RESEARCH ON DIGITAL TRANSFORMATION IN THE TOURISM SECTOR OF VINH PHUC PROVINCE, VIETNAM

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ABSTRACT

This study examines the status of digital transformation in the tourism sector of Vinh Phuc province, Vietnam. Primary data was collected directly and randomly from research subjects using questionnaires. Respondents include 32 tourism businesses in Vinh Phuc province, 120 residents and 05 officials of the Department of Culture, Sports and Tourism. The criteria for assessing digital transformation were developed based on the Enterprise Digital Transformation Index of the Ministry of Information and Communications, along with consultation of experts and reference documents on related aspects. Research has shown that Vinh Phuc province has promoted the application of digital technology in management, operation and construction of tourism ecosystem, digital transformation in enterprises and tourism development, etc. However, besides the achievements in digital transformation in the tourism sector of Vinh Phuc province, there are still some limitations such as the application of technology and construction of digital platforms, and the operational management index is still not high.

Keywords: Digital transformation, digital transformation in the tourism sector, tourism, Vinh Phuc province, Enterprise Digital Transformation Index.

1. INTRODUCTION

Blessed with beautiful landscapes and a long-standing cultural and historical value system, Vinh Phuc has become an attractive tourist destination for domestic and foreign tourists. Solutions such as accelerating digital transformation, building smart tourism products associated with environmental protection; strengthening linkages and cooperation, promoting infrastructure investment and preferential policies have created favorable conditions for the province's tourism industry to develop rapidly, comprehensively, and commensurate with its advantages.

Digital transformation in the tourism sector in Vinh Phuc province has become more necessary than ever in the context of the 4.0 industrial revolution changing the way economic sectors operate. Tourism, with its characteristic of being a service industry that requires high interaction between parties, cannot be outside this trend. Digital transformation helps tourist destinations in Vinh Phuc become more accessible to visitors through online platforms, while improving the visitor experience with digital services, from searching for information, booking tickets, to exploring attractions through virtual reality technology.

In addition, the application of digital technology solutions in tourism management and promotion also helps Vinh Phuc province improve the effectiveness of state management, optimize resources and build a centralized data system. This not only supports the management, monitoring and

analysis of tourism situations, but also helps effectively promote the province's tourism image to domestic and foreign tourists. After the COVID-19 pandemic, the demand for smart and safe tourism services has increased, which further highlights the importance of digital transformation. In the future, promoting digital transformation will help Vinh Phuc sustainably develop the tourism industry, enhance competitiveness with other localities and promote economic growth. Digital transformation not only brings short-term benefits such as attracting more tourists or increasing revenue, but also contributes to building a sustainable tourism ecosystem, closely connecting businesses and state management agencies, thereby creating long-term value for the entire economy of Vinh Phuc province.

2. LITERATURE REVIEW
2.1 Digital transformation
Digital transformation is a concept that emerged during the Internet boom and has become increasingly popular in recent times. This concept describes the process of applying digital technology to all aspects of a business, thereby completely changing the way it operates, enhancing collaboration efficiency, improving labor productivity, and creating new value for customers.

According to Brynjolfsson (2011), digital transformation is the integration of digital technologies into all areas of the enterprise, aiming to fundamentally change the way of operation, business model, and bring new values to customers. In this process, technology is considered the foundation leading to the transformation of thinking, perception, and institutions, thereby changing the business model and ultimately creating breakthrough values, bringing benefits to people.

According to Reis et al. (2018), different definitions of digital transformation can be classified into three distinct elements, including (1) Technological - digital transformation is based on the use of new digital technologies such as social media, mobile devices, analytics or embedded devices; (2) Organizational - digital transformation changes organizational processes or creates new business models and (3) Social - digital transformation is a phenomenon that affects all aspects of human life. It can be seen that the different ways in which digital technology is applied are evident in economic benefits, productivity improvements and brand enhancement, connecting customers more closely with the company (Kohli & Grover, 2008).

Hinings B. et al. (2018) argue that digital transformation is the combination of the effects of several digital innovations that bring about novel actions, structures, values, and beliefs that can change, threaten, replace, or supplement existing rules in organizations, ecosystems, and industries. However, the combination of digital innovations is a complex issue.

Nguyen Thi Thu Van (2021) believes that the nature of digital transformation is a comprehensive and overall transformation process in the way of working, managing, and organizing activities based on digital technology.
According to Vo Huu Hoa (2021), digital transformation is the process of changing old models, traditional models into digital enterprises, based on new technology applications, such as Big data, IoT, cloud computing... to change the way of operating, business operations, customer care management, work processes and labor culture in enterprises.

2.2 Criteria for assessing the level of digital transformation
Many studies have mentioned this issue and currently there is no consensus in building a set of criteria to assess the level of digital transformation of sectors and enterprises. In fact, it is difficult to have a consensus because each type of enterprise, business type, and enterprise scale is different, so the criteria are difficult to cover everything, not to mention the level of continuous updating of information and data in the industrial revolution is very fast as today. Through the Enterprise Digital Transformation Index by the Ministry of Information and Communications, along with consultation with experts and reference documents on related aspects, the research team and the author have built a set of reference criteria for the survey project of tourism businesses in Vinh Phuc with 6 groups of criteria. The criteria are divided into measurement criteria clusters with internal criteria, measured by a 5-level Likert scale and the convention is from not implemented to well implemented (Assessment levels: 1: not implemented; 2: weak; 3: average, 4: fair, 5: good). Specifically as follows:

1. Digital experience for customers, including Customer Insight Index from the Outside; Customer experience management index; and Customer insight index.

2. Digital Strategy Pillar, including Marketing and Brand Management Index; Ecosystem Management Index; Financial Sponsorship Index; Market Intelligence Index; Portfolio Management Index; Strategic Management Index.

3. Infrastructure and Digital Technology Pillar, including Technology Governance Index; Technology Architecture and Application Index; Safety and Security Index; Application and Platform Index; Connectivity and Computing Index.

4. Operational Activities, including Operational Management Index; Service Design and Innovation Index; Service Deployment/Transformation Index; and Service Operation Index.

5. Pillar of Corporate Culture Digital Transformation, including Enterprise Value Index; Talent Management Index; Workplace Support Index.

6. Pillar of Data and information assets, including Data Governance Index; Data Engineering Index; Data Value Realization Index.

3. METHODOLOGY
To clarify the current status of digital transformation in the tourism sector of Vinh Phuc province, this study uses secondary and primary data. Secondary data is exploited from articles and research works of domestic and foreign authors related to the topic. Primary data is collected directly and randomly by questionaire from 32 tourism businesses , 120 people in Vinh Phuc province, and 05 officials of the Department of Culture, Sports and Tourism. The study uses a non-probability (convenient) sampling method.

Data were encoded and processed on SPSS 22.0 software, applying statistical analysis methods to calculate, compare and evaluate necessary indicators.4. RESULTS

4.1. Current status of tourism industry development in Vinh Phuc province
Tourism development is considered a correct decision with strategic vision of Vinh Phuc province. In each period, this province builds a master plan for tourism development with specific goals, clusters, routes, destinations and typical tourism products.

In the current period, the tourism industry of Vinh Phuc province is oriented to develop in 3 main types, including resort and ecological tourism; cultural, historical, scenic, and craft village tourism;

conference and seminar tourism to maximize and exploit effectively the available advantages and potentials in the locality.

Table 1: Development situation of tourism sector in Vinh Phuc province in the period 2019 - 2022

No	Criteria	Unit	2019	2020	2021	2022
1	**Tourism service revenue, including:**	**Bil VND**	**4.231**	**3.623,2**	**3.948**	**5.075,1**
1.1	Accommodation and food services, specifically:	Bil VND	4.127,2	3.543,5	3.903,3	4.897,2
	- Accommodation services	Bil VND	358,7	290,3	554,1	872,1
	- Food services	Bil VND	3.768,5	3.253,2	3.349,3	4.025,1
1.2	Travelling	Bil VND	103,8	79,7	44,7	177,9
2	**Number of tourists**	**Number of people**	**6.100.000**	**4.700.00**	**2.035.300**	**8.229.646**
2.1	International	Number of people	43.500	26.500	23.750	73.500
2.2	Domestic	Number of people	6.056.500	4.673.500	2.011.550	8.156.146

Source: Vinh Phuc Provincial Statistics Office (2023)

Table 1 shows that:

Total revenue: Total revenue from tourism services tends to increase gradually over the years, from 4,231 billion VND in 2019, although it decreased in 2020 (3,623.2 billion VND), it has recovered and increased sharply to 5,075.1 billion VND in 2022.

Number of tourist arrivals: The number of tourist arrivals dropped sharply from 6,100,000 in 2019 to 4,700,000 in 2020 and only 2,035,300 in 2021. This reflects the severe impact of the COVID-19 pandemic and the social distancing measures, travel restrictions and closure of tourist attractions. The tourism industry has had an impressive recovery, with the number of tourists increasing sharply again, reaching 8,229,646 in 2022. The number of international tourists also tends to recover from 26,500 in 2020 to 73,500 in 2022. Thus, domestic tourists still account for a large proportion and are the main driving force for the growth of the tourism industry in Vinh Phuc province.

4.2. The current situation of digital transformation in the tourism sector of Vinh Phuc province

In the context of the strong development of the Fourth Industrial Revolution, Vinh Phuc tourism is gradually implementing digital transformation to improve the quality of tourism products and services, meeting the increasing needs of tourists. This trend is inevitable to enhance competitiveness and develop a high-quality, sustainable tourism industry. Implementing the strategy of developing tourism in a professional, high-quality, and effective direction, in recent times, Vinh Phuc tourism industry has been promoting the application of digital technology in management, operation, and building a tourism ecosystem. That contributes to promoting the image, enhancing the experience for tourists, and supporting effective connections between State management agencies on tourism, businesses, tourists, and related entities, towards a model of smart tourism, digital tourism, with high applicability and efficiency.

In 2023, Vinh Phuc Tourism Industry has built and put into operation the Smart Tourism Portal and Smart Tourism App on IOS and Android platforms. This is considered a new development

step for Vinh Phuc Tourism Industry in the digital transformation process. At the end of April 2023, Vinh Phuc Smart Tourism Portal officially operated on the most advanced technology platform of the 4.0 revolution such as Artificial Intelligence, VR 360 virtual reality tours... Digital content is integrated on the website https://visitvinhphuc.com and Vinh Phuc Smart Tourism App to help visitors easily access diverse, complete and accurate information sources related to destinations, scenic spots, typical craft villages, accommodations, restaurants, shopping places and other utilities when coming to Vinh Phuc. The digital data system of 60 tourist destinations in the province is unified and linked together to support visitors in finding their desired destinations in Vinh Phuc conveniently and easily. Since the implementation of the Vinh Phuc Smart Tourism Portal and Smart Tourism App, the Vinh Phuc Smart Tourism App has had nearly 500,000 visits, more than 15,000 people have downloaded and used the app. Thanks to that, the number of tourists coming to Vinh Phuc in 2023 reached more than 9.2 million, an increase of 13% compared to 2022 and exceeding the annual plan by 2%. Of which, international visitors reached more than 81,000. Total tourism revenue is estimated at more than 3,600 billion VND.

4.3. Survey results on digital transformation in tourism sectors in Vinh Phuc province

4.3.1 Survey results of tourism businesses on the digital transformation in the tourism sector in Vinh Phuc province

* Digital Experience for Customer

Table 2. Survey Results on Digital Experience for Customer

No	Criteria	N	Minimum	Maximum	Mean
1	Customer Insight Index from the Outside	32	3	5	3,94
2	Customer experience management index	32	3	5	3,93
3	Customer Insight Index from the Outside	32	3	5	3,83
4	Customer Confidence Index	32	3	5	4,04

Source: Survey results (2024)

Table 2 shows that the criteria reflecting the digital experience for customers are all at a fair level, in which the Customer Confidence Index is the highest, reaching the highest level of 4.04 points, while the Customer Insight Index has the lowest score of 3.83. The Customer Experience Management Index and Customer Insight Index from Outside have scores of 3.93 and 3.94, respectively.

*Digital Strategy

Table 3. Survey Results on Pillar of Digital Strategy

No	Criteria	N	Minimum	Maximum	Mean
1	Marketing and Brand Management Index	32	3	5	3,92
2	Ecosystem Management Index	32	3	5	3,86
3	Financial Sponsorship Index	32	3	5	4,19
4	Market Intelligence Index	32	3	5	3,91
5	Portfolio Management Index	32	3	5	3,89
6	Strategic Management Index	32	3	5	4,02

Source: Survey results (2024)

Table 3 shows that: Vinh Phuc tourism enterprises need to improve ecosystem management (3.86 points) and investment portfolio (3.89 points) to improve service quality. Market research (3.91 points) and marketing and brand management (3.92 points) have achieved quite good results, while strategic management (4.02 points) and financial sponsorship (4.19 points) are strengths that need to be maintained and promoted.

*The Infrastructure and Digital Pillar
Table 4. Survey Results on The Infrastructure and Digital Pillar

No	Criteria	N	Minimum	Maximum
1	Technology Governance Index	32	3	5
2	Technology Architecture and Applications Index	32	3	5
3	Safety and Security Index	32	3	5
4	Applications and Platforms Index	32	3	5
5	Connectivity and Computing Index	32	3	5

Source: Survey results (2024)

Table 4 shows that: The Technology Management Index (4.04) and Connectivity, Computing (4.0) of Vinh Phuc tourism businesses show the ability to manage and deploy modern technology and strong connection infrastructure. The Technology Architecture and Application Index (3.99) reflects a good technology system but still needs improvement. Safety and Security (3.96) scored high, ensuring customer data protection. However, Applications and Platforms (3.88) are the weakest points which needing to continue improvement to enhance user experience.

Overall, tourism businesses in Vinh Phuc have a good technology foundation with strong technology management and connectivity. However, to maintain and enhance competitive position, it is necessary to focus on improving applications and platforms, simultaneously continuing to ensure information safety and security.
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* Operations

Table 5. Survey Results on Operations

No	Criteria	N	Minimum	Maximum	Mean
1	Operations Management Index	32	32	3	3,95
2	Service Design and Innovation Index	32	32	3	4,03
3	Service Implementation/Transformation Index	32	32	3	4,02
4	Service Operations Index	32	32	3	4,03

Source: Survey results (2024)

Table 5 shows that: Tourism businesses in Vinh Phuc scored high in service design and operation (4.03), demonstrating the ability to innovate and maintain stable service quality. The service implementation and transformation index reached 4.02 points, showing the ability to implement new projects effectively and reflecting flexibility and efficiency in business activities. Operational management reached 3.95 points, although the lowest but still quite high. Thus, it is necessary to pay attention to further improvements in operational management to increase overall efficiency and achieve sustainable development in the tourism sector. Investing and optimizing operational capacity will help businesses improve customer experience and increase competitiveness.
        * Pillar of Organizational Culture Digital Transformation
Table 6. Survey Results on Pillar of Organizational Culture Digital Transformation

No	Criteria	N	Minimum	Maximum	Mean
1	Organizational Value Index	32	3	5	4,11
2	Talent Management Index	32	3	5	4,14
3	Workplace Support Index	32	3	5	4,10

Source: Survey results (2024)

Table 6 shows that tourism enterprises in Vinh Phuc have been doing well in talent management, building organizational values, and improving working conditions. These efforts help improve the quality of the staff and create a positive and effective working environment. This will help them improve their competitiveness, attract and retain talent, and increase service quality, meet the increasing needs of tourists, thereby promoting the comprehensive development of the tourism industry in Vinh Phuc province.

* Pillar of Data and information assets

Table 7. Survey Results on Data and information assets

No	Criteria	N	Minimum	Maximum	Mean	Std. Deviation
1	Data Governance Index	32	3	5	3,96	
2	Data Engineering Index	32	3	5	4,04	
3	Data Value Realization Index	32	3	5	4,01	

Source: Survey results (2024)

Table 7 shows that the criteria reflecting the Data Pillar and information assets are all at a fair level. Tourism businesses in Vinh Phuc are demonstrating good technical capacity and realizing value from data. This shows that they have invested and deployed modern data technologies effectively, contributing to improving business performance and service quality. However, data management needs to be improved to ensure safety and overall efficiency. Investing in and improving data management capacity will help businesses optimize data usage, secure customer information and comply with legal regulations. This helps increase customer trust and enhance the competitiveness of tourism businesses in Vinh Phuc in the market.

4.3.2. Citizen survey results

Table 8. Survey Results on Digital transformation of tourism organizations in Vinh Phuc province

Criteria	N	Minimum	Maximum	Mean
1. Using information technology in advertising and marketing	120	2	5	4,13
2. Developing online platforms for culture and entertainment	120	2	5	4,09
3. Using technology in event organization and management	120	2	5	4,16
4. Utilities and mobile applications in tourism	120	3	5	4,17
5. Technology in sports experiences	120	2	5	4,21
6. Developing online platforms for cultural heritage	120	2	5	4,20
7. Managing customer data and interactions	120	3	5	4,16
8. Integrating online and offline experiences	120	2	5	4,16
9. Using artificial intelligence and data analysis	120	2	5	4,07
10. Customer feedback and reviews	120	2	5	4,13
Valid N (listwise)	120			

Source: Survey results (2024)

Table 8 shows that: Technology in sports experience reached 4.21 points, showing people's preference for applying technology in sports. Health monitoring applications, event information, and virtual reality experiences have increased interaction. Online platforms for cultural heritage

and tourism applications are also highly appreciated with 4.20 and 4.17 points, showing that digital transformation has supported cultural preservation and improved tourism experiences. However, the index of artificial intelligence and data analysis in tourism reached 4.07 points, that is the lowest. This shows that although people are quite satisfied, there is still room for technological improvement to enhance the tourism experience.

4.3.3 Management official survey results

4.3.3.1 Assessment of the current status of digital transformation of units and organizations in the tourism sector

Table 9. Survey results of managers on digital transformation of tourism organizations in Vinh Phuc province

Criteria	N	Minimum	Maximum	Mean
1. Awareness of the leadership and management team of units and organizations about digital transformation	5	4	4	4,00
2. The level of proficiency in many software, the ability to explore and learn about technology of the staff	5	3	5	3,60
3. Information security issues of units and organizations	5	3	4	3,20
4. Activities of providing digital experiences	5	3	4	3,60
5. Activities of planning digital transformation strategies	5	3	4	3,60
6. Planning and investing in technology infrastructure for digital transformation of units and organizations	5	2	4	3,40
7. Digitizing business processes of units and organizations	5	2	4	3,00
8. Digital transformation culture in organizations	5	2	4	3,20
9. Data management activities in organizations	5	3	4	3,40
10. The suitability of the Provincial mechanism and policies on digital transformation with the actual situation of digital transformation in the province	5	3	4	3,80
11. The timeliness of the Provincial mechanism and policies on digital transformation in Vinh Phuc province	5	3	4	3,60
12. The feasibility of the Provincial mechanism and policies on digital transformation in Vinh Phuc province	5	3	4	3,80

Source: Survey results (2024)

Table 9 shows that the awareness of leaders and managers about digital transformation in Vinh Phuc reached 4.00 points, showing that the importance of digital transformation has been understood. Employees have a technology proficiency level of 3.60 points, so more training is needed. However, information security issues only reached 3.20 points, requiring much more attention to security. Digital experience and digital transformation strategy development reached 3.60 points, but still need improvement. Technology infrastructure has been invested but only reached 3.40 points, requiring further support. Digitalization of processes and digital transformation culture are still limited, reaching 3.00 and 3.20 points, respectively. Data management is at 3.40 points, requiring system improvement. The province's policies on digital transformation are highly appreciated for their suitability and feasibility, reaching 3.80 points,

respectively, but still need to improve the timeliness currently at 3.60 points.

4.3.3.2 Assessment of the current status of digital transformation of state management agencies in the tourism sector

Table 10. Survey results of managers on digital transformation of tourism state management agencies in Vinh Phuc province

Criteria	N	Minimum	Maximum	Mean
1. Transforming Perceptions	5	4	4	4,00
2. Digital Institutions	5	3	4	3,80
3. Digital Infrastructure	5	3	4	3,86
4. Digital Information and Data	5	3	4	3,87
5. Digital Human Resources	5	3	4	3,85
6. Cybersecurity	5	3	5	3,74
7. Digital Government Activities	5	3	4	3,94
8. Digital Social Activities	5	3	5	3,75

Source: Survey results (2024)

Table 10 shows that Awareness of Digital Transformation reached 4.00 points, showing that managers have clearly understood the importance of Digital Transformation. Digital institutions and infrastructure reached 3.80 and 3.86 points, respectively, but still need to be improved to be more suitable and effective. Digital information and data are well managed (3.87), but need to increase security. Digital human resources reached 3.85 points, needing more training. Social activities and network information security scored low (3.75 and 3.74), needing to be expanded and focused on more. Digital government activities reached 3.94 points, have made progress but still need to improve efficiency.

5. CONCLUSIONS

Digital transformation is an inevitable trend in the era of the 4.0 industrial revolution. Evaluating the results of the digital transformation process in the tourism sector in Vinh Phuc province has shown important changes from awareness to action of businesses and state management agencies. At the same time, the research results also reflect the barriers and difficulties that businesses are facing in this process. These issues require investment and changes from management agencies, specialized units and businesses in the tourism sector, thereby promoting the digital transformation process, to create a new trend in the management and operation of the tourism sector of Vinh Phuc province in the current digital age.

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