The Survey Research on Creating Satellite Accounts for the Digital Economy

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Background and Objectives

○ The new international standard for the SNA, known as the 2025 SNA, was adopted by the United Nations Statistical Commission in March this year, and addressing digitalization is considered one of its key challenges.

○ Specifically, the 2025 SNA highlights initiatives such as the capitalization of data, the valuation of free-of-charge digital products, and the creation of satellite accounts to keep records of the digital economy.

○ Concerning satellite accounts for the digital economy, preliminary estimates in a previous digital SUT were taken (with 2015 as the base year and 2018 as the projected estimate), but this has not been updated.

○ Meanwhile, the OECD published a handbook for estimating digital SUTs (the OECD handbook) in November 2023, making it possible to re-estimate the digital SUT using the most recent available statistics.

○ In light of these circumstances, a preliminary estimate of the digital SUT for the year 2020 was conducted in fiscal year 2024, in accordance with the OECD handbook.

○ The general framework for the estimation is as follows:

- The estimation method is based on the OECD handbook.
- The target year is 2020. Information from the 2021 Census for Business Activity will be reorganized and processed, and the supply and use tables published by the Ministry of Internal Affairs and Communications (MIC) will be reorganized and disaggregated.

Structure of the Digital Sector [1] (A Concise Introduction to the OECD Handbook)

○ Digital SUTs are created according to the OECD handbook. In the handbook, the digital sector is divided into three sections: Digital Industries, Digital Products, and The Nature of the Transaction.

- Section 1: Digital Industries
  - ✓ The digital sector is composed of seven components: The digitally enabling industry, financial service providers that predominantly operate digitally, digital intermediation platforms (DIPs) that charge a fee, data- and advertising-driven platforms, e-tailers, producers dependent on DIPs, and other producers that only operate digitally.
    - ー The digitally enabling industry ⇒ Entities that fall under the category of information and communication technology (ICT) sectors in ISIC Rev. 4.（e.g., manufacture of electronic components and boards)
    - ー Financial service providers that predominantly operate digitally ⇒ Financial service operators that operate primarily online.
    - ー Digital intermediation platforms (DIPs) that charge a fee ⇒ DIPs that hold no physical inventory and that earn revenue through transaction fees from purchases.
    - ー Data- and advertising-driven platforms ⇒ Companies operating as digital platforms that primarily generate revenue from the sale of data they have created based on the information they have gathered and from advertising services.
    - ー E-tailers ⇒ Wholesale retailers whose revenue comes mostly from digital orders.
    - ー Producers dependent on DIPs ⇒ Producers that depend on DIPs for most of their sales.
    - ー Other producers that only operate digitally ⇒ Producers operating only online that do not fall under the definitions of the other categories.

Structure of the Digital Sector [2] (A Concise Introduction to the OECD Handbook)

- Section 2: Digital Products
  - ✓Digital products are composed of four components: ICT goods, digital services (excluding DIS and CSS), digital intermediation services (DIS), and cloud computing services (CSS).
    - －ICT goods ⇒ Computers and peripheral equipment, communication equipment, consumer electronic equipment, and miscellaneous ICT components and goods.
    - －Digital services (excluding DIS and CSS) ⇒ Manufacturing services for ICT equipment, business and productivity software and licensing services, information technology consultancy and services, telecommunications services, leasing or rental services for ICT equipment, and other ICT services.
    - －Digital intermediation services (DIS) ⇒ Online intermediation services that mediate transactions between multiple buyers and multiple sellers and receive transaction fees as compensation.
    - －Cloud computing services (CSS) ⇒ Cloud computing services consist of computing, data storage, software, and related IT services accessed remotely over a network, supplied on demand and with measured resource usage that allows charging on a pay-per-use basis.

- Section 3: The Nature of the Transaction
  - ✓The method of ordering and means of delivery are classified into digital and non-digital variants.
    - －Digital ordering ⇒ The sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders.
    - －Digital delivery ⇒ Transactions that are delivered remotely over computer networks.

⇒These three sections will be used as the basis for disaggregating the MIC's 2020 SUT and estimating a digital SUT.

Summary of the Estimation Procedure

Disaggregation shall proceed sequentially from the sections Digital Industries, Digital Products, and, finally, The Nature of the Transaction. Specifically, the following steps will be taken:

Step 1: Disaggregate each of the following: 1) Digitally Enabling Industry (Industry [Manufacturing]) and ICT Goods (Products) and 2) Digitally Enabling Industry (Industry [Services]) and Digital Services (Products).

Step 2: Deduct processing fees related to digital products from ICT Goods (Products) and add them to Digital Services (Products).

Step 3: Separate Financial Service Providers Predominantly Operating Digitally (Industry) from existing financial and insurance firms using the financial information of each company.

Step 4: Separate Digital Intermediation Platforms (DIPs) Charging a Fee (Industry) and Data- and Advertising-Driven Platforms (Industry) from existing internet-based service firms.

Step 5: Separate E-tailers (Industry) from existing retailers.

Step 6: Pick out Producers Dependent on DIPs (Industry).

Step 7: Pick out Other Producers Only Operating Digitally (Industry).

Step 8: Classify the value of transactions in each cell into those corresponding to Digital Orders and those corresponding to Non-Digital Orders.

Explanation of the Estimation Procedure (Step 1)

Step 1: Disaggregate each of the following: 1) Digitally Enabling Industry (Industry [Manufacturing]) and ICT Goods (Products) and 2) Digitally Enabling Industry (Industry [Services]) and Digital Services (Products).

⇒ Using information from the 2021 Economic Census for Business Activity, the Digital Industries section is disaggregated into “Electronic Devices,” “Communication, Image, and Audio Equipment,” “Electronic Data Processing Machines, Digital and Hybrid Computer, and Peripheral Equipment,” “Communication Services,” and “Information Services,” etc., and the Digital Products section is disaggregated into “Business Oriented Machinery,” “Electronic Devices,” and “Communication, Image, and Audio Equipment,” etc.

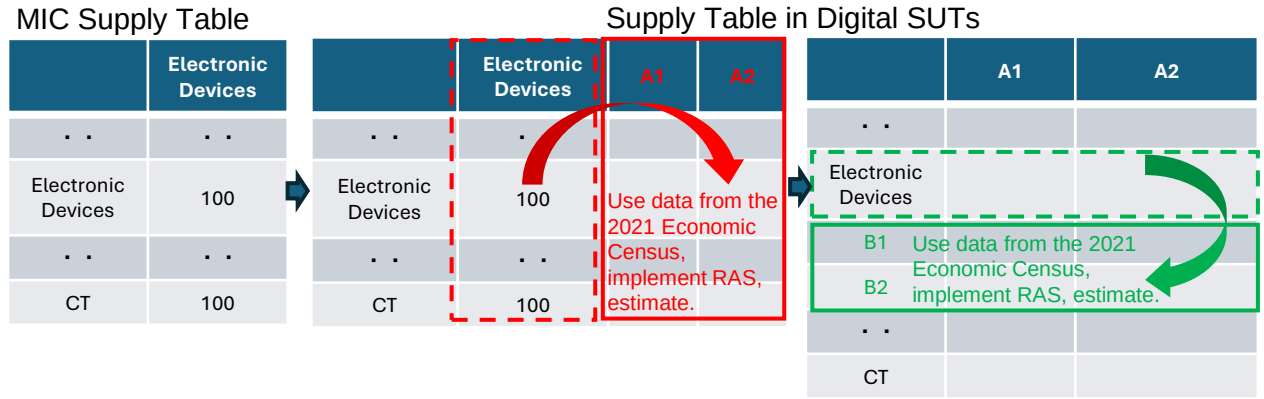
1. MIC and Digital SUT Classifications

MIC Classification	Classification of Digital Industries and Digital Products for Digital SUTs
Electronic Devices (Industry)	Electron Tube Manufacturing
	Photoelectric Conversion Element Manufacturing
	Manufacturing of Semiconductor Devices, Excluding Photoelectric Conversion Element
	Integrated Circuit Manufacturing
	Liquid Crystal Panel and Flat-Panel Manufacturing
Electronic Devices (Products)	Electron Tubes
	Photoelectric Conversion Element
	Semiconductor Devices
	Integrated Circuits
	Panels

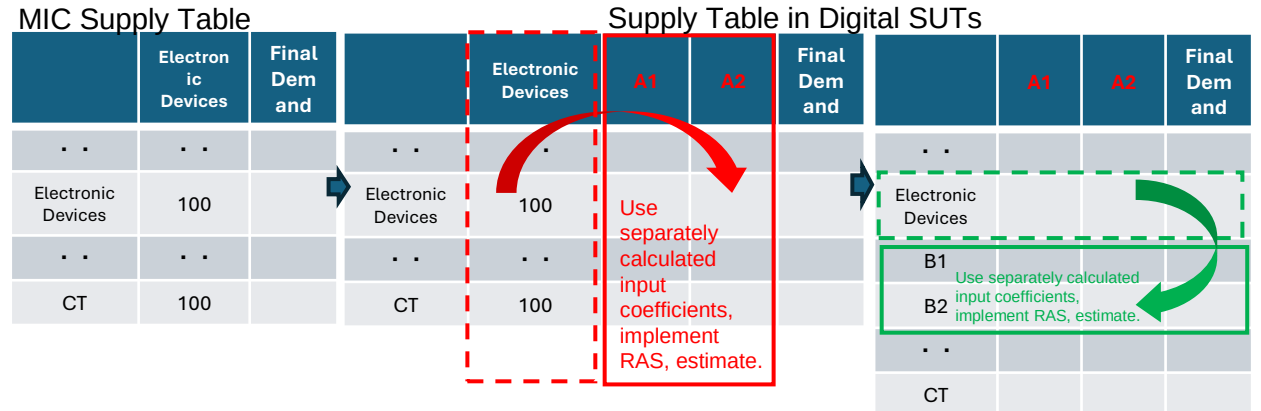
※1: A portion of items to be disaggregated.

2. Order of Disaggregation and Estimation in SUTs

(1) Disaggregation in the supply table: Disaggregation by industry and product in sequence



(1) Disaggregation in supply table: Disaggregation by industry and product in sequence, similar to the use table



Explanation of the Estimation Procedure (Step 2)

Step 2: Deduct processing fees related to digital products from ICT Goods (Products) and add them to Digital Services (Products).

⇒ Using the ratio of the shipment value of manufactured goods to the income from processing fees, extract a portion of the output value recorded in ICT Goods and aggregate them under “Manufacturing Services for IT Equipment (Goods).”

1. Handling of “Manufacturing Services for ICT Equipment” and the corresponding processed item

Subordinate Items Under “Manufacturing Services for ICT Equipment” ※4	Corresponding Processed Item※5
Electronic Component and Board Manufacturing Services	・Electron Tube ・Photoelectric Conversion Element ・Semiconductor Devices ・Integrated Circuits ・Liquid Crystal Panels and Flat Panels
Computer and Peripheral Equipment Manufacturing Services	・Electronic Data Processing Machines, Parts, Attachments, and Accessories ・Personal Computers, Parts, Attachments, and Accessories ・External Storage, Parts, Attachments, and Accessories ・Printers, Parts, Attachments, and Accessories ・Display Units, Parts, Attachments, and Accessories ・Other Peripheral Equipment, Parts, Attachments, and Accessories

※4: In addition to the categories shown, “Communication Equipment Manufacturing Services,” “Consumer Electronics Manufacturing Services,” and “Magnetic and Optical Media Manufacturing Services” are also subordinate items under “Manufacturing Services for IT Equipment”

2. Ratio for extracting the income from processing fees for “Manufacturing Services for IT Equipment”

Shipment Value※6 (¥1 million)	Electron Tube Manufacturing	Photoelectric Conversion Element Manufacturing
Electron Tubes	76,763	0
Photoelectric Conversion Element	0	393,005

Income from Processing Fees※6 (¥1 million)	Electron Tube Manufacturing	Photoelectric Conversion Element Manufacturing
Electron Tubes	2,063	0
Photoelectric Conversion Element	0	7,066

(Extraction Ratio)	Electron Tube Manufacturing	Photoelectric Conversion Element Manufacturing
Electron Tubes	0.0262	0
Photoelectric Conversion Element	0	0.0177

Use each ratio to extract the portion for processing fees from the supply and use tables※7

※5 : Although the official name for the processed product is “Electron Tubes (Piecework),” we did not use it to fit the text on the page.

※6 : Estimated using the 2021 Census for Business Activity.

※7 : Extraction is not conducted for the Service Industry and Import Sector in the supply table and for the Service Industry and Final Demand in the use table.

Explanation of the Estimation Procedure (Step 3)

Step 3: Separate Financial Service Providers Predominantly Operating Digitally (Industry) from existing financial and insurance firms using the financial information of each company.

⇒ Classify banks “without physical branches or establishments” etc., as Financial Service Providers Predominantly Operating Digitally (Industry)

Line of Business	Details on this Category	Output Value (¥1 million)
Banking	Banks without physical branches or establishments Example: Sony Bank, Daiwa Next Bank (We considered using the new quantitative criterion for defining digital banks (the ratio of tangible to intangible fixed assets) in response to changes in the handbook’s definition but eventually decided against it.)	377,994
Securities	Standalone securities firms operating over the Internet Example: SBI Securities, Matsui Securities	151,965
Insurance	Firms operating primarily over the Internet Example: Sompo Himawari, Orix	Life Insurance: 665,708 General Insurance: 172,873
E-commerce payment	Full member of the EC Payment Forum Example: GMO Payment Gateway Inc.	89,732

Explanation of the Estimation Procedure (Step 4)

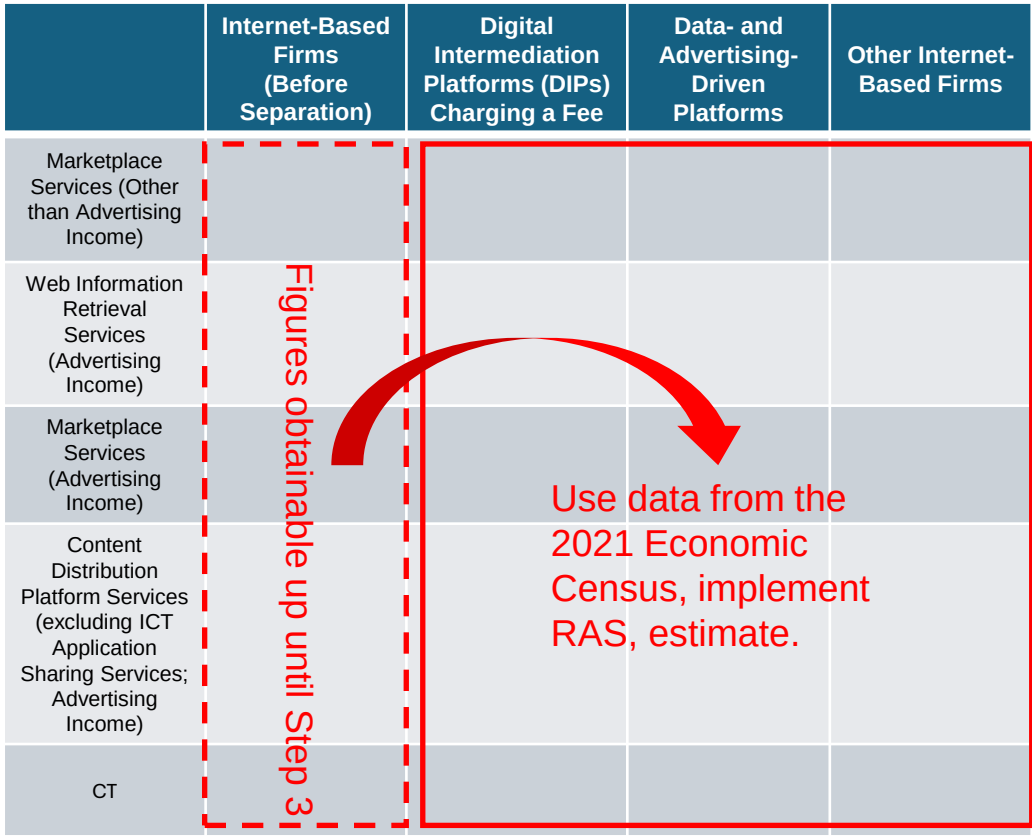
Step 4: Separate Digital Intermediation Platforms (DIPs) Charging a Fee (Industry) and Data- and Advertising-Driven Platforms (Industry) from existing Internet-based service firms.
⇒Classify establishments based on questionnaire data and estimate the output of the PF industry in the supply table using the PF industry's share of revenue from business establishments within the total revenue of Internet-related services from business establishments.

1. Classification of Business Establishments

Category	Details
Digital Intermediation Platforms (DIPs) Charging a Fee	Business establishments with the highest share of sales※8 in "Marketplace Services (Other than Advertising Income)"
Data- and advertising-driven platforms	Business establishments with the highest share of sales in "Web Information Retrieval Services (Advertising Income)," "Marketplace Services (Advertising Income)," and "Content Distribution Platform Services (excluding ICT Application Sharing Services; Advertising Income)." ※8

※8: Estimated using the 2021 Census for Business Activity, enterprise-related aggregations, cross-industry aggregations, construction, and service revenue

2. Estimation for the PF Industry in the Supply Table※9



※9 : The separation in the use table is done by multiplying the CT of the PF industry and other Internet-related services (as derived from the table above) by the same input ratio as that of Internet-related services (before separation).

Explanation of the Estimation Procedure (Step 5)

Step 5: Separate E-tailers (Industry) from existing retailers.
⇒ After classifying “E-tailers” according to the census, calculate the “E-tailer” ratio and conduct estimation for “E-tailers” in the supply table.

1. Classification of E-tailers and Estimation of their Proportion

Category	Details
Method for Classifying “E-tailers”	Classify establishments as “e-tailers” if their largest “share of retail sales by sales channel※10” falls under “Internet sales.”
Calculation of the Margin Ratio for “E-tailers”	○Calculate the margin ratio from the Economic Census (Enterprise Questionnaire Form). ○Multiply this margin rate by the value of merchandise sales of affiliated establishments to calculate the establishment’s margin value ○Aggregate the results separately for “E-tailers” and “non-E-tailers,” and calculate the margin ratio※11 for “E-tailers.”

※10: The sales channels for retail sales includes Internet sales as well as in-store sales, door-to-door sales, mail-order catalog sales, vending machine sales, and others.
※11: Calculate the ratio separately for retail margins and cost-based commerce.

2. Estimation for E-tailers in the Supply Table

Supply Table	Retailers	Non-Retail Firms	Domestic Output
Retailers	40,168	3,591	43,758

○ Estimation for retailers for whom their main business is as an “E-tailer”
- ✓Separate the values for retail margins and cost-based commerce, use the ratios from the table on the left-hand side to estimate the “E-tailer’s” share for each, and then sum the two.

○ Estimation for retailers for whom their sub-business is as an “E-tailer”
- ✓Using information from the census, aggregate sales from business activities other than retail for “E-tailers” and “non-E-tailers” separately, and calculate the “E-tailer” ratio for each activity.
- ✓ Link these business activities to products in the supply table and multiply the output value for each good by the E-tailer ratio.

3. Estimation for E-tailers in Use Table

○ Estimation of the share from the “Retail” (Industry) entry in the use table
- ✓Using data from the census and other sources, calculate the “E-tailer” ratios for the gross value added, employee compensation, and consumption of fixed capital. Then, subtract these ratios from 1 to derive the intermediate input ratio.
- ✓Multiply these ratios by the output value of “E-tailers” obtained from the supply table.

Explanation of the Estimation Procedure (Step 6)

Step 6: Pick out Producers Dependent on DIPs (Industry) (hereafter, Dependent Firms).

⇒ For each non-digital industry, obtain the share of “dependent firms” and estimate the output, etc., of these firms in the supply and use tables.

1. Proportion of “Dependent Firms” in the Non-Digital Industry

○ Extend past estimates of the proportion of “Dependent Firms” in previous fiscal years’ commissioned studies using the “Family Income and Expenditure Survey” and the “E-Commerce Market Survey.”

Statistics	Details of Projected Estimates
Family Income and Expenditure Survey	○ Calculate the share of spending made using the internet for each item. ○ After making the corresponding association to the specific industry, make a projected estimate using the rate of change from 2015 to 2020.
E-Commerce Market Survey	○ After linking the e-commerce penetration rate (B2C) for each field/category to the corresponding industry, make a projected estimate using the rate of change from 2015 to 2020.

○ Calculate the average of both estimates.

2. Estimation for “Dependent Firms” in the Supply Table

Multiply the output of each industry by the share of “dependent firms” to estimate the output of “dependent firms” in the supply table.

(Before Separation)

	Industry A
Product A	20
Product B	40
Product C	40
CT	100

20% proportion of “Dependent Firms” ⇒

(Supply Table After Separation)

	Industry A’	Dependent Firm A
Product A	20×0.8	20×0.2
Product B	40×0.8	40×0.2
Product C	40×0.8	40×0.2
CT	100×0.8	100×0.2

3. Estimation for “Dependent Firms” in the Use Table

Estimate the input value, etc., of “dependent firms” in the use table by using the output value of the “dependent firms” and the pre-separation intermediate input ratio.

(Before Separation)

	Industry A
Product A	0.2
Product B	0.5
Product C	0.3
CT	1

⇒

(After Separation)

	Industry A’	Dependent Firm A
Product A	(100×0.8) ×0.2	(100×0.2) ×0.2
Product B	(100×0.8) ×0.5	(100×0.2) ×0.5
Product C	(100×0.8) ×0.3	(100×0.2) ×0.3
CT	100×0.8	100×0.2

Explanation of the Estimation Procedure (Step 7)

Step 7: Pick out Other Producers Only Operating Digitally (Industry).
⇒ Identify and separate business establishments that operate exclusively online from the industries categorized as non-digital up until Step 6 (specifically, Video Picture Information, Sound Information, and Character Information Production Services)

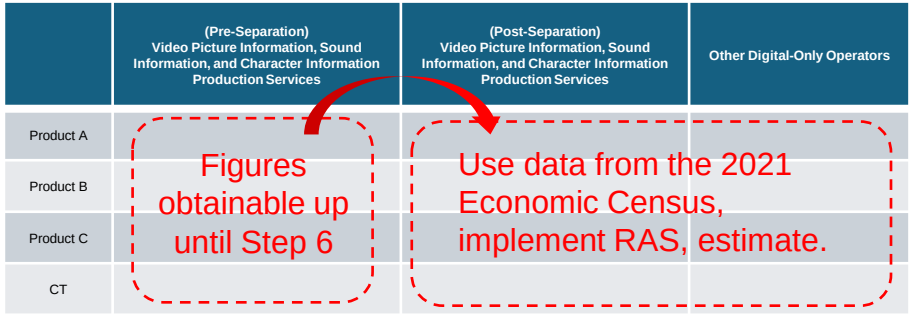
1. Estimation of Figures for Identification and Separation

○ Aggregate sales by product for establishments classified under “Video Picture Information, Sound Information, and Character Information Production Services.”
○ Then, aggregate the product-level sales for establishments that produce only the products listed below.
- Industrial packaged software (for distribution)
- Home-use software (excluding game software) (for distribution)
- Game software (for distribution)
- Game application sharing services
- Video software (for distribution)
- Music software (for distribution)
- Online newspapers (subscription charges)
- Online magazines (subscription charges)
- Online books

○ Treat these as the sales output produced by “Other Producers Only Operating Digitally.”

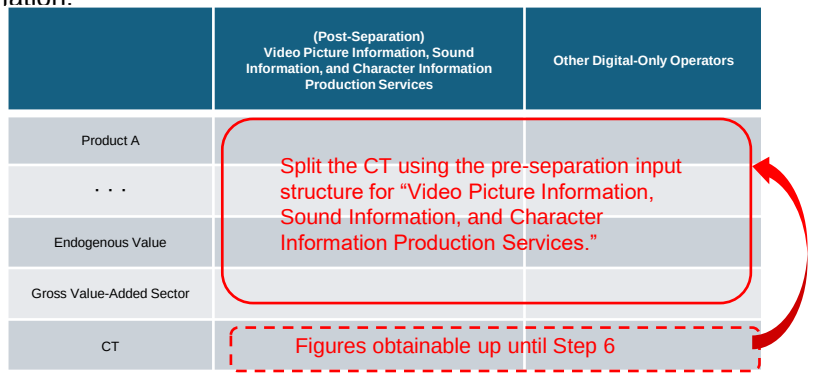
2. Estimation for the Supply Table

○ Conduct estimation by deducting values for “Other Producers Only Operating Digitally,” etc., from the pre-separation values for “Video Picture Information, Sound Information, and Character Information Production Services”



3. Estimation for the Use Table

○ Conduct estimation by using the pre-separation input structure for “Video Picture Information, Sound Information, and Character Information Production Services” and the CT obtained from the supply table estimation.



Explanation of Estimation Procedure (Step 8)

Step 8: Classify the value of transactions in each cell into those corresponding to Digital Orders and those corresponding to Non-Digital Orders.

1. Estimation of the Proportion of Digital Orders

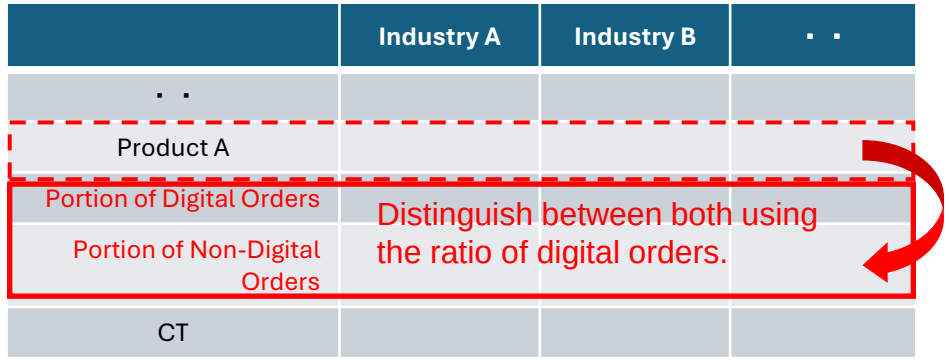
○ For each product, estimate the ratio of "digital orders" separately for B2C and B2B.

Category	Method of Estimation
B2C	○ From the "Family Income and Expenditure Survey," calculate the 2015-to-2020 multiplier for the share of spending made using the Internet. ○ Multiply this multiplier by the 2015 ratio of digital orders.
B2B	○ From the "E-Commerce Market Survey," calculate the 2015-to-2020 multiplier for the rate of e-commerce penetration, broadly defined. ○Multiply this multiplier by the rate of e-commerce penetration, narrowly defined.

○ Then, using the compensation ratios of household consumption expenditure and other expenditures as weights, integrate the ratios of B2C and B2B digital orders and estimate the ratio of digital orders for each product.

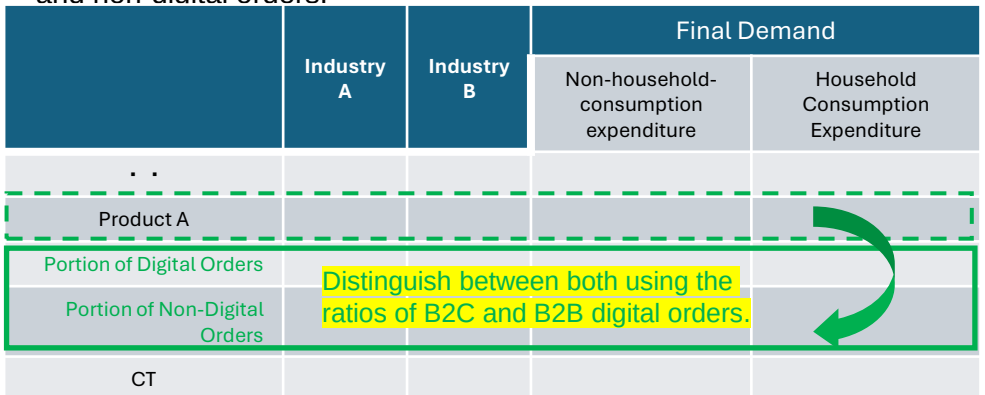
2. Estimated Share of Digital vs. Non-Digital Orders in the Supply Table

○ Use the estimated ratio of digital orders for each product, and distinguish between digital and non-digital orders



3. Estimated Share of Digital vs. Non-Digital Orders in Use Table

○ Apply the ratio of B2C digital orders to household consumption expenditure and the ratio of B2B digital orders to both other expenditures and endogenous sectors; then, distinguish between digital and non-digital orders.



Overview of the Estimation Results (Supply Table)

Among the total domestic production, digital industries, including the digitally enabling industry (service industry) and digital services ,etc., accounted for ¥94 trillion, or 9.1% of the total (red solid line), while digital products accounted for ¥67 trillion, or 6.5% of the total (blue dotted line). The ratio of digital orders represents 21% of the total domestic production.

		Digitally Enabling Industry (Manufacturing)	Digitally Enabling Industry (Services)	DIPs Charging a Fee	DIPs (Revenue from Data or Advertising)	Digital Finance Industry	E-tailers	Dependent Firms	Others	Non-Digital Industries	Domestic Production	Total Supply (Purchaser Price)
ICT Goods	Digital	6,865	0	0	0	0	0	7	0	638	7,510	13,462
	Non-Digital	9,420	1	0	0	0	0	3	0	891	10,315	19,691
Digital Services	Digital	216	11,692	609	184	0	13	55	1	1,198	13,968	14,845
	Non-Digital	230	25,280	1	650	0	23	37	0	3,390	29,612	32,396
CCS	Digital	0	1,253	798	26	0	0	4	0	134	2,215	2,232
	Non-Digital	0	0	0	0	0	0	0	0	0	0	0
DIS	Digital	0	47	1,506	138	0	0	0	0	57	1,749	1,762
	Non-Digital	0	0	0	0	0	0	0	0	0	0	0
Digital Advertising	Digital	0	48	298	1,452	0	0	5	0	111	1,914	1,937
	Non-Digital	0	0	0	0	0	0	0	0	0	0	0
Semi-Digital Products	Digital	1	4,449	16	114	0	2	7	0	180	4,767	5,252
	Non-Digital	2	2,393	1	2	0	0	3	0	160	2,561	2,979
Non-Digital Products	Digital	483	415	4	12	1,482	2,361	8,553	61	168,421	181,794	204,889
	Non-Digital	989	1,311	8	31	64	570	9,753	0	758,482	771,209	821,370
Output	Digital	7,565	17,905	3,231	1,926	1,482	2,376	8,631	63	170,740	213,918	244,378
	Non-Digital	10,641	28,985	9	684	64	593	9,796	0	762,924	813,697	876,436

Overview of Estimation Result (Use Table)

- In 2020, Japan's total use amounted to ¥1,121 trillion, with digital-related sectors accounting for ¥244 trillion.
- The total gross value added was ¥562 trillion, of which digital industries (red solid line) accounted for ¥48 trillion, or 8.5% of the total (the Digitally Enabling Industry (Services) contributed the most at ¥26 trillion).

		Digitally Enabling Industry (Manufacturing)	Digitally Enabling Industry (Services)	DIPs Charging a Fee	DIPs (Revenue from Data or Advertising)	Digital Finance	E-tailers	Dependent Firms	Others	Non-Digital	Demand Sector	Total Use
ICT Goods	Digital	2,381	21	1	1	0	14	23	0	2,733	8,289	13,462
	Non-Digital	3,122	27	1	1	0	18	30	0	3,582	12,909	19,691
Digital Services	Digital	117	1,180	112	90	10	32	66	0	2,808	10,429	14,845
	Non-Digital	233	4,231	318	256	41	87	210	1	8,713	18,306	32,396
CCS	Digital	2	406	61	49	2	16	27	0	1,058	612	2,232
	Non-Digital	0	0	0	0	0	0	0	0	0	0	0
DIS	Digital	2	289	56	45	1	15	23	0	937	395	1,762
	Non-Digital	0	0	0	0	0	0	0	0	0	0	0
Digital Advertising	Digital	2	312	60	49	1	16	25	0	1,033	439	1,937
	Non-Digital	0	0	0	0	0	0	0	0	0	0	0
Semi-Digital Goods	Digital	17	453	75	60	7	23	44	0	1,808	2,763	5,252
	Non-Digital	28	236	34	28	20	10	48	0	2,005	570	2,979
Non-Digital Goods	Digital	1,551	3,050	230	185	111	333	1,604	7	100,727	97,089	204,888
	Non-Digital	4,346	10,638	868	699	378	1,184	5,670	21	294,664	502,898	821,366
Gross Value-Added Sector		6,404	26,046	1,425	1,148	973	1,223	10,657	32	513,593		
Output Value		18,206	46,890	3,241	2,610	1,545	2,969	18,428	63	933,678		

Endogenous Sector