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The mobifone group's investment capital management in telecommunications infrastructure construction

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Abstract
Infrastructure, particularly information technology, telecommunications, data, electricity, and energy... plays a critical role in ensuring the digital economy's sustainable development. Modern, high-quality, synchronous, widespread, and secure telecommunications, information technology, and data infrastructure, as well as stable and high-quality electricity and energy infrastructure, serve as the foundation for the deployment of digital economy technologies and services, thereby promoting national digital transformation activities and the growth of Vietnam's digital economy.

Keywords: Situation of Vietnam's telecommunications infrastructure system

1. Introduction

Vietnam's telecommunications infrastructure system has emphasized investment and construction in recent years, becoming increasingly synchronous and modern, specifically:

(i) The national infrastructures for information technology and telecommunications are robust and well-developed. By 2020, the national telecommunications infrastructure would span the entire country, including remote, border, and island regions, and would include over 800,000 kilometers of fiber optic cables and transceiver stations. The quality of information technology and telecommunications infrastructure continues to improve at a rapid clip. The broadband network has advanced significantly. Vietnam was ranked 43rd out of 86 countries in the 2018 Global Internet Index, surpassing several countries in the region (Indonesia was 49th and the Philippines was 54th); Vietnam's average download speed exceeded 6.9Mbps in 2018, placing it 75th out of 200 ranked countries 1 (higher than Indonesia at 5.8 Mbps, the Philippines at 5.2 Mbps). The total number of fixed broadband subscribers has surpassed 13.58 million, with over 12 million subscribers accessing the internet via FTTx fiber optic cable at speeds greater than 10Mbps. Six undersea cable routes connect to the rest of the world, providing a total international bandwidth of more than 8.1Tbps. Vietnam's internet service fees are moderate, and the country's fixed broadband internet service fees are the lowest in the Asia Pacific region (converted according to purchasing power parity).

Vietnam's mobile network is thriving, with a coverage rate of 99.7 percent. The third and fourth generation (3G and 4G) mobile networks have been extensively covered. Additionally, a 5G mobile network has been licensed for testing and preliminary success. Subscribers increased at a rate of 30%-40% per year, and there are now more than 100 million landline and mobile phone subscribers and tens of millions of Internet subscribers. Vietnam's Internet user rate has surpassed both the regional and global averages (In 2016 there was 46.55 percent of the population of Vietnam accessing the internet; in 2018, there were 64 million people in Vietnam using the internet).

Vietnam is also developing satellite technology at a glacial pace. By early 2019, Vietnam had launched several satellites, including providing Internet access to remote areas.

The majority of the Party's and State's leading agencies, ministries, central agencies, localities, agencies, organizations, and enterprises have internal information networks and operate using information technology. Many organizations have their website for management and administration. There is an increasing number of electronic newspapers and information pages. Also, e-commerce is accelerating its growth.

(ii) The development of national data infrastructure is accelerating in both the public and private sectors. On a national level, some national-scale databases have been formed and promoted effectively to provide online services, including the national database on population, business registration, insurance participation, tax, customs, and social insurance.

Along with promoting the application and development of digital technology, the business sector is responsible for developing and forming large databases to serve customers and businesses.

(iii) Additionally, an electronic authentication system is being developed and invested in. There are currently 12 licensed enterprises nationwide that provide public digital signature authentication services to individuals and businesses, assisting in the convenience and security of online transactions, particularly for businesses. Enterprises can access high-level online public services (levels 3, 4) in the areas of taxation, customs, and insurance... The Government Cipher Board has provided digital signature authentication services to political system agencies, including Party, State, Government, and political organizations.

(iv) The rapid and diverse development of the electricity and energy infrastructure system at 500kV, 220kV, 110kV, and medium voltage levels between 35kV and 6kV has ensured power supply and quality improvement, voltage, minimizing loss, avoiding overload, and ensuring the system's stability. Along with hydroelectricity and thermal power, renewable energy sources have thrived. Currently, two 500kV networks connect the North - Central - South power systems, facilitating the rational exploitation of power sources throughout the system, reducing the possibility of local power shortages, and ensuring the system's high stability. By the end of 2019, the national power system's total capacity would have increased to nearly 54,880 MW, a roughly 2.6-fold increase over 2010. (in 2010, the full power capacity of the whole system was 20,411 MW). The power grid system has been heavily invested in and developed regionally, ensuring electricity supply to remote, border, and island areas. The 220kV and 110kV power transmission grids have covered the entire country, enhancing the country's energy security. By the end of 2019, the capacity of 500 kV substations would have increased 2.84 times, while the capacity of 220-110 kV substations would have increased 2.82 times...

The findings as mentioned above are the result of the following primary factors: Attention and increased investment by the State in infrastructure development; Attract private sector investment capital for socialization from all economic sectors in the construction and development of infrastructure for the digital economy's development; The effect of mechanisms and policies aimed at encouraging and attracting state investment in infrastructure development, particularly policies aimed at developing broadband infrastructure, information technology infrastructure, and information - communication infrastructure, as well as policies to support the price of electricity generated by renewable energy sources...; The process of reforming and streamlining administrative procedures governing telecommunications licensing encourages businesses to invest in the development of telecommunications network infrastructure; Strictly and effectively managing, ensuring on-time completion of several infrastructure investment projects...

1.2. Limitations

Apart from the achieved results, Vietnam's infrastructure system for developing the digital economy has not yet met development requirements, particularly those specific to the digital economy.

First, the telecommunications and information technology infrastructure systems are hampered by numerous constraints: The speed and quality of information technology infrastructure are insufficient to support the development of the Internet of Things, smart cities, and autonomous vehicles. Automatic, intelligent production...; access to mobile broadband services is still limited in rural and mountainous areas; the actual connection speed is incompatible with the connection speed in the virtual environment; the physical infrastructure has not yet met the requirements for the application of intelligent management methods, such as automatic and remote control; the new 5G network system is still in the testing phase, has not been commercialized, and is not widely available.

Second, the national-scale infrastructure and database system that serves as the foundation for developing the digital economy remains fragmented, deficient, non-standardized, asynchronous, and exploitable. The development and completion of the national database system have been a slow process. Both the public and private sectors' databases are still insufficiently connected and shared. Connectivity, inter-parameter connectivity, and inter-infrastructure connectivity remain low and inconsistent. Data collection, storage, and processing technology are still limited and unreliable. The safety and security of the network cannot be guaranteed.

Thirdly, the amount of data accumulated by state agencies is limited, and the data is fragmented and scattered. Currently, state agencies' data systems terminate at level 2, which is fragmentation. Data exists in a variety of different agencies and units and has not been managed consistently.

Fourth, digital payment infrastructure is not synchronized, does not leverage shared infrastructure, and is concentrated in urban areas; mobile payment infrastructure has been deployed, but its scope is insufficient to meet market potential, and electronic payment methods are limited.

Fifth, the electricity infrastructure still has some points that do not meet development requirements; in some areas, power failures, grid problems, and local overloads occur. Specific power projects, 500-220 kV, and grid construction are running behind schedule—unstable power backup.

The limitations listed above are due to a variety of factors, including the following: (i) Lack of awareness of the role and importance of infrastructure for the development of the digital economy, particularly data and infrastructure digital payment; data is not valued correctly during the process of construction and exploitation; (ii) Certain mechanisms and policies governing finance, investment, site clearance, and public-private partnerships (PPP) are not synchronized, unified, and complicated, leaving many investors fearful; regulations and policies governing data sharing are a mess. (iii) The country's capacity for supporting industry, research, technology development, and equipment manufacturing remains limited, with a heavy reliance on imported components, high prices, and high investment costs; (iv) Mechanisms and policies for attracting non-state capital to invest in infrastructure have not fully realized their effectiveness and efficiency, and borrowing domestic and foreign capital is becoming increasingly complicated... (v) Several projects are stalled or delayed due to a lack of investment capital, difficulties with compensation and site clearance, as well as the limited capacity of investors, construction firms, and construction units. …

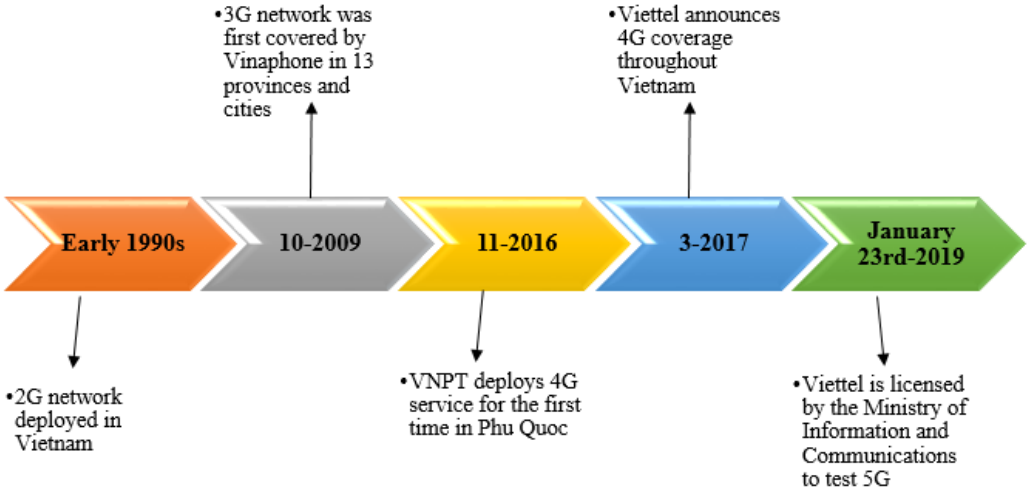
2. The Telecommunications Act encourages competition and fosters the development of modern telecommunications network infrastructure

The Law on Telecommunications, which the 12th National Assembly passed during its sixth session on November 23, 2009, took effect on July 1, 2010, has a significant impact on the development and organization of the economy in general and the telecommunications industry in particular. This is a watershed moment in our country's telecommunications law evolution, particularly in light of the globalization trend.

After more than a decade of implementation, the Telecommunications Law and its guiding documents have aided in the promotion of competition, the development of modern telecommunications network infrastructure, the growth of a diverse telecommunications market, meeting the needs of users, and the country's socio-economic development in the context of international economic integration, and contributing to Vietnam's security and territorial integrity. Vietnam is one of the world's fastest-growing telecommunications and information technology markets. After the global telecommunications market began to open up and transition from monopoly to competition, the industry made significant advances in technology, networks, and services, moving from a single network to a single service. To enable customers to migrate to a broadband network capable of simultaneously transmitting voice, data, mobile, and fixed images, telecommunications is evolving toward a trend of converging technology, networks, and providing a slew of services users.

Currently, the Vietnamese telecommunications market comprises seven enterprises that provide mobile telecommunications services, of which five provide 4G services, and 63 offer Internet services.

As of May 2021, there are 123.32 million mobile phone subscribers generating traffic and 68.2 million mobile broadband subscribers developing traffic. The total number of fixed broadband Internet subscribers is 17.95 million, and the total bandwidth available for international Internet connections is 11.6 Tbps, while the total bandwidth available for domestic Internet connections is 4.1 Tbps. The telecommunications infrastructure has been expanded, modernized, and strengthened; the 4G network has been upgraded; 5G has been licensed for testing, and the fiber optic network has been widely expanded to cover each household.



The results of Vietnam's mobile network development from the early 1990s to the present

Fig 1

The law has aided in the diversification of economic sectors involved in field development, the management of telecommunications resources - frequency, internet - the achievement of the telecommunications master plan through 2020, the promotion of healthy competition, and the management of charges. Promotions are managed to safeguard consumers' interests...

While telecommunications is rapidly evolving, it still ensures the market's health, sustainability, and diversity. This is reflected in the continued growth of investment capital and the involvement of numerous economic sectors in the telecommunications business, particularly in network infrastructure establishment. The world has witnessed a technological revolution in recent years. The convergence of technology and services has become an unavoidable requirement for all industries and fields. Telecommunications infrastructure is evolving into digital infrastructure, serving as the backbone of the digital economy and society. The telecommunications sector has undergone dramatic changes, necessitating the revision and adjustment of policies and management practices to keep pace with the market's rapid growth.

Telecommunications infrastructure will evolve into digital infrastructure, incorporating new areas such as cloud computing, artificial intelligence (AI), the Internet of Things (IoT), data analytics, and block chain; digital transformation platforms such as digital identity and mobile-based digital payment platforms; and new markets such as digital government, digital economy, and digital society.

Thus, regulations governing the telecommunications market are developed to foster the growth of new markets, wholesale markets, and the relationship between content enterprises and telecommunications enterprises following market trends and development needs to grow. Proactively promoting the development of new telecommunications infrastructure The digital economy's foundation is built on telecommunications infrastructure, which supplements connection management policies, manages the establishment of cloud infrastructure, and provides services related to infrastructure and cloud platforms...

3. Several alternatives for accomplishing the system of telecommunications infrastructure

The Document of the 13th Party Congress identifies the construction of an asynchronous and modern infrastructure system as one of three strategic breakthroughs for socio-economic development in the coming decades. The Document, in particular, clearly defines the priority direction for developing an infrastructure system for the digital economy: "Focus on developing information and telecommunications infrastructure, laying the groundwork for national digital transformation, and taking incremental steps toward developing the digital economy and society" [5]; "Strongly develop digital infrastructure, building and developing synchronously national, regional, and local data infrastructure with synchronous and unified connectivity, laying the groundwork for developing the digital economy and society" [6]. According to the preceding perspectives and orientations, it is necessary to focus on implementing many synchronous solutions in the coming years to perfect the infrastructure system for the development of the digital economy:

To begin, revise, supplement, and adjust planning for developing infrastructure systems for the digital economy, ensuring overall efficiency and systematization, particularly for the electricity network, telecommunications infrastructure, and infrastructure. The technology of information, data infrastructure...Create a list of investment priorities, mechanisms, broad policies, and specific policies for specific projects (such as electricity, telecommunications, information technology, data infrastructure works...). Capital from the state budget should be prioritized for the development, consolidation, upgrade, and modernization of postal and telecommunications infrastructure and information technology in the immediate future. Transform telecommunications infrastructure into information technology infrastructure by implementing the transformation. Plan and execute the development of national broadband infrastructure, a cloud computing infrastructure, a national data management infrastructure, and a reliable electronic identification and authentication service infrastructure.

Second, continue to review and eliminate impediments to infrastructure investment to develop the digital economy in institutions, laws, and policies. Enhance public awareness, transparency, stability, and equality in the legal system governing the construction of infrastructure systems. To optimize the monitoring, management, and allocation of investment capital for each infrastructure development project. Create institutions to facilitate the creation, connectivity, sharing, and commercialization of national databases. Develop a fee collection mechanism for data mining to consolidate and expand the data held by state agencies; optimize the coordination and cooperation mechanisms between the State and private sector to build data. Develop and complete relevant legal regulations governing user data security, information security, and information safety to create a secure and reliable environment for digital transactions. Continue to perfect legal documents and eliminate bottlenecks in public-private partnership (PPP) infrastructure construction, such as completing criteria for selecting PPP projects, PPP investors, and the PPP project ratio. Contribute public and private capital under current circumstances... Enhance financial and investment mechanisms and policies that encourage enterprises to invest in and develop infrastructure to develop the digital economy.

Third, continue to mobilize investment capital from all economic sectors at home and abroad to upgrade and build new infrastructure, equipping it with cutting-edge technological capabilities to develop the digital economy. It is necessary to have specific mechanisms and policies in place to mobilize and align the interests of the State, investors, and people when it comes to resource mobilization. In addition to the state budget, additional sources such as ODA, government bonds, international bonds, construction bonds, and socialization resources will be utilized. When investing in infrastructure systems for the digital economy, particular emphasis is placed on attracting private investment capital. The benefits of information technology, communication, and energy infrastructure are readily available can recoup capital and generate immediate revenue through the sale of wholesale electricity bandwidth. This will assist in attracting private sector investment to the sector. Additionally, there are mechanisms and policies in place to attract foreign investment in the fields of information technology, electronics, and telecommunications...; to adopt preferential policies for foreign investment projects utilizing "high, new, clean, and economical" technologies; to promote foreign investment in energy infrastructure, particularly clean energy infrastructure and renewable energy sources such as wind and solar...

Fourth, promote the use of advanced technology in the management and operation of energy infrastructure, including developing an intelligent power network capable of distributing electricity from multiple power generation locations. Actively innovate and develop science and technology in the information technology - communication - and energy industries to increase localization, master technology, and equipment, contributing to cost savings associated with imports and equipment purchases. Prioritize scientific and technological capital and capital from national programs for high-tech development, domestic product, service, and solution development, among other things, to support the construction and development of infrastructure systems platforms for the development of the digital economy.

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