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DIGITAL TRANSFORMATION IN THE MANAGEMENT OF STATE AGENCIES AT ALL LEVELS IN THE NORTH MOUNTAIZE AREA: THE SITUATION AND PROPOSED SOLUTIONS

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ABSTRACT

The implementation of digital transformation is based on a system of socio-economic indicators to serve the management and management decision-making of leaders at all levels in state agencies in Vietnam. In the northern mountainous provinces, although technology has begun in departments, it is necessary to connect them and to help automate management and administration transparently. The article analyzes the current state of management of state agencies at all levels in this region through survey surveys and statistical analysis on factors: the age of managers, information technology infrastructure, and practical application information management at all levels. Research results have shown the opportunity to realize digital transformation by building an intelligent information system management software using large data sets, which is suitable and responsive to the current situation and progressing to the plan to build e-government in these localities.

Keywords:

socioeconomic indicators, digital transformation, management of state agencies, northern mountainous region, Vietnam.

1. Introduction

Leadership and management activities at all levels of government depend largely on the process of collecting, synthesizing, processing, and analyzing information. This process is iterative because of the constant change of database and information over time. Decisions made by leaders and managers at all levels are considered correct only when they accurately reflect the objective situation, the laws of society's movement, reality, and the common interests of society. Timely and accurate statistical and aggregated information will help leaders and managers set guidelines and decisions with the focus and practical conditions, thereby improving quality and job performance.

The Northern Midlands and Mountains region includes 14 provinces of Ha Giang, Cao Bang, Lao Cai, Bac Kan, Lang Son, Tuyen Quang, Yen Bai, Thai Nguyen, Phu Tho, Bac Giang, Lai Chau, Dien Bien, Son La, and Hoa Binh. The total area of the whole region is about 116,898km2, accounting for 35% of the regional nature of the country, and many precious and rare natural resources and minerals; There are more than 30 ethnic groups living in the region, with a population of 14.7 million people, accounting for about 15.2% of the country's population. This is a particularly important strategic area in terms of politics, economy, culture, society, national defense, security, and foreign affairs; the western and northern gateway of the country.

Approaching the digital transformation, and building e-government, the Northern mountainous region began to implement scientific solutions to promote the application of Information Technology to improve management efficiency and decision-making management decisions in State agencies at all levels through the systematic management of socio-economic indicators. Digital transformation in management also aims to save time and costs, ensuring consistency and long-term use. At the same time, it also moves towards an open orientation for people, businesses, and other organizations to appropriately participate in the activities of state agencies, and interact with state agencies to enhance transparency, improve service quality, solve problems, and create value for society.

The article researches to assess the management status management and management decision-making of leaders at commune, district, and provincial levels in the Northern mountainous region. From there, some recommendations propose to make the management and use of socio-economic information more effective at all levels through digital transformation and the use of large data sets of the provinces.

2. Research overview

2.1. Socio-economic indicators and state management at all levels

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According to Force and Machlis (1997), socio-economic indicators are defined measures of economic and social aspects collected over time and from available data sources. Such that data is used for management and decision-making. In terms of social, social indicators are used to measure social welfare; life quality; community and population health; and sustainability. Thereby, the proposed policies are the implementation of programs and projects, supporting the planning process, and allocating resources more effectively (Cobb, C. & C.Rixford, 1998).

Socio-economic indicator research is alerted policymakers to the existence and causes of problems for resolution. Feedback obtained from socio-economic indicators can assist communities and policymakers in assessing the value of current social strategies and inform effective plans and actions for the future (Cobb, C. & C. Rixford, 1998). They can also help uncover strengths and weaknesses in social infrastructure development and introduce changes to existing initiatives and programs. Socio-economic indicators are valuable for identifying and predicting trends and setting goals for organizations, agencies, and programs Edmonton LIFE (2002).

Research by Papalardo et al (2015) on the application of big data in the correlation of resource mobility models and socio-economic indicators. Three open directions can developed from the results of this study. First, because data from mobile phones can provide information about social interactions, managers can extract indicators that reflect individuals' social behavior. Secondly, it is necessary to propose a suitable forecasting model to reflect the correlation between aggregate mobility indicators, and socio-economic indicators. Third, there is a need to study the correlation between human mobility patterns and socio-economic development indicators from a multidimensional perspective. These indicators allow us to filter research based on the correlation between the mobility indicators extracted from big data and the level of socio-economic development of each country or territory.

2.2. Digital transformation in the management of state agencies

Many views on digital transformation have been raiseing in the process of implementing digital transformation across the field. Digital transformation includes changes associated with the application of digital technologies in all aspects of human society (Stoterman et al., 2004).

According to Hinings et al. (2018), digital transformation is the synthesis of several digital innovations that bring about new effects (and related impacts) that make the system structural, practical, functional, practices, values, and beliefs that change, threaten, replace, or supplement existing rules in organizations, industries or sectors.

Digital transformation refers to the changes arising from digital technology (Hess et al., 2016), including the ability to understand the problems that it can carry out the organization's activities in the face of changes problems in technology.

The Department of Informatization - Ministry of Information and Communications (2022) sets out the orientation for digital transformation in state agencies as follows: Digital transformation of state agencies is an activity to develop digital government. It is the development of digital government and smart cities by local government agencies at all levels. Challenges in digital transformation at the local level include planning the local network (building networks and infrastructure), ensuring equality in digital technology access, and developing the digital technology administration.

Decree No. 20/2016/ND-CP dated March 30, 2016, of the Government promulgating the construction of the national database in 2016 clearly states. "The national database is one of the natural resources of the land. The country must to build and enrich, which is the foundation for sustainable e-Government development. The national database is an important information technology infrastructure in providing information to serve the direction of government regulation. Serving the state management of industries and fields in the direction of transparency and increasing labor productivity; Promoting administrative reform and enhancing national competitiveness are fundamental factors."

The management activity of the local government is to comprehensively manage all aspects of activities in each territory in the country. The state management process includes information systems serving local management needs. This system must ensure the unity and centralization of the State from the central to local levels. At the same time, this system has to be combined, bringing into play the dynamism, creativity, autonomy, and traditions of each locality within the framework of state laws.

3. Research Methods

The study uses descriptive statistics combined with cross-sectional analysis in time and space. The primary data used in this study were collected from the interview survey by 03 sets of questionnaires with each group of subjects including representatives of leaders at the provincial, district, and commune levels in the Northern mountainous area from October to December 2021.

4. Results and discussion

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4.1 Some general characteristics of the survey subjects

The research team surveyed 646 managers at the level provincial in the northern mountain area. The contents include collection, use, and management information for administrative management at all levels.

The results show that the majority of managers are between the ages of 31 and 50 (accounting for 68.9%), and the number of leaders under 30 and over 51 years old accounts for only about 31.1%. Accordingly, the number of years of working experience of the officials in the province is highish (most over 10 years experience), do to handle job duties and changes well. In terms of educational attainment, the survey results show that 100% of managers in the Northern mountainous region have university degrees, meeting the job standards of managers. However, the reality shows that the number of cadres with postgraduate qualifications (master's and doctorate) accounts for a very few proportions, so the government needs to invest and create conditions to improve their levels.

The results show that ages, experiences, and educational leaders at provincial, district, and commune levels are suitable for accessing and using information technology. It is one of the advantage points for successful digital transformation in the province's management.

4.2 Current situation of information technology infrastructure at all levels in the Northern mountainous provinces
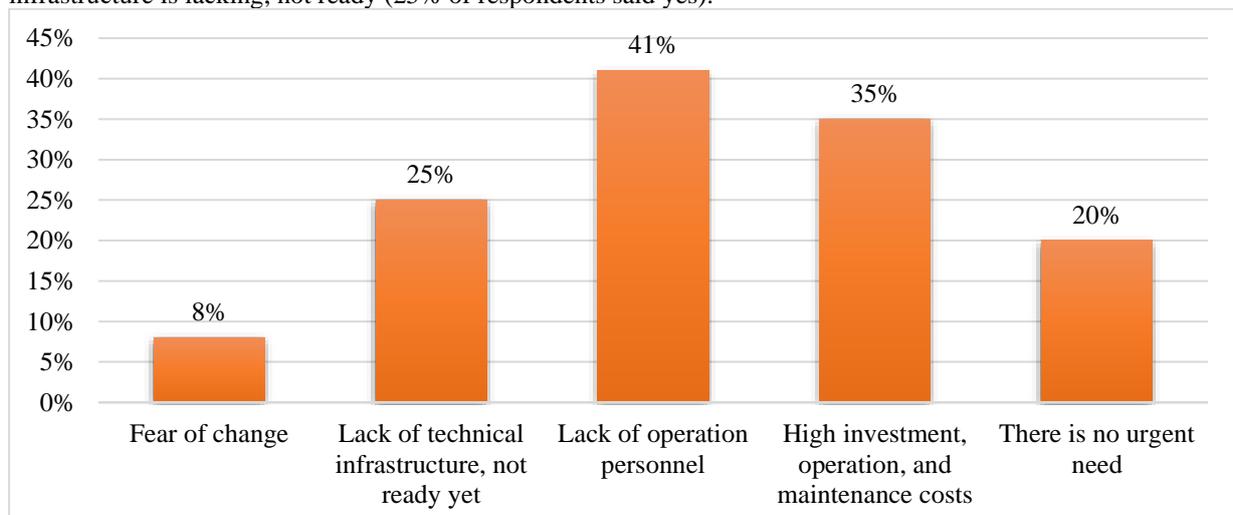
The reality of IT application infrastructure at all levels shows that the number of servers, laptops, desktops, printers, scanners, and fax machines is not much. Most communes do not have servers and fax machines. Desktop computers are arranged for many staff to serve the management.

Most of the authorities have used the Internet with stable connection and used quite often by officials. The purpose of using the Internet for officials is mostly to search, collect information, and manage work. However, the number of officials using email is not regular, with little management, planning, data analysis, and modeling. In addition, the security of the information has not been attended to.

Survey results of staff satisfaction with the application of information technology tools and software in management activities show that the majority of officials only rate it at 3/5, saying that the application Using information technology to collect and synthesize data, there is little analysis, forecasting, and evaluation of socio-economic indicators at the commune level.

In addition, depending on each functional unit, the provision, collection, and processing of information is also implemented through specific software such as public service management software, personnel management software, and work email (.gov domain).

When surveyed about the difficulties in applying IT in collecting, analyzing, monitoring, and forecasting socio-economic indicators, the majority of leaders and managers surveyed answered the reason that they have not or not using a lot of management software is a lack of operation personnel (41% of the surveyed respondents agreed), investment, operation, and maintenance costs are high (35% of respondents said yes), the technical infrastructure is lacking, not ready (25% of respondents said yes).

Figure 1 . The reason why the unit has not used or used a lot of management software?
(percentage of officers surveyed agree)
Source: Research team synthesizing survey results, 2021

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Data inconsistency occurs when the same data is stored in multiple databases and multiple attributes of the same data have different values. Analysis of the survey results shows that inconsistent data occurs in 82% of departments at the Provincial People's Committee and departments of departments. The proportion of cases with conflicting data that occurred was 18%. When in-depth interviews of the investigated subjects, there is no data inconsistency due to the synchronization levels on all systems. Howerer, there are still some units where data conflicts sometimes occur. It is because the synchronization process does not perform data synchronization.

The application of IT in collecting, analyzing, monitoring, and forecasting socio-economic indicators is quite interesting by leaders and managers (45%) and very interesting (25%) (Figure 2).
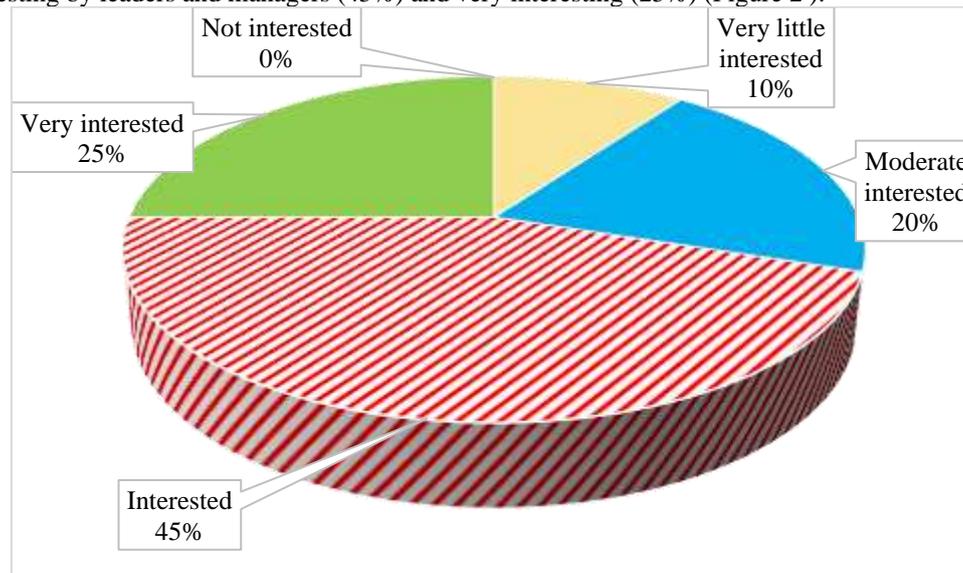

Figure 2 . The level of interest of leaders in applying IT in collecting, analyzing, monitoring and forecasting socio-economic indicators

Source: Research team synthesizing survey results, 2021

Up to now, the digital social infrastructure in the province has had 100% of communes have fiber optic cables to the center; the number of transceiver stations (BTS) reached 2,418 stations (783 2G stations, 932 3G stations, 703 4G stations); the percentage of communes, wards and townships with broadband Internet access to the commune centers and densely populated areas reaches 100%; mobile phone coverage rate reached 98.6%; smartphone rate reached about 58.2%. People have actively participated in the services of the digital society, gradually forming a digital culture.

4.3 Practical application, provision and management of information at all levels in the northern mountainous provinces

Most managers at all levels use websites, mobile applications, rest APIs, and Message Queues. But the part that picks up data from the processed streams into the database and server is less exploited and used.

The application of digital signatures in sending and receiving electronic documents is strongly directed by the government, creating a clear change.

Functions such as tracking socio-economic development indicators of departments, branches, districts, and communes when assessing socio-economic indicators and managing information by each field are specific. Some district administrative use insurance declaration software, the Justice Department uses DTSoft asset management software; Departments and branches of Labor - Invalids - Social Affairs use software to manage data of poor households, data of children, social insurance participants, and people with meritorious services; Departments and branches of Agriculture and Rural Development are currently using more information technology application software to build their database; The Department of Statistics uses software for livestock production, cultivation, electronic questionnaires, etc.

The survey results also received positive feedback from the leadership team about this document management system. The system not only supports leaders to operate and manage work, transparently, at all times but also helps them to fully grasp information, thereby making accurate decisions. However, some leaders and civil servants have not yet fully exploited the benefits of the software, so the effectiveness of document implementation at all levels is still not high.

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Through the survey, it was found that some difficulties when applying information technology in collecting, analyzing, and monitoring socio-economic indicators and management activities of officials include: High performance, lack of technical infrastructure, and low level of technical response (Figure 3).
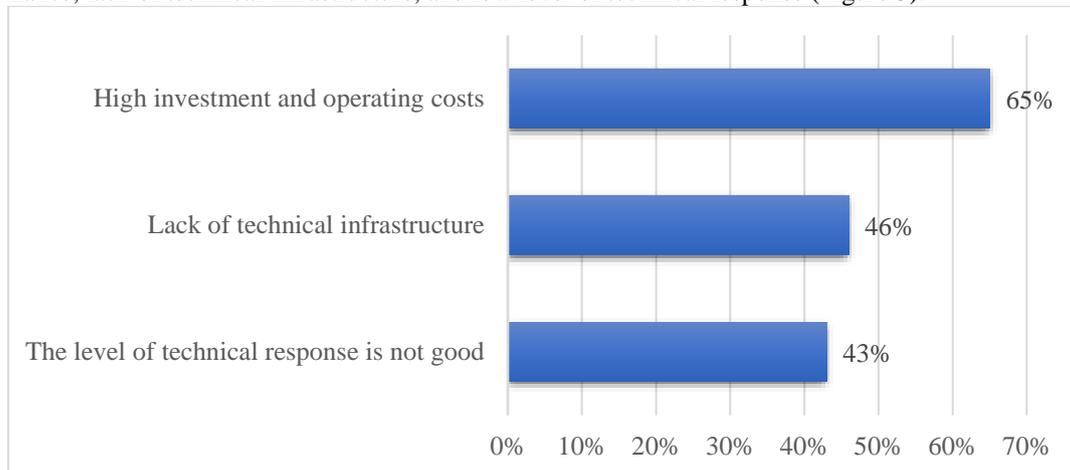

Figure 3. Percentage of officials who assessed difficulties when applying information technology
Source: Research team synthesizing survey results, 2021

In particular, there is still an inconsistency in data between different departments, departments or units; The level of interest of leaders and managers at all levels in the application of IT in their work is only at an average level, they do not know how to extract reports according to the used software.

4.4 The importance of the system of socio - economic indicators at all levels

To confirm the importance of socio-economic indicators at all levels in assessing the socio-economic development of the Northern mountainous provinces, the research team used a questionnaire with a Likert 5 scale to evaluate the importance of socio-economic indicators (1 – Not important, 2 – Very little important, 3 – Moderate important, 4 – Important, 5 – Very important).

The evaluation results of managers on the importance of the system of socio-economic indicators are shown in the following data table:

Table 1. Importance of the system of socio-economic indicators

TT	Socio-economic targets	Average importance (Mean)	Meaning
first	Number of establishments, employees in economic and non-business establishments	3.0	Less important
2	Number of establishments and employees in administrative establishments	3.0	Less important
3	Area planted with annual crops	4.0	Important
4	Area of perennial plants	4.5	Important
5	Yield of some major crops	5.0	Very important
6	Production of some major crops	5.0	Very important
7	Number of livestock, poultry and other livestock	5.0	Very important

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8	Quantity and output of main livestock products	3.5	Important
9	Newly concentrated planted forest area	3.0	Less important
ten	Aquaculture area	2.0	Less important

Source: Survey results of the research team, 2021

The results showed that, in the socio-economic indicators given for the survey, leaders at all levels assessed: Yield of some major crops, Productivity of some major crops, Output of some major crops, Number of livestock, poultry and other livestock which has the most important position. Indicators related to Number of establishments, employees in economic and non-business establishments, Number of establishments and employees in administrative establishments, Newly concentrated planted forest area, Aquaculture area which are assessed as less important in economic development - provincial society.

If we compare the evaluations of leaders at all levels, we can see a fairly large similarity. Besides, there are also some differences due to the specific advantages of each commune in the study area.

5. Recommendations and suggestions

In general, the sources and channels for providing information for the leadership and decision-making of managers are quite complete, detailed and have the application of information management software. However, the information is still quite fragmented and has not been built into a management information system to support decision making in a timely and effective manner.

Officials in charge of internal affairs, finance, culture, society, education, health, budget revenue, expenditure, and economy (agriculture, forestry) have not exploited their effectiveness to the results of existing software for routine work.

It is necessary to build an effective information management system with resources including people, hardware, software, data sources, and operational processes, communication procedures between people and machines. It is necessary to design a database including input and output information, functions, interfaces of the management system, and various types of monthly, quarterly, and yearly reports to include in the software. The new system helps the management to be fast, timely, and effective. The new system also is capable of collecting information on socio-economic indicators at each commune, district, department, sector, and province level through Web applications, Mobile Apps. The indexes will be updated immediately on the server to monitor the socio-economic indicators of the province, relevant departments, and agencies. The parallel data processing modules receive and analyze, then update to the monitoring and warning modules. In particular, the system supports multi-level users for leaders, analysts at all levels, and the province down to the district and commune. Depending on different locations, users have the right to access and exploit information in the system and receive automatic email notifications from the system. The system uses open-source software and tools, minimizing costs in purchasing software licenses such as databases, web servers, and data streaming systems. At the same time, the system supports data analysis and multi-dimensional indicators, thereby helping leaders make timely and quick decisions, which are very practical and effective in management. , administration, and decision-making of provincial leaders.

This collection and analysis system needs to provide the exact information in time, to the right users and give early warnings about potential problems and fluctuations that may occur soon.

Thus, building an intelligent information management system to help analyze, forecast, and monitor the implementation of the socio-economic goals of the Northern mountainous region is an urgent task. This system serves the management and administration of socio-economic activities in the province. Indicators reflecting the socio-economic situation must also ensure simplicity to a certain extent, accessibility, and compatibility with existing technologies. The system is scientifically meaningful and informative, reflecting the socio-economic status, and will be an effective tool for decision-making on management for leaders of the northern mountainous provinces.

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