



Chapter 10

Digital Government in Facilitating GVC Participation

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1. Introduction

Global value chains (GVCs), the cross-border splitting of the production process within vertically integrated manufacturing industries, have been a key facet of economic globalisation over the past several decades, especially in East Asia (Athukorala and Yamashita, 2006; Fernandes, Kee, and Winkler, 2021). With the cross-border fragmentation of products within GVCs, a country no longer needs to specialise in the production of an entire product. Instead, GVC participation can be based on niche segments within the entire production process where it has comparative advantages. Consequently, there has been a rapid increase in cross-border trade in parts and components within the East Asian region, linking a diverse set of countries specialising in different stages of production (Yamashita, 2010). This has also given unequalled opportunities for emerging economies, microenterprises, and small firms¹ to be part of GVCs. Being connected to the globalised market facilitates productivity growth, technological spillovers through learning effects, and improved resource allocation, all of which contribute to broader industrial development in a developing country (Verhoogen, forthcoming). It is thus argued that participating in GVCs expands the scope of economic prosperity for firms, industries, and countries (World Bank, 2020). Promoting GVCs is now seen as a pillar in economic development strategies and thinking in contemporary public policy.

However, the resilience of the GVC system was abruptly put to the test by the coronavirus disease (COVID-19) pandemic and economic lockdowns. Some argue that this speeds up the reshoring trend by returning some production blocs home. Others argue that this spurs the development of GVCs (but in a different form) and the geographical diversification of GVCs, especially shifting away from China (Kimura, 2020; Urata, 2020).

Ironically, despite all the economic and social devastation it has caused, the COVID-19 pandemic provides an opportunity for more emerging countries to tap into GVCs. In this process, the enhancement of digital capabilities has emerged as a key input.

With this ongoing development in mind, we examine how GVCs in East Asia can be further facilitated. Our focus is on the government digital support for export promotion and assessing how effectively governments can provide a digitally inclusive environment, making information and support usable by the large community of users in the open public space.

We first provide a framework for the study, followed by a survey of the efficacy of export promotion strategies. We then investigate the case of Vietnamese small and medium-sized enterprises (SMEs) to depict the firm-level characteristics of GVC participating firms. This is followed by a survey of the current state of e-government in selected countries of East Asia.

¹ According to the World Bank, microenterprises are firms with up to 10 employees, small enterprises have up to 50 employees, and medium-sized enterprises have up to 300 employees. The average number of employees that we use (described in Section 2) is about 30. We hence call our sample 'small firms' (Tewari et al., 2013).

2. Global Value Chains

Overview

GVCs broadly describe the process of breaking up the vertically integrated production process into finer stages and relocating each stage to the most suitable location across borders. In this study, GVCs cover both intra-firm transactions of parts and components and intermediate inputs between parent firms of multinational enterprises and their foreign affiliates as well as international arm's-length subcontracting transactions (inter-firm trade with unaffiliated suppliers) in these items. Additionally, the focus of this study is on the physical separation of production stages in the manufacturing production process across international borders in East Asia. GVC participation in the service industry is beyond the scope of this study.

Several factors have contributed to the development of GVCs. First, the communication and digitisation revolution has led to significant cost reductions, making it easier to coordinate a separate production process across international borders – called service link costs in Jones and Kierzkowski (1990). Second, the continuous decline in transportation costs, especially air freight costs and improved containerisation methods, has made it less costly and faster to move parts and components from one location to another (Hummels, 2007). The reduction in transportation costs has also facilitated the international separation of products that comprise higher values relative to their bulk (e.g. computer chips). Third, modular technology advancement has increased the separability of the production process into finer degrees and segments depending on the factor intensity used, allowing some components to be standardised for the use of multiple final products across different sectors (Jones, 2000).² Examples include computer chips and long-lasting batteries. Fourth, multilateral trade liberalisation has added to the rapid growth of fragmentation trade across national borders. Yi (2003) made the point that even a small tariff reduction has a 'magnification effect' on fragmentation trade. This is simply because, unlike finished products, components and unfinished products can cross international borders multiple times before reaching the final stage of the production process. Therefore, any marginal reduction in the protection scheme can significantly lower trade costs.

Digitisation and SMEs' GVC Participation

Embracing digital technologies in business can create new products, new services, and new markets. On the one hand, digitisation smears out a boundary between different links in GVCs and increases in information transparency for all participants. With this, firms can benefit from the low cost of

² This has facilitated a process once trapped within domestic trade to move across international borders (Krugman, 1995). For instance, engineering activities, such as the manufacture of automobiles and electronics, have increasingly been separated into discrete production stages – manufacture of components, assembly, testing, and packaging – with different skill requirements, scales, and factor inputs.

people-to-people connections and further fragment tasks internationally. Service linkages, such as for business and financial services, are becoming more important to coordinate and connect each stage of GVCs with seamless operation of the whole system. On the other hand, the application of digital technologies and related business models in the service sector makes services more productive. Digital-empowering service links, either digital-enabled or digital-born, can improve the capacity of GVC coordination and spur network extension. This tends to lower the threshold of GVC participation and benefit all businesses, particularly micro, small, and medium-sized enterprises.

However, digitalisation also poses a challenge to SMEs' development. While the integration of GVCs provides greater economic benefits, they can be heterogeneous in effects. With economies of scale, combined with the higher fixed costs of exporting, large firms are well positioned to reap a greater share of the benefits. This puts SMEs at a disadvantage, as they face a substantial barrier to participating in GVCs.

An important parallel development is the spread of digital marketplaces (e.g. eBay and Amazon), becoming another trade facilitator matching global buyers and sellers. This can expand GVCs by reducing the fixed costs associated with exporting and connecting a diverse set of firms (Antràs, 2020).

In sum, in theory, digitalisation has the potential to empower SMEs to be part of GVCs and bring about further opportunities to be more competitive. However, the benefits are not automatic, requiring governments to provide a conducive business environment.

3. Experience of Vietnamese SMEs

This section uses data from the Viet Nam SME survey of manufacturing industries (UNU-WIDER, n.d.) and checks the characteristics of firms engaged with GVCs. This unique data source provides firm-level engagement for GVCs. The biennial SME surveys were jointly conducted and administered by the Central Institute for Economic Management, the University of Copenhagen, and the United Nations University World Institute for Development Economics Research (UNU-WIDER), starting in 2005 and ending in 2015 (i.e. 2005, 2007, 2009, 2011, 2013, and 2015).

We use the data for the 2011, 2013, and 2015 surveys. Each wave of the survey covered about 2,500 SMEs in 10 provinces, spread across three regions of Viet Nam – north (Ha Noi, Ha Tay, Phu Tho, and Hai Phong); south (Ho Chi Minh, Long An, and Khanh Hoa); and central (Nghe An, Quang Nam, and Lam Dong). The sampled enterprises include households, informal firms, private firms, cooperatives, and limited liability firms, which are represented in each province (Trifković, 2017).³

³ A representative sample of registered household and non-household firms in manufacturing was drawn from the Establishment Census from 2002 and the Industrial Survey 2004–2006 of the General Statistics Office of Viet Nam under a stratified sampling procedure.

The salient feature of the Vietnamese SME data is information about both direct and indirect involvement with GVCs at the firm level. We identify direct involvement with GVCs if firms record any positive values of sales of exporting and importing raw materials (the translated survey questions are in Appendix A). Indirect involvement with GVCs is identified if firms report any positive value of sales to foreign-invested enterprises (FIEs) and outsourcing and subcontracting with FIEs operating in the local economy (Trinh and Doan, 2018).⁴ All other firms that are not categorised in GVCs are labelled as non-GVC firms.

Within GVC firms, the data permit us to distinguish between exporting and/or importing firms as well as firms selling to and processing inputs for FIEs operating in the local economy.

Table 10.1 presents the number of firms by GVC engagement. As expected, GVC firms account for a small proportion of the total number of firms in this data set. This confirms that GVC participation requires a high fixed cost, and only productive firms can engage in GVCs. Table 10.2 shows the industry distribution, comparing GVC and non-GVC firms. There is no stark difference in terms of industry distribution between GVC and non-GVC firms; labour-intensive industries (e.g. apparel and fabricated metals) are concentrated in both types of firms.

Table 10.1. Number of SMEs in Survey Years 2011, 2013, and 2015

Item	(1)	(2)	(3)	(4)	(5)
	All	GVC	Direct	Indirect	Non-GVC
Unique firm	2,864	520	214	244	2,637
Firm-year	5,918	728	305	289	5,190

GVC = global value chain, SMEs = small and medium-sized enterprises.

Notes: Companies are considered to be part of GVCs (GVC firms) if they report any positive sales from exporting and importing raw materials, sales to foreign-invested enterprises, or outsourcing and subcontracting for foreign-invested enterprises. Any companies that do not meet these criteria are considered non-GVC firms.

Source: Data from UNU-WIDER (n.d.).

⁴ This definition is broad, encompassing not only exporters and importers, described as GVC participating firms in Antràs (2020), but also firms supplying and processing intermediate inputs for FIEs and exporters. Without access to the detailed level of firm-to-firm transaction data such as the one presented in Bems and Kikkawa (2021), our approach using the specific survey questions about the involvement of GVCs is a second-best method. However, we argue that our firm-level measurement is still an improvement on studies measuring GVCs at industries and regions, using international input-output tables.

Table 10.2. Industry Distribution

GVC				Non-GVC			
Sector	Name	Count	Share (%)	Sector	Name	Count	Share (%)
14	Wearing apparel	84	11.54	10	Food	1,119	21.56
25	Fabricated metals	81	11.13	25	Fabricated metals	1,042	20.08
16	Wood and cork	80	10.99	16	Wood and cork	529	10.19
10	Food	79	10.85	31	Furniture	401	7.73
22	Rubber and plastic	74	10.16	22	Rubber and plastic	328	6.32
17	Paper	39	5.36	14	Wearing apparel	271	5.22
31	Furniture	33	4.53	23	Non-metallic minerals	265	5.11
23	Non-metallic minerals	31	4.26	13	Textiles	209	4.03
27	Electrical equipment	31	4.26	18	Printing	165	3.18
18	Printing	28	3.85	17	Paper	160	3.08
Total		76.93				86.50	

GVC = global value chain, SMEs = small and medium-sized enterprises.

Sources: Vietnamese SMEs; data from UNU-WIDER (n.d.).

Table 10.3 compares the characteristics of GVC and non-GVC firms. As expected, GVC firms are larger and more productive than non-GVC firms. Table 10.4 focuses on digital access; survey questions ask if firms have internet access and a website. While not perfect, this information can be used to evaluate access to the digital economy. Again, unsurprisingly, GVC firms have better internet access (86% of GVC firms have internet access, against only 41% for non-GVC firms) as well as company websites (40% of GVC firms have their own websites, against 8% for non-GVC firms). This simple comparison does not allow us to draw any causal inferences on the relationship between digital access and GVC participation, but it indicates the importance of investment in digital capacity as firms seek to participate in GVCs. Continued progress in this area, coupled with greater emphasis on helping SMEs adopt new technologies, will help SMEs take advantage of the opportunities that digitalisation has to offer and enable countries to undertake a more inclusive recovery from the COVID-19 crisis.

Table 10.3. Firm-Level Characteristics

All	GVC	Direct	Indirect	Non-GVC
Revenue per employee	663.9	357.6	306.2	0.002
Total wages per employee	46.8	34.1	12.7	0.000
Value added per employee	144.4	89.8	54.6	0.000
Profit per employee	94.6	55.0	39.6	0.000
Capital per employee	539.9	453.3	86.6	0.005
No. of employees	50.4	12.7	37.6	0.000
Age	12.7	14.3	-1.6	0.000

GVC = global value chain, SMEs = small and medium-sized enterprises.

Note: Diff. refers to the difference between GVC and non-GVC firms.

Sources: Vietnamese SMEs; data from UNU-WIDER (n.d.).

Table 10.4. Comparison of Digital Access

Item	All	GVC	Non-GVC	Direct	Indirect
Export (y/n)	0.05	0.38	0	0.63	0
Import (y/n)	0.04	0.36	0	0.62	0
Sales to FIE (y/n)	0.06	0.52	0	0	0.89
Subcontract FIE (y/n)	0.01	0.10	0	0	0.19
Internet (y/n)	0.46	0.86	0.41	0.94	0.78
Website (y/n)	0.12	0.40	0.08	0.47	0.28

FIE = foreign-invested enterprise, GVC = global value chain.

Sources: Vietnamese SMEs; data from UNU-WIDER (n.d.).

Overall, with further development of digitisation and GVCs, SMEs in emerging economies are set to gain. As shown in the case of Vietnamese SMEs, firms that are directly involved with GVCs in exporting and importing are still in a minority. We also identified firms with indirect involvement, supplying and processing for local FIEs. This pattern is linked to productivity sorting; firms with higher productivity have a higher likelihood of engaging in GVCs. It is not straightforward to devise public policy tools to improve productivity for all firms in the economy. Government support can be directed towards reducing the digital divide by further reducing the costs of digital access for SMEs. Concurrently, governments can support SMEs to invest in adopting digital technologies and acquiring new skills to leverage data-driven innovation.

4. Digital Trade Facilitation Platform

This section presents a survey of the current practices of digital trade facilitation, undertaken in selected East Asian countries.

The underlying premise of government-led export promotion is to reduce information friction for exporters and buyers in uncertain export markets. Prospective exporters need to overcome various knowledge and information barriers to penetrate global markets, including potential markets for their products and their demand structure and characteristics, the degree of market competitiveness, as well as marketing and distribution channels. However, this information issue essentially boils down to identifying and matching with importing partners.

The information gap is likely to be more severe for SMEs with an existing digital divide and limited access to a broader information pool. Large exporting firms often have established networks with few information barriers. These large exporters tend to be experienced exporters and are less likely to benefit most from public export promotion.⁵

An online marketplace platform is a digital place where search and matching between buyers and sellers occur digitally, driven by algorithms via a browser, app, or text interface (e.g. Amazon, eBay, and Rakuten). Typically, this platform is designed to match buyers (exporters) and sellers (importers) with the search engine, whereby searchers form a consideration set through textual search. The platform usually provides a mechanism for delivering goods and services reliably, with minimal risks. Online

⁵ While export promotion, in theory, is usually framed as an effective vehicle for promoting exports, empirical studies are sceptical of the effectiveness of public export promotion. The results at best are mixed. Some studies have found evidence that public Export Promotion Agencies (EPA) can be effective in improving the required social capital, such as business contacts, to initiate and complete new trade transactions. This argument is based on the idea that information barriers and networks are important in international trade. Other studies have found that the new trade transactions would have occurred without the EPA programme. Volpe Martincus and Carballo (2008) estimated the impacts of export promotion on exporters that chose to participate in the EPA programme using detailed firm-level data for Peruvian exporters during 2001–2005. They found that export promotion participation leads to increased exports, but primarily along with the extensive margin (new export market entry or new product introduction to existing export markets). Görg, Henry, and Strobl (2008) found that government grants to Irish manufacturing firms during 1983–2002 were effective in increasing the export revenues of existing exporters (intensive margin) but ineffective in encouraging firms to become new exporters (extensive margins). Bernard and Jensen (2004) showed that export promotion did not appear to have any significant influence on the probability of exporting (extensive margin) of United States manufacturing plants during 1984–1992. In sum, export promotion programmes induce some positive impacts on exports. The effects, however, are quite heterogeneous along the extensive and intensive margins of exports. Information and promotion can be useful for firms that are new to the export markets and resource-constrained firms.

marketplaces are rapidly gaining in popularity as an alternative to the traditional market. Growth in online shopping is expected to continue, with more businesses turning to digital marketplaces because of the pandemic and economic lockdowns.

They are two main types of digital marketplaces: a business-to-business (B2B) model in which the exporter's customer is another business (a distributor, wholesaler, or retail store); and a business-to-consumer (B2C) model, directly exporting and selling to consumers. Since exporting also entails knowledge about local fields (e.g. logistics, social media, and foreign language customer service), public digital marketplaces usually provide information about exporting.

While digital marketplaces lower the entry barriers for potential exporters, they also come with risks (Fradkin, 2017). For instance, both sellers and buyers face risks through anonymous transactions. This entails the risk of sellers remaining unpaid, their assets being damaged, or having to deal with overly demanding or unpleasant buyers. Buyers face the risk of not getting the good or service they expected to get. A typical solution to the problem of trust can be developing reputations.

For example, Japan's public trade promotion agency, the Japan External Trade Organization (JETRO), provides an online trade fair database – a search engine tool for upcoming trade fairs/exhibitions around the globe. This caters for both exporters from Japan to the world market and for exporters from the world to Japan. Searches can be conducted based on keywords, and the search results include a date, place, and brief description of the marketing events. In most cases, there is a link to the official website of the events. Additional information includes stories of Japanese companies based in Japan and overseas in selected industries (e.g. machinery, food, and information technology). A section on exploring craftsmanship and culture in Japan showcases stories about culture and market insights for exporters targeting the Japanese market. The website also lists company directories for FIEs by prefecture, providing a list of companies engaged in exporting and importing.

To gain further insight, we conducted an online interview with a director of JETRO in Wakayama, Japan.⁶ Wakayama is situated on the Western coast of the Kii Peninsula in the Kansai region of the mainland in Japan, Honshu and is adjacent to Osaka. Wakayama is well known for agricultural products such as oranges and plums, which are exported to other Asian countries (Tourism Exchange Division, n.d.). During the interview, we learnt about noteworthy developments for SMEs from Wakayama expanding their operations overseas.

The director presented key export successes and the crucial role that JETRO played in facilitating international business expansion for Wakayama-based firms. He also confirmed our assertion that online support has expanded substantially, especially since the COVID-19 pandemic, and believes that

⁶ We would like to thank the Chief Economist of ERIA (Economic Research Institute for ASEAN and East Asia), Prof. Kimura, for creating this opportunity for us.

online support (e.g. trade fairs) will remain strong. He confirmed the importance of digital support in lowering information barriers through the provision of updated and comprehensive information for businesses overseas in the initial stage of expansion. JETRO's national and worldwide networks, with offices in several countries, provide continued support and services for businesses operating overseas. The director discussed an example of how JETRO Wakaura has been involved in the initiation of business development by an auto parts producer in China through information exchange at a trade fair, connecting the business to overseas JETRO networks, and via consulting and mentoring.

We also conducted a cursory survey of public trade promotion services available to selected East Asian countries (Appendix B). Overall, the survey reveals that two types of services have been implemented:

1. A marketing platform promoting companies, products, and brands, with some matching facility functions.
2. A transactional website promoting products and brands, allowing buyers (importers) to purchase products directly (and a payment facility).

Surprisingly, amongst the surveyed countries, only the public agency in the Republic of Korea (henceforth, Korea) provides a digital marketplace with a B2B model promoting Korean exporters. Cambodia provides a B2C platform that advertises locally produced products and provides a payment system. Most countries only provide a marketing platform with information on exporting and importing.

5. Conclusion

Promoting GVCs has become a pillar of economic development strategies and thinking in public policy. With further digital transformation, GVCs can become more inclusive – involving SMEs and microenterprises. However, only productive and capable firms can participate in and enjoy the benefits of GVCs. Digital transformation is one possible way of reducing entry barriers and achieving inclusion in GVC participation. This process can eventually deliver trickle-down effects to the wider economy.

With this ongoing development in mind, we discussed how effectively governments can provide a digitally inclusive environment for firms, especially SMEs. We paid particular attention to public marketplaces. The current practice of government support for export promotion in East Asian countries focuses on providing information – such as trade fairs and market intelligence. There is significant room for governments to facilitate trade in the digital space. Services targeting SMEs could be particularly beneficial, as we identified a group of firms still indirectly involved with GVCs.

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Appendix A: Survey Questions to Define GVC Firms

The survey questions used to define global value chain (GVC) connections were as follows in the 2013 Enterprise Survey:

- I. Sales structure (in 2012) of the most important products (in terms of value). Calculate as percentages.
 - A) Individual people/households (non-tourists)
 - B) Tourists
 - C) Non-commercial government authorities
 - D) Domestic, non-state enterprises
 - E) State enterprises
 - F) Foreign-invested enterprises
 - G) Direct exports

- II. From whom did the enterprise procure its raw materials and other inputs in 2012. Give percentage distribution in terms of value.
 - A) From households
 - B) Other non-state enterprises
 - C) State enterprises
 - D) Other state agencies
 - E) Imported (directly)
 - F) Other

- III. Outsourcing
 - A) Did the firm outsource production in 2012? Yes or No
 - B) If yes, how many outsourcing subcontracts in 2012?
 - C) What was the total costs of outsourcing in 2012? (D million)
 - D) What percentage of your outsourcing contract value was for exports?
 - E) The main reason for outsourcing parts of the production

- IV. Firm as a subcontractor:
 - A) Did the enterprise itself produce as a subcontractor in 2012? Yes or No
 - B) If yes, how many subcontracts in 2012?
 - C) What was the total revenue from these subcontracts in 2012? (D million)
 - D) What percentage came from subcontracts with foreign-invested enterprises?

Appendix B: Summary of Government-Led Export Promotion

Australia

The Australian Trade and Investment Commission, Austrade (<https://www.austrade.gov.au/australian/export>), provides information and advice to help Australian companies reduce the time, cost, and risk of exporting. The agency provides the following services: information and advice on doing business in international markets, help with overseas market selection, identification of relevant overseas contacts, assistance with market entry and expansion, and identification and follow-up on specific international business opportunities.

This agency also administers the grants scheme, a financial assistance programme for exporters. One example is a specialised programme for start-up businesses investigating overseas markets, Landing Pads, which offers business scale-up programmes with an operational base and customised support for their overseas expansion goals. This immersive programme is based on one of the following cities: Singapore, San Francisco, Tel Aviv, Berlin, and Shanghai. The support includes a mentoring programme; co-working space; connection to local founder communities; and Austrade customer networks, partners, and contracts.

Cambodia

The General Directorate of Trade Promotion (<https://www.gdtp.gov.kh/>) is a government organisation under the Ministry of Commerce, responsible for trade policy development and strategic planning, market development, domestic product promotion, export promotion, and exhibition coordination; and acts as the Cambodian Inter-Ministerial Committee for participation in the World Expo and International Trade Exhibitions and coordination with the One Village One Product Movement National Committee. It also administers the B2C Go4eCam.

Indonesia

Inaexport (<https://inaexport.id>), developed at the end of 2019, is the official B2B platform of the Directorate General for National Export Development under the Ministry of Trade. Its mandate is to connect Indonesian exporters with worldwide buyers, promote Indonesian companies worldwide, and provide updated trade news for registered entities.

The platform facilitates searches and matching through a chat function. It also has a screening tool that requests detailed information about companies during the registration process, including product images, a summary of company profiles, and product specifications. It provides access to buyers' inquiries and can communicate directly with buyers and representatives of the Ministry of Trade (Indonesian trade attachés and the Indonesian Trade Promotion Center). Inaexport also provides updates on trade statistics, workshops, training, and trade show participation.

Malaysia

Malaysia's External Trade Development Corporation (MATRADE, <https://www.matrade.gov.my/en/>) is a Malaysian government agency that promotes the export of Malaysian products and services to overseas markets. Established in 1993, MATRADE's mission is to enhance Malaysia's export competitiveness by developing and promoting Malaysian exporters and their products and services to overseas markets. MATRADE provides various services to Malaysian exporters, including market research and analysis, trade promotion, business matching, trade advisory and consultation services, as well as trade education and training programmes. The agency also organizes trade exhibitions, seminars, and missions to help Malaysian businesses explore new markets and expand their export opportunities.

Republic of Korea

The Korea Trade-Investment Promotion Agency (<https://www.buykorea.org/>) provides the B2B online platform, buyKOREA. Offering more than 250,000 high-quality Korean products, the platform focuses on buyers of Korean products. It also facilitates payment services (via credit card or PayPal). Buyers can post inquiries and requests for quotation on buyKOREA, and Korean suppliers reply to buyers' inquiries directly. The platform also includes information about trade shows in Korea.

Singapore

Enterprise Singapore (<https://www.enterprisesg.gov.sg/>) is an agency under the Ministry of Trade and Industry, with the mandate of developing the overseas growth of Singapore-based enterprises and international trade. It has offices in more than 30 locations worldwide, helping enterprises export, develop business capabilities, find overseas partners, and enter new markets. It also provides similar services for overseas business trying to enter the Singapore market. Singapore is marketed as an ideal launchpad because of its unique advantages of strategic location, stable government, competitive workforce, and pro-business environment. It also provides a range of financial assistance based on the type of firm (e.g. start-ups).

Viet Nam

The Vietnam Trade Promotion Agency (VIETRADE) has contact details in English on its webpage (<http://www.vietrade.gov.vn/>) and a LinkedIn page (<https://vn.linkedin.com/company/vietnam-trade-promotion-agency>). VIETRADE provides a wide spectrum of services to assist Vietnamese and foreign enterprises in their business development and expansion.