

Defining Canada's Digital Economy

A New Framework for Understanding Digital Work and Economic Participation

ICTC CTIC

Developed by

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Information and Communications Technology Council

Conseil des technologies de l'information et des communications

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Canada

PREFACE

The Information and Communications Technology Council (ICTC) is a neutral, not-for-profit, national centre of expertise with the mission of strengthening Canada's digital advantage in the global economy. For more than 30 years, ICTC has delivered forward-looking research, practical policy advice, and capacity-building solutions for individuals and businesses. The organization's goal is to ensure that technology is utilized to drive economic growth and innovation and that Canada's workforce remains competitive on a global scale.

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The framework also draws on labour market, occupational, industry, and economic data produced and maintained by public statistical agencies and other data providers. ICTC recognizes the importance of these data systems in enabling consistent and transparent analysis of Canada's digital economy.

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ABSTRACT

This paper presents ICTC's framework for defining and measuring Canada's digital economy. Using a data-driven, occupational classification approach informed by international best practices, ICTC introduces a four-tier taxonomy of digital workers, industry categories, and a composite measurement index, structured across three dimensions and more than 50 indicators, to track Canada's digital economy performance in future work. The paper argues that a shared, rigorous definition is a prerequisite for effective skills policy, labour market forecasting, and international benchmarking.

ABBREVIATIONS

AI	Artificial Intelligence
GDP	Gross Domestic Product
ICTC	Information and Communications Technology Council
IRCC	Immigration, Refugees and Citizenship Canada
JVWS	Job Vacancy and Wage Survey (Statistics Canada)
LFS	Labour Force Survey (Statistics Canada)
LMI	Labour Market Intelligence
NAICS	North American Industry Classification System
NOC	National Occupational Classification
O*NET	Occupational Information Network (U.S. Department of Labor)
OECD	Organisation for Economic Co-operation and Development
PSIS	Postsecondary Student Information System

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FOREWORD



Anne Patterson

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What do we mean when we talk about the digital economy? The question sounds straightforward, but the answer has become increasingly complex.

For many years, the digital economy could be understood through a familiar set of industries and occupations centred on telecommunications, software, computing and digital services. Those foundations still matter, but digital technologies, skills and infrastructure now reach much further into the economy. A software developer may work in banking or energy. Advanced manufacturing depends on automation, sensors and data. Agriculture, health care, finance and professional services are all becoming more digitally intensive.

What we choose to include in our definition of the digital economy shapes the story data can tell about Canada's growth, workforce and competitiveness.

A definition that is too narrow can miss important digital activity taking place outside the traditional technology sector. A definition that is too broad can lose analytical value. Canada needs a framework that reflects how the economy actually operates today while preserving a clear distinction between specialized digital activity and routine technology use.

Using the framework developed in this paper, ICTC estimates that approximately 2.7 million people in Canada are part of the digital economy. That is a substantially larger and more diverse workforce than technology-sector-only definitions would suggest. It includes the people who build and maintain digital systems, but also workers in occupations where specialized digital capabilities have become central to how the work itself is performed.

That scale is significant. It shows that the digital economy is a major source of employment, productive capacity and future growth. It is also a part of the economy that has been expanding quickly. ICTC's earlier labour market tracking, using its previous digital economy definition, demonstrates the trajectory of growth: digital economy employment increased by 51% between 2014 and 2024, compared with 15% across the overall economy.[1]

Those numbers help explain why getting the definition right matters. When a workforce of this scale is growing significantly faster than the wider labour market, how we classify it has implications for how Canada understands future labour demand, develops skills, attracts talent, plans infrastructure and evaluates its economic performance. It also changes the way we think about the digital economy itself. Its growth increasingly reflects the diffusion of digital capability throughout Canadian industry.

That need for a clearer picture has become more urgent. Against a backdrop of geoeconomic fragmentation, technological disruption and a shifting industrial landscape, countries are reconsidering the foundations of competitiveness. Technology, talent, infrastructure, energy and industrial capacity are increasingly interconnected. At the same time, the pace of technological change adds another layer

1 Maryna Ivus, Todd Legere, Christopher Lindstrom, Sheldon Lopez, and Faun Rice, *Digital Economy Pulse: Productivity and Employment Trends in Canada* (Ottawa: Information and Communications Technology Council, 2025), 5, 9–10.

of urgency. Successive waves of computing, connectivity, software, cloud technology, data, automation and artificial intelligence have shortened the path between technological breakthrough and economic application.

This challenge is recognized internationally. The OECD's 2026 *Going Digital Measurement Roadmap* calls for stronger approaches to measuring digital intensity, emerging technologies, skills and economic outcomes across sectors.[2] The World Bank has similarly emphasized the need to connect digital production and adoption with infrastructure, jobs, innovation and inclusion.[3]

For Canada, these are strategic questions. Better measurement can help us understand where our competitive strengths are emerging, which industries are becoming more digitally intensive, which skills employers will need, where talent or infrastructure gaps may constrain growth, and whether investments in technology are translating into productivity.

This is why ICTC has undertaken this work.

For more than three decades, ICTC has worked at the intersection of technology, talent and economic change. That experience has shown us that digital transformation moves across industries, transforms occupations, creates new skills demands and reshapes how businesses compete.

ICTC has developed this framework in consultation with the Organisation for Economic Co-operation and Development (OECD), Innovation, Science and Economic Development Canada (ISED), Employment and Social Development Canada (ESDC), Statistics Canada and the International Labour Organization (ILO). These discussions have helped situate the framework within Canadian and international measurement efforts and strengthen its relevance to the questions Canada now faces.

Our goal is larger than producing a new estimate of the digital economy. It is to build a stronger evidence base for understanding how Canada's economy is changing and where future opportunity lies.

That evidence can help Canada identify capabilities with global potential, anticipate workforce and infrastructure needs, understand regional and sectoral differences, and make better decisions about where to invest, compete and lead. It can also help ensure that growth is inclusive by shining a light on who is accessing new opportunities and where gaps remain.

For ICTC, this work is part of our broader contribution to advancing Canada on the world stage. A clearer understanding of the digital economy can strengthen competitiveness at home while helping Canadian businesses, workers and expertise succeed internationally.

The framework will continue to evolve as technologies, industries and occupations change. We see it as a piece of economic infrastructure that can be refined over time as better data and new evidence become available.

Canada cannot predict every technological shift or global disruption ahead. It can, however, ensure that it has the information needed to understand change and respond effectively.

Knowing what we mean when we talk about the digital economy is an essential first step. Measuring it well gives Canada a stronger foundation for building a resilient, competitive and future-ready economy.

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2 Organisation for Economic Co-operation and Development, *The OECD Going Digital Measurement Roadmap 2026*, OECD Digital Economy Papers, no. 382 (Paris: OECD Publishing, 2026), 6–15, doi:10.1787/b455e132-en.

3 World Bank, *Digital Progress and Trends Report 2023* (Washington, DC: World Bank, 2024), xv–xvi, doi:10.1596/978-1-4648-2049-6.

EXECUTIVE SUMMARY

Canada's digital economy is growing rapidly, yet the tools to measure it have not kept pace. AI and digital technologies are not just creating new jobs: they are transforming the tasks, skills, and workflows within occupations across every sector of the economy.

As work itself is reconfigured, the frameworks used to measure the digital workforce must keep pace. This report presents ICTC's framework for defining and measuring the digital economy in the Canadian context. Its primary purpose is to establish a standardized, reliable methodology for tracking digital growth and its evolving impact on the workforce. By addressing longstanding measurement gaps in the digital labour market, this framework provides policymakers and industry leaders with the precise data needed to navigate shifting employment trends, skill shortages, and technological disruptions across Canada.

Defining and measuring the digital economy remains highly complex and uniquely challenging because technology constantly redefines how, where, and by whom work is performed. While definitions of the digital economy exist internationally, these were developed for different purposes and use different occupational and industry scopes. What is needed is a definition grounded in Canada's own labour market classification system, and applicable consistently across federal programs and research, supports more reliable measurement of digital workforce and its performance. This is precisely why ICTC undertook this initiative: to develop a rigorous, Canada-specific framework that fills this measurement gap and equips policymakers, researchers, and industry leaders with a common, evidence-based foundation for understanding and tracking the digital economy.

Using a data-driven occupational classification approach, ICTC identifies approximately 2.5 million Canadian workers across 55 occupations as part of the digital economy. An additional approximately 200,000 workers are employed in digital economy sectors but work in non-digital occupations, bringing the total digital economy workforce to approximately 2.7 million workers as of June 2026.

On the industry side, ICTC identifies 26 industries organized into six functional categories (hardware, software, support services, telecommunications, e-commerce, and digital media) as the structural core of Canada's digital economy. ICTC's approach is thus more comprehensive than general estimates derived from technology-sector-only definitions, reflecting the reality that digital skills are now embedded across professional services, manufacturing, health care, and many other sectors.

The framework organizes digital workers into four tiers based on the centrality of digital work to their occupation. **Core Digital** workers (approximately 1.34 million) directly create and maintain digital systems. **Digital-Enabled** workers (486,000) are in roles fundamentally transformed by digital tools. **Digital-Adjacent** workers (445,000) support digital infrastructure. **Digital-Intensive** workers (253,000) are in traditional occupations with substantial digital job variants. Together these four tiers provide a more complete and policy-relevant picture of Canada's digital workforce than sector-based definitions alone.

To track Canada's performance within this defined scope, ICTC has developed a composite measurement index integrating more than 50 indicators across three dimensions: **Digital Capacity and Foundations, Digital Industries and Economic Activity,** and **Inclusivity and Workforce Outcomes**. The index draws on federal statistical sources including the Labour Force Survey, the Job Vacancy and Wage Survey, and the Postsecondary Student Information System, alongside real-time labour market data and international benchmarks.

Several indicators in the framework capture dimensions not currently tracked in existing Canadian statistical sources, including an AI Impact Score measuring task-level AI exposure across digital occupations, an AI Readiness Gap comparing job-level exposure to firm-level AI adoption, and a Digital Economy Labour Productivity measure benchmarked against the national average.

GLOSSARY OF KEY TERMS

This glossary presents an overview of key terms used in this paper.

Digital Economy: Economic activities, occupations, and industries that create, enable, support, or are fundamentally transformed by digital technologies, including software, data, networks, and automation systems.

Digital Skills: Competencies that allow workers to create, manage, analyze, or apply digital technologies in the course of their work. Digital skills exist on a spectrum from foundational digital literacy through to advanced technical specializations such as software development, data engineering, and cybersecurity.

Digital Intensity: The degree to which digital technology is structurally central to an occupation. ICTC distinguishes between occupations where digital proficiency is incidental to the role and those where it is a defining requirement.

Occupational Lens: An analytical perspective that identifies digital workers based on the skill intensity of their occupations, regardless of which industry employs them.

Industry Lens: An analytical perspective that identifies digital economy sectors based on whether their primary economic output is the production, enablement, or delivery of digital goods, services, content, or infrastructure.

Four-Tier Taxonomy: ICTC's classification of digital workers into four tiers (Core Digital, Digital-Enabled, Digital-Adjacent, and Digital-Intensive) based on the nature and centrality of digital work within each occupation.

Composite Measurement Framework: A measurement system that organizes multiple indicators into a structured framework for tracking performance. ICTC's framework tracks Canada's digital economy across three dimensions and more than 50 indicators; composite score calculation will be addressed in future work.

CANADA'S DIGITAL ECONOMY HAS OUTGROWN TRADITIONAL BOUNDARIES

Digital technologies have transformed how Canadians work. Software, data systems, and automation are now embedded across all sectors of the economy, including agriculture, finance, health care, and manufacturing, and others. Yet despite the scale of this transformation, a straightforward question remains difficult to answer with precision: how big is Canada's digital economy, and who exactly works in it?

This is not merely a definitional problem. The answer shapes how governments design skills programs, set immigration targets, and evaluate the impact of technology investment. It determines whether Canada can benchmark its digital workforce against international peers, and it affects whether researchers, educators, and businesses are working from the same picture of the labour market or from subtly different ones.

Definitions of the digital economy do exist. Statistics Canada has developed a digital economy measurement framework.[4] The OECD publishes digital economy statistics.[5] The European Union tracks digital economic activity through its Digital Economy and Society Index.[6] What these frameworks share is rigour; where they diverge is scope, methodology, and national context. A definition developed for OECD-wide comparisons may not translate cleanly to Canada's occupational classification system. A framework built around industry production may miss the millions of workers in non-digital industries whose roles have been transformed by digital tools.

ICTC's approach starts from a different premise: that the digital economy is best understood through the lens of work itself, the skills and activities that make an occupation digital, rather than the industry in which that occupation happens to sit. Drawing on internationally validated occupational data and cross-walking it to Canada's National Occupational Classification (NOC) system, ICTC has developed a four-tier taxonomy that identifies digital workers across the full range of Canada's labour market, from software developers to industrial engineers using computational modelling.

This paper documents ICTC's framework for defining and measuring Canada's digital economy. It proceeds in a sequence intended to clarify the logic of the framework: explaining why Canada needs a more precise definition, defining what is being measured, situating ICTC's contribution within Canadian and international measurement efforts, presenting the occupational and industry methods, and then outlining limitations, governance considerations, next steps, and conclusions.

4 Statistics Canada: *Measuring digital economic activities in Canada*, Statistics Canada, 2019

5 OECD: *Measuring the Digital Economy: A New Perspective*, OECD Publishing, 2014; updated through *OECD Digital Economy Outlook* series

6 European Union DESI: *Digital Economy and Society Index (DESI)*, European Commission, annual publication

WHY BETTER MEASUREMENT MATTERS NOW

While the framework is grounded in rigorous methodology, the primary purpose of this paper is to establish a practical and transparent definition of Canada's digital economy and explain why such a definition is needed.

The urgency of this work is driven by a fundamental shift in how digital technologies are affecting the labour market. AI and automation are not primarily eliminating jobs. Emerging research from organizations such as the International Labour Organization (ILO) suggests they are more likely to transform tasks within occupations than to eliminate occupations entirely.[7] Workers increasingly need new combinations of technical, digital, and domain-specific skills,[8] while employers are redesigning roles and workflows around digital tools and AI-enabled systems.[9] Existing digital economy definitions from Statistics Canada, the OECD, and the European Commission were built for a labour market in which digital work was concentrated in a discrete technology sector. As digital skills spread across occupations and industries, these frameworks capture a shrinking share of the workforce actually doing digital work.

A definition limited to core technology occupations systematically undercounts the growing number of workers whose roles are being reconfigured by digital technologies, and any policy built on that undercount inherits the same blind spot.

As digital transformation accelerates, Canada continues to adapt its skills, immigration, and economic development policies to meet changing labour market needs.[10] Governments are designing skills training programs, immigration pathways, and economic development strategies that depend, implicitly or explicitly, on assumptions about who the digital workforce is and how large it is. Educational institutions are determining which programs to expand to meet labour market demand. Businesses are assessing their competitive position in a digital economy whose boundaries have never been clearly drawn for the Canadian context. A common reference point can support greater consistency across these decisions, one that is transparent in its methodology, broad enough to capture the true scope of digital transformation, and precise enough to be analytically useful.

Canada already has official measures of digital economic output and transactions. ICTC adds a complementary occupational and skills-based framework designed for labour market analysis.

This paper presents ICTC's framework as a reference point for defining and measuring Canada's digital economy. It is intended to function not as a final, fixed classification, but as a living framework. Recognizing that the digital economy continues to evolve, this framework is intended to be updated over time as technologies, occupations, and industries change, supporting sound decision-making across government, industry, and research communities.

BUILDING ON CANADIAN AND INTERNATIONAL EXPERTISE

In developing this framework, ICTC has engaged in consultations with a number of national and international organizations working on related measurement questions, including the Organisation for Economic Co-operation and Development (OECD), Innovation, Science and Economic Development Canada (ISED), Employment and Social Development Canada (ESDC), and Statistics Canada. These discussions have helped situate ICTC's framework within existing Canadian and international measurement efforts and have informed its development. Consultations were

7 ILO: *World Employment and Social Outlook 2024: The Role of AI on the Labour Market*, International Labour Organization, Geneva, 2024

8 McKinsey Global Institute: *A New Future of Work: The Race to Deploy AI and Raise Skills in Europe and Beyond*, McKinsey & Company, 2024

9 OECD: *OECD Employment Outlook 2023: Artificial Intelligence and the Labour Market*, OECD Publishing, 2023

10 Government of Canada: *Canada's Digital Ambition*, Innovation, Science and Economic Development Canada, 2022

held separately with each organization to allow for focused, in-depth discussion tailored to each partner's own measurement work and priorities. Sessions covered ICTC's occupational and industry classification methodology, the structure of the composite index, and areas where alignment with existing federal and international measurement approaches could be strengthened. Feedback from these discussions has directly informed revisions to the framework's classification boundaries and its treatment of data limitations.

Participation in these consultations does not imply endorsement of ICTC's definition, estimates, or composite methodology by any of the organizations named above. The framework presented in this paper reflects ICTC's own analysis and methodological choices, and any errors or limitations remain ICTC's alone.

Alignment with the OECD's 2026 *Going Digital Measurement Roadmap*

ICTC's approach is informed by the broader international effort to improve how digital transformation is measured. In its 2026 *Going Digital Measurement Roadmap*, the OECD identifies priority actions for strengthening countries' capacity to monitor digital transformation and its economic and social impacts. OECD recognizes that conventional statistical systems do not always make digital activity sufficiently visible and calls for complementary indicators, more timely and disaggregated data, stronger measurement of emerging technologies and skills, and improved data infrastructure.

ICTC's framework responds to several of these priorities in the Canadian labour market context:

1. **Making digital transformation more visible in economic statistics.** The OECD identifies the need for measures that complement traditional macroeconomic statistics to better capture digital transformation. ICTC's occupational and industry lenses respond to this challenge by identifying digital activity both within core digital industries and in occupations where digital capabilities are structurally central to the work, including those located outside the conventional technology sector.
2. **Improving the measurement of emerging technologies, particularly AI.** The OECD identifies the measurement of key digital technologies, notably AI, as a distinct priority. ICTC's broader measurement work is developing indicators that examine how AI affects occupations and tasks, including measures of occupational exposure and the relationship between workforce exposure and organizational adoption. These measures are intended to help distinguish technological diffusion from its potential labour market effects.
3. **Connecting digital transformation to economic outcomes.** The OECD calls for better evidence on the economic impacts of ICTs. ICTC's framework establishes a common occupational and industry boundary that can be linked to labour market and economic data over time, supporting analysis of employment, wages, labour demand, productivity, investment, and other economic outcomes within a consistently defined digital economy.
4. **Defining and measuring changing digital skill needs.** Skills are another explicit area of focus in the OECD Roadmap. ICTC's occupational taxonomy and concept of digital intensity provide a structured way to distinguish broadly used digital literacy from the specialized and domain-specific capabilities that make digital technology central to particular occupations. This creates a basis for more consistent analysis of changing skill requirements across occupations and industries.
5. **Using new and complementary data sources to improve timeliness.** The OECD highlights the need for interdisciplinary approaches to timely data collection and for complementary data infrastructures capable of capturing digital activity as it evolves. ICTC's measurement work combines established statistical sources with real-time labour market information, including job-posting data, to identify emerging occupational and skills signals that may appear before they are visible in traditional surveys.

6. **Supporting more granular and disaggregated analysis.** The OECD emphasizes the importance of disaggregated data for identifying digital divides and understanding who is most affected by technological change. ICTC's framework is designed to support analysis across occupations, industries, regions, and workforce groups, creating a foundation for examining how participation in and the benefits of the digital economy are distributed.

7. **Building measurement infrastructure that can evolve with the digital economy.** The OECD identifies stronger data infrastructure capabilities as a prerequisite for modern digital measurement. ICTC's approach similarly treats the definition as part of an ongoing measurement system. A consistent occupational and industry classification can be applied repeatedly as new data become available, while documented updates allow the framework to evolve as technologies, occupations, and industries change.

Together, these areas of alignment place ICTC's work within an established international direction of travel in digital economy measurement. ICTC's contribution is specifically focused on translating these measurement priorities into a Canadian labour market framework that can consistently identify who participates in the digital economy and support repeatable analysis of how that economy changes over time.[11]

How ICTC's Framework Fits Within Existing Measures

Existing measurement efforts provide important foundations for understanding digital economic activity, but they are designed for different purposes. Statistics Canada, the OECD, the IMF, the U.S. Bureau of Economic Analysis, the Bank of Canada, the International Telecommunication Union, and other organizations each contribute methods for measuring digital production, adoption, infrastructure, skills, or broader digital transformation. ICTC's framework is intended as a complementary contribution focused specifically on Canada's labour market: who performs digital work, how that work is distributed across occupations and industries, and how Canada can track digital workforce performance over time.

The consultative process helped situate ICTC's occupational and industry approach within this broader measurement landscape. The result is not a replacement for official measures of digital output or digital transactions, but a labour market framework that can be used alongside them to answer workforce, skills, and policy questions that production-based measures alone do not fully address.

WHY THE DIGITAL ECONOMY MATTERS FOR CANADA'S FUTURE

Every advanced economy is, to some degree, becoming a digital economy. But the pace and depth of that transformation in Canada, and what it means for workers, businesses, and policymakers, need to be better understood. This section explains why digital economy measurement is an area of growing interest and why an improved and shared definition matters for how Canada tracks that growth.

Digital Technology is Changing How Work and Value are Created

Across Canada's economy, jobs are being reconfigured. AI, automation, and connected digital systems are not simply creating new occupations. They are reshaping how existing work is performed, which tasks workers carry out, and what combinations of skills employers require. Emerging research from organizations such as the International Labour Organization suggests that AI is more likely to transform tasks within occupations than eliminate occupations entirely. The result is a labour market in which digital proficiency is no longer confined to technology companies. It has become a requirement embedded in roles across manufacturing, healthcare, financial services, natural resources, and the public sector. This shift has implications that extend well beyond the technology sector. Workers in traditionally non-digital occupations are increasingly

11 Alignment with the OECD Roadmap refers to common measurement priorities and methodological direction. It does not imply OECD endorsement of ICTC's definition, classifications, estimates, or future measurement methodology.

required to develop digital competencies to remain effective in their roles. Understanding this shift requires looking past industry classifications and toward the underlying skills and activities that define digital work.

Digital Activity Is an Increasing Source of Canadian Growth

Digital economic activity, measured across a range of industry-based definitions, has expanded steadily as a share of Canadian GDP and employment over the past decade.[12] The ICT sector contributes substantially to Canada's GDP. In 2023, the sector's GDP was $125.5 billion (in 2017 constant dollars), accounting for 5.7% of national GDP, continuing a trend of taking a higher share of national GDP.

The ICT sector accounts for 18.7% of national GDP growth between 2018 and 2023.[13] This growth is not only a story of new digital firms and occupations—it reflects the broader reconfiguration of work across all sectors, as employers redesign roles and workflows around digital tools and AI-enabled systems. Several forces are driving this expansion. Advances in artificial intelligence and automation are accelerating the digitization of tasks that were previously resistant to technology adoption. Cloud computing and data infrastructure have lowered the barriers for businesses of all sizes to adopt digital tools. Consumer and business demand for digital products and services continues to rise. And digital capabilities are becoming an increasingly important factor in global competitiveness.

CANADA NEEDS A COMMON WAY OF MEASURING THE DIGITAL ECONOMY

Traditional measurement approaches were designed for a labour market in which digital work was concentrated in a discrete technology sector. They are increasingly inadequate for a labour market in which digital skills are embedded across the full range of occupations and industries. As jobs are reconfigured by AI and digital technologies, the boundary of the digital economy shifts with them, and measurement frameworks must evolve alongside it. Defining the digital economy is not simply a statistical exercise: it is a workforce and economic policy issue with direct implications for skills development, immigration, education, productivity, and Canada's long-term competitiveness. For Canada's labour market context, a definition grounded in occupational skill intensity, aligned with national classification systems, and applicable consistently across federal programs represents an improvement on what is currently available.

Beyond improvement, consistency matters. Workforce shortages are difficult to assess accurately without an agreed population boundary. Skills training investments are more challenging to evaluate without a clear occupational scope. International comparisons become more reliable when Canada's definition aligns with those used by the OECD and other bodies. These are not merely methodological concerns — they directly affect the quality of decisions made by governments, educational institutions, and employers.

Canada is making important decisions about skills policy, immigration, and economic competitiveness. A shared and evidence-based definition of the digital economy can help ensure those decisions rest on a consistent analytical foundation.

12 Statistics Canada. *Measuring digital economic activities in Canada, 2010 to 2017*. The Daily, May 3, 2019.

13 Innovation, Science and Economic Development Canada. *2023 Canadian ICT Sector Profile*.

DEFINING CANADA'S DIGITAL ECONOMY

A DEFINITION BUILT AROUND DIGITAL WORK AND ECONOMIC ACTIVITY

ICTC defines the digital economy as:

Economic activities, occupations, and industries that create, enable, support, or are fundamentally transformed by digital technologies, including software, data, networks, and automation systems.

This definition is deliberately broader than conventional approaches that limit the digital economy to the technology sector. It reflects the reality that digital capabilities are now embedded across professional services, manufacturing, infrastructure, natural resources, and creative industries. At the same time, the definition is bounded: it does not include every worker who uses a computer or digital device in the course of their work. The defining criterion is whether digital technology is structurally central to a role, whether the absence of digital proficiency would make the work substantially different or impossible to perform.

TWO LENSES ON THE DIGITAL ECONOMY: WORKERS AND INDUSTRIES

ICTC's definition is operationalized through two lenses that work together. The first is an **occupational lens**, which identifies workers whose roles are defined by digital skill intensity, regardless of which industry employs them. The second is an **industry lens**, which identifies sectors whose primary economic output is the production or delivery of digital goods, services, content, or infrastructure.

Both lenses are necessary because they answer different questions. The occupational lens captures, for example, a data scientist employed by an insurance company, a worker clearly engaged in digital work within an industry not classified as digital. The industry lens captures, for example, a telecommunications company, many of whose employees may not individually be classified in digital occupations but whose collective output is foundational digital infrastructure.

In practice, most labour market indicators, including employment, unemployment, and wages, draw on both lenses together: a worker or job is counted as part of the digital economy if they fall within one of the 55 digital economy occupations (NOC codes) or within one of the 26 digital economy industries (NAICS codes). This combined approach avoids double-counting while ensuring the framework captures digital economic activity wherever it occurs, whether through the nature of the work itself or the industry in which it takes place.

Alongside these combined indicators, the framework also reports select indicators separately at the occupational level and the industry level. Occupational-level indicators isolate patterns specific to digital work regardless of sector. Industry-level indicators isolate patterns specific to digital sectors regardless of occupation. These disaggregated views allow the framework to answer more targeted questions than the combined population alone can address.

WHERE DIGITAL WORK BEGINS: SKILLS AND DIGITAL INTENSITY

Central to this framework is the concept of digital skills, the competencies that allow workers to create, manage, analyze, or apply digital technologies in the course of their work. Digital skills exist on a spectrum. At one end are foundational digital literacy skills, such as the ability to navigate common software applications, which are now broadly distributed across the workforce and do not, on their own, indicate digital economy participation. At the other end are advanced technical skills, software development, data engineering, machine learning, network architecture, and cybersecurity, that are concentrated in a smaller population of specialized workers.

Between these two ends lies a substantial population of workers whose roles require domain-specific digital competencies: the engineer who uses computational modelling software, the designer who works in digital production environments, the statistical analyst who applies advanced data analytics. ICTC's framework is built to identify and classify this full range of digital skill intensity, rather than treating digital skill as a binary characteristic that a worker either has or lacks.

IDENTIFYING CANADA'S DIGITAL WORKFORCE

To translate the conceptual definition into a usable classification, ICTC organizes Canada's digital workforce into four tiers, distinguished by the nature and centrality of digital work within each occupation. In total, this framework identifies 55 digital economy occupations and approximately 2.5 million Canadian workers in those occupations as of June 2026. An additional approximately 200,000 workers are employed in digital economy sectors but classified in non-digital occupations, bringing the total digital economy workforce to approximately 2.7 million workers.

Tier 1 — Core Digital occupations involve the direct creation, maintenance, or management of digital systems and software. This tier includes software developers, cybersecurity specialists, data scientists, and information technology managers. Approximately 1.34 million Canadian workers across 17 occupations fall into this tier.

Tier 2 — Digital-Enabled occupations are those in which digital tools have become so central to job performance that the role has been fundamentally transformed. This tier includes occupations such as graphic design, statistics, and digital marketing. Approximately 486,000 workers across 12 occupations fall into this tier.

Tier 3 — Digital-Adjacent occupations support digital infrastructure or rely extensively on digital tools without directly building digital systems. This tier includes telecommunications technicians and electronics specialists. Approximately 445,000 workers across 16 occupations fall into this tier.

Tier 4 — Digital-Intensive occupations are traditional occupations that have developed substantial digital job variants, such as engineering roles involving computational modelling or industrial control systems. Approximately 253,000 workers across 10 occupations fall into this tier.

Tier 1 — Core Digital:
Building and Managing Digital Systems

NOC	Occupation
21232	Software developers and programmers
21231	Software engineers and designers
21311	Computer engineers
22220	Computer network and web technicians
10030	Telecommunication carriers managers
21234	Web developers and programmers
21222	Information systems specialists
21230	Computer systems developers
21220	Cybersecurity specialists
20012	Computer and information systems managers
22222	Information systems testing technicians
21223	Database analysts and data administrators
21211	Data scientists
21233	Web designers
22221	User support technicians
21221	Business systems specialists
21310	Electrical and electronics engineers

Tier 2 — Digital-Enabled:
Work Transformed by Digital Technology

NOC	Occupation
50011	Managers - publishing, broadcasting
22212	Drafting technologists and technicians
52120	Graphic designers and illustrators
21210	Mathematicians, statisticians, actuaries
22214	Geomatics and meteorology technicians
14112	Desktop publishing operators
12111	Health information management
52111	Graphic arts technicians
10022	Advertising, marketing, PR managers
12112	Records management technicians
11202	Professional occupations in advertising, marketing and public relations
00014	Senior managers - trade, broadcasting
21310	Electrical and electronics engineers

Tier 3 — Digital-Adjacent:
Supporting Digital Systems and Infrastructure

NOC	Occupation
52112	Broadcast technicians
72204	Telecommunications line installers
72205	Telecommunications equipment installers
22302	Industrial engineering technologists
22310	Electrical/electronics engineering techs
52110	Film and video camera operators
52113	Audio and video recording technicians
22311	Electronic service technicians
72201	Industrial electricians
72202	Power system electricians
62100	Technical sales specialists
72203	Electrical power line workers
53111	Broadcasting, photography assistants
92021	Electronics manufacturing supervisors
72011	Electrical trades supervisors
94201	Electronics assemblers

Tier 4 — Digital-Intensive: Traditional Roles with Advanced Digital Requirements

NOC	Occupation
21390	Aerospace engineers
21301	Mechanical engineers
22211	Industrial designers
21100	Physicists and astronomers
21321	Industrial/manufacturing engineers
21300	Civil engineers
21200	Architects
22210	Architectural technologists
22301	Mechanical engineering technologists
20010	Engineering managers

IDENTIFYING THE INDUSTRIES AT THE CORE OF THE DIGITAL ECONOMY

On the industry side, ICTC identifies 26 industries organized into six functional categories, selected according to a consistent principle: these are industries whose primary economic output is the production, enablement, or delivery of digital goods, services, content, or infrastructure.

Hardware industries manufacture the physical infrastructure, computers, semiconductors, telecommunications equipment, without which the digital economy could not exist. **Software** industries publish the programs and applications that make that infrastructure functional. **Support Services** industries provide the professional services, hosting, systems design, and training necessary for digital systems to operate effectively. **Telecommunications** industries deliver the transmission networks that connect devices and enable data to flow. **E-Commerce** industries operate the digital marketplaces through which transactions occur. **Digital Media** industries create and distribute content accessed through digital platforms.

Digital Economy Component	NAICS Canada 2022 v1.0	Description
Digital Media	51211	Motion picture and video production
Digital Media	51223	Music publishers
Digital Media	51224	Sound recording studios
Digital Media	51225	Record production and distribution
Digital Media	51611	Radio broadcasting stations
Digital Media	51612	Television broadcasting stations
Digital Media	51621	Media streaming distribution services and other media networks and content providers
Digital Media	51929	Web search portals and all other information services
E-Commerce	45410	Electronic Shopping and Mail-Order Houses
Hardware	33411	Computer and peripheral equipment manufacturing
Hardware	33421	Telephone apparatus manufacturing
Hardware	33422	Radio and television broadcasting and wireless communications equipment manufacturing
Hardware	33429	Other communications equipment manufacturing
Hardware	33431	Audio and video equipment manufacturing

Digital Economy Component	NAICS Canada 2022 v1.0	Description
Hardware	33441	Semiconductor and other electronic component manufacturing
Hardware	33461	Manufacturing and reproducing magnetic and optical media
Hardware	33592	Communication and energy wire and cable manufacturing
Hardware	41731	Computer and communications equipment and supplies merchant wholesalers
Software	51321	Software publishers
Software	54151	Computer systems design and related services
Support Services	51821	Computing infrastructure providers, data processing, web hosting, and related services
Support Services	61142	Computer training
Support Services	81121	Electronic and precision equipment repair and maintenance
Telecommunications	51731	Wired and wireless telecommunications carriers (except satellite)
Telecommunications	51741	Satellite telecommunications
Telecommunications	51791	Other telecommunications

Industries that use digital tools extensively but whose primary economic output is not digital are not included within this industry boundary. Their digitally skilled workers are nonetheless captured through the occupational classification described above, ensuring that the overall framework does not understate the scope of digital work occurring within conventionally non-digital sectors.

FROM DEFINING THE DIGITAL ECONOMY TO MEASURING ITS PERFORMANCE

A useful definition must do more than describe the digital economy. It must create a consistent basis for measuring how that economy changes over time.

ICTC has therefore developed a broader measurement framework that applies the occupational and industry boundaries established in this paper to a repeatable set of labour market and economic indicators. The framework is designed to support consistent tracking of Canada's digital economy across areas including workforce capacity, labour demand, economic activity, productivity, skills, inclusion, regional distribution, and technological change.

The full indicator methodology is outside the scope of this paper. Its purpose here is to establish that ICTC's definition is designed for ongoing empirical use. The same occupational and industry classifications can be applied across successive periods and data sources, allowing changes in the size, composition, performance, and distribution of the digital economy to be measured on a comparable basis.

This creates a common analytical foundation for ICTC's ongoing labour market intelligence. It can be used to examine questions such as:

- How large is Canada's digital economy, and how quickly is it growing?
- Which occupations, industries, and regions are driving that growth?
- Where are labour demand, skills shortages, and workforce pressures emerging?
- How are wages, productivity, and employment outcomes changing?
- How is AI reshaping occupations, tasks, and skills requirements?
- Is digital economy growth creating broad-based opportunities across regions and demographic groups?

ICTC's measurement framework draws on federal statistical sources, real-time labour market information, and international benchmarks. It also supports the development of new measures for areas that are not fully captured in conventional labour market statistics, including AI-driven occupational change, digital economy productivity, and the distribution of workforce outcomes.

Together, the definition and measurement framework provide ICTC with a consistent, reliable, and repeatable system for tracking Canada's digital economy. This foundation will underpin future reports, labour market outlooks, dashboards, regional and sectoral analysis, and other research. As new data become available and the economy evolves, the framework can be updated transparently while preserving comparability over time wherever possible.

The detailed indicator framework, validation approach, and applications will be presented through future ICTC research and measurement products.

KEEPING THE FRAMEWORK CREDIBLE AS THE ECONOMY CHANGES

ICTC's framework is designed as a transparent and evolving measurement tool rather than a final or fixed classification.

Several limitations should be considered when interpreting the results. Occupational crosswalks inevitably involve judgment when translating international skill data into Canada's National Occupational Classification system. Some digital activities are difficult to observe in official data, especially when they occur within industries that are not primarily digital. Provincial and regional estimates may be constrained by sample size, data availability, or classification detail. Industry classifications can also lag behind emerging business models, especially where digital activity cuts across traditional sector boundaries.

To address these limitations, ICTC intends to treat the framework as a living system. The occupational and industry classifications should be reviewed regularly as technologies, occupations, and data sources evolve. Validation should include comparison with official statistical measures, consultation with federal departments and statistical agencies, engagement with industry and labour market experts, and periodic review of whether emerging technologies are changing the definition of digital work itself. Governance is therefore central to the framework's credibility: updates should be documented, methodological choices should remain transparent, and revisions should preserve comparability over time wherever possible.

WHAT'S NEXT: BUILDING THE NEXT GENERATION OF DIGITAL ECONOMY MEASUREMENT

The next phase of ICTC's work will focus on validating the classification boundaries, refining the composite measurement framework, and improving the data infrastructure needed to track Canada's digital economy over time.

Priority areas include testing the occupational taxonomy against new labour market evidence, refining the treatment of digital workers in non-digital industries, developing and validating indicators related to AI exposure and readiness, and clarifying how composite scores will be calculated and interpreted in future publications.

ICTC will also integrate its AI Measurement Framework into this next phase of work. That framework can strengthen the digital economy measurement system by distinguishing technical AI exposure from likely labour market impact, including whether AI is more likely to augment work or create displacement risk across occupations and industries. In future iterations, measures such as AI exposure, complementarity, augmentation potential, displacement risk, readiness gaps, and industry-level AI impact could be incorporated into the indicator framework to better track how AI is reshaping digital work over time.

These next steps will support a more durable evidence base for skills policy, immigration planning, productivity analysis, and international benchmarking. They will also help ensure that the framework remains useful as the digital economy continues to evolve.

CONCLUSION

A Clearer View of Canada's Digital Economy

ICTC's framework offers a more comprehensive and policy-relevant picture of Canada's digital economy than technology-sector-only definitions.

By combining an occupational lens with an industry lens, it identifies approximately 2.7 million Canadian workers across 55 digital economy occupations, alongside 26 core digital industries organized into six functional categories. This broader scope reflects how digital work is now distributed across the Canadian economy, while preserving a clear boundary around occupations and industries where digital technologies are structurally central.

The value of this framework is not only its larger estimate. It is that the estimate is grounded in the nature of work itself. By identifying digital skill intensity at the occupational level, the framework captures digital transformation where it occurs, including in sectors that would not traditionally be classified as digital. This matters for skills policy, immigration planning, education pathways, productivity analysis, and international benchmarking.

For policymakers and labour market partners, the framework provides a common reference point for asking more precise questions: which occupations require advanced digital capabilities, where digital work is growing, how digital skills are distributed across industries and regions, and whether Canada has the talent and measurement infrastructure needed to support long-term competitiveness.

The composite measurement framework builds on this definition by organizing more than 50 indicators across three dimensions: Digital Capacity and Foundations, Digital Industries and Economic Activity, and Inclusivity and Workforce Outcomes. In doing so, it creates a basis for tracking not only the size of the digital economy, but also its quality, resilience, inclusiveness, and contribution to Canada's future economic performance.

The framework should be understood as a living system. As technologies, occupations, industries, and data sources evolve, ICTC's classifications and indicators will need to be validated, refined, and updated. The aim is not to create a static definition, but to establish a transparent analytical foundation that can evolve with the digital economy itself.

ICTC invites researchers, federal departments, statistical agencies, industry partners, and other labour market stakeholders to validate, challenge, and build on this framework. A clearer shared definition will make Canada's digital economy more visible, more measurable, and better understood, strengthening the evidence base for decisions that shape Canada's workforce, competitiveness, and future growth.

ABOUT THIS RESEARCH

This framework was developed by ICTC. The occupational classification draws on internationally validated skill and knowledge data cross-walked to Canada's National Occupational Classification (NOC) system, informed by approaches developed by the Brookings Institution, the United States Bureau of Labor Statistics, and academic researchers at Carnegie Mellon University and elsewhere. The measurement framework is constructed using Statistics Canada data, including the Labour Force Survey (LFS), the Job Vacancy and Wage Survey (JVWS), and the Postsecondary Student Information System, together with real-time labour market data from Vicinity Jobs and international benchmarks from the OECD, the World Economic Forum, and the World Intellectual Property Organization.

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