bilateral partners, and human rights allies. The long-term impact of the discursive shift in Ugandan LGBT+ activism is still unfolding, and it is arguably too early to identify the impact of the aforementioned troublesome chilling effects on content. There is, however, a reason to suspect that the loss of Ugandan voices will negatively impact efforts to challenge the post-colonial amnesia that sustains erroneous beliefs around African sexuality as singularly heterosexual. This case study can serve as a critical case for understanding the chilling effects caused by heavy-handed legislation. The study also seeks to contribute methodologically by offering insights into how chilling effects in digital spaces can be studied empirically.

### **Smart Cities for Whom? Exploring the Role of Gunshot Detection Systems in Marginalized Communities**

*Severo Pastor, Grant Oosterwyk, Pitso Tsibolane and Irvin Kinnes (University of Cape Town, South Africa)*

The growing concept of smart cities has led to the development of technology-based initiatives to enhance urban safety. Among these, gunshot detection systems (GDS) have emerged as a potential tool for crime prevention. This paper examines the implementation of a GDS in Cape Town, a city that simultaneously holds the title of a smart city while grappling with a persistent gun violence problem, particularly in marginalized communities. In particular, the study focuses on exploring the perceived effectiveness of GDS in reducing gun violence in Cape Town's marginalized Cape Flats community. Using a qualitative, inductive approach, the research aimed to discover new insights and provide residents with a platform to share their voices across three communities where the GDS and other smart crime



prevention technologies have been deployed. The findings highlight a complex interplay of social (drug trafficking and gangsterism), economic (poverty), and technical factors (unreliable supply of electricity) that negatively influence the perception and implementation of gunshot detection systems in marginalized communities. Addressing these issues requires a holistic approach that considers community engagement, poverty alleviation, communication strategies, and considerations for the ethical implications of surveillance technology. This research holds valuable insights for developing inclusive urban safety strategies.

### **Partners in Design: Insights from an Innovative Education for Sustainable Development Module Design Process**

*Timothy Savage (Trinity College Dublin, Ireland),*

*P. J. Wall (Technological University Dublin, Ireland),*

*Deepak Saxena (Indian Institute of Technology Jodhpur, Rajasthan, India)*

This paper presents a case study of an innovative module design process for education for sustainable development in higher education, specifically in digital innovation to achieve the Sustainable Development Goals that the authors were charged to create. An analysis of the goals of education for sustainable development led the authors to identify intercultural learning groups and authentic situated case studies as key components of an effective module design. This presented the research problem of how to identify both situated, innovative and socio-culturally appropriate development case studies, and groups of learners from culturally diverse locations with whom to partner for the creation of intercultural learning groups. This qualitative reflective case study presents the approach undertaken whereby the authors engaged with higher educational institutions engaged on the ground with sustainability initiatives in key countries (India, Uganda, and Ethiopia) to both identify appropriate case studies for collection and potential student group partners for the proposed roll out of the finished module. The experience is described and challenges and opportunities to this approach presented and discussed.

### **Postcolonial 4IR Environmental Scanning for IS Education: A Transformative Mixed-Methods Approach for Decolonization and Inclusivity**

*Rennie Naidoo (University of the Witwatersrand, South Africa)*

The Fourth Industrial Revolution (4IR) heralds a significant turning point for Information Systems (IS) education in the global South, particularly in postcolonial nations such as South Africa. This study aims to introduce a preliminary transformative mixed-methods approach to environmental scanning for assessing and responding to the rapidly evolving postcolonial IS educational landscape in the 4IR era. Drawing from recent theoretical and methodological advances in IS and postcolonial research, this approach uniquely combines quantitative data analysis for broader trend identification with qualitative inquiries to capture in-depth perspectives from diverse educational stakeholders in postcolonial contexts. This transformative sociotechnical tool can better align IS curricula with rapid technological advancements and varied industry needs while critically addressing the social, political, cultural, ethnic, and economic development complexities inherent in postcolonial contexts. The paper proposes a complementary approach for employing an adapted environmental scanning approach that extends upon conventional mixed-methods approaches by explicitly addressing social injustice, inequality, and power issues in postcolonial regions. The paper also discusses the sociotechnical challenges of implementing this approach in diverse and resource-constrained educational environments, such as limited funding, access to technology, and a deficit of postcolonially-sensitive educators. This paper aims to contribute to advancing IS education and guiding administrators, educators, and policymakers in developing technologically current and socially inclusive curricula. This paper lays the groundwork for future empirical research and transformative IS education discourse and actions for postcolonial regions in the 4IR era.

### **Exploring COVID-19 Vaccine Misinformation on Twitter (x): A case of #VaccineRollOutSA**

*Sivile Manene and Liezel Cilliers (University of Fort Hare, South Africa)*

Social media has become part of the risk communication strategy of governments all over the world. However, the information posted on social media is not validated and may contribute to the problem of misinformation. In South Africa, one of the causes of vaccine hesitancy during the Covid-19 pandemic was attributed to misinformation on social media. The aim of this study is to investigate what type of information was posted using the #VaccineRolloutSA on Twitter that may influence vaccine hesitancy. A total of one hundred tweets with the hashtag #VaccineRollOutSA were harvested from Twitter (X) and thematically analysed. Using the Motivational Theory of Role Modelling and Health Belief models, the tweets were categorised according to the Twitter users' opinions regarding the COVID-19 vaccine. The categories identified included Inspirational, Misinformation, Informative, Political, and Poll. Eighteen percent of the tweets were found to be misinformation. The recommendation of the study is that governments must be aware of misinformation on social media and incorporate strategies to mitigate this risk in the risk communication plan.

### **Rationalizing Effects of Mobile Applications: A Systematic Review of Literature**

*Musa Chemisto (Islamic University in Uganda),*

*Gordon Amoako, Neidy Tunzine and Joshua. Azaki (University of Cape Town, South Africa)*

This paper adapts a Systematic Literature Review (SLR) process to investigate the influence of selected mobile applications on service delivery improvement and then categorizes their developmental contributions. Using conceptual categories from a framework for ICT-based development initiatives, we categorize descriptive perceptions for consequences of app implementations from literature. The two categories adopted are *improved government*

*services and enhanced internal economic activity*; used in providing denoted contextual literature that relates selected apps to developmental contributions. Our literature findings provide an interpretive understanding of the significance of apps chosen towards service delivery and growth in particular sectors. The success of some apps manifested in development of new apps such as MomConnect, Mose and NurseConnect in South Africa. From the literature, we generated and tabulated themes or concepts related to the developmental contributions of the apps. However, the study was limited by inadequate theoretical literature associated with the service delivery influence of mobile apps on development - Mobile for Development (M4D). Future studies aim to develop an M4D framework for the analysis of mobile app developmental contributions.

### **A Socialized affordance perspective of a mobile application for patients' assessment and referrals at the community level in Malawi**

*Florence. Matewere, Jens Kaasbøll (University of Oslo)*

*Chipo Kanjo (University of Malawi)*

The implementation of mobile health applications plays a crucial role in enhancing healthcare delivery in developing countries, leading to both anticipated and unforeseen consequences. This study investigates the social practices involved in deploying a mobile application designed to aid Community Health Workers (CHWs) in patient assessment and referral processes, facilitating their connection to higher-level healthcare facilities. Utilizing the concept of socialized affordance, we examine how social structures influence the interactions between human actors and technology. We identified four key socialised affordances: streamlining CHWs' work processes in village clinics, improving communication between CHWs and health facilities, strengthening monitoring and accountability, and enhancing CHWs' digital knowledge and skills development. These affordances led to several intended outcomes, including improved CHWs adherence to protocol, improved patient referrals, enhanced time management, improved CHWs performance, and improved digital capacity building. However, unintended outcomes also emerged, such as the exclusion of volunteers, heightened respect from community members, increased workload for CHWs, stretched budgets, and heightened anxiety among CHWs. Consequently, this study contributes to the understanding of socialized affordance by illustrating how the interplay between human actors and technology is shaped by the institutional, cultural, and social dimensions of the environment where the affordances are perceived and actualized.

### **Designing a health assessment system for the quality of Napier leaves for animal feeding in Rwanda**

*Ramadhan Omar, James Rigwema, Richard Musabe and Marvin Ogore.(Rwanda University)*

The lack of real-time equipment to monitor the quality of the environment for animals creates a challenge in livestock-keeping activities. These local methods lead to an increase in outbreaks of diseases in animals, while the quality of the product also decreases. With the current improvement in the development of the Internet of Things in the agricultural sector, the Internet of Things Animal Healthcare (IoTAH) using the spread of computing is considered a fundamental approach through sensing and actuating technologies in assessing animal health. IoT devices in different forms such as wearable devices, sensors deployed units, and Unmanned Aircraft Vehicle (UAV) moving devices have been used to track the stimuli of husbandry activities. In this research work, we introduce a Quality-Leaf-IoT Assessment System (QLIAS) for examining the quality of leaves for the best animal feed based on the basic color of Red, Green, and Blue (RGB) appearance using a color sensor to assess the solid color of the leaf. Secondly, will track the humidity and temperature of the corresponding areas. Animal caregivers, pastoralists, breeders, researchers, and agricultural experts can receive reports of the abnormal situations facing leaves such as weeds, lack of water, bad weather, and so forth. In addition, we will develop a Leaf-Pack Quality Accessing Kit (LPQAK) a portable kit mounted with sensors. Short-range cellular technology will be a communication means applied in this project for collecting data, analyzing them, and producing the result using a machine learning (ML) model.

### **An Understanding of How Learning Takes Place Amongst Crowdworkers Based in Nigeria Tech Hubs**

*Michael Adetu (University of Sheffield, United Kingdom)*

This research investigates the dynamics of learning among crowdworkers based in tech hubs in Nigeria, examining how they navigate challenges and opportunities for upskilling. The study delves into Nigeria's unique cultural context and the pivotal role of tech hubs in enabling knowledge exchange. The theoretical framework draws from the philosophy of Ubuntu, which emphasises communal learning and support within the tech hub environment. This paper aims to unravel the motivations behind crowdworkers' learning, the various forms that learning takes, and the specific influence of Nigerian culture and tech hubs in this learning process. Using a qualitative approach, the investigation centres on three tech hubs in Lagos, Nigeria. Semistructured interviews and observations are used to capture the intricacies of crowdworker experiences. The conceptual framework suggests that cultural factors, notably the Ubuntu philosophy, play a significant role in shaping knowledge exchange practices and the subsequent upskilling of crowdworkers. The proposed contributions of the research include implications and recommendations for enhancing learning support mechanisms within tech hubs, thereby enriching the broader discourse on global crowdworking and skill development.

### **Bridging the Digital Divide: Securing Information and Computer Systems in an Unequal World**

*Peter Meso, Daniel Acheampong, Johana Brito-Mieses and Isaac O. Agyemang (Florida Gulf Coast University);*

*University of Electronic Science and Technology of China)*

This study examines security challenges in an unequal world, primarily focusing on marginalized populations, particularly in the Global South. Utilizing the Global Cybersecurity Index (GCI) Score as a robust metric, the study examined the sophisticated relationships between various factors and information and computer security. Notably, the study reveals the crucial role of cutting-edge technologies, exemplified by the positive correlation between advancements in Artificial Intelligence (AI) and the GCI Index Score.

One significant aspect that our study addresses is the complex relationship between income inequality and security measures. We have established a noteworthy negative association between the Gini Index and the GCI Index Score through the World Economy model. This finding highlights that reducing income inequality is closely linked to increased information and computer security. Furthermore, our study underscores the global nature of cybersecurity challenges by elucidating positive associations between ICT services imports and exports, fixed broadband subscriptions, and active mobile broadband subscriptions with the GCI Index Score.

AI Advancement is statistically significant, positively impacting both the World Economy and the Global South, underscoring the universal benefit of technological progress in bolstering cybersecurity across diverse economic landscapes. Income Inequality (Gini Index) negatively impacted the World Economy, signifying that efforts to reduce income disparity are crucial for enhancing cybersecurity readiness. ICT Services Trade and Fixed broadband subscriptions per 100 people (Digital Infrastructure) exhibit a positive correlation with the GCI Index Score in the World Economy, highlighting the significance of digital infrastructure in securing information and computer systems. Conversely, the relationship in the Global South is non-significant, pointing to infrastructure and access challenges that may impede cybersecurity enhancements in these regions. Mobile Broadband Access has a statistically significant positive relationship with the GCI Index Score across both the World Economy and the Global South. This indicates the growing importance of mobile access in contributing to cybersecurity readiness globally. These variables collectively paint a complex picture of the cybersecurity landscape, marked by significant disparities between developed and developing nations. This study provides practical guidance and concrete structures for cross-sector collaboration, advocating for adaptive, context-specific solutions. Acknowledging its limitations, the study contributes to academic discourse by stimulating future investigations into additional metrics for a more complex understanding of security challenges and exploring regional difficulties within the Global South. This study significantly contributes to the evolving digital security landscape and socioeconomic disparities.

### **Digitalizing monitoring of National Development Plans: A case study from Uganda**

*Eric Munyambazi, Ahyot Gizaw, Petter Nielsen and Johan Sæbø (University of Oslo, Norway)*

Development planning is key to the attainment of global and national goals, especially in low- and middle-income countries where diverse sectors leverage each other's capacities to maximize limited resources. In this paper, we discuss approaches to digitalizing monitoring of national development plans in Uganda along a two-phase timeline where the first attempt to build a system failed while the second achieved relative success. The cross-sectoral dimension in our case adds to an already challenging situation where monitoring is challenged by duplicated data collection, poor data quality, inadequate technological infrastructures, and limited skills in most of the sectors. The empirical material is obtained from our work with a public organization in Uganda following the building and implementation of a monitoring system for national development plans and related challenges in its digitalization process. Our findings highlight variations in implementation approaches based on how user needs are coordinated and the installed base is cultivated. We posit that achieving national information infrastructures for cross-sector planning not only requires cultivation of the installed base to address emerging user needs but also effectively addresses challenges related to adaptability in a cross-sector setting. The study contributes by providing evidence of information infrastructures constructs especially from low-resource setting countries and the context of truly heterogeneous sectors.

### **A Pilot Mobile App to Collect South African Child Language Data**

*Tessa Malan, William Tucker (Stellenbosch University)*

*Sefela Yalala (Northwestern University)*

To create effective early childhood development resources and language development intervention programs, we must be informed of linguistic developmental benchmarks. To be informed, we need data - in quality and quantity. In South Africa, there is a project undergoing language data collection in 10 of our 12 official languages, in the form of standardised questionnaires answered by caregivers.

For the final phase of data collection, approximately 20000 questionnaire responses are required. To do so, we present the pilot version of a multi-modal mobile app. This app is the product of an extensive user-centered co-design process with stakeholders ranging from lead researchers to young mothers, where their feedback has been the main design influence. It has supplementary audio support, as a mode of presenting the questionnaire and data collection. The pilot app contains a subset of the questionnaire in three languages - South African English, isiXhosa and Afrikaans.

### **Social Inclusion and public participation in the Digital Era: A Critical Discourse Analysis of the 2016 World Bank Report**

*Calisto Kondowe (University of Cape Town, South Africa)*

Recent studies have discussed the remarkable contribution of information and communication technologies (ICTs) in promoting public participation and social inclusion of the poor in developing countries. They portray ICTs as central

in shaping and enhancing public participation in various discourses. The integration of ICTs in public participation processes is argued as having the potential to democratise access to information, facilitate communication, and empower citizens to engage in meaningful discussions. It follows that ICTs can make the world more inclusive and create opportunities for the poor and the previously marginalised. However, in some contexts where ICTs have been deployed, public participation has remained a myth, as new forms of inequity, social exclusion and marginalisation were accelerated. It is clear that ICTs offer the much-needed force to forge social justice and inclusion of the marginalised populace, hence, it is important to unveil how ICTs may be implicated in forces that reinforce social exclusion. This study is part of the broader study of a critical discourse analysis of World Bank Report 2016, Digital Dividends (WDR16), which aims to illustrate the embedded narrow view of relating to ICTs' contribution to social inclusion and public participation in a developing country context. Although the report can be applauded for uncovering the ways in which ICTs enhance inclusion, it is argued that the WDR16 view of social inclusion and public participation is limited and flawed, as it does not take into account the new forms of marginalisation and social exclusion of the poor, which require attention if social justice and development are to be achieved through ICTs.

### **The Unequal World of Migrant Domestic Workers in the Middle East: The Paradoxical Role of Technology**

*Ayomikun Idowu (University of Sussex, UK)*

This qualitative study examines the experiences of African domestic workers in the Middle East, with a focus on understanding the role of technology in shaping their experiences of social exclusion and invisibility. Utilising in-depth interviews with 21 returnee African domestic workers in Nigeria and Ghana, the study explores the multifaceted impact of technology on their lives in a foreign work environment. The research reveals that ICTs play a paradoxical role in the lives of these workers. On one hand, technology facilitates the global reach of traffickers, providing digital platforms for the commodification of human lives, on the other hand, technology emerges as a beacon of hope, offering means for these workers to maintain their identity and seek external assistance.

A key finding is the varying levels of access to technology among the workers, which significantly influences their experiences of surveillance, control, and isolation. The study uncovers the intricate interplay of technology in both exacerbating and alleviating their marginalisation. The deprivation of technological access is revealed as both an economic issue and a form of social alienation.

This study contributes to the understanding of the complex dynamics of social exclusion and the role of technology in the context of domestic work in the Middle East. It underscores the need for nuanced approaches in addressing the challenges faced by migrant domestic workers, highlighting the imperative for interventions that ensure equitable access to technology and enhance their social and legal agency. The findings of this study have significant implications for policy and practice, calling for a re-evaluation of the ethical and societal obligations towards migrant domestic workers.

### **Challenges of ICT4D solutions in Somalia: A Case study of Land Management**

*Mohame Nuh, Mikko Ruohonen (Tampere University)*

*Samuli Pekkola (Jyväskylä University)*

This paper investigates the challenges in Information and Communication Technology for Development (ICT4D) initiatives, wherein they face difficulties when advancing beyond their initial phases, particularly when being deployed across diverse geographical regions. The paper focuses on the interplay among technological integration, local contextual nuances, community engagement, and governmental regulatory frameworks, identifying these as pivotal determinants for ICT4D endeavors. This notion offers value for both scholars and practitioners seeking to enhance the effectiveness of these projects and drive socio-economic advancements within marginalized communities.

### **The contributions of business intelligence and big data to public healthcare in South Africa**

*Ntombi Makhaye and Samwel Mwapwele (University of the Witwatersrand)*

The public healthcare sector in South Africa generates massive data and it caters to about 71% of the population. The introduction of electronic medical records has made this data difficult to process. The adoption of business intelligence and big data became a solution for processing and analysing this increased data. The research aimed to provide an understanding of the existing contributions of business intelligence and big data in public healthcare in South Africa. Our research question is *what are the benefits and challenges of adopting the use of business intelligence and big data in healthcare in South Africa?* A systematic search was conducted in seven electronic databases (EbscoHost, Science Direct, ProQuest, Scopus, Sabinet, SpringerLink, and Google Scholar). The inclusion criteria were journal papers, books, book chapters, reviews, and conference proceedings reporting on big data, big data analytics, and business intelligence in South African healthcare. 22 articles were analysed for the study. The findings revealed that business intelligence and big data help by shortening diagnostic tests (through early diagnosis), reducing risks in healthcare services, reducing hospital costs, and improving patients' health. However, there are issues like privacy, security, and poor data quality that need attention. The study contributes to the body of knowledge on healthcare informatics. Our study provides evidence for practitioners, policymakers, scholars, and technology advocates to advance the adoption and use of big data and business intelligence in the public healthcare system in developing countries. Our research contributes to sustainable development goal 3 (target 3.d).

### **A Socio-Cultural Perspective on Technology for Environmental Sustainability: The Case of Filtering**

### **Water Pots (G-filters) in Rajasthan, India**

*P. J. Wall (Technological University Dublin),*

*Rajkumar. Satankar (Poornima College of Engineering),*

*Anand K. Plappally, Deepak Saxena (Indian Institute of Technology)*

*Timothy Savage (Trinity College Dublin).*

In addressing the ongoing environmental sustainability crisis in the Global South, the design and adoption of socio-culturally appropriate technologies emerge as pivotal. Yet, implementing technology-driven sustainability initiatives has often been highly problematic, with many failing to achieve their intended objectives or generate significant impact at scale. This is because such endeavours are complex, multifaceted, and interdisciplinary and require a comprehensive understanding of the interplay between tradition, technology, ethics, politics, climate, and sustainability. Such projects are also likely to be highly socio-culturally contextual and thus require a deep understanding of the specific context and culture within which they will be built and deployed. This paper presents the results of an ongoing research project in Rajasthan, India, where filtering water pots (G-filters) are used to purify waste-laden water. The pots are made by the traditional Kumhar potter caste and are used extensively for domestic and agricultural use in the local community. Ongoing research has leveraged critical realist-based approaches to hypothesize several generative mechanisms, which indicate that these pots fulfil many of the criteria required for impactful technology-based projects in the Global South. We briefly discuss the mechanisms hypothesized, and conclude by making recommendations based on our findings to date.

### **Community and large-scale digital transformation for poverty eradication and economic growth in Africa: A rapid review of existing research for the period 2013-2023**

*Hugo Lotriet (University of South Africa, South Africa)*

This article investigates recent scholarly research on large-scale community and digital transformation (DT) in Africa that relates to SDG 1 (no poverty) and SDG 8 (decent work and economic growth). The study used a rapid review approach to get an exploratory overview of recent scholarly research on the topic. Thirty-seven scholarly papers were included and analysed, departing from a sociotechnical perspective. The findings present a fragmented picture. Most of the studies were quantitative and cross-sectional. A significant number of studies focused on aspects of agriculture, underscoring the importance of agriculture in terms of economic sustainability in Africa. Many studies do not indicate any conceptual foundations that inform the research, or the results presented. The dimensions of DT that were focused on include drivers and disruptions, enablers and constraints, the DT process, and outcomes. The most significant technology related to DT in Africa is mobile technologies. It is also clear from these studies that the development of appropriate technologies cannot be viewed separately from their contexts. Given this, the geographical coverage of Africa in the studies is too limited. The actual changes in the sociotechnical systems during DT are not adequately researched. Studies only focused in a limited way on novel and niche technologies. There is limited evidence of a focus on gender issues, despite their importance. There is a significant scope for qualitative longitudinal studies, and such studies should be accessible to key decision makers and role players.

### **The role of source systems strengthening in the effective interoperability of digital health systems**

*Leonard Peter Binamungu (University of Dar es Salaam, Tanzania)*

Although electronic information systems (IS) that act as main sources of information in an ecosystem of digital systems are important in the success of IS interoperability, the conditions and challenges of source systems that affect IS interoperability have not received enough attention in the body of existing scientific knowledge. Using the System Theory, this paper relies on empirical evidence from two IS interoperability case studies to argue that the interoperability of electronic information systems can only succeed if due attention is paid to the individual systems that are involved in an IS interoperability project. Among other things, it was found that IS interoperability can only be achieved if the individual systems meet the requisite conditions, and that an environment surrounding a source system could substantially impact its ability to be interoperable with other systems.

### **A Social Justice Analysis of Competing Tensions in a Pan-African Open Science Initiative**

*Pamela. Abbott (The University of Sheffield, UK)*

The case study presented in this paper can be argued to embody the representation of two dominant discourses that frame the persistent problem of lack of African research visibility in global knowledge systems. The first proceeds from a deficit perspective, suggesting endemic dysfunctions within in-country research systems, while the second recognizes potential systemic injustices, which are deemed to create unequal opportunities for knowledge production and dissemination for African scholars. Four selected interventions from the case study are analyzed using a social justice framework, developed in the paper, that synthesizes these two critical perspectives. It was found that all but one of the interventions emanate from a country deficit discourse and that the actions taken tend mainly to ameliorate, not challenge this perspective. The paper concludes by demonstrating through the social justice lens why the African research visibility issue continues to persist and hints that counter narratives initiated by the case study could offer an alternative outcome.

### **Tailoring Agile for Medical Software Development: Global South Perspective**

*Yazidu Salihu, Julian Bass and Gloria Iyawa (University of Salford, Manchester, UK)*

Agile practices have been adopted in developing various software for ICT4D due to their flexibility in empowering

development teams to provide higher-quality, customer-aligned software. Medical software developers find it challenging to adopt agile scrum practices because of the stringent safety and regulatory requirements. This research explores how practitioners tailor agile approaches to develop medical software for ICT4D in the Global South context. The study employed a qualitative research methodology and gathered data by engaging 11 highly experienced practitioners developing medical software in India and Nigeria through semi-structured interviews. Snowballing, a purposive technique, and a professional network of experiences were used to identify and recruit the practitioners. The data analysis was informed by grounded theory, which involved open coding of the transcripts, constant comparison, memoing of the data and theoretical saturation.

We identified 14 core categories and mapped to five roles and artefacts to enrich emerged memos, which include hybrid agile and plan-based practices, tailored roles, and software quality assurance artefacts. In addition, we developed a new and detailed breakdown of the activities in the clinical tester and CTO roles. Further, we developed a novel classification of agile quality assurance artefacts for medical software development.

Our main contribution is that the 14 core categories mapped to roles and artefacts help practitioners build and deploy high-quality medical systems for ICT4D locally. Our findings show that practitioners require additional skills and capabilities in agile tailoring concepts. We discovered a lack of national regulatory mechanisms to guide practitioners, especially in the Nigerian context.

### **Digital Inclusion and Human Development: Is Digital Inclusion a Social Determinant of Health that Matters?**

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*Blessing Oladokun, Keerti Tekale and Kavya Nadendla (University of Nebraska Omaha)*

The unequal distribution of resources following the pandemic have exacerbated existing inequalities in income and access to services needed to stay healthy. Digital technologies, in particular, mobile health applications, are seen to be a means of transforming access to care and socio-economic resources. This paper explores the impact of digital inclusion on human development and health outcomes. It also examines whether access to digital technologies and services, like mobile health, can act as a means to improve healthcare access and socio-economic resources, thereby addressing health inequities. This study on digital inclusion, human development, and health outcomes investigates two main questions: 1) How does digital inclusion effect human development? And 2) what is the role of digital inclusion as a social determinant of health? In order to investigate, study adopts a quantitative approach to explore how digital technologies and services can enhance healthcare access and socio-economic resources, potentially mitigating health inequities. By analyzing the correlation between digital inclusion and the Human Development Index (HDI), the study highlights a significant positive relationship, suggesting that improving digital access could lead to better health outcomes and reduced disparities. Out of the nine location factors tested for correlation with human development and digital inclusion, electricity access and incidence of multidimensional poverty turned out to be strongly correlated with both human development index and digital inclusion. The contribution of this paper is in illustrating that digital inclusion does in fact become a social determinant of health in improving health outcomes.

### **Utilisation of Digital Farm Technologies towards Enhancing Agriculture Productivity in low-income countries: A case of National Agriculture Management Information System in Malawi.**

*Eddons Munthali (Lilongwe University of Agriculture and Natural Resources),*

*Kondwani Munthali, Chomora Mikeka (University of Malawi)*

Digital agriculture, ascribed to tools used to digitally collect, store, analyse, and share electronic data, has revolutionised the agriculture industry as the newest shift of technological transformation. This research analyses factors influencing the use of digital farm technologies to carry out extension services by extension workers and stakeholders, including farmers in Malawi. It discusses using digital farm technology in farm management to shape agriculture productivity in low-income countries. It finds factors shaping the utilisation of digital farm technology in Malawi. This digital transformation has strengthened farm productivity and could help ensure agriculture satisfies Malawi's current and future needs and the global population. The researcher employed the UTAUT theoretical model with its decisive factors of social influence, performance expectancy, effort expectancy and users' behavioural intention. The research used a questionnaire for data collection distributed to agriculture planning officers in the 14 districts currently using the National Agriculture Management Information System, the NAMIS portal. The researcher quantitatively analysed data based on the UTAUT model constructs. The result found that social influence and effort expectancy influence behaviour intention to use digital farm technology. On the other hand, performance expectancy is not a statistically significant determinant of use behaviour. This research will inform literature regarding the digitalisation of agriculture and help the government formulate policies aiming to assist farmers in scaling up the use of digital farm technologies to enhance agricultural productivity. Further, small-scale farmers will realise maximum productivity and boost households in the national and global economies.

### **Situational analyses of Climate Data Infrastructure in Mozambique**

*Jordão Joaquim Uache and Joaquim Agostinho Malauene (Universidade Eduardo Mondlane)*

Applications in meteorology, hydrology, and climatology are based on different assumptions, serve different needs, and have different objectives. Nevertheless, they all depend on atmospheric data, commonly called climate data. Accurate weather, ocean, and climate predictions and reanalysis are not possible without an adequate specification of the initial state of the respective Earth system, based on satellite and in situ observations, which suggests

improvements in capacity building. In Mozambique, many in-situ observations only have traditional instruments that are dependent on human intervention for data management, sometimes causing data errors and delays in the delivery of information. The errors and delays negatively affect the forecast with efficiency and effectiveness, which means that there are gaps in the information infrastructure. This research aims to investigate the challenges and opportunities in establishing climate data infrastructure in Mozambique. The research is a case study that will follow a qualitative approach, using interviews, observations, relevant documents, and a literature review.

### **Digital health, development and social exclusion: DHIS2 and HIV prevention among Adolescent Girls, Young Women and Key Populations in Zimbabwe**

*Rangarirai Matavire (HISP/Itinordic AS)*

*Jørn Braa (University of Oslo)*

The dominant philosophy guiding digital health studies on interventions is that of 'equity' of healthcare services. This study takes on a different approach, that of equity of health, basing on a capability lens, which sees equity as a differential phenomenon, and extends this to technology development and implementation. This is particularly fitting in contexts where the focus is on populations who have traditionally been exposed to disparities in healthcare due to stigma and discrimination. The study follows an initiative which sought to promote uptake of health services by socially excluded members of society. The initiative was aimed at implementing digital health technologies to support adolescent girls, young women, and key populations in Zimbabwe. This study sought to understand the role digital health plays, and can play, in addressing the problems of social justice, and particularly health equity, in the context of socially deprived groups. It discusses the phenomenon in relation to emerging conceptualisations of health equity which go beyond utilitarian perspectives that focus on the distribution of healthcare services. The study does this by complementing conceptual ideas from Amartya Sen's capability approach, with those from Shoshana Zuboff's smart machine perspective. This helps to trace the specific ways in which technology is implicated in development and, specifically, social justice and equity.

### **The Application of Artificial Intelligence in Diabetes Prediction: A Bibliometric Analysis**

*Emmanuel Mbuya, Tsholofelo Mokheleli, Tebogo Bokaba and Patrick Ndayizigamiye (University of Johannesburg)*

This study aimed to map the evolution and impact of artificial intelligence (AI) in diabetes prediction research from 2013 to 2023.

Utilizing Scopus database records, a bibliometric analysis was conducted on documents featuring AI and diabetes prediction keywords. The analysis used the Bibliometrix and VOSviewer tools to evaluate research publication trends, author collaboration, and keyword co-occurrence in the application of AI in diabetes prediction. Data screening, focusing on specific terms in titles and abstracts, ensured the relevance of the documents. The study included diverse document types and subject areas, reflecting the field's multidisciplinary nature.

The findings revealed a significant annual growth rate of 84.86% in AI applications for diabetes prediction, with 1 498 documents from 802 sources highlighting strong scholarly interest. A peak in citation impact in 2018 marks key contributions and diverse research themes in that year. International co-authorship, notably from the USA, India, China, and Saudi Arabia, underscores extensive collaboration. Thematic analysis points to focal areas like ophthalmology in diabetes-related complications and identifies central topics and emerging trends, including the Internet of Things.

The bibliometric review highlights a significant interdisciplinary expansion in AI research applied to diabetes prediction, with a marked increase in global collaborations and contributions. The study underscores the importance of AI in enhancing diabetes diagnostics and management, indicating a promising trajectory for future research, healthcare policy, and clinical practice. The evolution of AI, particularly machine learning, in diabetes prediction, demonstrates the potential for innovative solutions in managing this chronic condition

### **Lessons Learned from EdTech Integration during the COVID-19 Pandemic**

*Tsuyoshi Kano (Kanazawa Institute of Technology, Ishikawa, Japan)*

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The integration of Information and Communication Technology (ICT) into education, such as EdTech, in low- and middle-income countries has provoked various global debates. Meanwhile, the worldwide COVID-19 pandemic since 2020 has transformed the situation, elevating ICT as essential for education access. Thus, to systematically address the issues that need consideration when introducing EdTech at the national level, a case review of EdTech implementations in Bhutan and Nepal was conducted. We selected these countries as cases for comparison from the perspective of project timeline, including responses to the COVID-19 pandemic. The review took place from a socio-technical perspective encompassing the "conceptualizing and planning phases" and "execution phase" of the project life cycle. As a result, the cases were organized by their respective phases, and similarities and differences between the two cases were analyzed. After the analysis and comparison, generalizable lessons were identified; the usefulness of low-tech media, the importance of locality, and the necessity of capacity/infrastructure development were the major factors in realizing effective EdTech projects. These insights will contribute to the effective design and implementation of EdTech in the future

### **Unveiling the smart vision guiding ICT-enabled rural development**

*Pragyan Thapa, (University of Agder, Norway)*

ICT4D scholars note that broader visions of development generate serious consequences on IT-enabled development initiatives. However, much remains to deepen our current understanding about the interplay of emergent development visions and ICT4D initiatives in specific development sectors. This paper explores the vision of 'smart rural development' that is increasingly framing rural development goals and policies. Conceptual and empirical papers focusing on this issue, within the field of ICT4D, information systems, rural development studies and development studies, are reviewed. Findings from the review are interpreted with the lens of institutional logics perspective to develop a typology of three smart rural development visions. The typology offers alternative assumptions about rural transformation and ICT4D practices, thus opening new avenues for research and practice of ICT-enabled rural development.

### **Exploring the Digital Readiness of Underprivileged Secondary Schools in South Africa**

*Barrett Flowers and Maureen Tanner (University of Cape Town, South Africa)*

This study explored the issue of digital readiness in underprivileged secondary schools in South Africa, delving into the complexities and challenges associated with technology integration in education. The study focused on understanding the relationships between the availability of infrastructure, the attitudes of teachers towards using technology in teaching, the effectiveness of technological implementation, and external challenges such as load shedding. The study adopted a qualitative case study approach, utilizing semi-structured interviews to gain insights from participants on their experiences, perceptions, and challenges related to technology usage in the classroom. The findings highlight the disparity in infrastructure availability, with many schools grappling with insufficient or outdated equipment. Additionally, the study uncovered different attitudes among teachers, with older educators showing a leaning toward traditional teaching methods despite acknowledging the potential benefits of technology. The challenges of integrating technology into the daily teaching routine are further compounded by the unpredictable nature of load shedding, which disrupts planned activities and hinders the consistent use of technological tools. In conclusion, the study emphasizes the critical need for a context-aware approach in improving the digital readiness of underprivileged schools, underscoring the importance of continuous teacher training, administrative support, and strategic partnerships for equipment donation. It contributes significantly to existing literature by providing insights specific to the South African context and lays a foundation for future research and policy initiatives aimed at fostering digital literacy and readiness in underprivileged educational settings.

### **The Impact of Post-Adoption Expectations on Continued Usage Intentions of mHealth in Malawi**

*Donald Malanga and Wallace Chigona (University of Cape Town, South Africa)*

This article investigates the impact of post-adoption expectations on the satisfaction and continued usage intentions of mHealth by community health workers (CHWs) in Malawi, a developing country context. The study proposes a framework based on the expectation confirmation model and integrates it with some constructs from the updated information systems success model. Using a mixed-method convergent design, the researchers collected data using both survey questionnaires and semi-structured interviews with community health workers who were users of Cstock. Cstock is a mHealth application used by CHWs for ordering medical supplies via a short message service. The findings show that post-usage usefulness, information quality system quality, and service quality have an impact on CHWs' satisfaction and continued usage intention of Cstock. Furthermore, the study noted that objective-based expectation beliefs such as system quality, service quality, and information quality also significantly affect the continued usage intentions of Cstock. The findings offer both theoretical and practical recommendations for understanding user expectation factors critical for sustaining continued usage intentions of mHealth in developing countries and Malawi in particular.

### **Complexity and Distress in Open-Source Health Information System Implementations in Countries with Developing Economies – The Case of Lesotho**

*Kopano Moeketsi and Irwin Brown (University of Cape Town)*

Many countries with developing economies (CDEs) are currently engaged in strengthening their national health information systems (HIS) through Free/Libre and open-source software (FLOSS). While open-source provides a cost-efficient means compared to the proprietary alternatives, there are many challenges to their successful implementation, thereby hindering the optimal leverage of these open-source products. Underestimation of complexity and distress are attributed to FLOSS-based HIS implementation failure. Complexity refers to how intricate and sophisticated a system is. The concept of distress is used in information systems (IS) to characterize a system that experiences challenges during its lifetime. Understanding HIS complexity is crucial to navigating the challenges that cause distress in HIS implementation. This research-in-progress aims to propose an investigation to identify underlying causal mechanisms that give rise to distress in FLOSS-based HIS implementations in CDEs. A critical realism (CR) case-based research lensed through a complex adaptive systems (CAS) theory with multiple sources of data will be employed. A purposefully chosen case will be abductively and retroductively analysed to develop new theoretical positions. Interviews, field observations, and focus group discussions will be used to collect data. A CR case-based approach to this research will lead to a novel theoretical explication of the complex interactions occurring within the HIS implementations, which can contribute to more effective strategies for mitigating distress and improving the HIS implementation processes. This study is important given the potential for IS to contribute to the improvement of



health outcomes in CDEs.

### **Appropriation of Artificial Intelligence in an E-learning Institution to Enhance Tuition**

*Siphamandla Mncube (University of South Africa, South Africa)*

The adoption of artificial intelligence (AI) systems is taking place in higher education spheres. However, the different AI systems that are appropriated by academicians in an open distance e-learning context are not well articulated. The interpretivism paradigm and qualitative approach have guided this study. The appropriation process was used as the main theoretical underpinning for the study. The study found that non-appropriation is the cause of lack of knowledge and lack of interest. The appropriation occurs because of the usage of AI systems and the benefits of tuition and the conduct of online examinations. However, the dis-appropriation of AI occurred when users (academics) were expected to subscribe to some AI systems. The study proposed regular training and exploration of relevant AI systems to enhance innovative teaching and learning. Future research should focus on how students in an ODeL appropriate AI for learning

### **Harnessing the Unseen: A Case Study on the Barriers to Big Data Analytics in a Major South African Retailer**

*Shaun Moloji, Grant. Oosterwyk and Adheesh Budree (University of Cape Town)*

While international companies increasingly invest in analytics to achieve a competitive edge, a major challenge is the underutilisation of this data, especially by offline retail businesses. The research underscores the disparity between abundant literature on e-commerce Big Data Analytics (BDA) utilisation and the need for more studies concerning South African offline retail organisations. Adopting the Technology-Organization-Environment (TOE) framework, the study utilised a comprehensive qualitative approach by interviewing various Information Technology experts in an offline retail organization. Findings revealed that organisational factors, especially top management support and structure, are primary challenges to BDA adoption. The study also illuminates technological and environmental challenges specific to the case, such as recurring power outages and regulatory complexities. In conclusion, while BDA presents transformative potential for the retail sector, its successful implementation necessitates context-specific strategies, infrastructure investment, and upper-level managerial commitment.

### **Factors Influencing Generation Z's Cybersecurity Practices: An Empirical Analysis**

*Ethan Slamet and Zainab Ruhwanya (University of Cape Town, South Africa)*

With the rise in technology use among Generation Z, recognizing their specific cybersecurity risks is vital. Adopting effective cybersecurity practices is essential for their protection, yet the factors influencing these protective behaviors remain underexplored. This study proposed an adapted Theory of Planned Behavior model, testing it with data from 123 participants. Analysis using SPSS for descriptive statistics and PLS-SEM for data evaluation revealed that knowledge and self-efficacy significantly predict Gen Z's cybersecurity practices. Contrarily, their attitudes, awareness, and subjective norms showed no substantial influence on these practices. This research highlights the need for increased awareness and efficacy in cybersecurity measures among young technology users.

### **Educators' Perspectives on Cybersecurity: Case of resource-constrained Schools in South Africa**

*Caroline Magunje, Laban Bagui and Wallace Chigona (University of Cape Town, South Africa)*

Cybersecurity has become a global security priority in recent years. Many African countries have embarked on important efforts to improve their cybersecurity posture in all sectors, including education. The increased use of information communication technologies (ICTs) by educators implies a greater exposure to cyber threats and risks prompting the need for cybersecurity to become a priority for schools. Cyber threats and risks have the potential to disrupt school operations and compromise the safety of learners, educators, administration staff, parents, and the surrounding community. The way respective stakeholders engage with cybersecurity and respond to cybersecurity intervention will, to an extent, depend on their perspective of the phenomena. There is paucity on literature on African educators' perspectives on cybersecurity as a starting point. This study aims at answering the question: What are perspectives on cybersecurity of educators in resource-constrained schools in South Africa? The study used a qualitative exploratory case study methodology. Data was collected through in-depth and semi-structured interviews from four schools in the Western Cape and Limpopo provinces; these represent an affluent and a rural province. It was analysed using thematic analysis based on the Social Cognitive Theory. Findings suggest that when it comes to cybersecurity, educators' self-efficacy is low, and their outcome expectancy is negative. Their socio-structural environment does not provide enough support to boost their confidence due to their exposure to ICTs, cybersecurity awareness, and available resources. The more a school is resource-constrained, the less educators prioritise cybersecurity. The study contributes to cybersecurity in education by shedding light on the cybersecurity perspectives of educators in resource-constrained schools in South Africa to pave the way for initiatives that cultivate a culture of cyber safety.

### **Surveillance of antimicrobial resistance in the environment: Imperatives for ICT4D research**

*Sundeep Sahay (University of Oslo)*

*Arunima Mukherjee (HISP India)*

Antimicrobial resistance (AMR) in the environment is an emerging problem, particularly impacting low and middle income countries. The One Health (OH) approach currently being promoted by global and national agencies, while

highlighting importance of studying the interconnections between humans, animals and environment, tend to downplay the environment. Further, this paper argues that the concrete methods and data required to design and develop digital environmental AMR monitoring systems within the context of governmental systems in LMICs are significantly under studied. This paper makes a small effort towards highlighting the problem of environmental AMR in LMIC contexts, and more particularly related to the design and development of a digital monitoring system. The paper argues IS and ICT4D research has an important role to play in this effort, particularly in bringing in principles of systems thinking to the design and development processes.