Unimagined Futures – ICT Opportunities and Challenges

Leon Strous, Roger Johnson, David Alan Grier, Doron Swade

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IFIP – The International Federation for Information Processing

IFIP was founded in 1960 under the auspices of UNESCO, following the first World Computer Congress held in Paris the previous year. A federation for societies working in information processing, IFIP's aim is two-fold: to support information processing in the countries of its members and to encourage technology transfer to developing nations. As its mission statement clearly states:

> *IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.*

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

IFIP distinguishes three types of institutional membership: Country Representative Members, Members at Large, and Associate Members. The type of organization that can apply for membership is a wide variety and includes national or international societies of individual computer scientists/ICT professionals, associations or federations of such societies, government institutions/government related organizations, national or international research institutes or consortia, universities, academies of sciences, companies, national or international associations or federations of companies.

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Foreword

IFIP – the International Federation for Information Processing – was founded in 1960 following the first World Computer Congress, and under the auspices of UNESCO. Its aim was to support and advance the work of the then fledging societies dealing with information processing (which we now refer to as information and communication technology, or ICT) and the nascent computing industry.

Today, IFIP is the global federation of ICT societies and associations committed to advancing the professional and socially-responsible application of technology. IFIP's members are national, regional, and international ICT societies. In turn, their members are ICT professionals, practitioners, researchers, academics, educators, and policy-makers, who are focused on: developing and advancing ICT knowledge and expertise; promoting digital equity; educating and enhancing public understanding of technology and its potential (both for good and, occasionally, ill); and increasing professionalism and professional standards.

IFIP is a strong advocate for digital equity ("all of the Internet, for all of the people, all of the time", access to technology for minorities, particularly those in remote areas, and gender equality). Along with its member societies, it works closely with the United Nations and its agencies (UNESCO, ITU, and UNCTAD being the most prominent ones), and many other international bodies, to promote understanding of issues related to technology. It aims to collaborate on solutions to help in the achievement of the United Nations Sustainable Development Goals (SDGs).

IFIP organizes more than 100 events every year to bring together international experts on various ICT-related topics, to share the latest developments, explore possibilities, and to discuss the latest issues of relevance to the ICT profession.

Events, such as the World Computer Congress (WCC) – which spawned the creation of IFIP in the first instance – bring together thought leaders from across the globe to share their knowledge and expertise and to share information about emerging technology issues and policies. The World IT Forum (WITFOR) is specifically focused on means of enhancing access to technology for developing nations to enable them, and their citizens, to play an active role in the global digital economy.

IFIP's International Professional Practice Partnership (IP3) is the leading group driving professional practice for technologists around the world. It has been responsible for having the importance of professionalism as a key enabler of the SDGs being recognized and discussed at the United Nations General Assembly.

IFIP also seeks to raise awareness and understanding among the wider community about where technology is headed, how it can enhance the quality of all our lives, and how to ensure that all people have equal access and equal opportunity. We must also, of course, be aware that as in the natural sciences, many new technologies that have much potential for good also have potential for harm.

IFIP is uniquely placed to achieve these outcomes through its global network of 13 Technical Committees and more than 130 Working Groups, that bring together experts

in different fields in order to share and enhance their knowledge, and to focus attention on key areas related to technology.

IFIP member societies, and their individual members, have access to the largest network of technical expertise in the world. This enables them to make valuable connections, grow their knowledge and skills, and contribute to the development of global insights and standards for ICT and ICT professionals.

This collection is a celebration of IFIP on the occasion of its diamond jubilee. The authors have almost all – at some point or other – made significant contributions to IFIP and IFIP member societies, as well as to their own respective technical areas. As a result, they understand both the organization and the issues well. The contributions in this book highlight those developments and challenges that society, in general, and IFIP and other ICT-related societies around the world (including IFIP's own members), in particular, are facing. They consider contributions and developments in a number of key and emerging technical areas and address IFIP's and other ICT societies' important role in policy, professionalism, and professional ethics. These are all significant issues for the ICT industry as it evolves to consider new technologies, new areas of application, and the increasing influence of technology on almost every aspect of our lives. Indeed, as that influence grows, it becomes more of an issue for all of us.

Unimagined Futures: ICT opportunities and challenges reminds us briefly of IFIP's past; it addresses its present context, and its future challenges in a variety of areas. Many of these, of course, are challenges for all of us, and are not unique to IFIP. This excellent collection is written and edited by some of those who know IFIP best. It stands as a record of what the ICT industry—and ICT community as a whole—should be, and can become.

September 2020

Mike Hinchey
IFIP President (2016-2022)

Preface

The International Federation for Information Processing (IFIP) was formally established in 1960. Like many organizations it has celebrated its "significant birthdays" with a publication. Looking at a number of examples from different organizations on our bookshelves, most contain two elements in varying proportions – firstly reviewing the progress made since the last birthday volume and secondly looking to the future.

For this volume, the first of two planned 60th anniversary books, IFIP invited experts in different aspects of the contemporary ICT scene to contribute essays from their specialist areas. While addressing the contemporary challenges facing the ICT community today, the book provides the opportunity to look back to help understand the contemporary scene and identify appropriate future responses to them. As such, the book aims to contribute to the ICT community worldwide, as well as IFIP and its member societies, on setting their policy priorities and agendas for the coming decade. We hope to provoke discussion about appropriate responses to the challenges by individuals as well as by national and international bodies including IFIP.

The title *Unimagined Futures: ICT opportunities and challenges* reflects the fact there were many futures in the past that happened without our having envisaged them, and there are multiple futures that we now speculate about. Often the way things turned out exceeded our wildest imaginings and we can be sure that this will be no different for things to come.

In a conversation with Eunika Mercier-Laurent for the chapter "The future of AI or AI for the future," the term Imaginative and Creative Technology[1] was used as the meaning of ICT instead of Information and Communication Technology. Maybe by becoming more imaginative and creative, we can create even better unimagined futures.

ICT's capabilities have been transformed beyond recognition since 1960 and ICT practitioners have had a substantial role in transforming the world in which we all live. The ICT workforce since 1960 has changed from programmers, analysts, and operators numbering a few tens of thousands worldwide into the highly diverse multi-million strong body we see today. For the end user, there are no longer levels of intermediaries between them and the computer–programmers to create software and operators to run the programs. Users have direct access to their PC or mobile device providing access to applications undreamt of in 1960.

While there are still software developers and operations staff – now concerned with networking as much as processing – the workforce has diversified to include new activities such as the graphic design, building, and maintenance of myriad web sites.

In 1995, at the opening ceremony of the IFIP Secretariat office in Laxenburg just outside Vienna, Austria, Prof. Heinz Zemanek, then the IFIP Historian, reminded the audience of the story of the early days of the telephone service when it started to dawn on telephone company executives in the USA that eventually half the population would

[1] While difficult to find who coined the term, a Google search resulted in a few hits.

be making telephone calls while the other half would be employed as telephone operators connecting their calls. He went on to observe that telephone technology rapidly set about automating the connection process so that every telephone user was transformed into an operator by giving us all initially a dial and latterly a keypad. Zemanek was an important computer pioneer but, as an indicator of the speed of change, he had no idea that 25 years later it would be normal for people to carry a "mobile" which would be a portable computer, one of whose many functions would be a telephone, and that people would often use texts and social media to communicate with other people rather than making telephone calls to one individual.

While the contributions were invited and not peer-reviewed like in conference proceedings, all chapters were reviewed by two editors to assure its quality by providing feedback to authors. This volume is the first Festschrift in the IFIP *Advances in Information and Communication Technology* (AICT) series. Festschrifts honor individual researchers and their scientific work, or they honor institutions or fields like IFIP Technical Committees, Working Groups, or other initiatives. Historical and even personal aspects may show up. They present internationally relevant technical contributions with a reasonable topical focus. As such, the Festschrifts also contribute to the principal aim of the IFIP AICT series to encourage education and the dissemination and exchange of information about all aspects of computing.

The editors accept full responsibility for the choice of topics, realizing that many more topics would have deserved a chapter in the book. We are especially grateful to the authors willing to give freely of their expertise and time to contribute to this book during the very difficult period of the first half of 2020.

We are very pleased with the rich content of the contributions and by making the volume open access, we trust that it will be read and enjoyed by many.

September 2020

Leon Strous
Roger Johnson
David Alan Grier
Doron Swade

Authors

Wil van der Aalst
Prof. Dr. ir. Wil van der Aalst is a Full Professor at RWTH Aachen University leading the Process and Data Science (PADS) group. He is also part-time affiliated with the Fraunhofer-Institut für Angewandte Informationstechnik (FIT) where he leads FIT's Process Mining group. His research interests include process mining, Petri nets, business process management, workflow management, process modeling, and process analysis. Wil van der Aalst has published over 800 articles and books and is typically considered to be in the top 15 of most cited computer scientists with an H-index of over 150 and more than 100,000 citations. Next to serving on the editorial boards of over 10 scientific journals, he is also playing an advisory role for several companies, including Fluxicon, Celonis, Processgold, and Bright Cape. Van der Aalst received honorary degrees from the Moscow Higher School of Economics (Prof. h.c.), Tsinghua University, and Hasselt University (Dr. h.c.). He is also an elected member of the Royal Netherlands Academy of Arts and Sciences, the Royal Holland Society of Sciences and Humanities, the Academy of Europe, and the North Rhine-Westphalian Academy of Sciences, Humanities and the Arts. In 2018, he was awarded an Alexander-von-Humboldt Professorship.

Wil is proud to be an IFIP Fellow.

Ron Berndsen
Prof. Ron Berndsen is an independent director of LCH and chairs the LCH Risk Committees. He is also attached to the Tilburg School of Economics and Management at Tilburg University as Full Professor of Financial Market Infrastructures and Systemic Risk. Ron is Editor-in-Chief of the *Journal of Financial Market Infrastructures* and a member of the Advisory Council of the SWIFT Institute.

The author has been active in the field of payments and market infrastructures for over 17 years. He was Head of the Oversight Department and Head of the Market Infrastructures Policy Department at De Nederlandsche Bank. Ron also served as a member on the Market Infrastructure Board at the European Central Bank and as member of the Committee on Payments and Market Infrastructures at the Bank of International Settlements. He also co-chaired the FSB Group on Cross-Border Crisis Management for Financial Market Infrastructures and was a member of the Oversight Committees of CLS, EuroCCP, Euroclear, LCH, SWIFT, and TARGET2.

He was awarded a doctorate of Tilburg University in 1992 for his PhD thesis in Economics and Artificial Intelligence.

Regina Bernhaupt
Regina Bernhaupt's main research passion is to make people's lives better. Her research focus is on understanding how, when, and why interactive systems fail and how to evaluate the impact of new technologies on people's everyday lives. Her main contributions have been in areas like interactive television, games, and

entertainment-oriented applications. Her special topic is how to allow people to stay in control of a system, but as well as to stay in control over their data (privacy) and their lives. Regina was introduced to IFIP during the Interact conference 2003, and became a member of the Working Group 13.2 Methodologies for User-Centred System Design of IFIP in 2005. Today she is the president of this Working Group. She also serves as the Dutch representative of IFIP TC-13. She has been actively involved in the TC-13 Interact conference since 2005 in various roles and was Papers Chair for Interact in 2017.

Vinton G. Cerf
Vinton G. Cerf co-designed the TCP/IP protocols and the architecture of the Internet and is Chief Internet Evangelist for Google. He is a former member of the National Science Board and current member of the US National Academies of Engineering and Science and is a Foreign Member of the British Royal Society and Swedish Royal Academy of Engineering. He is a Fellow of ACM, IEEE, AAAS, and BCS. Cerf received the US Presidential Medal of Freedom, US National Medal of Technology, Queen Elizabeth Prize for Engineering, Prince of Asturias Award, Japan Prize, ACM Turing Award, Legion d'Honneur, the Franklin Medal, the Catalunya International Prize, and 29 honorary degrees.

Robert Davison
Robert Davison is a Professor of Information Systems at the City University of Hong Kong and Fellow of the Association for Information Systems. His research focuses on the use and misuse of information systems, especially with respect to problem solving, guanxi formation, and knowledge management in Chinese organizations. He has published over 200 articles in a variety of the premier IS journals and conferences. He is particularly known for his scholarship in the domain of action research. Robert chairs IFIP's Working Group 9.4 (Social Implications of Computing in Developing Countries), is a member of Working Group 8.2 (Information Systems and Organizations), and is also a member of the IFIP Digital Equity Committee. He serves as the Editor-in-Chief of the *Information Systems Journal* and the *Electronic Journal of Information Systems in Developing Countries*. Robert seeks to enhance the inclusion of scholars from the global south within our community and frequently visits developing countries where he offers research seminars and workshops, engaging with PhD students and scholars. As a researcher and as an editor, he champions local and indigenous perspectives. Home Page: http://www.is.cityu.edu.hk/staff/isrobert.

Moira de Roche
Moira de Roche is an independent consultant. She is the Chair of IFIP IP3, and a member of the IFIP board. She is also a Director on the Global Industry Council, an IFIP think-tank comprised of senior people from all parts of the globe who are involved with ICT. Moira was awarded the IFIP Silver Core in 2016.

Moira is an accomplished speaker and has presented at conferences around the world, including South Africa, on diverse subjects such as Technology and Learning, IT Leadership, Future Skills, and more. Her speaking engagements on behalf of IP3 have seen her speaking on Professionalism, Trust, and the Duty of Care in Digital, as

well as people-related issues with Industry 4.0. She has attended and presented at the World Summit for Information Society since 2012.

A Past President of IITPSA (Institute of IT Professionals South Africa) Moira is a Professional Member and Fellow, and currently serves as a Non-Executive Director. She received the IITPSA Distinguished Service in ICT Award in 2009.
Moira is also a member of ACM and the South African Institute of Directors. She serves as a Councilor on the board of the South African National Museum and is a member of the Board Committees on HR, Governance, and Legal as well as Core Business and IT.

Erik DeBenedictis
Erik has a background in Computer Science and Engineering, starting with BSc and PhD degrees in Electrical Engineering and Computer Engineering from Caltech in 1978 and 1983, and an MA degree in Computer Engineering from Carnegie Mellon University in 1979. He worked at Bell Laboratories on hypercube parallel computers, Ansoft Corporation (now Ansys) developing the sparse matrix solver for the High Frequency Structure Simulator (HFSS, mentioned in the article), and in a project management role. He then worked at nCUBE corporation on hypercube parallel supercomputer before founding NetAlive, Inc., a startup with a wireless internet software application framework. He later joined Sandia National Laboratories performing research on supercomputers, cryogenic computers, quantum computing, and spacecraft computing. He is now the principal of Zettaflops, LLC.

He is a Senior Member of the IEEE and has had volunteer leadership roles as a co-lead of the Rebooting Computing initiative, the Quantum initiative, and is Editor-in-Chief of IEEE *Transactions on Quantum Engineering*.

Per Fors
Per Fors is a postdoctoral scholar at the Department of Civil and Industrial Engineering at Uppsala University. His main research interests are topics related to technology, sustainability, and ethics, and he is teaching ethics, and sustainability to engineering students. Per is a member of the IFIP WG 9.9 (ICT and Sustainable Development).

David Alan Grier
David Alan Grier is the Technology Principal at Djaghe LLC and is the author of *When Computers Were Human*. He is an IEEE Fellow and has served as president of the IEEE Computer Society, Editor-in-Chief of *Computer*, Editor-in-Chief of the *Annals of the History of Computing*, editorial columnist for *Consumer Electronics Magazine* and the *Communications of the Chinese Computing Federation*.

Roger Johnson
Dr. Roger Johnson is a Fellow of the British Computer Society and a Chartered Engineer. He worked for 30 years in the School of Computer Science at Birkbeck University of London following a period as a software engineer developing software mainly in the financial services industry. He published extensively on database management and later the history of computing. He is a leading authority on the work of Andrew Booth, who invented the Booth multiplier, and was the first person to successfully connect a magnetic storage device to a computer.

Roger is a Past President of the British Computer Society and was the UK representative to IFIP from 1992 to 2010. He served as IFIP Honorary Secretary from 1999–2010. He was also a UK member of the Council of European Professional Informatics Societies (CEPIS) and served as President from 1997–99. He was a founding member of the Computer Conservation Society in 1989, the UK's computer history society, serving as Chair from 2003–2007 and is currently its Program Secretary. He is Secretary of the Turing-Welchman Bombe Rebuild Trust which owns, maintains, and demonstrates the replica of Turing's Bombe to visitors to the National Museum of Computing on the Bletchley Park Campus, UK.

David Kreps

David Kreps is a Reader in Philosophy of Information Systems. His books include *Against Nature: The Metaphysics of Information Systems* (Routledge); *Bergson, Complexity and Creative Emergence* (Palgrave); *Gramsci and Foucault: A Reassessment* (Routledge); *This Changes Everything: ICT and Climate Change – What We Do?* (Springer); and *Technology and Intimacy: Choice or Coercion?* (Springer), and he has published in the *European Journal of Information Systems; Information Communication and Society; First Monday; Information Technology and People; Journal of Information, Communication and Ethics in Society; and Ethics and Information Technology*, and is a regular contributor to the International Conference on Information Systems and other conferences in the field.

After many years involvement with IFIP Working Group 9.5 on Virtuality and Society, including two terms as Chair, in 2018 David became Chair of the IFIP's Technical Committee 9 on ICT and Society (IFIP TC-9). David has Chaired three of the Human Choice and Computers conference series: HCC12 "Technology and Intimacy: Choice or coercion" Salford, Manchester, 2016; HCC13 "This Changes Everything," Poznan, Poland, 2018; and HCC14 "Human-Centred Computing in a Data-Driven Society," which was to have taken place in Tokyo, Japan, 2020, but had to be canceled due to the COVID-19 pandemic. He was Editor of the proceedings for all three conferences, including the eBook of HCC14, which went ahead.

In his role as TC Chair, David is proud to have led on the creation of an IFIP Position Paper on E-Waste and the creation and adoption of the IFIP Code of Ethics.

Christopher Leslie

Christopher Leslie, the Chair of IFIP's Working Group 9.7 on the History of Computing, is a Lecturer in the School of Foreign Languages at the South China University of Technology in Guangzhou. A two-time winner of a Fulbright fellowship, he has taught at Hunter College, John Jay College, New York University, Universität Potsdam, and the South China University of Technology. Dr. Leslie was born and raised in a village in the western part of New York State, but he took his MA and PhD from the City University of New York Graduate Center in New York City. His research interests include the interactions among science, technology, and culture.

Gabriela Marín Raventós

Gabriela Marín Raventós received a MSc in Computer Science from Case Western Reserve University in 1985 and a PhD in Business Analysis and Research from Texas A&M University, USA, in 1993. She has been a Computer Science faculty member at

Universidad de Costa Rica (UCR) since 1980. She was Dean of Graduate Studies and Director of the Research Center for Communication and Information Technologies (CITIC), both at UCR. Currently, she is the UCR Graduate Program in Computer Science and Informatics Chairperson.

She has organized several international and national conferences, and has been, and still is, Chair of several Program and Editorial Committees. From 2012 to 2016, she was President of the Latin American Center for Computer Studies (CLEI), becoming the first woman to occupy such a distinguished position. Since September 2016, she is Vice President of the International Federation for Information Processing (IFIP), in charge of the Digital Equity Committee. Her research interests include Smart Cities, Human Computer Interaction, Decision Support Systems, Gender in IT, and Digital Equity.

Eunika Mercier-Laurent

Eunika Mercier-Laurent is an electronic engineer, holds a PhD in Computer Science, is an expert in Artificial Intelligence (AI), and is an Associate Researcher at the University of Reims Champagne Ardennes as well as Professor at EPITA International Masters and SKEMA. Her teaching and MOOC includes Knowledge Management and Innovation powered by AI, Ethical Development of AI Systems, Innovation Ecosystems, and Innovation Week Challenges.

After working as researcher in INRIA and a computer designer and manager of innovative AI applications with Groupe Bull, she founded Global Innovation Strategies devoted to all aspects of Knowledge Innovation. Among her research topics are: Knowledge and Eco-innovation Management Systems, methods and techniques for innovation, knowledge modeling and processing, complex problem solving, AI for sustainability, and eco-design and impacts of AI.

She has over 15 years of involvement with IFIP including the Chair position of Technical Committee 12 on AI since 2019 and Chair of WG 12.6 (AI for Knowledge Management). She is representative of TC-12 in France since 2018.

Eunika is President of Innovation3D, International Association for Global Innovation, expert for EU programs, and author of over hundred scientific publications and books.

Bertrand Meyer

Bertrand Meyer is Provost and Professor of Software Engineering at the Schaffhausen Institute of Technology in Switzerland and holds associated positions at Innopolis University and Politecnico di Milano. He is also Chief Technology Officer at Eiffel Software (Santa Barbara, California). He was previously Professor of Software Engineering and Department Chair at ETH Zurich. His works spans several areas of software engineering including software verification, programming languages, object technology, requirements engineering, and concurrent programming. His contributions include the concept of "Design by Contract," the Eiffel development method and programming language, and a number of widely used books.

Chris Rees

Chris Rees was President of the British Computer Society, The Chartered Institute for IT, in 2018–2019. During his presidential year he chose the Ethics of AI as his theme, and lectured on the topic to professional and lay audiences in the UK, Europe

(including at the IFIP World Computer Congress in Poznan in 2018), Sri Lanka, Mauritius, and Australia. He is a Liveryman of the Worshipful Company of Information Technologists and Chaired its Ethical and Spiritual Development Panel. He advises charities which benefit from the WCIT Charity on the ethical development of AI systems.

Before his retirement in 2015 he was a Director of Charteris plc for 18 years and before that a Partner in Deloitte Consulting for 12. At Deloitte he led the Knowledge Based Systems Centre, a unit developing knowledge-based systems, including the first working fraud detection system for Barclaycard and systems to detect fraudulent share applications in government privatization issues. He practised as a management consultant and as an expert witness in large scale IT disputes. His earlier career was with IBM UK, National CSS (later Dun & Bradstreet) in the USA, and Logica. He has an MA from the University of St Andrews.

He is co-author of *From Principles to Profit – The Art of Moral Management* (Duckworth, London, 2006).

Liesbeth Ruoff-van Welzen

Liesbeth Ruoff-van Welzen acquired expertise in various fields. After starting as a marketeer in education at the predecessor of the Rotterdam School of Management and IT firms in the hardware and services sector, she became CEO of IDC Benelux. She played an important role in the development and growth of the company and its market research in different sectors like services, channels, and networks. Her last role was Group Vice President IDC EMEA. In 2002 she decided to leave IDC and to start her own company LRWA. In the beginning she worked closely with Paul Strassmann and Tom Pisello. Topics LRWA addressed lay in the area of the added value of IT, how to achieve that within organizations, and how to deliver as an IT company added value. It became more and more clear that skills, attitude, and competences of human capital within organizations were the differentiator between a positive or negative result. That topic is LRWA's main focus.

She currently spends most of her time ensuring that professionalism of the ICT world and digital skills of professional users and citizens are taken seriously, and adequate actions are taken. She does that in her role as chairman of the Interest Group (IG) Digital Skills of the KNVI, the Dutch organization for the information professional, member of CEN TC-428, the European Standardization Committee for ICT Professionalism and Digital Competences and board member of IP3, a part of IFIP.

Adrian Schofield

Adrian began his career in the UK petroleum industry, followed by some years in casino administration. He spent 25 years in various executive and consulting roles in the South African ICT sector prior to joining the Joburg Centre for Software Engineering at the University of the Witwatersrand in 2008 as Manager: Applied Research Unit. In 2018, he was appointed Production/Program Consultant at IITPSA (Institute of Information Technology Professionals South Africa).

He has lectured about the Management of Technology and Systems Thinking and is a regular commentator in the trade media. Adrian has spent more than 30 years promoting standards and growth in the ICT sector. Adrian has served as President of the Information Technology Association in South Africa and as Vice Chairman

of the Africa ICT Alliance. He received the 2012 Distinguished Service in ICT Award from Computer Society South Africa (now IITPSA). In 2015, he was appointed as a Councillor for the Broad-Based Black Economic Empowerment (B-BBEE) ICT Sector Council, until March 2020.

He currently serves as Vice Chairman (Standards and Accreditation) of IP3 (the International Professional Practice Partnership at the International Federation for Information Processing).

Adrian is a Fellow and Professional Member of IITPSA, having served terms as its Vice President and President.

Leon Strous

Leon has a background in business economics, business informatics, and a postgraduate degree in IT-Audit. He worked eight years for Philips Electronics in The Netherlands with a focus on internal control and information security. Since 1993, Leon is with De Nederlandsche Bank (DNB), the reserve bank of The Netherlands. Previous positions in the internal audit department, in the oversight department, and in a policy department of the cash and payments division. Currently his main job is advancing business continuity and crisis management arrangements with the key players in the payments and securities processes in the financial sector in The Netherlands. He is also liaising between the financial sector and the government concerning critical infrastructure protection programs.

His more than 25 years of involvement with IFIP include being Chair of Technical Committee 11 on Information Security and Privacy Protection (2001–2007) and President of the Federation (2010–2016). He was the representative for The Netherlands in TC-11 from 1995–2007 and in the General Assembly from 2001–2017.

He has co-authored and co-edited publications in the area of information security and has been involved in various roles in the organization of many conferences, including IFIP World Computer Congresses and the IFIP World IT Forum (WITFOR).

Leon was awarded Knight of the Order of Orange-Nassau in 2015. He is an Honorary Member of IFIP.

Doron Swade

Doron Swade is an engineer, historian, and museum professional. He was Curator of Computing for many years at the Science Museum, London, and later Assistant Director and Head of Collections. He has studied physics, mathematics, electrical engineering, control engineering, philosophy of science, and man-machine studies at various universities including University of Cape Town, University of Cambridge, University of Essex, and University College London. He designed digital hardware for 10 years and consulted for the microcomputer industry in the UK and USA. He lectures widely and has published four books (one co-authored) and many scholarly and popular articles on history of computing, curatorship, and museology. He is a leading authority of the life and work of Charles Babbage and is responsible for the construction of Charles Babbage's Difference Engine No. 2 built to original nineteenth-century designs. He founded the Computer Conservation Society in 1989, which is dedicated to the preservation and restoration to working order of historic computing machines. He is an Honorary Fellow of the British Computer Society (2019)

and of Royal Holloway University of London (2018). He was awarded an MBE in 2009 for services to the history of computing.

Ruth Wandhöfer

Dr. Ruth Wandhöfer operates at the nexus of finance, technology, and regulation, and is passionate about creating the digital financial ecosystem of the future. She is an expert in the field of banking and one of the foremost authorities on transaction banking regulatory and innovation in financial technology matters. After a distinguished career of over a decade with Citi, Ruth is now an independent Non-Executive Director on the boards of Permanent TSB and Digital Identity Net as well as a Partner at Gauss Ventures. She is a Strategic Adviser of the European Third Party Provider Association (ETPPA) and Adviser at Coinfirm. Until recently, she has served as independent Non-Executive Director on the Board of the London Stock Exchange Group and Pendo Systems Inc.

Ruth was named as one of 2010s 'Rising Stars' by Financial News; named in Management Today's 2011 '35 Women under 35' list of women to watch, and identified as one of the 100 Most Influential People in Finance 2012 by the Treasury Risk Magazine. She received the 'Women in Banking and Finance Award for Achievement' in 2015 and in 2016, 2017, and 2018 she was named on the global 'Women in Fintech Powerlist' of Innovate Finance. She is a 2018, 2019, and 2020 Top 10 Global Fintech Influencer (Fintech Power 50).

She speaks five languages, has completed studies in Financial Economics (MA, UK), International Politics (MA, FR), and an LLM in International Economic Law (UK). She was awarded a doctorate by CASS Business School, London, and Tilburg University in 2019 for her PhD thesis in Finance on the topic of "Technology Innovation in Financial Markets."

She published two books: "EU Payments Integration" (2010) and "Transaction Banking and the Impact of Regulatory Change" (2014), is a Fellow of CASS Business School City University London, a Visiting Professor at the London Institute of Banking and Finance, and also lectures at Queen Mary London School of Law.

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Anthony is an industry thought leader and has served on the IT Industry Innovation Council for the Australian Government. He chaired the New South Wales (NSW) Government ICT Advisory Panel and served on the NSW Digital Transformation Taskforce.

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