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E-commerce Session

Enterprise surveys and the measurement of digital trade in services in Canada

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Introduction

Statistics Canada has been making digital activities visible in international trade in services through two new initiatives, which focus on the concept of digital intensity.

First, efforts have been made to estimate the share of services exports that are being digitally delivered to global trading partners, while simultaneously offering profiles of these exporters that rely on digital means to deliver their products. This profiling occurs through the integration of digital delivery as a characteristic of each enterprise within the Trade in Exporter and Importer Characteristics - Services (STEC) program at Statistics Canada. This paper will provide key information on STEC and on how digital intensity of services exporters as an indicator is evolving within this program.

Second, distinct but equally important efforts have been made to isolate import transactions that involve businesses and consumers in Canada directly importing services from non-resident enterprises. Initially, the focus was on identifying transactions related primarily to the rise in streaming of audio, video and gaming, but the scope broadened to include imported services through accommodation, ride-sharing and app purchasing platforms, and data-driven and advertising revenue-oriented platforms, as well as other digital infrastructure platforms. This work has been undertaken as a horizontal project and will serve as a foundation for expanding the measurement of digital intensity to services imports.

This article will describe the initial work measuring enterprises' digital activity and digital trade in goods and services in the early 2000s. The first section will discuss the foundations laid for digital trade measurement through business surveys, starting with the Survey of Digital Technology and Internet Use (SDTIU) first launched in 2005 and most recently published in 2019.¹ E-commerce as it relates to Canada's retail sector was then measured through the addition of digital questions to the Monthly Retail Trade Survey as of 2014, a year in which many digital platforms emerged in the Canadian market.

More recently, in 2018, building on the terminology and infrastructure established by these earlier business surveys, a digital trade module was developed to augment the [annual International Transactions in Commercial Services survey](#). This work required extensive international collaboration, especially with partners in the United States Bureau of Economic Analysis and the UK Office of National Statistics, and allows Canada to identify the share of digital delivery of cross-border services as a characteristic of each

¹ [SDTIU](#) was most recently in survey collection in 2021 with these results anticipated to be compiled and disseminated in fall 2022.

exporter.

This evolution of these business surveys, combined with advances in data linkage, has culminated in significant advances in measuring cross-border digital transactions, in establishing methodologies and in introducing nuance into compilation discussions. The next steps include a roadmap for development and exploration of the inclusion of the digital intensity of imports within STEC and the improvement of quality and coverage when measuring the role of non-resident platforms and online actors in cross-border digital services, as well as profiling services traders' digital trade in both goods and services by leveraging data sources within the Trade by Exporter Characteristics – Goods (TEC – Goods) and Trade by Importer Characteristics – Goods (TIC – Goods) programs.

Evolution of enterprise surveys to capture digital ordering and delivering

Survey of Digital Technology and Internet Use (SDTIU) as a starting point

Enterprise surveys, starting with Canada's Survey of Digital Technology and Internet Use (SDTIU), have been important mechanisms to compile statistics on e-commerce and digital trade in Canada. The first iteration of this particular survey was for reference year (RY) 2012. Originally branded as the Survey of Electronic Commerce and Technology, this survey program was started based on data gaps related to e-commerce that were identified during the 1998 OECD Ministerial held in Ottawa, Canada.

During the early 2000s, this survey was attempting to isolate a universe of about 8% of the private sector that was engaging in electronic commerce, while simultaneously focusing on “capturing each new enterprise engaging in such practices.” Statistics Canada statisticians at that time stated that “the fact that one of the survey's main objectives is to measure a rare event amplifies the challenges faced in fulfilling the evolving analytical needs.”² While this was less than 20 years ago, it is important for context to recognize that the digital presence in the Canadian market was still emerging, led by a few very large online sellers. Collection of high-quality e-commerce information was difficult for firms that sold through a combination of online and in-store methods since they often did not have a mechanism to track each type of sale separately.

Statistics Canada statisticians at that time stated that “the fact that one of the survey's main objectives is to measure a rare event amplifies the challenges faced in fulfilling the evolving analytical needs.” Even now, there are collection challenges such as “not all enterprises engaging in electronic commerce track their sales separately” that remain, even if the “rare event” classification no longer applies. In the most recent iteration of the survey measuring activity in 2019, 86% of Canadian businesses had at least one type of web presence (such as a website, social media account or paid online advertising), and nearly 70% of businesses purchased goods or services over the Internet, with 25% of businesses receiving orders and generating sales revenue from goods or services over the Internet.³

² Raymond, Jason. Survey of Electronic Commerce and Technology: Past, Present and Future Challenges, Papers presented to ICES-III, June 18-21, 2007, Montréal, Quebec. <https://ww2.amstat.org/meetings/ices/2007/proceedings/ICES2007-000109.PDF>.

³ [One-quarter of Canadian businesses had at least some e-commerce sales in 2019](#), *The Daily*, Statistics Canada, November 23, 2020. This publication notes that this includes all sales of this business's goods or services where the order was received, and the commitment to purchase was made, over the Internet, including through web pages, extranet or Electronic Data Interchange. Payment can be made by other means, and sales can be made on company and third-party websites and apps. Respondents were asked to exclude the delivery of digital products and services for which orders were not made online and when orders were received or commitments to purchase made by telephone, facsimile or email.

It is important for compilers in international trade in services to reframe these findings in the digital trade context. In 2019, of those that sold goods or services online, 24% exported to customers outside of Canada. In that same year, this survey reported that nearly 50% of enterprises in the information and cultural industries operating in Canada, twice that of the average across all industries, sold their goods and services through digital ordering and delivery.

A refinement was added in the most recent survey text (for RY 2021 with publication anticipated for fall 2022) to gauge the share of overall sales that were generated online through digital ordering. This question was followed by “What percentage of the value of this business’s gross sales conducted over the Internet were for the following goods and services?,” which required responses for each of the following categories: a) Digitally delivered goods and services, b) Other Services, or c) Physical goods. This line of questioning allows us to delineate between digitally delivered services that were also digitally ordered, services delivered in-person that were digitally ordered, and goods that were digitally ordered.

Based on this evolution over time, from capturing the rare cases to enterprises existing increasingly in the digital trade realm, it becomes clear how this survey is an essential input to digital intensity of trade in goods and services analytics, and to current and forthcoming work at Statistics Canada.

Retail sales survey provides timely e-commerce indicator

Questionnaire content on e-commerce was integrated through the Monthly Retail Trade Survey into one of Statistics Canada’s core economic indicators, monthly retail sales, as early as 2014. At that time, modifications occurred to this business survey to compile retail e-commerce-generated revenue within the 11 major retail categories.

The retail e-commerce definition is to calculate the value of retail sales by all enterprises in the electronic shopping and mail-order houses industry (NAICS 45411), often referred to as e-tailers, and this revenue is combined with Internet sales from retail trade (NAICS 441 to NAICS453). Canadian businesses shopping in non-resident shops or using non-resident platforms to conduct their e-commerce are not included in Canadian retail sales figures.

After increasing on average 22.3% per annum from 2017 to 2019 reaching \$22. billion, retail e-commerce grew 75% to account for over 6% of total retail sales in 2020 and, in 2021, was reaching new heights of 6.5% of total retail sales. This growth, occurring in the context of a global pandemic, has been inclusive of gasoline and motor vehicle purchases, as well as other high-value subsectors such as food and beverage stores and building material stores, which remained primarily in-person and dampened the visibility of the transition that had occurred in other subsectors. By excluding food and beverage stores as well as building materials, the full scope of e-commerce growth in specific areas of retail sales becomes more evident. In 2017, 6.3% of the revenue generated by these seven retail sectors were through e-commerce; by 2021, 13.6% of retail sales revenues in Canada were generated through e-commerce.

In Figure 1, growth in online retail sales compared with brick-and-mortar stores is shown monthly for the period of 2016 to 2021. Online sales more than doubled over the four-year period, then had doubled again in the first year of the COVID-19 pandemic.

Figure 1. Online sales compared with in-store sales, indexed, 2016 to 2021 (January 2016 = 100, updated to 2021/12)

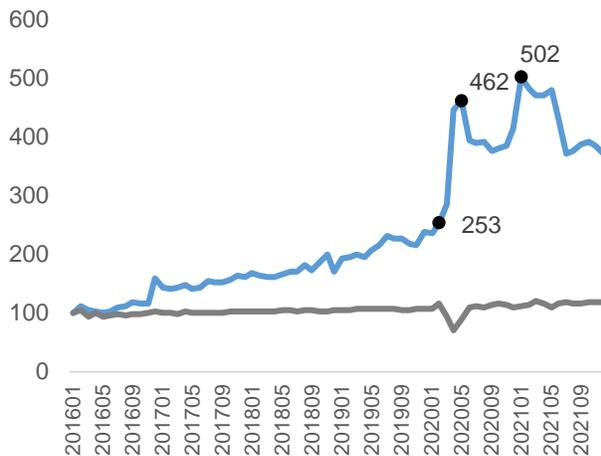
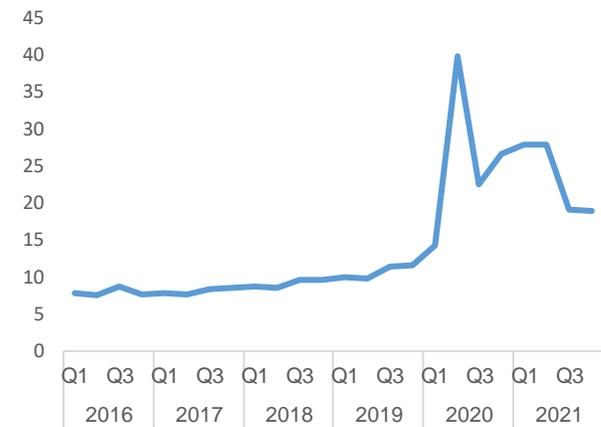


Figure 2. Share of online sales out of total retail trade, Clothing and clothing accessories stores, 2016 to 2021 (quarterly)



As has been reported anecdotally and confirmed in the data, it has been retail e-commerce sales in furniture; clothing; electronics and appliances; and sporting goods, hobby, book and music stores, and game stores that have pushed up the overall share of retail sales for which the transaction is digitally ordered. While the onset of the COVID-19 pandemic meant that 2020 was insufficient to indicate a trend, the level shift to e-commerce was maintained and augmented by a further 16% in 2021 and will continue to be monitored.

A specific example of this shift has taken place in clothing and clothing accessories stores (highlighted in Figure 2), most of which are located in shopping malls in Canada. As many of these retailers’ in-store sales were hampered by public health restrictions, online sales by clothing retailers picked up the slack, rising from an average share of 10% of overall sales in 2018 and 2019, to 25% in 2020 and 2021, with a peak in the second quarter of 2020 of nearly 40%.

International Transactions in Commercial Services—a new digital trade module

Building on the compilation knowledge and survey module infrastructure established by these earlier business surveys, a digital trade module was developed in 2018 to augment the annual International Transactions in Commercial Services survey.⁴

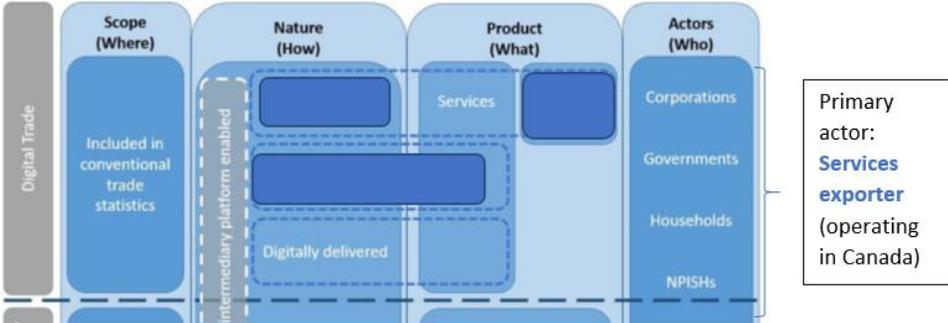
The outcome of the digital trade module has been an inclusion of services exporters’ reported propensity for digital delivery as a characteristic into the STEC program. Estimating the share of services exports that are being digitally delivered to global trading partners was then undertaken through a strategy of leveraging a combination of survey and administrative data.

⁴ Following retail sales, e-commerce questions were also extended to several existing services surveys, such as wholesale trade and key business services surveys such as the [Annual Survey of Services – Software Development and Computer services](#). This evolution was a central component on eventual adoption in the international accounts.

A primary avenue in measuring digital intensity of commercial services was the addition of one question posed to services exporters surveyed on an annual basis. Thanks to this survey, exporters of 15 service categories for RY 2018 and RY 2019 have reported their propensity to digitally deliver their services. This coverage increased in the RY 2020 iteration to include 25 services categories, because important areas such as information services were excluded from the first two annual collection cycles. By the end of collection RY 2020, more than 2,000 enterprises had self-reported the share of their services exports by service category that had been digitally delivered in at least one of the previous three years.

The second important avenue is a data linkage-based compilation of an enterprise’s propensity to report Internet revenue through the examination of both Statistics Canada business surveys and relevant administrative data sources. These data together map the main vehicles through which firms operating in Canada conduct sales, including both domestic sales and exports. The first avenue provided a first universe of firms that between 2018 and 2020 were definitively services exporters and for which the value reported related to digital delivery of those services exports by services category. The second avenue provided a digital orientation flag for a larger universe of firms engaged in both digital ordering and digital delivery of exports.

Figure 3. Adapted from *Handbook on Measuring Digital Trade* (2022)



Source: Adapted from *OECD/WTO Going Digital Toolkit note*

Statistics Canada has been collaborating with the Organisation for Economic Co-operation and Development, World Trade Organization, and United Nations Conference on Trade and Development framework for measuring digital exports and the *Handbook on Measuring Digital Trade*’s main objective of providing a view services that are being exported digitally across borders. The scope was initially reduced to focus on commercial services exports digitally delivered from services exporters in Canada.

A further concrete step will be to provide digital intensity for digitally ordered commercial services import values in the future, by using assumptions of digital delivery of services exports and imports being the same for the same reporting enterprise. The value allocated to various non-resident digital platforms is also being included in imports.

Closing the data gap on non-resident enterprises generating revenue in Canada

Generally, the role of non-resident platforms and enterprises engaged in retail e-commerce in domestic economies has come under further scrutiny, as perhaps further growth in e-commerce worldwide is now occurring off the measurement grid, since non-residents tend not to be surveyed or included in administrative data. In Canada, the revenue generated by non-resident platforms has been especially challenging to capture because the transactions between these platforms and Canadian enterprises and

households are high frequency and diffuse in nature. As a result of legislation implemented in Canada as of July 2021, a consolidated report on the goods and services tax paid by particular non-resident platforms with majority ownership was required from key players. This data source, in conjunction with others, such as companies' annual financial reports, will be vital in better ascertaining the geographical segment of Canada and the associated revenue streams for non-resident platforms more generally.

While the measurement of digital trade within STEC focused primarily on exports, with export share applied to enterprises' imports in 2020 solely as an experimental estimate, the most important challenge in recent years within trade in services has been in services imports, notably direct transactions with non-resident platforms involving digital ordering or delivery. These platforms can be classified into four groupings: accommodation, ride sharing and food delivery (margin-oriented platforms); streaming and services delivery (revenues attributed to the platform); data- and advertising-driven platforms; and other digital infrastructure platforms. Compilation practices alter considerably among these four.

For example, for households and business having direct transactions with non-resident platforms, there are multiple steps in arriving at a value of imports, and it is quite involved since the intent is to capture only the subscription, or margin received by the platform. For **accommodation, ride-sharing and food delivery**, it is necessary to break down the fee or margin from the overall revenue generated.

For **streaming** (music, podcast, audiobook, video, video game) directly from non-resident enterprises via the non-resident streaming platform, imports tend to have a subscription fee that is channelled to the non-resident platform. This streaming fee flows from the household or firm in Canada directly to the non-resident firm, and therefore, the entire fee is included in the import value.

For **data- and advertising-driven platforms**, data arriving from recent legislation, more complete reporting in annual financial reports by geographic segment and further mining of existing data sources can provide better estimated values.

For **other digital infrastructure platforms**, underlying payment and digital delivery facilitation mechanisms, domain name and security infrastructure, among other aspects of digital infrastructure, are necessary dimensions to capture to measure this activity.

Box 1. Canada's digital supply-use table—First attempts at an integrated view

All of Statistics Canada's work on measuring digital trade in goods and services occurs within a larger macroeconomic context of measuring the value of transactions occurring solely among residents in Canada and those occurring with facilitation by or direct transactions with non-residents throughout the rest of the world. As a result, digital trade discussions occur within a compilation reality of residents (household sector, corporate sector, non-profit sector, government sector) and the non-resident sector. For example, any operation of a US multinational in Canada is a resident, while any operation of a Canadian multinational outside of Canada is a non-resident actor.

As digital trade is highly entwined in complex multinational operations, it is important to consider that cross-border digital trade extends beyond goods to the full spectrum of services, including construction services, health care services, and services relating to mining and minerals, which were previously not thought to be adaptable to digital ordering and delivery.

Using Canadian supply and use tables as a framework, production by resident enterprises (operating in Canada) and imported products (goods and services) from non-resident enterprises are traced through their uses by enterprises in Canada, as final consumption (by the household sector), investment and exported products to the non-resident sector.

According to these initial 2019 estimates, digitally ordered products represented 6.8% (\$336 billion) of total supply, and digitally delivered services represented 2.3% (\$116 billion) of total supply. Most digitally ordered products (approximately 71%) were sourced directly from the supplier, whereas 27% were purchased through domestic retailers and wholesalers. Digital intermediary platforms were responsible for the remaining 2%, with non-resident platforms dominating activity relative to domestic platforms.

Approximately 7.2% of imports (\$52 billion) were digitally ordered, which slightly exceeded the share of digital orders from domestic producers at 6.8% (\$278 billion). The share of digitally delivered products in domestic production (2.4%) was higher than its share in imports (1.8%).

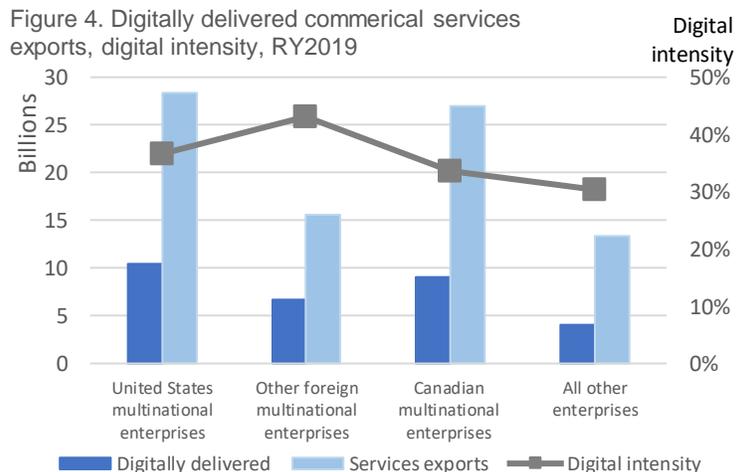
This broad initiative led to preliminary steps to better cover import transactions that involve consumers in Canada directly importing services from non-resident enterprises and to integrate this value in international trade in services. These transactions related primarily to streaming of audio, video and gaming, and the scope will be broadened to include imported services through accommodation, ride-sharing, and app purchasing platforms, and data-driven and advertising revenue-oriented platforms. Perhaps most importantly, deriving the supply and use tables highlighted key imbalances in imports of advertising services, as one example, as revenues generated by non-resident platforms were clear on the consumption side but not the production side of the equation.

Source: All figures are extracted from Economic Commission for Europe Conference of European Statisticians Group of Experts on National Accounts, Twentieth session, May 2021 Measuring the digital economy: The Canadian digital supply and use tables 2017-2019 Prepared by Statistics Canada, ECE/CES/GE.20/2021/10, available at <https://unece.org/sites/default/files/2021-04/ECE-CES-GE20-2021-10-EN.pdf>.

Digital intensity of services exports as a dimension of STEC

In measuring enterprises' propensity for digital trade, services exporters in Canada identify services provided to other countries without any individuals being present in that country to provide that service. The avenues through which the services are typically provided are platforms, used as intermediaries, or own-account applications and websites leveraged to generate revenue. Digitally delivered services exports are published based on the characteristics of the services exporter, whether a multinational or not (type of enterprise) and whether a smaller (0 to 499 employees) or large (500 or more employees) enterprise in terms of employment (enterprise size class).

For RY 2019, overall, nearly two-fifths of commercial services exports were reported to be digitally delivered, amounting to approximately \$30.2 billion of business services. Typically, these are services provided through the use platforms, applications and other means of transmission of materials online. This first estimate of digital intensity provided a foundation for assessing enterprise-level adaptation over the course of the COVID-19 pandemic in 2020 and 2021. In line with that average, 36% of services exported by majority-owned US multinationals operating in Canada were digitally delivered. The share of services exported to clients outside of Canada through digital delivery from other foreign multinationals operating in Canada was even higher at 43%, and further differentiating between SME and Large in employment size, these MNEs' digital intensity reached 53%. Canadian multinationals, partly because of their concentration in financial transactions, which were excluded from digital intensity in the 2019 compilation, reported the lowest digital intensity of services exports within multinational enterprises. Excluding financial institutions, the digital intensity of Canadian multinationals was more similar to US multinationals. Global leaders in digital intermediary platforms and digital infrastructure operating in Canada spanned Canadian, US and other foreign multinational enterprise groupings. Digital intensity measures for services exports for RY 2020 will be available upon the dissemination of STEC in November 2022.



Next steps

An objective of this paper has been to review the timeline of digital trade and e-commerce at Statistics Canada as viewed through the lens of business survey development. Another was to underline that data linkage expansion for measuring digital trade is very much grounded in core business survey findings. Through the development of enterprise surveys and amendments in terms of terminology of additional modules, compilers can minimize assumptions in data linkage and thereby leverage administrative data sources and other supplementary data much more effectively.

Through this approach, data linkage for measuring digital trade has a sufficiently robust foundation to advance the analytical framework of the universe of enterprises engaged in cross-border digital trade in services exports, then both directions of trade, and then all enterprise products.

The third and final objective is therefore to illustrate a path toward analyzing enterprises engaged in international trade in goods and services as a highly pertinent universe in its own right. This integrated approach will form an essential next step to strengthen the measurement of digital trade. While the split between goods and services may blur for certain enterprises, and while the distinction cannot always be measured, measuring digital trade in goods and services as reported by the enterprises allows steps to be taken toward better vision. Many key services producers are also high-value goods exporters and importers. Data linkage of Trade by Exporter and Importer Characteristics – Goods (TEC) and STEC allow the exploration of goods and services trade value and patterns of services traders—and will be a key step in integrated analysis on digital ordering and digital delivery.

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[Handbook on Measuring Digital Trade, Version 1 - OECD](#)