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# Current status of digital transformation implementation in rural areas of HaNoi to meet the requirements of modern rural development

**Dung Trung Hoang**
Faculty of Political Theory, Hanoi University of Civil Engineering, HaNoi, Vietnam

**Abstract**
The article analyzes the system of policies and digital transformation programs in Vietnam's agriculture, emphasizing the fundamental role of digital transformation in restructuring the sector and developing modern rural areas. Policies such as the National Digital Transformation Program, the Agricultural Digital Transformation Plan and the Sustainable Agricultural Development Strategy are presented in detail, clarifying the orientation of applying digital technology in management, production and consumption of agricultural products. The article also assesses the current situation in rural areas of Hanoi, pointing out the achieved results and limitations in awareness, infrastructure, human resources and institutions. On that basis, the author proposes key solutions to improve the effectiveness of digital transformation, including: Raising awareness, developing digital infrastructure, training human resources and perfecting support policies. The article contributes to clarifying the central role of digital transformation in the process of building modern agriculture, farmers and rural areas in accordance with Resolution No. 19-NQ/TW.

**Keywords:** Hanoi countryside, modern countryside

## Introduction

In the context of the Fourth Industrial Revolution spreading strongly, digital transformation has become an inevitable trend in the socio-economic development process of every country. For Vietnam, especially in the field of agriculture and rural development, digital transformation not only opens up opportunities to improve productivity, quality and value of agricultural products, but also contributes significantly to modernizing production, improving farmers' lives and building advanced new rural areas. In Hanoi, a locality with the characteristics of being both an urban center and a large rural area, the implementation of digital transformation in rural areas is of particular importance, contributing to narrowing the development gap between rural and urban areas, promoting sustainable rural economic growth. In response to that requirement, Hanoi has issued many specific policies, programs and plans to promote digital transformation in rural areas. However, the implementation still faces many difficulties in terms of infrastructure, awareness, human resources and institutions. Therefore, systematically studying policies, assessing the current status of digital transformation in rural Hanoi and proposing feasible solutions is an urgent task, contributing to effectively implementing the goal of developing modern and sustainable agriculture and rural areas in the new period.

## The Article Uses A System of Research Methods

Theoretical research, interdisciplinary research, historical-logical research; abstract; secondary data research. Research findings

## Research findings

### 1. Current Rural Digital Transformation Policy

Digital transformation of the agricultural and rural development sector plays a particularly important role in restructuring the agricultural sector, developing concentrated, large-scale commodity agriculture in a modern, high-value-added and sustainable direction, affirming the role of "support" of the economy, becoming a "measure of the country's sustainability". Digital transformation is an important solution to help farmers and businesses produce quality agricultural products at the lowest cost, but with the highest profits. This goal is also being promoted by sectors, localities, businesses and people with the expectation of creating a breakthrough in productivity, quality and competitiveness of agricultural products.

Rural digital transformation is the process of applying digital technology to agricultural activities, business and life management in rural areas. The ultimate goal is to create sustainable growth, improve the quality of life and improve productivity in rural communities.

The Party and State of Vietnam have issued many specific policies and programs to promote digital transformation in the fields of agriculture and rural development. These documents not only affirm the important role of digital transformation in modern rural development, but also provide strategic directions and specific actions for each stage.

First of all, the National Digital Transformation Program to 2025, with a vision to 2030 (issued under Decision No. 749/QD-TTg dated June 3, 2020 of the Prime Minister) clearly defines the goals of developing digital government, digital economy and digital society, in which the role of digital transformation in the agricultural sector is particularly emphasized. The program aims to have at least 70% of farming households universalized with basic digital skills by 2025, at least 50% of the country's key agricultural products traceable to their origin on a digital platform, and at the same time promote the construction of platforms connecting supply and demand of agricultural products and services for agricultural production.

Next, the Digital Transformation Plan for the Agriculture and Rural Development Sector for the 2022–2025 period (issued under Decision No. 924/QD-BNN-KH dated March

19, 2022 of the Ministry of Agriculture and Rural Development) specifies the goals of the National Digital Transformation Program in the agricultural sector. The plan aims to develop transparent, responsible and sustainable agriculture through building a sectoral database, promoting the application of digital technology in the management of land, crops, livestock, fisheries, and forestry; at the same time, encouraging businesses, cooperatives and farmers to participate in digital platforms in the production, distribution and consumption of agricultural products.

In addition, the Strategy for Sustainable Agricultural and Rural Development for the 2021–2030 period, with a vision to 2050 (issued under Decision No. 150/QD-TTg dated January 28, 2022 of the Prime Minister) has made digital transformation one of the pillars in the process of developing modern agriculture and civilized rural areas. The Strategy clearly identifies the requirements for promoting mechanization, automation, digitalization and artificial intelligence in agricultural production; developing a market information system and product traceability on a digital platform; and building a rural workforce capable of accessing and mastering digital technology.

In parallel with the above programs and strategies, the Project on raising awareness, popularizing skills and developing human resources for national digital transformation by 2025, with a vision to 2030 (issued under Decision No. 146/QD-TTg dated January 28, 2022) plays a key role in building a digital social foundation, in which rural areas are one of the key subjects. The project aims that by 2025, at least 70% of people of working age will have access to digital skills popularization programs, with priority given to online training, improving the capacity to use digital devices, e-commerce skills and personal information security.

The current digital transformation policy and program system has initially created a synchronous legal and strategic foundation, aiming at the goal of comprehensive digital transformation in agricultural and rural development. These orientations not only open up new opportunities for rural people to access modern technology, but also contribute significantly to the goal of building a new model rural area, smart rural area according to the orientation of Resolution No. 19-NQ/TW on agriculture, farmers, and rural areas in the new period.

In 2022, the Hanoi Party Committee issued Resolution No. 18-NQ/TU dated December 30, 2022 on digital transformation, building a smart city by 2025, with a vision to 2030. The City People's Committee also issued Plan No. 239/KH-UBND dated September 27, 2023 on digital transformation, building a smart city by 2025, with a vision to 2030. Every year, the city updates the central government's directives and guidelines on digital transformation, issues annual plans for implementation.

Identifying digital transformation as a new and important task, Hanoi has built an integrated plan from administrative reform, digital transformation, etc…including 27 targets. In particular, in the implementation organizatin, the city has both built and implemented projects and tasks of fundamental, fundamental and directional nature, and encouraged innovative models of localities and units, with many creative ways to not only complete the targets set by the city, but also create a change from awareness to action of the entire political system, from all levels of government to people and businesses, mobilizing all social resources in the digital transformation process, taking digital transformation as a method and driving force for socio-economic development in general and rural and agricultural development in particular.

## 2. Current Status of Digital Transformation Process in Rural Hanoi

Digital transformation in agriculture, farmers and rural areas is an important part of Resolution No. 19-NQ/TW of the 13th Central Executive Committee on agriculture, farmers and rural areas to 2030, with a vision to 2045. In Hanoi - a locality with both urban and rural characteristics - digital transformation in rural areas plays an essential role in promoting rural economic development, improving people's lives and building new rural areas and civilized rural areas.

One of the remarkable results is the application of high technology in agricultural production. By 2024, Hanoi will have about 245 agricultural production models applying high technology, accounting for about 1.3% of the total number of agricultural models, concentrated in districts such as Dong Anh, Soc Son, Dan Phuong [**Error! Reference source not found.**]. Many cooperatives have used traceability software and electronic production logs such as Dan Hoai Agricultural Cooperative (Dan Phuong) or applied IoT technology at a dairy farm in Ba Vi. Integrating digital technology in production stages has helped improve management efficiency, improve the quality of agricultural products and increase income for people.

E-commerce activities have also developed strongly. By the end of 2024, 100% of communes in Hanoi will have OCOP products, of which over 80% of products have been put on e-commerce platforms such as Voso and Postmart [**Error! Reference source not found.**]. Some typical models include Japonica rice products of Tan Long Cooperative (Ung Hoa) or Soc Son honey, which have reached the Southern market through online sales, helping to increase revenue by 25-30% compared to traditional channels [**Error! Reference source not found.**].

Regarding digital infrastructure, Hanoi has basically completed the telecommunications coverage network in rural areas. According to the report of the Hanoi Department of Information and Communications in 2024, currently 100% of communes have 4G coverage, 95% of villages have internet fiber optic cables. In addition, a system of more than 3,200 BTS stations has been installed, of which more than 94% are located in suburban areas, contributing to ensuring connectivity for people in remote areas [**Error! Reference source not found.**].

Digital skills training for farmers is also being widely deployed. In the period of 2023-2024, the Hanoi Farmers' Association in collaboration with the Ministry of Information and Communications will organize more than 300 training courses for more than 20,000 members [**Error! Reference source not found.**]. Training content focuses on smartphone usage skills, creating accounts on e-commerce platforms, operating smart agricultural applications, contributing to improving digital capacity for farmers.

Besides the achievements, the digital transformation process in rural Hanoi still faces many barriers.

Firstly, people's inadequate awareness of digital transformation. A 2023 survey by the Hanoi Department of Information and Communications in 8 districts showed that up to 46% of people did not clearly understand the concept of digital transformation, while nearly 70% of farming households still maintained traditional production and consumption methods [**Error! Reference source not found.**].

Second, there is a limitation in technology human resources. Only about 12% of cooperative staff have basic information technology skills, while the majority still manage by manual methods [Error! Reference source not found.]. Lack of on-site technology support staff makes it difficult to maintain effective tracking software and electronic logs.

Regarding infrastructure, despite significant investment, some areas such as Phu Luu Te (My Duc), Minh Quang (Ba Vi) still experience weak and unstable network connections, affecting livestreaming and application operations [Error! Reference source not found.].In addition, the rate of rural households with personal computers is only 15.4%, while although 72% of people have smartphones, they mainly use them for communication and entertainment purposes [Error! Reference source not found.].

Third, mechanisms and policies lack consistency and there is no unified database for common use in the agricultural sector at the commune level. Overlapping digitalization programs in some communes such as Xuan Non (Dong Anh) have caused difficulties in implementing and operating the system [Error! Reference source not found.].

The digital transformation process in rural areas of Hanoi, despite significant progress, still faces many unresolved issues. The main causes of this situation include inadequate awareness among people, limitations in digital infrastructure, a shortage of technology human resources, and insufficient support policies.

**First, Limited awareness and digital skills of people**

One of the biggest reasons affecting the digital transformation process in rural areas of Hanoi is the people's inadequate awareness of digital transformation and information technology. According to a survey by the Hanoi Department of Information and Communications, about 46% of people in suburban communes are still not fully aware of the importance of digital transformation, while 40% of farming households do not clearly understand the concept of information technology and digital applications in production [Error! Reference source not found.]. This leads to them not proactively applying technology to production and consumption activities, or communicating with state agencies via online platforms.

People's digital skills are also weak, especially in using electronic devices such as smartphones and computers. Although the smartphone ownership rate among farmers in Hanoi is about 72%, according to a survey by the General Statistics Office in 2024, only 30% of them use their phones to access digital services or participate in e-commerce [Error! Reference source not found.]. Most people still mainly use their phones for communication and entertainment purposes, instead of exploiting applications for agricultural production and consumption.

**Second, Digital Infrastructure is Asynchronous and Unstable**

Although Hanoi has made initial steps in investing in digital infrastructure for rural areas, Internet connection and telecommunications services in many localities have yet to fully meet the needs of people and businesses. According to a report by the People's Committee of My Duc district, many areas such as Phu Luu Te and Minh Quang still lack stable network connections, directly affecting the ability to use digital applications in agricultural production and consumption. In particular, in some villages, the rate of households with Internet connection is only 70%, while digital technology applications require high-speed Internet to operate effectively [Error! Reference source not found.].

In addition, farms and cooperatives also face difficulties in accessing new technologies due to the lack of synchronous digital technology infrastructure. Although there have been some high-tech agricultural models, the lack of technical infrastructure support, such as stable power grid systems and high-speed network connections, has reduced the effectiveness of technology application in agricultural production.

**Third, Lack of Human Resources with Technological Qualifications**

Another factor hindering the digital transformation process is the lack of technologically qualified human resources. Although some cooperatives have deployed technology applications in agricultural production and consumption management, the lack of staff with IT expertise remains a major barrier. According to a report by the Hanoi Department of Agriculture and Rural Development in 2024, only about 12% of agricultural cooperative staff in Hanoi have basic knowledge of information technology [Error! Reference source not found.]. The lack of technological skills in managing and operating software systems means that many digital agriculture models cannot be effectively deployed or maintained, despite initial investment.

**Fourth, Policies and Support Mechanisms are Not Yet Synchronized**

The Government and Hanoi City have had many policies to encourage digital transformation in agriculture, but this policy system still lacks synchronization and is not strong enough. One of the major weaknesses is the lack of financial support policies for farmers and cooperatives to invest in high-tech equipment. The People's Committee of Dong Anh District pointed out that digital transformation support programs still lack connectivity and coordination between agencies, leading to overlap and inefficiency in implementation. In addition, support policies on human resource training for digital transformation are still limited, making it difficult for people and officials to access technology training opportunities.

**3. Solutions to Promote Digital Transformation in Rural Hanoi in the Coming Time**

For the digital transformation process in rural areas of Hanoi to take place effectively and sustainably, it is necessary to synchronously deploy many groups of solutions with high practicality and applicability. These solutions are not only technical but also cover social, institutional and human factors. Below are the key solutions:

**First, Raising Awareness and Digital Capacity For Rural People**

The fundamental and long-term solution is to raise people's awareness of the role and benefits of digital transformation. Correct understanding will be the premise for people to voluntarily participate in the transformation process and apply technology in all aspects of life. Raising awareness does not stop at one-way information communication, but it is necessary to build community education programs on digital transformation, suitable for the characteristics of the people's intelligence, culture and rural livelihoods.

In addition, it is necessary to focus on training practical digital skills for people, especially skills in using smartphones, social networking applications to access information, skills in using e-commerce platforms, agricultural production management software, and product traceability. The core force in training can include commune officials, youth organizations, local teachers, or volunteer digital transformation collaborators. Training forms need to be flexible: short-term classes, training sessions at cooperatives, direct instruction through model models at households, or using simple, easy-to-understand videos so that people can learn over the phone.

In particular, it is necessary to build pilot models of "digital farmers" and "digital cooperatives" to create motivation for learning and replication. Through the changes of some typical individuals, the farming community will see the practical benefits of applying technology, thereby gradually changing traditional perceptions and habits.

**Second, Develop Synchronous Information Technology and Communication Infrastructure**

Technology infrastructure is the foundation for all digital transformation activities. In rural areas, this infrastructure still has many shortcomings such as: low network speed, uneven coverage, lack of basic technology equipment, and no commune-level technical support centers. Therefore, it is necessary to have a synchronous information and communication infrastructure development strategy, linked to the geographical and population characteristics of each region.

High-speed Internet coverage, especially 4G and moving towards 5G, needs to be deployed quickly and prioritized in concentrated production areas such as craft villages, farm clusters, and agricultural processing zones. In addition, free Internet access points (public Wi-Fi) should be built at village cultural houses, commune People's Committees, medical stations, etc. to help people easily connect and access information. Along with that, local authorities need to develop a plan to support technology equipment for poor and near-poor households, to ensure that no one is left behind in the digital transformation process.

In addition, it is necessary to develop digital agricultural data infrastructure such as digital farming maps, OCOP product databases, market data, weather, epidemics, etc. These data need to be digitized, periodically updated and publicly shared so that people can look up and serve their production and business decisions. The construction of technological infrastructure needs to be associated with the training of technical personnel to operate, maintain and support the community.

**Third, Developing Digital Transformation Human Resources at The Grassroots Level**

Human resources are the central factor determining the success of digital transformation. In rural areas, the workforce with technology expertise is still in great shortage. Therefore, training and fostering human resources for digital transformation at the grassroots level is an urgent task, including managers, cooperative staff, local businesses, and people.

First of all, it is necessary to develop specialized short-term training programs for commune and district officials on skills to organize and implement digital transformation activities at the local level. This force plays a key role in guiding, guiding and supporting people. At the same time, it is necessary to strengthen training for technical staff at cooperatives, cooperative groups and farms - those who directly use and manage technological tools in the production, traceability, processing and consumption of agricultural products.

It is necessary to form a network of "grassroots digital transformation collaborators" – including young people with technology skills, student interns, and IT teachers at schools – to act as a bridge to provide technical support to people in each village. This model both reduces pressure on the administrative apparatus and helps spread digital knowledge quickly and widely.

On the other hand, to sustainably develop human resources, it is necessary to encourage links between schools, businesses and local authorities in practical training, organize digital startup competitions, and create a creative experimental environment for rural youth to stay close to their homeland.

**Fourth, Perfecting Institutions and Policies to Support Rural Digital Transformation**

Rural digital transformation cannot be successful without a clear legal framework and appropriate incentive mechanisms. Therefore, it is necessary to build and perfect a synchronous system of policies to support digital transformation, from the central to local levels.

It is necessary to issue specific financial support programs for agricultural models applying technology such as: preferential loan support, tax exemption and reduction for technology equipment, support for management software costs, traceability... In particular, there should be a priority mechanism for cooperatives and agricultural cooperative groups in digital transformation because they are important intermediary forces between farmers and the market and technology.

It is necessary to build funds to support digital startups in rural areas, encourage young people and local businesses to implement innovative initiatives. Projects applying technology to agriculture, e-commerce, community tourism, or agricultural logistics need to be selected, funded, and replicated.

Management agencies need to simplify electronic administrative procedures at the grassroots level, helping people access online public services more easily. This not only improves the efficiency of state management but also creates trust and motivation for people to stick with digital platforms.

It is necessary to strengthen the monitoring and evaluation of digital transformation progress in localities through appropriate indicators. Periodic evaluation will help identify bottlenecks, discover effective models and flexibly adjust policies according to reality.

**Conclude**

Digital transformation in rural areas of Hanoi is not only an inevitable trend in the context of modern socio-economic development, but also an urgent requirement to solve the inherent challenges of traditional agriculture and narrow the development gap between rural and urban areas. In practice, the digital transformation process in rural areas of Hanoi has achieved some remarkable initial results, especially in building commune-level e-government, developing smart agricultural production models and applying e-commerce to

agricultural product consumption. However, this process still faces many limitations such as uneven intellectual level, weak technological infrastructure, digital human resources that do not meet requirements and policy mechanisms that have not kept up with reality.

In that context, proposing and implementing solutions to promote digital transformation in rural areas of Hanoi is of particular importance. First of all, it is necessary to prioritize raising awareness and equipping practical digital skills for people - the direct subjects of rural production and consumption. Changing farmers' thinking, habits and access to information is an important driving force to promote digital transformation from the roots. Next, developing a synchronous information technology and communications infrastructure, combined with building a digital agricultural database, will help create essential material and technical conditions for people to access and use digital services conveniently. At the same time, it is necessary to focus on building and developing human resources for digital transformation at the grassroots level, not only at the government level but also in cooperatives, local businesses and communities. This is the force that plays a leading role in supporting and spreading effective digital models in the community. Finally, perfecting institutions and policies to support digital transformation is a condition to ensure that transformation activities take place consistently and in a directional manner, while encouraging widespread and long-term participation of people, businesses and local authorities.

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