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International Information Management Association  
IIMA 2024**

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Monday, September 2nd – Wednesday, September 4th, 2024**

***Theme: Digital for everyone in the age of intelligence***

**BOOKLET OF ABSTRACTS**

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## ABSTRACTS OF KEYNOTES

### **Keynote: In the Age of the Responsible Machine: Ethics and Responsible Technologies in the 21st Century**

*Laurence Brooks, Professor in Information Systems, University of Sheffield*

*As we reach nearly a quarter of the first century in this new millennia, we can see that technology, in all its facets, plays an integral part in all our lives. From the smart technology in our pockets to the networks spanning the globe that enable those devices to work anywhere at any time, to the potential of smart technologies, such as AI, to enhance our lives through healthcare, education, finance and so much more. But what prices are we paying? Do we really know what the various implications of those technologies are, from the power which is embedded within them by the choices developers make to the opportunities afforded, or not, by the choices the deployers make. This talk will explore the various ethical and responsibility issues around technology, not just for today but for the future and possibly for future generations.*

### **Keynote: Empowering the Future: Harnessing Drones, Sensors and AI for Positive Impact**

*Darren Ansell, Professor of Aerospace Engineering, University of Central Lancashire*

*In this talk, you'll hear about two pioneering uses for technology that combine drones, sensors and AI to perform tasks in the agricultural sector and in the field of humanitarian demining of unexploded ordinance. Proof of concept prototypes have been manufactured by the University of Central Lancashire and Prof Ansell will present the technology and its potential benefits and impact.*

## **ABSTRACTS OF WORKSHOPS AND PANEL**

### **(4A) Workshop A: Exploring Generative AI: Enhancing Pedagogy in Higher Education**

This workshop is on Exploring Generative AI: Enhancing Pedagogy in Higher Education. To engage in the hands-on activities in the workshop please install ChatGPT on your device in advance. If your professional device has restrictions, consider installing on your personal device. You can find ChatGPT at <https://www.openai.com> You will need to register unless you already have an OpenAI account. Alternatively, an App for your mobile device can be found from the Apple App Store / Google Play Store – please ensure it is the OpenAI version. If required, further instructions can be found here: <https://i4ar.com/wp-content/uploads/2024/08/HandsonActivitiesintheWorkshop.pdf>

**Facilitator: Alison Munsch**

### **(7A) Workshop B: Digital4Sustainability: Accelerating the Twin Transition Through Skills Learning Programmes**

Workshop on Digital4Sustainability addresses the skills needs of industry in the key areas of Digital & Sustainability. accelerating the twin transition (digital transformation and sustainability) through skills learning programmes.

**Facilitators: Sabina Boesen-Mariani & Anand Sheombar**

### **(8A) Workshop C: Revolutionizing Healthcare: The Power of Machine Learning for Big Data**

The workshop discusses the main concepts and some Machine Learning applications in healthcare and utilises tools, tips, and best practices adapted from various healthcare organisations.

**Facilitator Najah Al-Shanableh**

### **(6A) Panel: Beyond the Doctorate – Different Routes to Becoming a Professor or Else?**

This panel session is an opportunity to hear from experienced academics from across the world about their different career experiences and reflections on what they know are career opportunities for doctoral graduates and new academics. You will have the opportunity to ask questions or seek advice on how to develop your own plans and experience.

**Panellists: Tanya Goette, Pascal Ravesteijn, and Ian Allison.**

# ABSTRACTS PER SESSION

## SESSION 1A TRACK: INFORMATION SECURITY AND PRIVACY - A

### Federated Learning Approach for Early Detection of Sexual Predators

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#### ABSTRACT

*Generally, A human being below the age of 18 is considered a child. The malicious activities that involve children directly or indirectly in activities such as the production of sexual images & materials, using abusive terminologies, recording or streaming sexual activities for or of children, online talks by hiding age, encouraging children to behave in a sexually inappropriate way, grooming, live streaming, and showing indecent images involving children or for children online, etc., comes under child sexual abuse (CSA). The lack of prior adolescent communication and related information makes it harder to focus on applications/ tools for protecting the children. It is also difficult to ensure the offender's age engrossed in the online social media platforms such as Facebook, Instagram, and messaging apps like WhatsApp, Zalo, telegram, etc. In addition to this, it is a herculean task to Identify the offenders online.*

*This article addresses detecting the issues related to online child abuse with the help of federated learning. The federated learning approach for early detection of sexual predators. The article also focuses on the research gaps to identify, detect, and analyze the offender's false profile that shows their age and gender and shows the intense knowledge about federated learning approach to tackle this societal issue. The federated learning approach somehow helps to detect CSAM by securing the privacy and its scalability. It also highlights lacunas in all existing policies. The main Significance of this article is to show an efficient and comprehensive framework for supporting the cybercrime Investigation related to online child protection.*

**Keywords:** Online Child Abuse, Federated Learning, Cyber Forensics, Machine Learning, Privacy and Security

# Enhancing Security with CSNs and CNNs: Biometric Innovations in Practice at Financial Institutions

**Jim Jenkins**  
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## **Abstract**

*In this session, we explore the implementation of biometric technologies, specifically Generative Adversarial Networks (GANs) for facial recognition and Convolutional Neural Networks (CNNs) for voice recognition, within the context of credit unions in the United States. Biometric authentication has emerged as a necessary component in the financial industry as it can offer enhanced protection against identity theft and fraud. GANs, known for their ability to generate spectrographic like images, were applied to facial recognition systems to help improve the accuracy in identifying Members during transactions at branches as Members conduct their normal business. Similarly in this session, we will examine how CNNs were used as they demonstrate strong correlations in analyzing voice patterns. These tools provide credit unions with advanced tools to verify member identities through voice biometrics with high precision and reliability. This session will delve into the technical underpinnings of GANs and CNNs, discussing their implementation strategies and effectiveness in enhancing security protocols within credit unions and will illustrate the real-world impact of these biometric technologies.*

**Keywords:** Biometric authentication, Generative Adversarial Networks (GANs), Convolutional Neural Networks (CNNs), Facial recognition, Voice recognition, Financial security, Credit unions

**SESSION 1B TRACK: AI, BIG DATA, DATA SCIENCE AND MARKETING  
SCIENCE – A**

**Is ChatGPT Advancing or Compromising Contemporary Methods of  
Learning?**

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**Abstract**

*This study examines the impact of Chat Generative Pre-Training Transformer (ChatGPT) on contemporary learning methods, particularly focusing on its usability and effectiveness as perceived by educators and students. With the increasing integration of artificial intelligence in education, there is a pressing need to evaluate whether such technologies enhance or hinder the learning process. A survey conducted among 200 participants, comprising 85 teachers and 115 students, will provide insights into their experiences and opinions. The findings will reveal significant differences in perceptions based on academic levels, raising questions about the role of AI in education and its potential to revolutionize or disrupt traditional learning paradigms.*

**Keywords:** Artificial intelligence, ChatGPT, Machine Learning, Education, Learning



# Enhancing Email Spam Detection through Ensemble Machine Learning: A Comprehensive Evaluation of Model Integration and Performance

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## Abstract

*Email spam detection and filtering are crucial security measures in all organizations. Email spam detection is applied to filter unsolicited messages; most of the time, they comprise a large portion of harmful messages. Machine learning algorithms, specifically classification algorithms, are used to filter an email as spam or not. These algorithms entail training models on labeled data to predict whether an email is spam or not based on its features. Traditional machine learning methods have been applied for decades but proved ineffective against fast-evolving spam emails. In this regard, ensemble techniques are introduced to solve the problem of combining several good machine-learning algorithms for email spam detection to develop better models with improved accuracy and robustness in spam email detection. This approach would enhance the performance when classifying spam by aggregating outputs from different algorithms to reduce false positives and negatives.*

*The paper proposed an ensemble approach where various machine-learning algorithms are combined to improve the accuracy and strength of spam detection systems. Using different algorithms, it tries to create an appropriate systematic behavior to increase the detection rates and reduce the number of false positives in this ensemble method. For this purpose, four machine learning algorithms were selected based on their proven effectiveness in spam detection: Naive Bayes (NB), Support Vector Machine (SVM), Decision Tree (DT), and K-Nearest Neighbors (KNN).*

*The selected algorithms were trained individually on the datasets, and tested. Subsequently, an ensemble model was created using stacking, where the predictions of the base models were used as input features for a meta-classifier, in this case, a Logistic Regression model. This proposed method was applied to benchmark datasets to test its performance, which was better than any single-model approach with 95.8% accuracy rate.*

*This study demonstrates the effectiveness of an ensemble approach for email spam detection. By integrating multiple machine learning algorithms, the proposed method enhances detection*

*accuracy and robustness. Future work will explore the inclusion of deep learning models and real-time adaptability to further improve spam detection systems.*

## **Review of the Current Cloud Computing Landscape – Results of Data Survey**

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### **Abstract**

*Academic and industry institutions have migrated essential services to Public Cloud providers (AWS, Microsoft, Google, etc.) with mixed results.*

*Cloud technologists believe that adopting a Hybrid Cloud environment provides a better path toward operational efficiency, better security, faster applications development, improved business insights, and better resiliency (Raynovich, 2023).*

*This research will explore and assess the ever-changing landscape of the services offered by Public Cloud providers and investigate the emerging trends and the evolving relationship between Public and Private Cloud services.*

## SESSION 2A TRACK: ETHICS IN DIGITAL - A

### **Integrating values in Dutch music copyright: a Q-methodology study**

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**Abstract:** *This research investigates the integration of stakeholders' values into the digital frameworks of Collective Management Organizations (CMOs) within the Dutch music copyright system. Utilizing Q methodology, the study captures diverse perspectives from composers, lyricists, publishers, and CMO representatives on values, value tensions, norms, and system requirements. A pilot study with four experts tested data collection methods and refined the study design for a larger, follow-up study involving 30 participants. Preliminary findings, based on factor analysis of participant rankings of 30 statements, reveal two distinct perspectives: one focused on "Fairness and Accountability," emphasizing trust-building and equitable treatment, and the other on "Technological Efficiency and Transparency," prioritizing clear information, verification mechanisms, and advanced IT systems. Qualitative insights from participant interviews provide nuanced understanding, highlighting the importance of transparency in royalty processes, balanced application of technology, and equitable royalty distribution in the digital age. This research contributes to the modernization of copyright management systems offering a conceptual model adaptable to other creative (Intellectual Property) industries*

**Keywords:** *Music Copyright, Collective Management Organizations, Q Methodology, Stakeholder Values, Digital Frameworks*

# How Can Researchers be Influenced to Comply with Guidelines of Research Data Management?

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## Abstract

*How come Open Science is a well-shared vision among research communities, while the prerequisite practice of research data management (RDM) is lagging? This research sheds light on RDM adoption in the Dutch context of universities of applied sciences, by studying influencing technological, organizational, and environmental factors using the TOE-framework. A survey was sent out to researchers of universities of applied sciences in the Netherlands. The analyses thereof showed no significant relation between the influencing factors and the intention to comply with the RDM guidelines ( $p$ -value of  $\leq .10$  and a 90% confidence level). Results did show a significant influence of the factor Management Support towards compliance with a  $p$ -value of 0.078. This research contributes towards the knowledge on RDM adoption with the new insight that the factors used in this research do not seem to significantly influence RDM adoption in the Dutch context of universities of applied sciences. The research does show that the respondents have a positive attitude in their intention to change, increase or invest time and effort towards RDM compliance. More research is advised to uncover factors that do significantly influence RDM adoption among of universities of applied sciences in the Netherland for stakeholders in Open Science and RDM to enhance their strategies.*

*Keywords: Research Data Management, Open Science, universities of applied sciences (UAS), RDM adoption, TOE-framework.*

## SESSION 2B TRACK: AI, BIG DATA, DATA SCIENCE, AND MARKETING SCIENCE – B

### The Intricate Dance Between Stars and Words: A Review of Customer Reviews in Tourism

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#### **Abstract**

*Travel and tourism industries rely heavily on customer reviews from past travelers as an invaluable source for informing potential travelers' decisions. Thanks to the internet, reviews are an invaluable source for both quantitative star ratings as well as qualitative text comments that evaluate travel experiences. In this paper we analyse this complex relationship between text comments and their associated star ratings; using existing literature we highlight their interplay to give an overall picture of customer satisfaction.*

*Factors that influence ratings and comments include both intrinsic (service quality, staff behavior) and extrinsic aspects such as location or price. Sentiment analysis through Natural Language Processing (NLP) helps interpret emotions or opinions expressed through comments to correlate them with star ratings. Review platforms such as TripAdvisor are key resources for travelers; however, they also face issues of biases or fake reviews that require further attention. This review emphasises the significance of taking both quantitative and qualitative aspects of customer reviews into account in tourism, providing valuable insights as well as uncovering gaps that require further exploration - for instance, specific travel styles, deeper qualitative analyses, cultural differences, or language barriers that need further investigation. Future research must extend beyond English reviews into non-English reviews from different travel segments as this could enhance decision-making and customer service in tourism businesses; by filling in gaps this could allow better customer understanding leading to increased satisfaction with services and informed decision-making by businesses. As this review concludes, its significance lies in emphasizing both quantitative and qualitative aspects of customer reviews in the tourism industry is clear. By filling any identified gaps through further research efforts, tourism organizations can deepen their understanding of customer experiences resulting in more informed decision-making processes and enhanced customer satisfaction ratings.*

**Keywords:** *Customer Reviews, Quantitative Star Ratings, Intrinsic Aspects, Extrinsic Aspects,*

## *Sentiment Analysis*

# Deep Learning In Covid-19 Detection Comparative Study of AlexNet, VGG, and ResNet on chest X-ray

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## **abstract**

*The COVID-19 has caused an unprecedented global health calamity, putting pressure on healthcare systems worldwide. As a result, the arena of Artificial Intelligence (AI) has emerged as a critical ally, providing innovative solutions to combat the pandemic through the analysis of vast datasets, predictive modelling, and enabling rapid and accurate diagnosis, ultimately contributing to the saving of lives and mitigating the impact of this devastating disease. Considering the worldwide impact of the COVID-19 pandemic, precise and quick diagnostic approaches are critical. This research reveals that deep learning outperforms traditional approaches for diagnosing COVID-19. To detect COVID-19 instances, advanced deep learning models like as AlexNet, VGG, and ResNet are trained on COVID-19 consist of chest x-ray images. The outcomes of the evaluations reveal that, these models are effective and accurate at predicting COVID from X- ray images. The study emphasizes the potential of deep learning algorithms as helpful tools for early diagnosis and timely intervention, while also highlighting future research directions, such as adding clinical data and applying ensemble models.*

*Keywords: AlexNet, VGG, ResNet, deep learning*

## SESSION 3A TRACK: ETHICS IN DIGITAL - B

# Ethical Dilemmas and Solutions in the Adoption of AI Technologies in Supply Chain

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### **Abstract**

*As organizations increasingly adopt artificial intelligence (AI) technologies to optimize their supply chain operations, they face a growing set of ethical challenges that demand careful consideration. This study explores the key ethical dilemmas and potential solutions in implementing AI within the supply chain context, drawing insights from in-depth interviews with a diverse group of experts. The thematic analysis of the interview data revealed four primary ethical dilemmas: algorithmic bias and discrimination, lack of transparency and explainability, privacy and data ethics issues, and the socioeconomic impacts of AI-driven automation. To address the dilemmas, this study identified various mitigation strategies, including techniques for bias detection and correction, methods for improving the interpretability of AI-driven decisions, comprehensive data governance frameworks, and approaches to responsible automation that prioritize human-AI collaboration. The findings of this research are grounded in various philosophical principles, such as fairness and distributive justice, and the ethical treatment of workers in the face of technological change. By contextualizing the practical challenges within these broader philosophical considerations, the study provides a holistic understanding of the ethical implications of AI adoption in supply chain management. The proposed ethical AI governance framework for supply chain organizations offers a systematic approach to navigating the complex terrain of responsible innovation, fostering a culture of ethical decision-making, and ensuring the long-term sustainability of AI-powered supply chain operations. This research contributes to the growing body of literature on the ethical dimensions of emerging technologies and their implementation within operational settings.*

**Keywords:** *Ethical AI, Responsible Automation, Data Ethics, Ethical Dilemmas, Supply Chain Management*



# Optimising Visual User Interfaces to Reduce Cognitive Fatigue and Enhance Mental Well-being

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## Abstract

*User interface design is a key priority in modern computer systems, especially when the users are non-technical. Due to the importance of designing more user-friendly interfaces, the focus has been increased on designing human-centred systems over functional-centred systems of the past. Any human-computer interface can cause different levels of cognitive fatigue in the user, which can cause significant mental stress, which is not healthy for the users. This study has used the critical literature review method and reviewed six theories/concepts related to the design of visual user interfaces which could potentially reduce user cognitive fatigue.*

*The reviewed theories are attention restoration theory, cognitive load theory, Gestalt principles, Fitts's law, progressive disclosure and UX honeycomb. The current commercial purposes of interface design do not seem to consider the user's mental health or well-being when designing user interfaces and user experience. They only try to maximise user retention and engagement. The study findings advocate for a paradigm shift towards designing visual interfaces that prioritize human-centric principles, with a primary emphasis on promoting user mental health and well-being over commercial objectives of constant user retention and engagement.*

*For example, attention restoration theory can be considered as one of the key theories which is helpful to design better interfaces which consider user health and well-being. However, there are challenges to the designers to find the right equilibrium between user engagement and user well-being. Designers can use the findings, subject to further empirical validations.*

**Keywords:** *Cognitive restoration, Cognitive fatigue, Human-computer interaction, Interface design, Mental well-being*

## SESSION 3B TRACK: ETHICS IN DIGITAL & INFORMATION SECURITY AND PRIVACY

### Ethical and Unethical use of Generative AI: Findings from a qualitative study

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#### **Abstract**

*Generative AI presents a multifaceted landscape with both positive and negative implications across various domains. Even though people know that there are different concerns involved, the use of Generative AI is still prominent and will continue to grow. However, to take its full advantage, it is very important to build some safeguards so that the use is more ethical and with few issues. There are different ethical frameworks which can be helpful to address this issue, and this research uses Mason's (1986) four key issues of information age: Privacy, Accessibility, Property, and Accuracy, to understand values and perceptions of generation Z in using Generative AI.*

*Privacy-wise, generative AI systems raise concerns about sensitive information disclosure (Chen, 2024). However, they also offer the ability to create synthetic data, reducing privacy risks for original data (Zhang et al., 2019). This duality underscores the importance of sophisticated privacy protection strategies (Shahriar et al., 2023). Regarding accuracy, generative AI demonstrates promising diagnostic capabilities in medical settings, albeit with variations based on the model and specialty. While concerns exist about the authenticity of AI-generated work and the challenge of validating information accuracy (Simms, 2024), leveraging AI technologies like natural language processing can enhance documentation accuracy in healthcare. Property rights are a significant consideration, with generative AI tools posing challenges to academic integrity and potentially reshaping print media (Kim, 2024). The issue of trust in AI-generated content is crucial, as labeling such content has become a topic of debate. Transparency in providing explanations for AI-generated insights is essential for advancing nursing practice and ensuring preparedness for the future (Rony, 2023). Accessibility to generative AI tools can influence trust and acceptance, with the preciseness of information and product quality affecting consumer perceptions (Kim et al., 2021). Engaging the public in discussions about privacy concerns related to AI research is vital for its seamless integration into clinical practice (Aldossari, 2023).*

*In conclusion, generative AI offers significant potential in various fields but also raises critical challenges related to privacy, accuracy, property rights, and accessibility. Addressing these issues requires a multifaceted approach that prioritizes privacy protection, accuracy validation, transparency, and public engagement. Our research fills an important gap in the literature –*

what values Generation Z have regarding use of generative AI, particularly as these relate to Mason's (1986), ethical IT use principles.

**Keywords:** Generative AI, Mason's ethical framework, Ethical Considerations, Privacy, Accessibility, Property rights, Accuracy

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# Can Cyber Warfare Fit into Just War Theory?

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## **Abstract**

*As sabre rattling becomes louder within the shifting geopolitical structures between the United*

*States of America, the Russian Federation, and People's Republic of China - 5<sup>th</sup> generation warfare (5GW) moves out of the shadows into the light. 5GW is warfare conducted primarily through non-kinetic means and includes tactics like the spread of disinformation, social engineering exploits, economic warfare, and most importantly for this paper – cyberwarfare.*

*The threat of a cyberattack has been bantered about for a number of years, but the threat inflation of its use over the past couple of months through the increasing level of tensions within the developing multipolar geopolitical reality creates a need for review to determine if cyberattacks can be conducted within the ethical framework of Just War Theory (JWT). As a reminder, JWT aims to ensure war and their associated tactics are morally justifiable. JWT has influenced military responses over the past centuries and studied by military leaders, theologians, and ethicists, to address both the morality of going to war (i.e., jus ad bellum) and the moral conduct of the military at war (i.e., jus in bello). While interest in this theory had declined, it was revived in the 20th century due to nuclear weapons development and the need for "humanitarian intervention" in order to prevent genocide and other crimes within a single state.*

*In this is a paper I work to define cyber warfare, differentiating it from cybercrime, then look at the application challenges for alignment to the time-tested implications of JWT, finally asking the question of whether we can fit the context of cyber warfare into the theory of Just War.*

**Keywords:** *Just War Theory, Fifth Generation Warfare, Cyberattack, Cyberwarfare*

## SESSION 4B TRACK: MODERN AGILE APPROACHES TO SOFTWARE DEVELOPMENT

### Activities Tailoring Within Agile Scrum Roles: A Case of Nigerian Healthcare Information Systems Development

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#### **Abstract**

*Developing quality agile healthcare information systems requires understanding regulatory compliance and evolving healthcare needs through activities tailored within agile scrum roles. Agile scrum, a widely adopted philosophy, offers significant advantages in managing software development processes. This research explores how activities within the agile scrum roles are tailored to agile healthcare information systems development within the Nigerian context.*

*This study adopted a qualitative case study methodology and interviewed 12 agile practitioners developing healthcare information systems within Nigeria using semi-structured open-ended interview guide questions. The practitioners were selected based on a snowballing process, a sunset of purposive sampling techniques from our network of experts. In this study, we used the data analysis techniques informed by the grounded theory, which includes open coding constant comparison, memoing, and theoretical saturation to analyse the data.*

*We identified 33 tailored activities performed by the scrum roles comprising product owner, scrum master and self-organising development team. The activities include adherence to medical regulatory standards, clinical quality assurance testing, documentation, and healthcare knowledge sharing, which are specific for developing quality agile healthcare information systems in the Nigerian context. We systematically mapped the practices into four high-level memos that comprise Activities Tailoring for Healthcare Information Systems Development, Tailoring Activities Within the Product Owner's Roles, Tailoring Activities within the Scrum Master's Roles, and Tailoring Activities within the Self-organising Team Role, which are the descriptive theory emerged from the grounded theory conceptual data analysis process.*

*Our primary contribution to this research is a detailed account of 33 tailored activities within Scrum roles and the memos presented, which are necessary for developing quality agile healthcare information systems software. Agile practitioners need more tailoring skills and adequate resources, local regulatory standards, data security infrastructures, and support from the government to deal with technical debt and issues with nonfunctional requirements.*

**Keywords:** Agile Healthcare Information Systems, Self-organising team, Nonfunctional requirement, Grounded Theory, Agile scrum roles.

# **Risk Identification and Mitigation In Agile Software Re-Engineering: A Case Study**

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## **Abstract**

Legacy software is becoming increasingly common, and many companies nowadays are facing the challenges associated with this phenomenon. In certain circumstances, re-engineering is the only logical way to deal with legacy software. Such projects, by their very nature, are subject to a wide variety of risks. The aim of this study was to begin building the basis of a risk framework that will support future re-engineering projects within Agile (Scrum) environments. An interpretive case study approach has been followed, where the case study was the first phase of a re-engineering process, with the method of analysis being inductive and reflexive Thematic Analysis. The dataset comprises a list of different risks that occurred during the re-engineering process. The risks observed were themed around people, processes, and technology. While technical and procedural risks are discussed in the literature, it was found that the presence of risks in social situations relating to re-engineering has been overlooked. Although these risks do not necessarily have a higher individual impact, they were found to outnumber those encountered in other aspects of the project by a significant factor. Furthermore, the social risks were often either underestimated or not even recognised. It has also been found that Scrum is an appropriate approach to re-engineering projects. Since many of the re-engineering tasks in the case study were unknown at the beginning, the flexibility brought by Scrum was an important factor in the timely and successful mitigation of emerging risks. The first contribution of this study is a comprehensive analysis of identified risks associated with one particular re-engineering project. The potential impact of those risks over a given development phase of the project, along with their actual impact, have been analysed. The second contribution discusses a proposed methodology for managing and mitigating risks in software re-engineering. It is intended that the identified risk categories form the basis of further research into different types of re-engineering projects in order to produce a more generalised framework. It is anticipated that the results presented here will help future project teams to prioritise areas of re-engineering and put adequate risk mitigation into place.

**Keywords:** *agile, software re-engineering, legacy software, risks*



## SESSION 5A TRACK DIGITAL TRANSFORMATION - A

# Augmenting Legal Expertise: The Role of AI in Enhancing Human Capabilities in Legal Services

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### Abstract

*This study explores the dynamics of digital transformation within the legal services industry, focusing on the integration of artificial intelligence (AI) to augment human capabilities. By examining the interplay between institutional norms and technological innovations, this research aims to understand how AI disrupts traditional legal practices while maintaining ethical standards and promoting equitable access to justice. Employing a qualitative content analysis, this research analyzes data from international news sources spanning April 2011 to March 2021. The study examines the roles of key industry actors, identifies barriers to digital adoption, and explores the implications of digitalization for competition within the legal sector. Institutional Theory is utilized to highlight the pressures influencing AI adoption. Findings reveal three primary barriers to digital transformation in legal services: limited incentives for technology investment due to traditional billing models, competency gaps between legal expertise and IT skills, and institutional resistance from entrenched professional norms. Despite these barriers, AI technologies offer significant opportunities for efficiency and innovation in legal practice. By automating routine tasks such as document review and case analysis, AI allows legal professionals to focus on higher-value activities requiring human judgment and creativity. This research contributes to the discourse on digital transformation by highlighting the unique challenges and opportunities within the legal services industry. It provides a nuanced understanding of the sector's slow yet ongoing adaptation to AI innovations, enriching the theoretical and practical discussions on digital transformation in professional services. The study's reliance on news sources for data collection may not capture the full breadth of internal industry perspectives on digital transformation. Future research could benefit from case studies or interviews with legal professionals to deepen the understanding of AI's impact. For legal practitioners and firm managers, this study underscores the importance of reevaluating business models, enhancing IT competencies, and navigating institutional norms to leverage AI technologies effectively. The findings suggest that digital transformation in legal services holds potential for democratizing access to legal advice, though it raises ethical considerations regarding the quality of automated services and data security. By investigating these dynamics, this study aims to contribute to a more comprehensive understanding of how AI can be ethically integrated into legal practices, ultimately enhancing human capabilities and promoting societal well-being.*

**Keywords:** *Digital transformation, legal services*

# **A Non-invasive Mental Health Risk Predictor Using Machine Learning Models Utilising Music Listening Habits**

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## **Abstract**

*Globally, there has been a rise in mental health issues such as insomnia, anxiety, and depression. However, the stigma that is associated with such a diagnosis makes individuals not want to seek help. Recent research has explored the relationship between music listening habits and mental health status, offering promising insights into the potential of leveraging this data for predictive modelling. This research proposes a non-invasive approach that integrates features extracted from music listening patterns including demographic and lifestyle data to build machine learning models that detect mental health conditions such as insomnia, depression and anxiety levels. The results show that Random Forest achieved an accuracy of 76.35%, which highlights the potential of using music listening habits to predict mental health states. The findings of this study provide valuable insight into the relationship between music and mental health predictors- namely depression, anxiety and insomnia across different age groups.*

**Keywords:** *e-health; mental health prediction; machine learning, music therapy*

## SESSION 5B TECHNOLOGY FOR GOOD - A

### **Opportunities for Global South Countries in the AI Value Chain**

**Richard Heeks**

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#### **Abstract**

##### ***Purpose/Contribution***

*The purpose of this presentation is to construct an AI value chain model and then explore the implications of that model for countries in the global South.*

##### ***Background***

*If the current wave of AI innovation can be termed a “revolution” then it is a revolution that is largely associated with the West, China and a few other high- and upper-middle income countries. At best this focus runs alongside a naively-positive and techno-solutionist narrative about problems in the global South that AI will resolve, or an extractive and colonialist perspective in which the global South represents a global data mine for foreign big tech firms. This presentation seeks a more realist approach through understanding in a generic sense where AI-based economic opportunities for global South countries may lie, centred around a value chain model.*

##### ***Approach***

*There are a number of different AI value chain models already in circulation: some covering individual AI projects, some looking more sectorally, and some encompassing the wider AI ecosystem. The presentation begins by synthesising these different approaches into a single union model of AI value chain and ecosystem (see figure below). Focusing down on the core AI value chain, it then examines the key resources and level of resource requirements for each of the main stages in that value chain. From this, potential economic opportunities for the global South can be identified. The presentation represents a first outing for these ideas, and feedback and revisions from conference participants will be sought.*

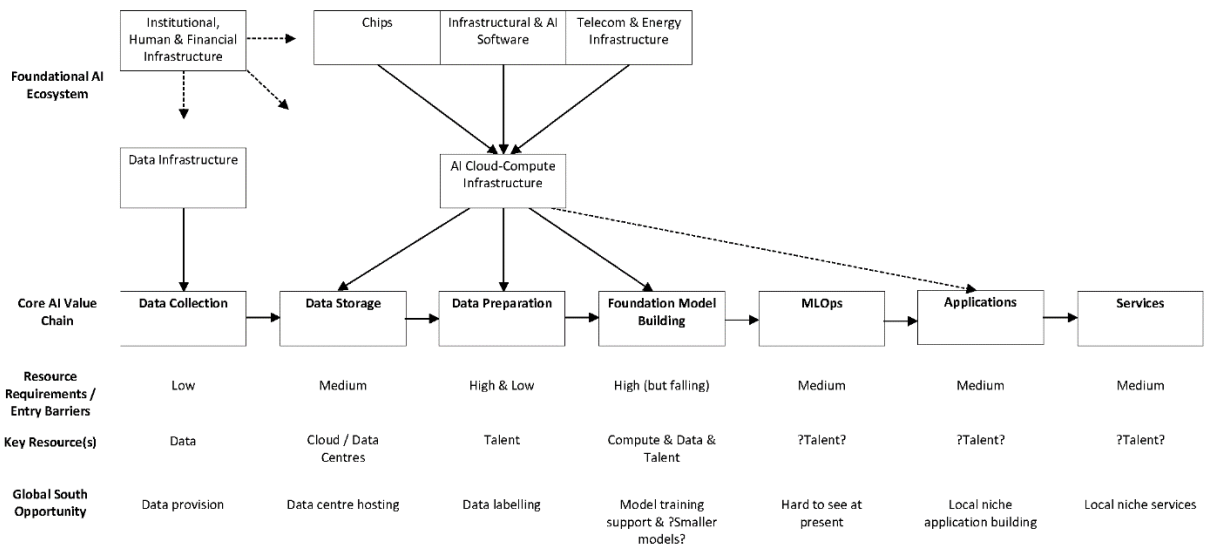
##### ***Findings***

*Global South countries can certainly provide a rich source of diverse and unique AI datasets but the opportunities run right across the AI value chain. At the relatively low value-added upstream part of the AI value chain, global South countries could expand two existing areas of activity: hosting of data centres, and preparing data for use by AI systems. The resource requirements for foundational model-building restrict this to a few very large big tech firms, but labour is needed to help in training these models and the rapid diminution of resource requirements mean opportunities are arising to build smaller models. Perhaps of most interest, though, will be the relatively higher value-adding downstream opportunities in building local niche AI applications – allowing local control over the determination of priority development problems and solutions – and in offering niche add-on services that again may help maximise the contribution of AI to locally-*

determined priorities.

### Implications

AI4D research to date has been strongly focused on issues of AI rights and ethics. While of course important, there needs to be an at-least equal research focus on the role of AI in economic development. The three main elements of this presentation – the core AI value chain, understanding the wider AI ecosystem, and identification of AI economic opportunities for global South countries – represent foundational concepts for the latter type of research. They also represent necessary foundations for research into the political economy and geo-politics of AI in the global South. The three elements likewise will be essential underpinnings for the formulation of national AI policies and strategies.



# What Can We Learn from a Co-Creation Journey for a Quick Scan Digital Transformation Maturity Assessment Tool for Development NGOs?

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## Abstract

*This paper describes the approach and lessons learned from a co-creation process with Dutch development NGOs to create a practical and easy-to-use assessment tool for practitioners to assess the organisation's maturity level of digital transformation. For this study, we applied a design science research methodology, specifically a six-step co-creation approach suitable for developing maturity models. The digital maturity assessment tool (quick scan) created is a domain-specific digital transformation maturity tool for development NGOs rather than a generally applicable tool. This artefact was evaluated using an eight-point Requirements framework for the development of digital maturity assessment tools. By developing a quick scan tool based on an existing practitioners' digital maturity assessment tool (Digital Principles), we have taken a reverse direction, going from a comparative to a prescriptive model. With this study, we contribute to the knowledge of digital transformation in the organisational context of development NGOs and the practical requirements for developing a domain-specific quick scan for digital transformation maturity (DTM) assessment that is also relevant for the ICT4D field.*

*In contrast to some DTM practitioners' tools and the literature, an absolute measure of organisational digital transformation maturity is not necessarily achievable or desirable for practical purposes. Furthermore, we argue that developmental paradigms may steer pathways in the organisational digital transformation maturity of development NGOs and should be included in an assessment. We conclude our paper with a series of lessons learned that can be useful for developing a digital transformation maturity assessment tool.*

**Keywords:** Digital Transformation, Maturity model development, Development NGO, DX4D

## SESSION 6B TRACK: TECHNOLOGY FOR GOOD – B

### **Caught between a rock and a hard place: a systematic literature review of inclusion and inequalities in ICT4D**

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#### ***Purpose***

*This presentation attempts to provide a systematic and comprehensive understanding of the current conceptualisations of digital inclusion and inequalities in ICT4D.*

#### ***Original Contribution***

*The main contribution of this presentation is the development of a matrix through which the dominant conceptualisations of digital inclusion as they exist in ICT4D can be understood, and their implications for knowledge and practice in relation to enhancing equity, including priorities for future research, can be discussed. The matrix as well as the conceptualisations are expected to enable scholars, academics, and practitioners to reflect on where their work fits in relation to the contestations and debates that surround inclusion and inequalities in ICT4D, hopefully offering pathways to build on their thinking and to consider and develop alternate theorisations. Overall, this presentation encourages both a critique as well as a constructive re-imagination of the notion of “technology for good” and the practice of deploying technology for positive socio-economic impacts.*

***Keywords:*** *digital divide, technology for good, equitable digital futures, digital good*

# **Bridging the AI Divide: Assessing the Readiness and Socio-Technical Implications of AI Adoption in Nigerian SMEs**

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## **Purpose**

The purpose of the study is to comprehensively assess the readiness of Nigerian SMEs to adopt AI technologies, analyse the socio-technical factors contributing to the AI divide, identify the specific challenges hindering AI implementation, and examine sector-specific understanding of AI adoption. Additionally, the study aims to draw a cross-case analysis with UK SMEs to identify best practices and successful strategies that could be applied to the Nigerian context. By thoroughly understanding the current state of AI readiness among Nigerian SMEs and highlighting influencing factors, the study seeks to offer actionable recommendations to bridge the AI divide and promote effective digital transformation, informed by successful practices observed in the UK.

## **Original contribution**

The original contribution of the study lies in its comprehensive evaluation of AI adoption readiness among Nigerian SMEs, focusing on the unique socio-technical factors and challenges specific to this context. A key aspect of the study is the development of a readiness assessment framework tailored to SMEs, which will help measure and enhance their preparedness for AI adoption. By integrating a comparative analysis with UK SMEs, the study not only identifies the barriers and opportunities for Nigerian SMEs but also incorporates best practices from more advanced contexts. This approach provides a novel framework for understanding and addressing the AI divide, offering targeted recommendations to enhance digital transformation efforts in Nigerian SMEs and potentially informing similar initiatives in other developing countries.

## SESSION 7B TRACK: TECHNOLOGY FOR GOOD - C

### On legislating cybercrime: Nigerian, South African, and United Kingdom perspectives

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#### **Abstract**

*Cybercrime has evolved to be a menacing challenge to all the countries of the globe. Consequently, it has become necessary for effective laws and policies to be enacted and implemented globally. This paper aims to review the cybercrime legislation of three jurisdictions: Nigeria, South Africa, and the United Kingdom (UK), to examine how each country has conceptualised and legislated cybercrime. The paper begins with a discussion on the definitional considerations necessary for legislating cybercrime. It draws from the Council of Europe Convention on Cybercrime (Budapest Convention) as the primary international convention on cybercrimes, to analyse some of the specific provisions in the laws of the respective countries. It then proceeds to unpack some of the specific provisions in the respective laws and discusses the offence relating to cyberforgery. It considers the offence from a different perspective in each jurisdiction. It examines the crime of cyberforgery by laying the descriptive foundation of the cybercrime in the South African Cybercrimes Act; then briefly considers the role of data insecurity from the UK perspective and finally comments on the challenge it poses for e-commerce from a Nigerian lens. Ultimately, the findings reveal that each country has unique strengths and weaknesses, resulting in varied experiences of cybercrime.*

**Keywords:** Budapest Convention, cybercrime, cyberforgery, cybercrime legislation, Nigeria, South Africa, United Kingdom, policies.



# Stakeholder Identification and Involvement in Digital Economy Policy Development and Implementation

*A Critical Systems Heuristics Evaluation of Nigeria's National Digital Economy Policy and Strategy (2020-2030)*

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## Study Aim

The overarching goal of the study is to *develop a stakeholder identification and involvement framework* suitable for formulating beneficiary-stakeholder-focused digital economy policies in developing countries.

## Study Purpose

The study seeks to use an iteration of the four dimensions and 12 boundary questions outlined in the Critical Systems Heuristics CSH framework to investigate the roles of various stakeholders, and the degree of their involvement in the development and implementation processes of Nigeria's National Digital Economy Policy and Strategy (FMCIDE, 2020) (NDEPS, henceforth), and from the insights gathered, develop a stakeholder identification and involvement framework suitable for formulating beneficiary-stakeholder-focused digital economy policies in developing countries.

## Original Contribution

This is the first time a comprehensive analysis and evaluation of the NDEPS will be conducted. As such, this study will:

- 1) help the policy formulators and implementers gather a richer understanding of how the stakeholders involved in the policy development processes directly impact the eventual beneficiaries, and
- 2) contribute to the literature by providing a data-backed stakeholder identification, selection, and involvement framework suitable for developing digital technology policies in developing countries.

## Keywords

*Stakeholder Identification, Stakeholder Involvement, Digital Economy Policy, Policy Development, Policy Implementation, Critical Systems Heuristics, Developing Countries, Nigeria*

## Cyber Threat Intelligence Sharing In Nigeria

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### Abstract

*Cybersecurity challenges are common in Nigeria. Sharing cyber threat intelligence is essential in addressing the extensive challenges posed by cyber threats. It also helps in meeting regulatory compliance.*

*There are a range of impediments that prevent cyber threat intelligence sharing. We hypothesise that we want to maximise this cyber threat intelligence sharing to resist malicious attackers. Therefore, this research investigates factors influencing threat intelligence sharing in Nigeria's cyber security practitioners.*

*To achieve this aim, we conducted research interviews with 14 cyber security practitioners using a semi-structured, open-ended interview guide, which was recorded and transcribed. We analysed the data using an approach informed by grounded theory. We coded the data, organised the data into categories, and used constant comparison to check our code's consistency and accuracy. We developed memos from which our descriptive grounded theory emerged.*

*After a detailed study, we found that cybersecurity practitioners in Nigeria are enthusiastic about collaborating to exchange and receive cyber threat intelligence. However, we discovered two impediments to sharing. Firstly, the existence of competing standardisation in cyber threat intelligence sharing and, secondly, the lack of practitioner's skills in data protection. These barriers inhibit cyber security practitioners from disseminating such cyber threat intelligence sharing inside Nigeria.*

*Based on our findings, we conclude that overcoming these impediments will help cybersecurity practitioners share more cyber threat intelligence in Nigeria.*

**Keywords:** Cyber threat intelligence sharing, Cyber security practitioners, Nigeria, Frameworks, Grounded theory.

# **Media and Internet Censorship in India: A Study of its History and Political-Economy**

**Ramesh Subramanian**

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## **Abstract**

*The Indian Constitution, which came into force on January 26, 1950, guarantees various fundamental rights, such as the freedom of speech and expression, freedom of religion, rights to form association, as well as rights to privacy. Yet, since the adoption of the Constitution, the Indian citizen has been subject to varying degrees of media censorship and surveillance. This paper seeks to delve into the historical evolution of media and Internet censorship and surveillance in India. It shows how media censorship of varying types have existed since the British colonists introduced restrictive laws in order to expand and control the native populations. Upon independence, these laws perpetuated the interests of India's new leaders, who have continued building upon the colonial era laws. All governments have used these laws to capture and hold on to power. This paper provides a qualitative analysis of the history and political economy of 200 years of media (and more recently, Internet) censorship and surveillance in India, the laws that enable them, their political and social history, methods of implementation, and legal, economic, and social ramifications. The paper concludes by offering some remedies.*

**Keywords:** Indian censorship laws; media censorship; Internet censorship; cybersecurity; colonial laws