Summary of 3 December Workshop Measuring the Digital Economy – Reimagining a Digital and AI-Driven World

by Erik Bohlin and Romel Mostafa, Ivey Business School

The workshop on the theme "Measuring the Digital Economy – Reimagining a Digital and AI-Driven World" was convened on 3 December 2025, at the Ivey Donald K. Johnson Centre in Toronto. It attracted more than 70 in-person registrations and 15 webinar participants. It was the fifth Ivey Workshop on Telecommunications Policy, convened by the Ivey Chair in Telecommunications Economics, Policy and Regulation, *Erik Bohlin*, and the Director of Lawrence National Centre for Policy and Management, *Romel Mostafa*, Ivey Business School at Western University.

The workshop explored various aspects of measuring the digital economy, including challenges in capturing value from digital platforms and AI, with presentations on digital usage indices, China's digital economy, and the need for new measurement ecosystems. The discussion covered consumer welfare from digital technologies, broadband impact measurement, and AI adoption across different sectors, with particular focus on Canada's approach to measuring and developing sovereign AI capabilities. The conversation ended with conversations about the importance of balancing partnerships with major AI companies while maintaining Canadian sovereignty, along with discussions about digital adoption challenges and the need for new regulatory approaches.

In the opening address, Professor *Erik Bohlin* linked the Land Acknowledgement and its recognition of territories to both the importance of maps, and the need to update them, as some legacy maps have also been exclusionary and focused on economic extraction. Now, in the age of AI, new conceptual maps are needed, as the standard metrics such as GDP and price indices miss the mark for a digital age. While initial efforts to measure the information economy has been around for 50 years or more, there is a need to develop new thinking and analysis, together with new collaboration between stakeholders. And this workshop intends to facilitate this, through presentations and panels. Welcome to all!

Professor *Romel Mostafa*, Director of Lawrence National Centre for Policy and Management, welcomed the participants further, and elaborated upon the importance of economic measurement, reminding the audience of the 1987 Nobel Laureate Robert Solow. He emphasized the fundamental importance of technological change to explain economic growth. The recent laureates Aghion and Howitt stressed the creative destruction of new technologies as a driver of growth and transformation. All of this suggests the increasing importance of knowing where we are heading and taking account of the fundamental changes posed by AI. This workshop is one of many efforts to improve our knowledge and collaboration in this important mission.

Professor *Shane Greenstein*, Harvard Business School, presented some new research on the digital divide. His team has built and analyzed new measures of digital usage that leverage telemetry data collected by Microsoft during operating system updates across 40 million Windows devices in U.S. households. These measures of U.S. household digital usage are significantly more comprehensive than those provided by any existing commercial or government survey. We

construct representations of devices in ZIP codes and find evidence of significant variation in usage reflecting an urban-rural divide. We also show the existence of substantial disparities in usage even *within* narrowly defined Metropolitan Statistical Areas. Income and education correlate with these observed differences. These effects are large and suggest digital usage gaps that extend beyond the availability of essential IT infrastructure at the local level. These findings call for interventions beyond the traditional focus on infrastructure access and address usage and skills development. The indices are made publicly available to support future research.

Professor *Yu-li Liu*, Distinguished Professor at the School of Journalism and Communication, Shanghai University, provided insights into China's platform economy and livestreaming commerce. According to official estimates, in 2023, China's digital economy reached approximately 56.1 trillion RMB, accounting for 44.2% of GDP, driven by advances in digital infrastructure, industrial digitalization, and data governance. Major platforms such as Tencent, Alibaba, and Meituan illustrate how expansive user networks, data-driven algorithms, and integrated ecosystems generate economic value and influence consumer behavior. Livestreaming commerce, now exceeding 3.5 trillion RMB in gross merchandise value (GMV) based on industry estimates, exemplifies a rapidly growing sector that blends entertainment, social interaction, and real-time transactions. By analyzing metrics such as monthly active users (MAUs), GMV, and conversion rates, this talk illustrates how platforms and live streamers create a mutually reinforcing flywheel that drives China's digital growth, with implications for global measurement of the digital economy and the future of innovation, regulation, and user rights.

Dr. *Volker Stocker*, Research Group Head, Weizenbaum-Institute Berlin, examined emerging policy challenges in two interrelated areas: the growing complexity of technical and business relationships in AI-driven tech stacks and digital ecosystems and changing concerns about asymmetric information and transparency. With AI, we need a much better and more capable multi-stakeholder measurement ecosystem, and we need to strengthen policymakers' human multidisciplinary institutional capacity. Furthermore, agentic AI and agent-to-agent transactions could alter the economics of digital platforms by weakening attention-based platform business models, reshaping network effects, and redistributing bargaining power. The analysis concludes that as AI becomes increasingly distributed and personalized, meaningful governance requires a workable multi-stakeholder measurement ecosystem and building multidisciplinary institutional capacity to interact with this ecosystem to enable evidence-based decision-making.

Professor *Avinash Collis*, Professor, Heinz College of Information Systems and Public Policy, Carnegie-Mellon University, spoke on the topic of measuring consumer benefits of AI. He noted that AI is transforming daily life far faster than conventional economic statistics suggest. While productivity and GDP figures show only modest gains, measuring consumer welfare reveals that Americans already derived about $97 billion in annual value from generative AI tools in 2024—more than ten times the industry's recorded revenues. In our work, we develop a new metric GDP-B (B for benefits), a complementary metric to GDP that captures the value of free and digital goods such as ChatGPT, Gemini, and Claude. Drawing on large-scale incentive compatible choice experiments across countries, we show how digital technologies and AI generate huge but largely invisible welfare gains that also reduce inequality. By augmenting production-based metrics with welfare metrics, we can gain a deeper understanding of how technological innovation truly enhances people's lives.

Professor *Elizabeth Mack*, Department of Geography, Environment and Spatial Sciences, Michigan State University, discussed challenges and opportunities on measuring broadband impact, covering both positive and negative effects. Professor Mack highlighted economic benefits, including increased productivity and GDP, while noting geographic disparities between urban and rural areas. She also discussed negative impacts such as environmental concerns from data centers and technostress, including digital addiction and mental health effects. She emphasized the challenges in measuring broadband impact, citing issues with data collection, privacy, and evolving technology. Finally, Professor Mack noted the increasing importance in measuring speed of broadband, digital skills, and challenges to understand use of broadband, when many seamless devices are being used. In the end, it is the actual use, which is of interest, but capturing the actual use can prove elusive. Data access for use is one future challenge for research, as is the many parties involved in data provision.

The first panel was moderated by *Jennifer Withington*, Acting Assistant Chief Statistician, Statistics Canada, together with *Viet Vu*, Researcher at the DAIS of TMU, *Patrick Gill*, Vice President, Business Data Lab, Canadian Chamber of Commerce, *Marie-Christine Tremblay*, Senior Policy Adviser, Bank of Canada and Chair of the G7 Finance Track's Digitalization Working Group. The panel discussed the state and measurement of AI adoption in Canada, highlighting both progress and challenges. During the panel, new initiatives such as the StatCan's Tech Stack program and upcoming surveys on AI adoption and use. The panel emphasized the need to measure AI's impact on the workforce. Concern was expressed about he uneven diffusion of AI across sectors and the need to measure both intentional and unintentional use. A new measurement framework for tracking AI related productivity developments across G7 countries, focusing on key dimensions such as infrastructure, investment, adoption and labour markets, was presented. The panelists agreed on the importance of developing a resilient measurement framework to support evidence-based policy decisions, while acknowledging the current challenges in measuring AI's intensity of use and its full impact on the economy and workforce.

The second panel was moderated by *Romel Mostafa*, Professor and Director, Lawrence National Centre for Policy and Management, with *Trina Alexson*, Head of Customer Success, Cisco, *Chris Madan*, Vice President, Customer Digital Solutions & Product, TELUS, *Costa Pantazopoulos*, Vice-President, Product, Bell Canada. The discussion focused on AI trends and infrastructure, with Trina Allison from Cisco highlighting their three-pronged approach to AI: systems for AI, AI for Cisco, and AI for customers. Chris Madan from TELUS shared their experience with AI adoption, including the development of an internal AI agent called IRIS and their approach to generative AI. Costa Pantazopoulos from Bell discussed their AI infrastructure initiatives, emphasizing productivity gains and the importance of networking infrastructure. The conversation concluded with a discussion on Canadian sovereignty in the context of AI, touching on issues like data location, regulation, and the U.S. Cloud Act. The panel members emphasized that sovereignty means complete operational control over hardware, software, networks, and staffing with Canadian teams, while also addressing sustainability through green computing and partnerships with First Nations communities. The panel concluded on the challenges and opportunities in developing sovereign AI capabilities in Canada and discussed the country's partnerships with major AI companies, emphasizing the need to balance these relationships with the goal of creating more sovereign AI solutions, and the need for strategic investments in data centers.

The workshop concluded with remarks by *Ian Scott*, former Chairperson and Chief Executive Officer, Canadian Radio-television and Telecommunications Commission (CRTC). He focused on the need to address digital adoption challenges, including affordability and digital literacy, as well as the importance of tracking who is *not* adopting AI technologies. He raised concerns about the lack of data on digital adoption and suggested that Canada needs a new approach to regulation that focuses on consumer protection and transparency rather than various forms of price control.

The workshop was adjourned shortly after 5PM.

Annex Agenda of the Day – 3 December 2025

Wednesday, December 3, 2025
12 – 6 p.m.
Donald K. Johnson Centre, First Canadian Place / Exchange Tower
130 King Street, Toronto, Ontario

Host
Ivey Business School, Western University, Ontario

Organizers
Erik Bohlin, Ivey Chair in Telecommunication Economics, Regulation and Policy, and Romel Mostafa, Director, Lawrence National Centre for Policy and Management, Ivey Business School

Schedule

Time	Location
12:00 – 1:00 p.m.	**Welcome Buffet Lunch**
1:00 – 1:10 p.m.	**Welcome and Introduction** Erik Bohlin, Professor and Chair in Telecommunication Economics, Policy and Regulation, Ivey Business School
1:10 – 1:30 p.m.	**Opening Keynote: A New Measurement of Digital Divide** Shane Greenstein, Professor, Harvard Business School
1:30 – 1:50 p.m.	**Measuring the Digital Economy: Insights from China's Platform Economy and Livestreaming Commerce** Yu-li Liu, Distinguished Professor, School of Journalism and Communication, Shanghai University
1:50 – 2:10 p.m.	**Measurement Challenges in the Age of AI** Volker Stocker, Research Group Head, Weizenbaum-Institute Berlin
2:10 – 2:30 p.m.	**Towards a New Proposal for Measuring Consumer Benefits in the Digital Economy** Avinash Collis, Professor, Heinz College of Information Systems and Public Policy, Carnegie Mellon University
2:30 – 2:55 p.m.	**Coffee Break**
2:55 – 3:10 p.m.	**Measuring Broadband: Impact: Challenges and Opportunities** *(virtual)* Elizabeth Mack, Professor, Department of Geography, Environment and Spatial Sciences, Michigan State University
3:10 – 4:00 p.m.	**Panel: Where Are We Now? Digital Metrics Today** Moderated by Jennifer Withington, Acting Assistant Chief Statistician, Statistics Canada Patrick Gill, Vice President, Business Data Lab, Canadian Chamber of Commerce Marie-Christine Tremblay, Senior Policy Advisor and Chair of the G7 Central Banks' Digitalization Working Group, Bank of Canada Viet Vu, Researcher at the DAIS of TMU

4:00 – 4:50 p.m.	**Panel: Reimagining Canada's Digital Economy: Building the Infrastructure for AI-Driven Innovation and Adoption** Moderated by Romel Mostafa, Professor and Director, Lawrence National Centre for Policy and Management, Ivey Business School Trina Alexson, Head of Customer Success, Cisco Chris Madan, Vice President, Customer Digital Solutions & Product, TELUS Costa Pantazopoulos, Vice-President, Product, Bell Canada
4:50 – 5:05 p.m.	**Conclusions and Outlooks: Implications for Canada** Ian Scott, former Chairperson and Chief Executive Officer, Canadian Radio-television and Telecommunications Commission
5:05 – 6:00 p.m.	**Networking Reception with Cocktails and Hors d'oeuvres**

Speakers

Trina Alexson brings over three decades of experience in the information technology industry, including a tenure at Cisco since 1996. Trina is head of customer success for Cisco's North American service provider segment. Prior to her current role, she led software development teams, spearheading the creation of high-availability features for Cisco's leading routing platforms. A graduate of Memorial University of Newfoundland with a Bachelor of Engineering, she also holds an MBA from the Richard Ivey School of Business at the University of Western Ontario. Driven by her passion for fostering the inclusion of women in IT, Trina co-authored "Bit by Bit," a book designed to inspire young women aged 15 to 25 to pursue careers in technology.

Erik Bohlin is Professor and Chair in Telecommunication Economics, Policy and Regulation at the Ivey Business School. He is an expert in telecommunications policy, an inter-disciplinary topic concerned with the impact of digitalization in the economy and society. He is Editor-in-Chief of *Telecommunications Policy*, a premier journal in the field. He is on leave as Professor at Chalmers University of Technology, Sweden. His graduate degree is in Business Administration and Economics at the Stockholm School of Economics (1987) and his Ph.D. is from Chalmers University of Technology (1995). He is a Member of the Swedish Royal Academy of Engineering, and Past Chair of the International Telecommunications Society, an inter-disciplinary professional society convening conferences on the evolving digital society and policy needs.

Avinash (Avi) Collis is an Assistant Professor at the Heinz College of Information Systems and Public Policy at Carnegie Mellon University. He holds a Ph.D. in Management Science from MIT Sloan School of Management. His research interests include the economics of digitization, focusing on measuring the welfare gains from digital goods. His research has been covered in major media outlets and policy reports, including the New York Times, Wall Street Journal, Washington Post, The Economist, CNN, BBC, Financial Times, Bloomberg, and NPR, and reports by the US White House, Federal Reserve, Senate, and UK Treasury. He was a member of the Federal Economic Statistics Advisory Committee (FESAC), which advised the Department of Commerce, BEA, BLS, and U.S. Census.

As a career-long innovator and intrapreneur, **Patrick Gill** has founded five national initiatives aimed at helping Canadian businesses compete and prosper globally. Among these, he co-founded the Canadian Chamber's Business Data Lab (BDL), an initiative dedicated to democratizing data for decision-making and advancing the country's understanding of Canadian business conditions and trends. Patrick's work has established him as a recognized thought leader, frequently featured in the media and think tank publications. Most recently, he authored BDL reports on business adoption of generative artificial intelligence—"Prompting Productivity"—and on scaling small businesses—"Scaling Success." He holds a master's degree in public policy and an advanced certificate in public administration and governance from Toronto Metropolitan University.

Shane Greenstein is the Martin Marshall Professor of Business Administration. He teaches in the Technology, Operations, and Management Unit. Encompassing a wide array of questions about microelectronics, computing, communication, and internet markets, Professor Greenstein's research extends from economic measurement and analysis to broader issues. His most recent book, *How the Internet Became Commercial* (2015, Princeton University Press), won the 2016 Schumpeter Prize for best book. Many media outlets cover his work. Professor Greenstein previously taught at the Kellogg School of Management, Northwestern University, and at the University of Illinois, Urbana/Champaign. He received his Ph.D. from Stanford University and his BA from the University of California at Berkeley, both in economics. He continues to receive a daily education in life from his wife and children.

Dr. **Yu-li Liu** is a Distinguished Professor at the School of Journalism and Communication at Shanghai University (SHU). She joined SHU in July 2023 after serving as the Head and Professor of the Department of Media and Communication at City University of Hong Kong. Prior to that, she held the position of Distinguished Professor and Vice President for Research and Development at Chengchi University in Taiwan. Currently, she serves as the Associate Editor of Telecommunications Policy and is a member of the editorial boards of five other notable international journals. Her research interests encompass AI ethics and governance, telecommunications law and policy, and new media business strategies, among others.

Elizabeth Mack is a Professor in the Department of Geography, the Environment, and Spatial Sciences at Michigan State University where she teaches courses in economic geography. Dr. Mack's research utilizes mixed methods to understand the evolution of the economy in the face of rapid technological change and climate change. Research on technological change evaluates the impact of information and communications technologies (ICTs) on the development trajectory of regional economies and everyday work. Her work on the environment and climate change evaluates household responses to changing environmental contexts, as well as uses and the ability to pay for water services. Dr. Mack's research has been funded by a variety of agencies including the National Science Foundation (NSF), the United States Department of Agriculture (USDA), the National Aeronautics and Space Administration (NASA) and the Kauffman Foundation for entrepreneurship research.

Chris Madan leads TELUS Digital with accountability for the digital client experience and commercial outcomes. Chris is best known for his visionary leadership focused on delivering large scale transformational change to meet the evolving consumer needs and his ability to drive business impact to succeed in a competitive market. A connector, educator and motivator of people and groups, Chris takes great pride in the top-performing teams he's built and championed over the years. As a successful visible minority leader Chris is committed to inclusion and has chaired a number of diversity groups with organizations he has worked for. Chris holds a number of professional designations in accounting and marketing, serves as a member of a not-for-profit board and audit committee in the medical field and holds a MBA from the Richard Ivey School of Business. Apart from work, Chris is a sought out industry expert and speaker at conferences across North America –and last but not the least -Chris is the proud father of 2 brilliant young ladies, NBA couch expert and an avid cricket player who spends most weekends at cricket pitches across the Greater Toronto Region.

Romel Mostafa is an Assistant Professor of Business, Economics and Public Policy at the Ivey Business School. Romel's areas of research and expertise include strategy & capability development in new firms, innovation & competitive dynamics, industrial evolution & policy, as well as behavioural decision-making. He has published in several leading academic journals, including Academy of Management Journal, Journal of Behavioral Decision Making, Journal of Risk & Uncertainty, Organization Science and Management Science. His research and commentaries have been featured in global media outlets such as CNN, NPR and the New York Times. Romel has taught both at graduate and undergraduate levels, and received

several teaching awards. He obtained his PhD and MSc from Carnegie Mellon University, and BA from Lawrence University. As the Director of Ivey's Lawrence National Centre for Policy and Management, Romel spearheads the Centre's research, outreach and teaching initiatives. The Centre advocates for sound policy and corporate action towards unlocking national competitive advantage, by focusing on critical challenges and opportunities around digital, trade and social infrastructural pillars.

Costa Pantazopoulos is Vice President of Enterprise Products for Bell Canada, helping lead innovation and growth for Canada's enterprise sector. With Bell since 2008, Costa is driving Bell's evolution through AI-powered solutions, positioning Bell as a trusted partner for digital modernization. He spearheads product strategy and partnerships with global technology leaders, enabling scalable, customer-centric offerings that differentiate Bell in a competitive market. Known for his collaborative approach, Costa brings a pragmatic yet insightful perspective on AI adoption and enterprise transformation, making him a sought-after voice on intelligent connectivity and the future of telecom. Costa is based in Montreal and holds a bachelor's degree in computer engineering from McGill University and an MBA from the University of Vermont.

Ian Scott has over 25 years of policy and regulatory experience in broadcasting and telecommunications both in the public and private sectors. Most recently, Mr. Scott served as the Chairperson and Chief Executive Officer of the Canadian Radio-television and Telecommunications Commission. Mr. Scott was appointed by the Governor-in-Council on July 14, 2017 and led the organization from September 2017 to January 2023. Earlier in his career, Mr. Scott worked at the Competition Bureau in both the Regulated Industries Branch and the Mergers Branch. After working at the Competition Bureau, he joined the CRTC from 1990 to 1994, where he collaborated on the development of a framework for long-distance telephone service competition in Canada. Between 2007 and 2008, as part of the Executive Interchange Program, he was Senior Policy Advisor to the Chairman at the CRTC. Before rejoining the CRTC in 2017, Mr. Scott held various executive positions in the communications industry, including at Telesat Canada, Telus and Call-Net Enterprises, one of the first companies to offer competition in the Canadian long-distance market. He also provided leadership on broadcasting policy and regulatory issues as an executive at the Canadian Cable Television Association. Mr. Scott has served on various boards, including Women in Communications and Technology, the International Institute of Communications, Canadian Aerospace Association and Ski Quebec Alpin, and holds a bachelor's degree in political science from McGill University.

Volker Stocker heads the multidisciplinary research group “Digital Economy, Internet Ecosystem, and Internet Policy” at the Weizenbaum Institute for the Networked Society (German Internet Institute) in Berlin. He is also a senior researcher in the Internet Architecture and Management Group at TU Berlin; an associated researcher at the Max Planck Institute for Informatics; a research fellow at the Quello Center at Michigan State University; and an affiliated scholar with the Dynamic Competition Initiative (UC Berkeley & EUI). Additionally, he serves on the board of the International Telecommunications Society (ITS) and is Co-Chair of ITS Europe. An economist by background, Volker takes an interdisciplinary approach in his research, combining different areas of expertise and methods to investigate critical issues related to the digital economy at the intersection of technology, economics, and policy. His recent research focuses primarily on economics, evolution, and regulation of digital infrastructures, platforms, and technologies, as well as the Internet ecosystem.

Marie-Christine Tremblay is a Senior Policy Advisor in the Bank of Canada’s International Economic Analysis Department. In this capacity, she chairs the G7 Finance Track Digitalization Working Group, advancing G7 insights on the implications of AI for productivity and financial stability. Previously, Ms. Tremblay served as a Director in the Bank’s Financial Stability Department, where she led pioneering work on the macroeconomic and financial system impacts of climate change. She played a key role in disseminating this work, notably by co-leading a related workstream at the Financial Stability Board. Ms. Tremblay has extensive experience in working on an array of global and economic analytical issues. Previously she held management positions at Finance Canada, Environment and Climate Change Canada, and the Treasury Board Secretariat of Canada. She served as a Head of Division at the OECD, leading and participating in several analytical initiatives, including through collaborations with international partners such as the International Energy Agency (IEA), the IMF and the World Bank. She recently served as guest editor for the journal of Energy Economics. Ms. Tremblay holds a BA in Economics from the University of Ottawa, an MA in Economics from Simon Fraser University, and a PhD in Economics from Université Laval.

Viet Vu (he/him) leads economics research at the Dais as Manager, Economic Research. Prior to the merger, at the Brookfield Institute, Viet has done extensive work on the impact of technology in the labour market in Canada, the technology sector and workers, digital skills, and scale-ups. His research has been cited widely in national media, and has impacted policies at all levels of government. He believes that research, when done rigorously, can not only help shape policy, but also bring attention to issues that impact those who have been left out of conversations about Canada’s future. Viet holds a Masters of Science in

Economics from the London School of Economics & Political Science, and a Bachelor of Arts with Honours in Economics from the University of British Columbia. Being a queer immigrant to Canada, Viet also devotes significant attention to ensuring the field of economics is inclusive to all. He sits on the Canadian Economics Association's Diversity committee, and co-chairs the Affinity groups working group.

Jennifer Withington is the Assistant Chief Statistician responsible for Economic and Environmental Statistics at Statistics Canada. She has been working at Statistics Canada for over 25 years. As an executive since 2016, Jennifer has held various roles including Director General of the Macroeconomic Accounts, and Director of the International Accounts and Trade Division. She is responsible for key economic indicators such as the Consumer Price Index, Gross Domestic Product, and International Merchandise Trade. Jennifer represents Statistics Canada on several International Committees including the United Nations (UN) Advisory Expert Group on National Accounts and the Group of Experts on National Accounts. Jennifer holds a bachelor's degree in economics and political Science as well as a master's degree in economics from McGill University.