



Chapter 5

Digitalising Public Services in Supporting Economic Development: The Case of Viet Nam

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1. Introduction

In common with many other one-party nations, Viet Nam has appointed the ruling Vietnamese Communist Party to play a leading role in enacting state-level developmental goals. It has also followed the policy of creating large-scale plans for the transformation of the economy and society in dimensions considered to be of strategic importance. In the case of digitisation, this is being accomplished through the National Digital Transformation Programme (NDTP), which has strict prescriptions up to 2025 and a vision towards 2030 (Vietnam Briefing, 2021). The plan contains a wide variety of measurable targets and milestones, with some aimed at incorporating more Vietnamese people into a developing, prosperous, and modern country, and others deepening the existing economic model of reliance on inward investment. In the first category, it is planned that 50% of customers' banking operations will be fully online, 50% of customers will have a digital checking account, and 80% of online public services at level 4¹ will be available through access to mobile devices. In the second category, the digital economy should contribute 20% of the total economy by 2025 and 30% by 2030 (it is currently 5%), while Viet Nam should be listed in the top 50 countries of the UN ICT Index by 2025 (Vietnam Briefing, 2021). To ensure these goals are met, a committee has been established, with 16 members, including the Prime Minister and representatives from a wide range of ministries and agencies. Named the National Committee on Digital Transformation, it will have the tasks of bringing about administrative reform, implementing the NDTP, developing e-government and society and smart cities, and monitoring the implementation of the National Strategy of the Fourth Industrial Revolution (Dharmaraj, 2021b). Clearly, these are wide-ranging responsibilities, and it will be hard for any group of people to fulfil such complex responsibilities. The situation is made more difficult because of the current environment, which contains several dangerous if not existential threats, such as the ongoing coronavirus disease (COVID-19) pandemic, the climate emergency, and rising international tensions focusing on the relationship between the United States (US) and China, as well as Russia's invasion of Ukraine. Under these circumstances, it would be useful to try to identify exactly what the NDTP means in terms of the definition of digitalisation, the forms that it takes with respect to different stakeholders across the country, and the challenges that are likely to be faced (although the possibility of suggesting solutions to such problems is likely to be beyond the scope of a chapter of this sort). The purpose of this chapter, therefore, is to map the extent to which digitalisation policies have been established and implemented in Viet Nam and, more importantly, to establish the gaps that exist in everyday life between what is being made available for people and their experience of those opportunities. It is argued that the gaps that do exist are likely to intensify existing problems of inequality in Vietnamese society but that the government nevertheless will continue to pursue them to achieve the desired level of economic growth.

Defining digitalisation is a task that has occupied many scholars, whose attempts have varied. Other chapters in this volume will explore this issue in greater detail. This chapter will follow Gobble (2018). In distinguishing between two related activities: '... digitization is the conversion of atoms to bits – replacing paper with electronic files, pictures with jpeg images, music with mp3s. Digitalization is the transformation of all those bits into value' (Gobble, 2018: 66). Table 5.1 indicates ways in which value may be created by such means.

¹ At level 4, users can complete and submit official forms entirely online.

Table 5.1. Typology of Digitalisation Strategies

Value creation	Creating novel offering configurations enabled by digital technology; understanding customer needs; creating value through ecosystem orchestration or collaboration
Value delivery	Developing and applying new capabilities; revising operational processes and activities for global delivery; revising roles and responsibilities in industrial ecosystems
Value capture	Improving internal processes that enable improved cost efficiency; generating new or increased revenue streams and new risk management strategies

Source: Parida, Sjödin, and Reim (2019).

Some authors consider digitalisation to be a more efficient means of digitisation, using contemporary applications and artificial intelligence, and they use the term 'digital transformation' for the revolutionary changes that the process can involve: 'Digital transformation goes beyond digitalisation by creating a comprehensive change to a company's business strategy. That company might implement an isolated project as a digitalization effort, but a project that has digital transformation as its goal will create change across all departments' (Yokogawa, 2021). Of course, these processes take place in the public as well as the private sector. In this chapter, digitalisation and digital transformation are separated from digitisation in scope and effect.

It is clear that creating value through digitalisation involves many of the technologies that constitute Industry 4.0, a concept that has been taken from its German context and generalised as a useful means of describing widespread change in the confluence of business, industry, and technology: 'Industry 4.0 is a concept of organizational and technological changes along with value chains integration and new business models development that are driven by customer needs and mass customization requirements and enabled by innovative technologies, connectivity and IT integration' (Nosalska et al., 2019: 838). It will depend on seven related and occasionally overlapping technologies: mechatronic systems and automation design and implementation; information technology (IT) and software-related issues; data science and data processing; new manufacturing technologies; networking and connectivity; robots; and system management and services (Nosalska et al., 2019). In the case of Viet Nam, it is evident that most of these Industry 4.0 technologies are not indigenous and their mobilisation will depend on the continuation of the existing economic model, which focuses on the transition from import-substituting, export-oriented intensive manufacturing based on low labour cost competitiveness (although that will continue as long as it can be managed) to innovation and branding – the higher value-adding parts of the value chain smile curve. Much of the government's digitalisation strategy will be involved, therefore, in facilitating the technologies and systems of inward investors and providing whatever inputs and support might be needed. It will also be stimulated by increasing awareness of the climate emergency and the need to promote resilience in communities and, particularly, the major urban areas of the country. It is assumed that the ongoing COVID-19 pandemic will, perhaps not straight away, be replaced by something that can be labelled a 'new normal' in due course. These issues will affect different countries in different ways, and the implications for digitalisation prospects will likewise vary. Currently, Viet Nam is ranked 55th out of 79 countries in progress in this area, according to Huawei's Global Connectivity Index (Dharmaraj, 2021a). This puts the country at the lower end of the adopters group; it is noted that weaker nations in this regard, known as starters, are beginning to catch up more quickly with those above them as technology matures and diffuses. The government's

first integrated policy on digitisation of the economy was published in June 2021 as Decision No. 942/QĐ-TTg, which was made to be consistent with other decrees relating to digital services in Viet Nam and the approach to Industry 4.0 (MIC, 2021). A minister from the Ministry of Information and Communications (MIC) made a statement which enumerated eight ways in which Industry 4.0 was to be approached (Dharmaraj, 2021c):

- (i) Renewing thinking, unifying awareness, strengthening the party leadership, and imposing state management over the Industrial Revolution 4.0
- (ii) Perfecting institutions to facilitate the Fourth Industrial Revolution and digital transformation
- (iii) Developing essential infrastructure, especially digital infrastructure
- (iv) Developing the national innovation capacity
- (v) Developing human resources
- (vi) Developing priority industries and technologies
- (vii) Integrating Viet Nam into the international economic system
- (viii) Promoting digital transformation

These goals are quite ambitious and consistent with other changes in the economy – e.g. providing high-quality services to society, broadening public engagement, improving state agency operations, effectively addressing issues in socio-economic growth, and achieving breakthrough changes in international rankings in relevant issues – but the measures that can be achieved are quite basic for most people. Access to mobile phones for most of the Vietnamese people and the ability to interact with the National Data Exchange Program are important and useful, but still primarily address digitisation issues. These policies mostly describe a world far away from the lived reality of most of the 97 million Vietnamese. Most Vietnamese do not participate in value chains or form part of the emergent urban middle class, so it is important to consider the digitalisation process from their perspective – focusing on how their lives are affected by it rather than by assuming that they will be drawn into it eventually. Further, the priorities contain several political goals which would not normally be expected in a policy paper from a western perspective. Some of the policies are difficult to imagine: is strengthening the party leadership to be achieved through digital transformation or is it a prerequisite of any change? It is not clear how the policies will distinguish between digitalisation and digitisation or even whether that distinction has any value here. The multiplicity of ministries and agencies involved also makes it more difficult to understand exactly how goals are to be achieved (Table 5.2). Consequently, as this chapter looks at various aspects of society and how they are likely to change because of these plans, there will be some imprecision over which of these approaches is being used at any one time. Bengtsson (2016), writing about the confluence of education and sustainable development, found that (through discourse analysis of relevant policy documents) important terms were not properly defined but instead ‘... they are suggestive of the limits of hegemonic power and allow for the emergence of a space of contestation’ (Bengtsson, 2016: 77). This is true of other policy areas, including the current one. New areas are addressed and commitments are made, but because of the need for a broad range of governmental consensus, individual ministries attempt to enforce their own discourse onto others and onto the final documents, resulting in a struggle which may or may not be resolved. The various sectors of society considered in this chapter also reflect this contestation process, which can therefore appear contradictory.

Table 5.2. Ministries and Agencies Responsible for Developing the Digital Economy

Ministry	Role
Ministry of Science and Technology	Regulating activities related to R&D and innovation; promoting the application, research, development, and transfer of the key technologies of the Fourth Industrial Revolution
Ministry of Information and Communications	Regulating and creating development plans in relation to publishing, news and media management, post, ICT, broadcasting, and national information provision
Ministry of Education and Training and Ministry of Labour, War Invalids and Social Affairs	Developing human resources with respect to ICT
Ministry of Finance	Regulating e-banking and e-finance; formulating policies on tax and finance to promote the application of ICT
Ministry of Industry and Trade	Regulating e-commerce and developing ICT applications in industry
Ministry of Planning and Investment	Developing socio-economic plans and strategies to promote digital adoption of ICT applications
Other ministries and provincial peoples' committees	Developing action plans and promoting ICT applications in regions

ICT = information and communication technology, R&D = research and development.

Source: Adapted from Foreign Investment Agency (2018).

2. Digitalisation and Agriculture

A recent overview of the role of digitalisation in agriculture (McFadden et al., 2022) observed that it offered opportunities to enhance productivity, sustainability, and resilience. It is composed of individual initiatives which could be defined as data collection methods, decision support tools, and precision equipment. Some success had been achieved in using these tools in the Organisation for Economic Co-operation and Development (OECD) countries in row crops (i.e. mostly cereal annual crops which benefit second crops) but less so in livestock management and specialty crops. Reasons for resistance to new tools include user-unfriendliness, lack of resources, and the threat of risk from reduced production or greater costs. In such circumstances, it is evident that government has a role in alleviating bottlenecks. In an interview, a senior spokesperson for the Steering Committee for Digital Transformation in Agriculture observed that the main obstacles to that transformation were the need to change the mindsets of farmers and local leaders and the challenge of scaling up small local initiatives (Ministry of Agriculture, Nature and Food Quality, 2022). However, some progress has been made with respect to digital transformation in agriculture. For example, the Ministry of Agriculture, Nature and Food Quality (2022) reported that (i) cultivation, animal husbandry, fisheries, and forestry use digital technology; (ii) farming uses software to analyse data about the environment and plant growth stages, allowing real-time tracking; (iii) animal husbandry applies the internet of things or blockchain and biotechnology to

large-scale farms; (iv) forestry uses barcode technology to manage varieties and forest products; (v) the seafood industry applies fish detectors using ultrasonic waves, satellite phones, and global positioning systems to manage offshore fishing fleets; and (vi) large enterprises such as Vineco or Hoang Anh Gia Lai, Dabaco use high and advanced technology to manage product production, distribution, and consumption.

While these are undoubtedly examples of progress, the results are not general. For example, in Viet Nam, many farming households now have access to mobile telephones, including smart phones, as well as some personal computers, so they would be able to assimilate some forms of precision agriculture when it comes to rice growing. However, the use of such information is still quite rudimentary (Minh, Son, and Trinh, 2019; Walsh, 2019). The World Bank considers improvements in the availability and use of information to be one of the principal benefits to agriculture of digital transformation. Schroeder, Lampietti, and Elabed (2021: 2) argued that 'Digital technologies and networks – rapidly developed and deployed – will transform the agrifood system by overcoming the long-standing transaction costs and information asymmetries'. Additionally, the adoption of precision agriculture will lead to efficiency improvements on the farm, with improvements to technology adoption and profitability (through greater awareness of market movements). Better information will lead to an improved fit with existing and emerging clusters and supply chains off the farm. Other relevant technologies, including distributed ledger technology, mobile money, and remote sensing for insurance, all offer new opportunities for farmers to adjust their production to market requirements (Schroeder, Lampietti, and Elabed, 2021).

Viet Nam earns more than \$40 billion in agricultural exports annually, with major goods including rice, shrimps, fish, rubber, and pepper. Having joined various multilateral trade agreements in recent years, the Vietnamese government and various agricultural institutions have been looking for ways to increase exports overall and to add value to product prices prior to export. This has become one of the more important priorities in economic development generally. However, most of the more obvious means of increasing productivity – e.g. expanding the amount of land under cultivation or increasing the quality of fertilisers and other inputs – have already reached a limit (OECD, 2020). In 2018, the government announced that 13 products would be eligible for preferential treatment, including financial incentives and exemptions and support for introducing technological applications. These efforts have been undermined by the measures necessary to take action against environmental degradation in a country in which more than 60,000 people a year die from air pollution (WHO, 2018) and in which the results of global climate change have become increasingly evident (Duc, Ancev, Randall, 2019). The government has introduced an action plan for agriculture for 2021–2030 to try to deal with these problems. However, the outbreak of the COVID-19 pandemic resulted in the closing of the rice export trade and pressure on many agricultural activities because of the suspension of travel. Viet Nam's attempt to minimise the number of infections through extensive lockdowns was quite successful until the arrival of the Omicron variant overwhelmed local defences. Consequently, there will continue to be disruptions to production and export processes in the near future. Further, the need to adjust to differing tariff structures and to new sanitary and phytosanitary standards for new export markets complicates the situation. This has been, in other words, a period of considerable uncertainty that has interfered with the government's ability to create and implement policy in a coherent manner. Planning was more able to go ahead than implementation, so the gap between the two has grown, which has not helped with public confidence.

In 2021, the MIC announced plans to put millions of farmers, cooperatives, and small businesses on nationwide e-commerce sites, Postmart and Vo So, to combat the modest role of e-commerce in agriculture to date (Dharmaraj, 2021c). Farmers will be able to obtain and share information and to receive IT training to be able to navigate the sites. However, it is difficult to imagine that this level of support will be sufficient for agriculturalists to take part in precision farming through such means, not least because of technology and logistics limitations. There is also the issue that Vietnamese people speak a language not spoken elsewhere, so additional language-related transaction costs are involved in the localisation of IT applications.

Other government policies have attempted to tackle problems that small businesses of all types face, such as the bureaucratic procedures necessary to access desired services and capital. Decree No. 116/2018/ND-CP provides various incentives to agricultural firms to obtain technological assistance, such as enabling them to borrow up to 70%–80% of new project investment without the need for collateral. Meanwhile, Decision 19/2018/QD-TTg simplified classifications of investment projects and agricultural technology use to help farming interests obtain support for investment (UEH News, 2021). Nevertheless, there remains a gap between the provision of services from the government and the ability of people at lower levels to be able to profit from them. This is evident from the following case studies.

Ngoc Linh is home to Viet Nam's premier ginseng-growing area. The plant grows well at height and its quality is established since becoming a national treasure according to Prime Minister's Decision No. 787/QD-TTg. The ginseng-growing area covers 1,600 hectares, with 1,200 households participating. As prices have increased to VND75 million–VND100 million per kilogram (\$3,300–\$4,400), some farming communities are becoming rich. A cluster of activities has formed around the growing of the ginseng, including the production of dietary supplements, energy drinks, and ginseng-flavoured alcoholic drinks, as well as the mounting of monthly fairs and an annual thanksgiving event. Support has been received from Gyeongsangnam-do Province in the Republic of Korea (henceforth, Korea), a world leader in ginseng production and consumption, which led to the creation of a trademark and the formation of a cooperative for more equitable involvement of all participants (Quang Nam Portal, 2019). The Vietnamese government has provided support both in the form of improving infrastructure and support services and in technical support for mapping and improving the genetic material of the plant (Saigon News, 2019). This project is an example of the new thinking of the Vietnamese government following the establishment of the Doi Moi economic reform programme. Agriculture fell behind industry because of poor rural infrastructure, low productivity and quality, lack of access to markets, and low involvement of the private sector. In response, the government initiated a decentralised participatory approach that encouraged local communities to concentrate on specialities that could be provided by their configuration of geographic factors and local knowledge. However, rather than providing incentives or subsidies, a policy of 'let the market decide' was adopted (World Bank, 2016), irrespective of the danger of promoting inequality.

A similar project in the mountainous northern province of Lao Cai had successfully transformed the existing fish farming industry, which was small and focused on typical Vietnamese fish, with low selling prices, to a systematically organised caged-fish aquaculture project raising and selling much more profitable sturgeons (*Viet Nam News*, 2019). This project also benefited from government support in terms of training local farmers to keep the fish living in clean water and, hence, good quality products. The government also assisted by identifying the potential of the area, which is home to many ethnic

minorities as well as hydroelectric plants, as suitable for this form of production and in helping to link the production with suitable regional and international markets. The first stage of the process, for both ginseng and sturgeon, is digitisation – i.e. itemising and documenting the wildlife and farmed products of the country (and Viet Nam is part of a region in which this process is still being undertaken (Associated Press, 2022)) and, then, using that information to create new business models which are beneficial to local people and to the overall development of the country. These two examples show the limitations on digitalisation in agriculture in Viet Nam, which is mostly still in the digitisation phase. Most people have access to the internet and can access information, but they tend to do so in quite a rudimentary way. Local government officials and extension service providers also tend not to be much more sophisticated in their use of information, so the activities they can provide are also limited. In these cases, greater use of market mechanisms might increase the amount of digitalisation taking place, although at the risk of perpetuating the unequal distribution of resources gained as a result.

These projects are examples of individual success that work in one place, but which are difficult to replicate elsewhere. In other words, they suffer from the scalability issue. In part, this is the result of inter-agency rivalry, as described above. In other cases, it is because the subject is complex and dependent on subjective opinions. USAID (2018) produced a tool for assessing the degree to which individual projects may be scalable, but its correct use requires a degree of technical capacity that may not always be available. It also requires decision-making to be free of local influences, which can be problematic.

Viet Nam has benefited from various free trade agreements that have made it easier to export goods to high-value markets, including the European Union, Japan, and Korea. Some have benefited from becoming integrated in China's advanced e-commerce agricultural systems, and these have been beneficial in the era of the COVID-19 pandemic. COVID-19 was tackled at first by strict local lockdowns and a zero-tolerance policy, which meant closed borders and workplaces. This was successful for some months, in which the spread of the disease was very restricted, and for months the country could claim that there had been no deaths. However, successive waves of the virus, especially the more infectious omicron variant, combined with increasing pressure on the economy, meant that this policy could not be sustained in the long term, and there have been more than 2.1 million cases and 37,000 deaths as of January 2022. The impact of COVID-19 included broken or fractured supply chains, as people were forced to remain at home, and concomitant loss of earnings. These effects were particularly noticeable in the agricultural sector: at times in Hanoi, leading supermarkets were bare of fresh produce, especially meat and fish. One longer-term impact of the pandemic has been the intensification of existing government plans for the sector, especially those involving the use of technology. In essence, technology replaces labour in agriculture, especially when it comes to larger-scale farming with more land involved, when the benefits of machinery over human labour become more obvious. In some cases, this involves similar processes to those mentioned above but at a higher scale – more data about land conditions, the prevalence of insects and pests, the impact of climate change, and so forth can be used to provide better planning for production schedules, while the use of appropriate software and hardware can greatly improve management efficiency (Dao, 2021). One characteristic of the 'new normal' that may settle once the virus is either defeated or just tolerated is the withdrawal of the individual from personal transactions (Walsh, 2021). Many people have become nervous of dealing with other people and will take precautions to reduce their human interactions.

In the case of agriculture, digitalisation is most influential in the area of value delivery. Farmers and their organisations are drawn more deeply into international value chains which are mainly organised externally, while production in Viet Nam is becoming more efficient and is becoming specialised in some cases in high-value items that can be exported. Until the country's retail system is liberalised and made more open to international competitors, there is only limited scope for domestic-led marketisation. It should be noted that many senior Vietnamese politicians and bureaucrats can remember hunger in the country (in the 1980s), and this makes them more reluctant to surrender food sovereignty to outside interests, which is one way of thinking about liberalisation. Food insecurity provoked by the COVID-19 pandemic will be a contributing factor to this reluctance. However, there are more possibilities in the case of sectoral development. Viet Nam is one of the world's largest cashew nut processors and exporters. However, processing capacity greatly exceeds domestic growing capacity, so large amounts of nuts are imported from various countries, including several in Africa and neighbouring Cambodia. Led by the Vietnam Cashew Association (VINACAS), detailed plans have been drawn up to promote various aspects of the supply chain and to create branded products for which premium prices might be paid. Viet Nam now accounts for 80% of the global trade in cashews (VNA, 2020). This progress has been made in a pre-digital transformation industry, although it is connected to digitalisation through the logistics industry. In common with other agricultural sectors, cashew nuts divide activities between a small minority at the top who are involved with technology at a high level and the majority at lower levels who persist with analogue-style activities. Decision 1992/QD-BCT, which aims to establish an institutional framework to support the National High-Tech Development Programme (VNA, 2021a), does so on the basis that it will involve a small number of entrepreneurs, global in thought and education and supported by capital, who might one day provide benefits across society but who will be more important in the foreseeable future in linking the Vietnamese economy with inward investors. Eventually, linkages with the rest of society will develop but it is not clear how long that will take.

3. The Informal Sector

Viet Nam has a large informal sector, in common with many other countries in the emerging market category. The informal sector consists of all those activities that are not covered sufficiently by formal arrangements. It is distinct from the illegal economy. The informal sector is distinguished by lack of registration of businesses, lack of taxation, lack of access to government services and, above all, lack of awareness of exactly who is doing what. Some people might be involved in the informal sector because they are own account workers who are never likely to earn enough to pay tax, they may be family members accompanying a migrant worker who seeks to supplement income by working in a market, or they may be related to a farming household and bring seasonal produce into towns and cities for sale to passing residents. As much as 82% of total employment in Viet Nam may belong to the informal sector (credible national-level statistics are scarce) and about 8.4 million informal household businesses. Of these, manufacturing and construction compose the largest component (43%), followed by trade (31%) and services (25%) (Cling, Razafindrakoto, and Roubaud, 2011). The Vietnamese government has made overhauling the informal sector one of its priorities, specifically by encouraging people in the sector to become part of its digital accounting systems. These include cloud and artificial intelligence (AI) technology to help introduce e-invoices into general use (Nguyen, 2022). Bringing more people into the formal sector would increase the government's tax revenues, and the increase in information would help to improve planning processes.

Depending on the nature of the state, officials may be neutral to informal sector workers – effectively ignoring them – or else be hostile. In the case of Viet Nam, sedentary and mobile street vendors have from time to time been considered *personae non gratae* because of their apparent unruliness and suggestion of a pre-modern reality. Hanoi authorities banned street vending in 2008, and vendors have spent the years subsequently learning how to dodge the authorities through various strategies (Eidse, Turner, and Oswin, 2016). More generally, the Vietnamese government had until recently shown little interest in the informal sector or in systematically drawing its members into the formal sector. There are relatively few interactions between the formal and informal sector, and city centres tend to be home to formal sector activities (Cling, Razafindrakoto, and Roubaud, 2011). However, the COVID-19 pandemic revealed the importance of the informal sector in supplying goods and services throughout the country, particularly food. It is estimated that 2.2 million Vietnamese moved internally during the COVID-19 period, which contributed to problems with the country's role in global supply chains. This has led to new emphasis on the role of the informal sector. Currently, the approach is not to bring workers into the formal sector completely but to make participation in social security compulsory, which will enable more security and control (Viet Nam Social Security, 2022). It will take some time before a comprehensive policy approach can be developed, if at all.

It was thought that the informal sector existed in an economy because its formal sector was not large enough to accommodate its members and that economic growth would, therefore, cause its inevitable elimination. This has been found not to be the case. Instead, the informal sector acts as a supplement to the formal sector, expanding or declining depending on the relative success at the time and providing the low-cost goods and services necessary to support an economy based on low labour cost competitiveness. During the COVID-19 pandemic, many workers lost positions in the formal sector and turned to informal sector work to compensate. Many types of informal sector work rely upon mobility, and this was greatly limited during the lockdown period. Consequently, new methods of working were required. One response has been the widescale creation of the motorcycle delivery system which, together with apps that can be used for mobile devices, has meant that a previously unthought of plethora of goods can now be delivered to the doorstep. This is a form of digitalisation, as it enables the intermediary company to coordinate demand and supply for goods by using riders to provide them. This has contributed to increases in pollution and the likelihood of accidents, which are risks that the riders must bear. When dining out and shopping became risky because of COVID-19, rather than a benefit of wealth and mobility capital, the middle classes returned to their homes and transferred the risk to the workers. This is true more widely in the informal sector, as workers have sought new ways of delivering their goods and services to customers. Research indicates that the informal sector in Viet Nam is not as well integrated in the formal economy as in other countries (Cling, Razafindrakoto, and Roubaud, 2011), so it is less likely to be able to benefit from government transfers to formal sector workers. For example, the estimated 200,000 Grab riders in Viet Nam were determined legally not to be employees and so, not having social security paid by an employer, were not eligible to receive relief benefits (Indochine Counsel, 2021).

In general, the informal sector is very heterogeneous in nature, in Viet Nam as elsewhere. Consequently, the impact of digitalisation and the threats and opportunities people face depends on a wide and probably unpredictable range of factors (GIZ, 2020: 9). Increasingly, everyday communications with digitalisation for the informal sector come through the online world. While this is welcome overall, given the relatively low costs of accessing the internet, dangers remain. Even mild criticism of

the government's response on Facebook has led to the arrest of one man (the latest in a long string of prosecutions) and the firing of a university lecturer (Whong, 2021). It is common for prosecutions to be mounted against critics of any sort, including journalists, and there are concerns about the extent to which free trials might be being received. United Nations human rights bodies have issued condemnations, but there is little prospect of any changes at present (Schlein, 2021). There is, of course, quite a distance between accessing an app for information and getting into trouble for making comments that are considered unwelcome by the government, but the same equipment may be used for both. It is not surprising that people generally assume that surveillance of their actions is widespread, and online interactions make recording what people say or think more convenient. This point will be revisited when smart cities are considered.

Members of the informal sector are spread across Viet Nam and present in many sectors, including agriculture. Although they are unlikely to benefit directly from government-led digitalisation, they may benefit indirectly from the kinds of projects discussed in the agriculture section above. Digitalisation helps move some people from the informal sector to the formal sector; in the formal sector, they may interact with other informal sector workers. These workers will also encounter some government services, e.g. through household registration or registration of motorcycles. It is likely that it will take some time before partial interaction with the state can be built up to a full portrait of people and their circumstances. People, after all, tend to see the world around them in consistent ways influenced by their background, their way of thinking and, technically, the physical embodiment of the cultural capital they possess (Bourdieu, 2010). That way of thinking is influenced – or not – by what daily interactions they have with, in this case, the state. In Viet Nam, the everyday politics (Kerkvliet, 2009) of individual-state interaction are quite common as state representatives are involved in nearly all aspects of daily life, from housing to street cleaning. It would not be surprising if some people in the informal sector prefer to try to avoid some of these instances of interaction.

Improving the situation and enabling members of the informal sector to be in receipt of digital services depends most critically on education, including skills-based education (O'Higgins and Viegelahn, 2021). Vietnamese families tend to prioritise university education above vocational education, even when skilled workers are in much greater demand in society. Finding some means of providing skills-based education, digitally, would be an important means of extending services to the informal sector. These issues relate to equality and equity as much as education and are, therefore, close to the heart of the government's stated policy. While a large informal sector and significant differences in lifestyles with the formal sector persist, the equity situation will remain problematic. The provision of further digital services, which will help narrow the gap between the two, is an important goal.

4. Smart Cities

Cities are increasingly important in human society. They have been described as ‘... the defining social and ecological phenomena of the twenty-first century’ (Dawson, 2017: 5). By 2020, most of the world’s population (56.2%) lived in cities and for developed countries that number reached 79.2%. Urbanisation is increasing most rapidly in developing Asia and Oceania (UNCTAD, 2021). Yet cities are particularly vulnerable to global climate change, since they are necessarily built on waterways and, most commonly, linked to the seaports necessary for international trade, at sea level, and hence vulnerable to rising sea levels. More than 50% of the world’s population lives within 120 miles (about 193 kilometres) of the sea, and that is likely to increase to 75% by 2025 (Dawson, 2017: 6). Viet Nam’s urbanisation rate reached 37.1% in 2017, and the country was on course to follow the dictum that no country achieves middle-income status without reaching 50% urbanisation. Most population change is occurring in and around Hanoi and Ho Chi Minh City, which offer attractive job opportunities to people in rural areas. These two cities dominate their areas (north and south) and are amongst the five cities that are under direct governmental control (Class 0, special cities) (Table 5.3). There are also 68 provincial cities, of which 14 are class 1 (relatively large), 24 are class 2 (medium size), and 30 are class 3 (small). Towns are usually class 3 and townships class 4 or 5 (World Bank, 2020: 3).

Table 5.3. Viet Nam’s Largest Cities

City	Population	City classification
Ho Chi Minh City	8,993,082	0
Hanoi	8,053,663	0
Da Nang	988,561	0
Hai Phong	841,520	0
Bien Hoa	830,829	1
Can Tho	812,088	0
Thuan An	588,616	3
Di An	474,681	3
Hue	351,456	1
Vung Tau	341,552	1

Source: Adapted from World Population Review (2022), Population of Cities in Vietnam. <https://worldpopulationreview.com/countries/cities/vietnam> (accessed 9 May 2023).

Digital government is a main component of smart city development. Central and local government agencies work to promote the means of ‘smartness’ within their cities through providing such means as online platforms on which people can find integrated information and services relating to public health, social security, education, and so forth. In the first stage of development, smart cities act like islands within nations and they may be linked together, ignoring rural areas. For sustainable development, it is necessary to move from the smart city concept to the smart nation concept (Kar et

al., 2019). This is a long-term process which involves extensive spatial planning at a time of uncertainty. Spatial planning is conducted by several ministries, and differences in definitions and practice amongst them can lead to lack of clarity in planning and some contradictions. Additionally, since the government allocates budgets for infrastructure based on the size of an urban area, there are incentives for local authorities to maximise the amount of land classified (in whatever way) as urban in nature. It is not surprising that such authorities would also want to benefit from income flows relating to smart city status.

The Vietnamese government is committed to the smart city concept and has announced a number of plans for different cities and the public–private partnerships that will help to build them. According to The Welding Institute (TWI), 'A smart city uses information and communication technology (ICT) to improve operational efficiency, share information with the public and provide a better quality of government service and citizen welfare' (TWI, 2022).

In general, smart city technology relies on big data analysis in real time to help make decisions about resource allocation, such as directing energy supplies and traffic management. This entails widespread monitoring of cities and their residents. A principal drawing point for the development of one new project is that it will provide facial recognition, which is becoming increasingly important in Viet Nam, as it is internationally, for a variety of reasons. One of these is for payment of bills. The pandemic encouraged people to prefer contactless payment systems and facial recognition helps with this. Now it is possible to install an app on a mobile device which can scan the face and then be used as a form of payment in convenience stores and elsewhere (Vietnam Insider, 2020). Meanwhile, some large hotels are introducing similar forms of technology so that guests can check in at reception without the need for human contact (Hotel Technology News, 2022).

However, this technology can act as a double-edged sword. Describing the government's approach to cybersecurity as part of its smart city approach, Arup and Vriens and Partners (2021: 43) stated that 'Cyber security regulation has been a big focus of the government over the past few years. Plans have been put in place to prevent the abuse of personal information, as well as access to illegal content. The government has also developed an emergency response plan in the case of a major cyber security breach'. It is quite clear that this policy is designed, in addition to any smart city application, to maintain and reinforce control of information in the country.

Reporters Without Borders (RSF) ranked Viet Nam 178th out of 180 countries for press freedom in 2023 (RSF, 2023) and this performance has been consistent. Authorities already use COVID-19 test and tracing apps to monitor people's movements: '[Vice Director of Hanoi's Department of Information and Technology Nguyen Viet] Hung referred to the widespread use of COVID-19 prevention and control apps, including PC-COVID and Bluezone, amongst the public, as well as QR code scanning to control people's movements' (Mai, 2022). As Frederick Douglass observed, 'Power concedes nothing without a demand'.

A second way in which people's lives will be directly affected by the introduction of a proposed smart city is through personal transportation. Viet Nam's cities are notoriously clogged with motorcycles, and many areas are reliant upon the narrow roads of earlier historical periods. People have become accustomed to using motorcycles to navigate cities from home to work to shopping centre to leisure activity and so forth, and space is routinely provided for parking at destinations. However, smart cities operate on the basis of large-scale public transportation as a more efficient means of moving people around the city and keeping other areas clean and modern in style. Unfortunately, lengthy delays have meant that the rail systems expected to serve Hanoi and Ho Chi Minh City have yet to be finished, so

the increases in public transport capacity will fall heavily on bus systems, which are not universally popular. Consequently, plans announced to end the registration of new motorcycles to reduce congestion in the capital city have been met with dismay because of the likely reduction in personal mobility and its impact on equality, since no such restrictions would be placed on new cars (Kiet, 2020).

A third area of smart city design with a direct impact on people's lives is environmental management. Having been built in a period in which few people felt it necessary to give any thought to the physical environment, many of Viet Nam's urban areas are subject to rapid flooding and air pollution from excessive traffic and the intensive industrialisation deemed necessary to enable the country to achieve its potential for economic growth. As a result, Hanoi was ranked as one of Southeast Asia's most polluted cities in 2021 and 80% of its wastewater is discharged directly into waterways. Metropolitan Hanoi is so densely packed that no solutions to these problems are possible without rehousing many residents, which precedent suggests will be only with limited agreement or compensation (e.g. Hai, 2021). It seems unlikely that the smart city concept in Viet Nam will be implemented without intensifying some inequalities.

Despite the proclamations of the importance of marrying digital transformation with the smart city concept, the example of Hue indicates the ways in which Vietnamese cities will really change. Hue will receive \$13 million from the Korea International Cooperation Agency as part of an overall \$18.8 million five-year plan to upgrade the city to a smart cultural and tourism city (Quy, 2021). The project will focus on the former imperial palace as a tourist destination. It will create a smart tourism information centre, a pedestrian walking zone, and lighting along the River Huong walkways. This project demonstrates the importance of international partnerships, which will import both capital and technology. The benefits will be restricted to a limited number of people, and few local people will benefit from the investment with jobs. It is not clear whether the project will have any impact on other parts of the city or pay attention to the needs of the people. In common with other instances of the introduction of digital transformation, the effect is to create an island that is connected to other similar islands within Viet Nam or overseas but has little contact with other, unimproved parts of the country. Meanwhile, the needs of the people which might be met by digitalisation are not addressed in ways likely to be as helpful as might be the case.

5. Regional Development

The Vietnamese government has been effective in reducing poverty across the country following reunification (Cuong, Tung, and Westbrook, 2015). This is an important policy issue for the government both in the context of the communist ideology and as a post-colonial state. The urban, coastal, and Mekong delta regions tended to be better developed than inland, often remote regions where ethnic minorities live and which it is quite difficult for government services to reach. To what extent will digitalisation make a positive change to this situation? A study of its adoption in the high-tech small and medium-sized enterprise (SME) sector of Viet Nam demonstrated that the major problems facing successful implementation involved managerial and technical capacity (Trung, Walsh, and Hoang, 2020). This problem is likely to be worse in rural areas, where skills and competencies are generally weaker than in urban companies. Digitalisation can involve decentralisation of resources

and decision-making, which could help to reduce interregional inequalities. However, there are challenges to overcome. Digital transformation can lead to displacement effects, wherein labour is replaced by technology and its share of value added is reduced. Further, it may bring about premature deindustrialisation, which would be particularly acute in the case of Viet Nam and the structure of its economy (Ing, 2022), not to mention the issues involved with cybersecurity and the concentration of market power. As will be seen below, the Vietnamese government has sought to tackle these issues through a systematic approach.

Although various tools and databases focus on provincial level indicators and resources relating to digitalisation policies, there is less information on how existing regional disparities will be tackled. It is known that there are significant differences between the urban and delta regions on the one hand and the mountainous and inland areas on the other hand (Table 5.4). Communist ideology requires that all people be treated equally and that the laws of the land be respected, demonstrating morality, obedience, and solidarity. However, the country remains culturally divided between north and south, specifically between Hanoi and its environs and Ho Chi Minh City. To some extent, neighbouring provinces will join the nearest metropolis to try to obtain advantage in resource allocation decisions, but some regions and provinces – remote from either city and with few resources to attract special consideration – may be ignored at the national level. Some research indicates that differences in equality result from the inability of rural areas to keep up with improvements in urban areas (Tuyen, Lanh, and Thao, n.d.).

Table 5.4. Selected Regional Indicators, 2020

Region	Population density (person/km ²)	Net annual migration rate (%)	% of trained labour force (15+)	Total registered capital of inward investment (\$ million)	Average compensation per month of employees in acting enterprises having business outcomes (VND'000)
Whole country	295	-	24.1	386,233.5	9,325
Red River delta	1,078	3.0	32.6	112,541.8	9,358
Northern midlands and mountain areas	134	-5.3	20.5	20,143.6	7,764
North central and central coastal areas	212	-6.2	22.7	59,927.4	6,608
Central highlands	109	-6.3	16.9	1,089.9	5,907
Southeast	779	18.7	29.5	161,242.9	10,260
Mekong River delta	424	-10.5	14.9	28,519.2	7,039

km² = square kilometre.

Source: General Statistics Office (2020).

From a strategic perspective, the government has established pilot projects targeting disadvantaged communes and aims to integrate them thoroughly in the national digital infrastructure. In Yen Hao, all government offices have computers and internet connections, and citizens mostly use smart phones (70%) and have household internet access (90%). A coalition of local government organisations is implementing a plan that will upgrade digital infrastructure, provide smart health care and education (remotely, if necessary), make available smart media, and develop trading and online payment systems to help trade agricultural products (i.e. market development) (FAO Regional Office for Asia and the Pacific, 2022). These activities will combine public and semi-private sector organisations. For example, Vbee, which is active in the digital village initiative, was established by MIC to help enact state-level developmental goals, such as a Vietnamese speech-to-text generator and other means of facilitating online interactions for local people through 'Make in Vietnam' (Khanh, 2020). Of course, there is a distance between setting up demonstration projects and scaling them up to the regional or national level. Also, it is not certain that government-established firms operating in what is close to being a monopoly will be able to compete in a less friendly marketplace. However, Viet Nam has created corporations from similar beginnings into successful multinational enterprises, such as Vinamilk and Viettel.

The use of various types of economic zones across the country has been designed to take advantage of location-specific characteristics. Those in the north focus on manufacturing and industry, while those in the south are based on service industries and high-technology applications, such as the Quang Trung Software Park, which is envisaged as the flagship for digital transformation (VNA, 2021b). Those in the central area currently lag but have extensive transportation infrastructure to help their growth in the future (Lang, 2022). The government has also, in this case, taken significant steps to enhance trade facilitation through digital applications (Ha & Lan, 2021). As Table 5.4 shows, different regions of Viet Nam are diverse in economic prospects as well as geography and climate. Outward migration from poorer areas with lower levels of educational attainment indicates a steady move towards urban areas, from where (COVID-19 permitting) remittances might compensate for some of the income inequalities between regions. The International Organization for Migration (IOM) has been working with the Vietnamese government to provide digital skills to young people, including migrants, via the platform congfanso.edu.vn, in cooperation with Microsoft (IOM, 2022). Eight courses are available, targeting vocational students and migrant workers in the various economic zones of the country (IOM, 2022). They are aimed at improving employability in the present and, through a module on entrepreneurialism supported by the Government of the United Kingdom, with a view to the future.

Some research shows that the use of zones can lead to the development of specialisations which increase the attractiveness of certain areas (Tien and Huong, 2020). Special economic zones (SEZs) work best when local firms can work as stakeholders for inward investing firms and provide them with valuable services and inputs. Doing so enables the main benefits of hosting investment (i.e. direct employment and taxation effects, technology transfer, and spillover effects) to take place. To enable local companies to do this, the Department of Enterprise Development under the Ministry of Planning and Investment has established schemes to help them to overcome lack of financial resources, poor IT infrastructure and cybersecurity, and lack of skilled workers (The Star, 2021). Nevertheless, a gap remains in the supply of suitable employees because of weaknesses in the country's education system, especially its propensity to produce university graduates with relatively low levels of transferable skills rather than skilled vocational education graduates.

As mentioned above, Viet Nam regulates its territory through the vertical and horizontal division of governmental agencies. There may be some discrepancies between definitions and policies between these agencies and, to some extent, there can be competition between local authorities in terms of attracting national attention and, particularly, budget allocations. Even if not at the level of digitalisation, the digitisation of many basic government services and functions would be beneficial and would contribute to equality issues.

6. Discussion

In his analysis of the impact of technology on work and the workplace, Mueller (2021) observed first that 'Technological development leads to vast accumulations of wealth and with that, power, for the people who exploit workers' (Mueller, 2021: 4) and, second, that 'Tech humanism is not about liberating people from digital capitalism, but about extending its reach' (Mueller, 2021: 122). These are useful reminders that technology is not neutral in terms of its impact on society and on the human relations that constitute society.

Digitalisation as a form of technology, therefore, will provide opportunities for more Schumpeterian creative destruction and this will provide winners and losers. Under the current economic model, most Vietnamese people ultimately work in export-oriented manufacturing or assembly industries. Much of the value added thereby generated will ultimately leave the country. While their quality of life may be enhanced by access to the online world, ultimately, for most people, their online interactions function to monetise their own data, which is then sold on to others. When this is presented in the form of a business transaction, the people involved treat it as work and, therefore, have no objection to providing time and data. It is expected that this will promote efficiency overall and that any opportunities created will be available to all.

Indeed, digitalisation offers network benefits; that is, the more members of the network there are, the greater the level of benefits available. This can be in the greater number of income-generating opportunities that can be found. Most businesses will expect the public sector to bear the cost of establishing and maintaining the infrastructure of such a network, as well as the risk of any cyberattacks. As previously discussed, the Vietnamese government sees its role in economic development as facilitating inward investment and in helping provide inputs that will be required by investors. This approach is in accordance with the argument by Lee, Lin, and Chang (2005) about the late industrialisation of Viet Nam, in which the state retains a dominant role and in which 'Market discipline can be introduced in two ways: first, by exposing firms to world export market competition; second, by allowing multinational corporations (MNCs) to compete with domestic firms (of course, these two mechanisms can be pursued simultaneously to an extent)' (Lee, Lin, and Chang, 2005: 46). While the process is similar, it is possible to wonder whether the pace of change is sufficient to the need and, indeed, the discourse of urgency that surrounds all discussions of digitalisation.

Digitalisation assists the process of movement of capital – the spatial fix that is required to overcome the falling rates of profit inherent in manufacturing and assembly, especially when that is based on low labour cost competitiveness. Moving capital to achieve the spatial fix can be problematic: ‘Frictions within or barriers to this spatial movement take time to negotiate and slow down circulation’ (Harvey, 2011: 42). Digitalisation helps reduce such forms of friction, making Viet Nam a more welcoming place for investors.

However, Viet Nam’s method of industrialisation involves more than just agglomerating capital in Viet Nam overall – it has a more sophisticated approach in terms of regional development. SEZs of various sorts have been used to attract investment to different parts of the country, to some extent to reduce the threat of increased inequality. As Glassman (2007) observed, the distribution of investment within a country requires different accumulation strategies and, therefore, different political coalitions. In different regions of Viet Nam, then, with different degrees of success, groups of political and commercial actors joined together to provide offers to international investors to use their services. Digitalisation has provided new dimensions by which communications can take place and through which value chains can be newly configured to be of service to investors. This is in line with Myovella, Karacuka, and Haucap (2020), who argued that different technologies benefit regions at different degrees of development and that digitalisation has resulted in economic benefits overall. In the case of Viet Nam, the country has successfully navigated a course from low- to middle-income status through the application of an economic model familiar in East Asia, which involves intensive manufacturing based on low labour costs that is intended primarily for export. The next stage of economic development adds innovation to the mix, with the intention that local firms and firms that have based themselves in Viet Nam will be able to compete with overseas firms and this means more import substitution will be possible. That means more added value will remain in the country. Digital applications have been introduced to support various aspects of this process, e.g. in online skills and trade facilitation, but the government has also been concerned with ensuring that this a national phenomenon – spread to every region in both rural and urban settings. This is why it has been important to consider regional inequality, smart cities, and the informal sector. If some sectors are left too far behind, this will be seen not just as an ideological failure but also a possible source of instability.

The value of digitalisation in an economy depends to a considerable extent on the human capital able to utilise it. Various studies (e.g. Schneider, 2018; Zaborovskaia, Nadezhina, and Avduevskaya, 2020; Fenech, Baguant, and Ivanov, 2019) have indicated the dialectical nature of the relationship between the two: digitalisation aids in human capital formation and is instrumental in making it effective. Successful policies in this regard should, therefore, incorporate a broad range of measures – including enhancing education, particularly vocational rather than degree-based education; spreading internet access to all communities; reducing the digital divide; and so forth. The Vietnamese government has been trying to implement policy platforms of this sort but has been hampered, significantly, over the past couple of years by the COVID-19 pandemic. For most of the time since, teaching at all levels has taken place online and this has revealed the digital divide within and between institutions and the lack of usable internet access for many students. It also revealed the poor housing that many Vietnamese must face, even amongst middle-class families in the major cities. Students in both Hanoi and Ho Chi Minh City really need to visit their campus to have space to work properly, not to mention all the other issues concomitant with insufficient space or overcrowding. It remains to be seen whether, should a new normal eventually be established, the necessary supports for human capital formation can be implemented.

The three methods of value production envisaged for digitalisation above (cf. Parida, Sjödin, and Reim, 2019) are all in action in the process taking place in Viet Nam. Of these, the most important activities are those that inspire existing human capital and embed new knowledge and competencies within the people involved. There is so much more to be achieved that it is difficult to imagine any alternative to the policy of doing everything at the same time. If differentiation is to be found in the progress made, it is likely that it would be the result of international influence, with specific requirements which would be planned for accordingly. As mentioned previously, large investors in the country can call upon quite a high degree of influence when necessary.

Overall, there is a gap in the official discourse between what the government proposes for the people in terms of digital transformation and what most of them can hope to receive for the foreseeable future. This is not unusual for any government – the intentions may be genuinely felt but the difficulties involved in bringing them to fruition can be formidable and the ability to solve them in a reasonable period overly optimistic. However, another gap is between the areas identified for improvement according to the desired economic development model, which relies to a considerable extent on external partnerships. Those partnerships should provide genuine benefit to the parts of the economy targeted and, in due course, spin off. This could cause technology transfer effects to spread the benefits more widely, although that is not definite and is not subject to a specific timescale. Consequently, it may reasonably be concluded that Viet Nam's two-tier economic policy is matched by its two-tier digitalisation policy.

Conclusion

There is little doubt about the determination of the Vietnamese government to realise the potential of digitalisation to the fullest extent possible, at least judged by the number of speeches, plans, and committees that have been created to try to bring this about. Resources have been invested in a series of databases and systems that come as close as might be hoped to achieve the ambitious goals set out for the policy. The plans are mostly issued at the top level, and it is expected that lower levels of government – local government and local communities – will do their part to enact them. It is quite possible that good results will be found at the highest level, especially because leading inward investors, whose influence is considerable when it comes to configuring the country's economic model, can make their feelings known and acted upon. However, at lower levels, some unintended and unexpected results might occur. These results may have negative consequences for people or communities: freedoms are restricted, personal mobility is limited, and opportunities are distributed unequally across the country. As a result, mostly passive resistance to change may emerge and, if this is interpreted as a challenge to government legitimacy, it could lead to a major event. It is hoped that personal or soft skills will develop to the same extent as hard skills in the implementation of digitalisation in the country.

Nonetheless, the methods chosen by the Vietnamese government to provide digitalisation may be criticised on the basis that they are not tested by competition and may face scaling issues. Ideology dictates that public sector-based solutions be prioritised and, as noted throughout the chapter, this approach has been adopted in the case of digitalisation. However, it is not clear that the public sector has the technical capacity and resources necessary to solve problems and enhance existing capacity throughout the country and, even if it does, whether these resources are sufficiently widely available that enterprises throughout might benefit equally. Companies now need quite advanced knowledge and extensive financial resources to be competitive in this area. Support from the international community is being made available in good numbers but there are sensitive issues to negotiate, and it is important that advice and support is provided in the Vietnamese language for equity issues. It is possible, in other words, for an alternative market-based approach that complements or partly replaces the current approach to prove more successful or efficient.

The aspects of society and the economy selected for study in this chapter have been intended to show how the Vietnamese government has identified a series of plans and policies for the country which mostly work in parallel with each other and in support of a specific economic model. This is a dynamic vision that is upgrading from being an export-oriented, import-substituting, intensive manufacturing state based on low labour cost competitiveness to a model in which Vietnamese firms and localised foreign firms contribute more value added to the global supply chains of which they have become a part. Various forms of digital transformation have been employed to try to facilitate this process, although progress has been interrupted by the COVID-19 pandemic and global economic problems. Specific applications have been brought in, for example, to enhance the skills of young people and in terms of agricultural extension. The government's plans to ensure that such applications are available nationally have yet to be fully achieved because of lack of capacity and resources.

It is customary to acknowledge the shortcomings in methodology in a work of this sort. It is true that it has been written at a time of uncertainty, with the ongoing COVID-19 apparently reaching a peak for the omicron variant, at least in some countries, although it is unknown whether new strains will emerge in a world in which many poorer countries remain mostly unvaccinated. At the same time, the climate emergency witnesses fresh instances of doom on almost a daily basis and world leaders have shown precious little evidence that they are willing to take the action required to address it. In such circumstances, all considerations of what might happen in the future are more hazardous than normal and more subject, therefore, to being proved wrong. There are numerous ways of framing the prospects for digitalisation in Viet Nam and it may be that others would be more useful in analysing the situation. As ever, more research would be helpful in improving the quality of the paper. More understanding of the connections between different levels of society and mobility between those levels would be useful. It might also be noted that the chapter has not referred to several of the more well-known and well-established databases established by the Vietnamese government, since these are addressed elsewhere in this volume.

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