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DIGITAL TRANSFORMATION OF SMALL AND MEDIUM ENTERPRISES IN RURAL TOURISM: A SYSTEMATIC BIBLIOMETRIC REVIEW

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ABSTRACT

Digital transformation has become a strategic driver of competitiveness, innovation, and sustainability in rural tourism, particularly for small and medium enterprises (SMEs) that constitute the backbone of this sector. Although growing academic attention has focused on the role of digitalization in rural tourism, a comprehensive and structured understanding of existing research remains limited. This study conducts a bibliometric analysis of 44 scientific articles retrieved from established academic databases, with the aim of examining the development, key themes, and intellectual structure of research on digital transformation in rural tourism SMEs. The analysis identifies dominant research streams, influential authors, institutions, and collaboration networks, as well as key thematic clusters related to technology adoption, digital policy support, innovation capacity, and strategic development. Based on these findings, the study proposes a conceptual framework that explains the relationship between digital transformation, SME competitiveness, and rural tourism development. In addition, it highlights key internal and external determinants of digital transformation in SMEs, including organizational readiness, infrastructure, stakeholder networks, and public-sector support. The study also identifies existing research gaps and suggests directions for future research, particularly the need for more empirical and longitudinal studies, as well as policy-oriented approaches. Overall, the findings contribute to a clearer understanding of the role of digital transformation in shaping SME performance and rural tourism development, while also offering practical implications for researchers, policymakers, and tourism professionals.

Keywords: rural tourism, digital transformation, small and medium enterprises, bibliometric analysis

1. INTRODUCTION

Digital technologies have brought significant transformations to the tourism industry, revolutionizing tourism businesses, products and experiences, business ecosystems and destinations. Digitalization has also changed the traditional roles of tourism producers and consumers, creating new relationships, business models and required competencies (Dredge *et al.*, 2018).

There is a strong link between industrial development and rural socio-economic development. Rural tourism represents an alternative to mainstream development models and can contribute to poverty reduction and the revitalization of rural areas. At the same time, understanding emerging trends in the tourism industry is essential, particularly the growing role of digital technologies (Kumar & Shekhar, 2020). The expansion of digital platforms has increased the variety and accessibility of tourism products and services, while also accelerating economic transactions, enhancing market visibility and enabling real-time customer feedback.

Despite the growing body of literature on digitalization and tourism, a clear and comprehensive conceptual framework that connects digital transformation with the strategic development of rural tourism, particularly in the context of small and medium-sized enterprises (SMEs), remains insufficiently defined. Existing studies have primarily focused either on digitalization in tourism in general or on rural tourism development separately, without adequately integrating these perspectives.

Therefore, the research problem of this paper lies in the lack of a systematic and integrated understanding of the role and key determinants of digital transformation in rural tourism SMEs. Addressing this gap is essential, as SMEs represent the backbone of rural tourism and their ability to adopt digital technologies significantly influences their competitiveness and long-term sustainability.

Accordingly, the main aim of this paper is to conduct a systematic literature review in order to develop a conceptual framework and provide a theoretical overview of digital transformation in rural tourism SMEs.

The objectives of the research are:

1. Identify and analyse the key factors influencing digital transformation in SMEs within rural tourism,
2. Map and visualize relevant scientific literature on this topic, and
3. Highlight research trends and underexplored areas for future investigation.

In line with these objectives, the study seeks to answer the following research questions:

- RQ1 What are the main research trends and themes in the field of digital transformation in rural tourism SMEs?
- RQ2 Which factors influence the digital transformation of SMEs in rural tourism?

RQ3 What gaps exist in the current literature, and what directions should future research take?

The findings of this study provide a concise overview of research trends related to rural tourism SMEs and highlight the relationship between digital technologies and the development of the rural tourism sector.

Previous studies, such as Kumar & Shekhar (2020), have focused on bibliometric analyses of technology in tourism and its role in socio-economic development. Similarly, Leković *et al.* (2020) examined trends in rural tourism literature, while Jiang and Phoong (2023) analysed the impact of digitization on the sustainability of tourism. However, none of these studies explicitly address digital transformation in rural tourism with a specific focus on SMEs, which further confirms the relevance of this research.

2. LITERATURE REVIEW

The existing literature shows that the development of rural tourism and the role of digital transformation have been studied from different perspectives over time. Early research emphasized the importance of sustainable tourism development, highlighting that tourism activities should be aligned with the interests of the local community while maintaining a high level of local satisfaction (Butler, 1991; Muller, 1994). With the advancement of technology, the focus gradually shifted towards the role of information and communication technologies (ICT), which have been recognized as key drivers of competitiveness in tourism (Buhalis, 1998), as well as an important factor in enabling interaction between SMEs and consumers through e-tourism (Buhalis, 2003).

More recent studies highlight that rural tourism directly contributes to rural development and economic progress, particularly through the establishment and growth of SMEs (Reddy, 2016).

In this context, digital transformation is increasingly seen as an important process that can improve efficiency, competitiveness and long-term sustainability of SMEs. By using digital technologies, these enterprises can better communicate with customers, reach new markets and develop new products and services. Previous research shows that digital transformation can improve performance by automating processes and reducing costs (Kargas *et al.*, 2025), while also supporting sustainable development by reducing the digital gap and encouraging the use of more accessible technologies (Ndlovu *et al.*, 2025).

At the same time, digital transformation is not only a technological issue, but also an organizational and strategic one, as it contributes to greater flexibility, innovation and changes in business models (Hess, 2016; Hinings *et al.*, 2018). Digitalization has also changed relationships between stakeholders in tourism, allowing more collaboration and co-creation of value (Dredge *et al.*, 2018). In addition, new technologies, such as virtual reality, contribute to creating more memorable and emotional tourism experiences (Servidio & Ruffolo, 2016; Lee & Lee, 2021).

However, many rural SMEs still face important challenges in this process. Limited financial resources, lack of infrastructure and insufficient digital skills are often highlighted as key barriers to digital adoption (Popescu, 2019; Istanti, 2021; Kargas *et al.*, 2025). In addition, resistance to change within organizations can slow down the implementation of digital solutions. To overcome these challenges, the literature emphasizes the importance of education, training and leadership development, as well as cooperation between different stakeholders (Zahro *et al.*, 2025). Results show that combining digital technologies with community collaboration can improve market access and support local development.

Recent research also shows the growing importance of digital technologies in shaping tourism demand and experiences. Tourists increasingly seek personalized and memorable experiences, which has led to the development of smart tourism solutions and greater use of digital platforms (Sia *et al.*, 2022; Trang, 2023). Concurrently, digital transformation has accelerated in recent years, especially after the COVID-19 pandemic, which has pushed many tourism businesses towards digital business models (Dana & Salamzadeh, 2021).

Finally, it is important to consider the wider socio-economic context in rural areas. Not all SMEs have equal access to resources or digital knowledge, which can lead to uneven development and deepen existing differences between regions. Overall, the literature confirms the importance of digital transformation for rural tourism, but also shows that its success depends on a range of internal and external factors, especially in the case of SMEs.

3. METHODS AND MATERIALS

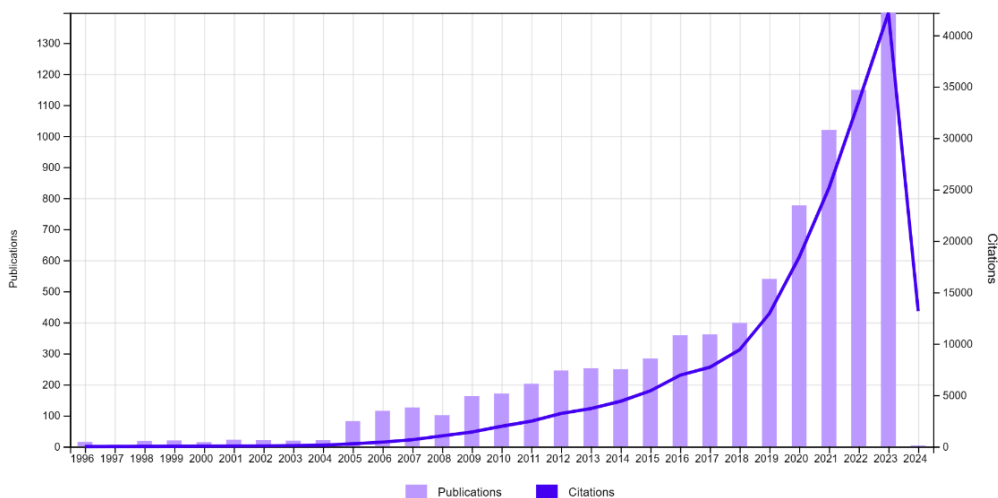
The analytical tool VOSviewer is used in this paper in order to visualize the impact of digital technology on rural tourism with special reference to this impact on rural SMEs. Selected relevant sources were analyzed to identify relevant theses and directions of the current scientific discussion, i.e. literature review. Most of the analyzed scientific papers from journals are referenced in Scopus and WoS databases, but articles from JSTOR, Springer Link and ScienceDirect databases were also used. Only those studies that explicitly deal with the topic of digital transformation in rural SMEs are included, and the papers that consider this form of tourism as part of a wider context are not included. The conceptual analysis was performed using the keywords: digital transformation, rural tourism and SMEs, and the search results were limited to articles published in English. 44 articles were obtained and forwarded for further analysis.

Further analysis includes: a presentation of the period of published papers on the topic covered with regard to the number of quotations, the structure of published papers according to relevant categories of papers, the number and structure of analysed papers according to relevant categories, an overview of published papers on the researched topic by country, the chronological development of the conceptual framework of the research topic, and bibliographic network analysis.

4. RESEARCH RESULTS

By analysing scientific papers on the researched topic: The impact of digital technology on rural tourism with a special reference of this impact on rural SMEs, it can be concluded that the interest of scientists in studying this topic has been growing over the years. The first paper was published in 1996. From then until today, 8,624 papers on this topic have been cited in the processed sources, with a total of 100,016 quotations (94,021 without personal quotations) of 22.66 per paper and an H-index of 166. The number of published papers as well as the number of quotations in the period since 1996 are shown in Figure 1, and the sources inclusive of 2023 are included.

Figure 1. Presentation of the period of the papers published about the analysed topics with regard to the number of quotes



Source: Author's research based on Clarivate Web of Science (2024)

Table 1 shows the number of processed papers by category. They are mostly articles (30) and review articles (9), there are several professional articles (3) and 1 book and 1 book chapter, a total of 44 papers.

Table 1. Number of papers by categories published in the WoS database

Category of the paper	Number of papers
Article	30
Review article	9
Book chapter	2
Expert article	3

Source: Author's research based on Clarivate Web of Science (2024)

The analysis below includes all works that appeared in the WoS database under the keywords "rural tourism, digital transformation, small and medium enterprises" and the filter "journal

articles, conference proceedings, English” has been applied. The WoS database consists of numerous thematic categories that are divided into the general category of science in general (Science Citation Index), the category of social sciences (Social Science Citation Index) and the category of arts and humanities (Arts & Humanities Citation Index). Table 2 shows the number and structure of analysed papers according to the relevant categories assigned to each individual journal in the WoS database. The relevant categories are: business, management, regional urban planning, economics, engineering industrial, operations research management science, environmental studies and hospitality, leisure, sport, and tourism.

Table 2. Number and structure of analysed papers on the researched topic in the WoS database according to relevant categories

Web of Science category	Number of papers	%
Business	72	62.609%
Management	55	47.826%
Regional Urban Planning	23	20%
Economics	17	14.783%
Engineering Industrial	16	13.913%
Operations Research Management Science	12	10.435%
Environmental Studies	8	6.957%
Hospitality, Leisure, Sport, Tourism	6	5.217%

Source: Author’s research based on Clarivate Web of Science (2024)

Table 3 shows an overview of published papers on the topic of digital transformation of small and medium-sized enterprises in rural tourism by country. The first place in terms of the representation of papers in this scientific field is Italy with 29.57%, followed by the People’s Republic of China with 28.70%, UK with 23.48% and USA with 16.52%.

Table 3. Overview of published papers on the researched topic by country

Countries	Number of papers	%
Italy	34	29.565%
People's Republic of China	33	28.696%
UK	27	23.478%
USA	19	16.522%
France	17	14.783%
Finland	11	9.565%
India	11	9.565%
Sweden	10	8.696%
Australia	7	6.087%
Denmark	5	4.348%
Malaysia	5	4.348%
Spain	5	4.348%

Source: Author's research based on Clarivate Web of Science (2024)

4.1 Chronological development of the conceptual framework of digital transformation in rural tourism with reference to SMEs

The chronological development of the conceptual framework for the topic of digital transformation in rural tourism with special reference to the impact on SMEs is presented in Table 4, followed by an interpretation.

Table 4. Chronological overview of selected literature on digital transformation in rural tourism SMEs

Author(s)	Title	Year	Source	Key Concepts	Main Findings
Butler	Tourism, Environment and Sustainable Development	1991	Environmental Conservation	Sustainable tourism, local community	Tourism development should align with local community interests and satisfaction
Muller	The thorny path to sustainable tourism development	1994	Journal of Sustainable Tourism	Sustainable development, tourism	Sustainable tourism requires balancing development and community well-being
Buhalis	Strategic use of information	1998	Tourism Management	ICT, competitiveness	ICTs play a key role in strengthening the competitiveness of tourist organizations and destinations and their strategic use
Buhalis	E-tourism - Information Technology in Strategic Tourism Management	2003	Book	E-tourism, digital interaction	E-tourism is a collective term for the application of information technologies in tourism, which change the nature of tourism services globally. E-tourism and the Internet especially promote interactivity between SMEs and consumers.
Reddy	Rural Transformation of a Village in Telagana	2016	International Journal of Rural Management	Rural development, SMEs	Rural tourism directly contributes to rural development. The establishment of SMEs contributes to the progress of rural areas.
Servidio & Ruffolo	Exploring the relationship between emotions and memorable tourism experiences	2016	Tourism Management Perspectives	VR, emotions, experience	Virtual reality technology helps customers create extraordinary emotional experiences through narratives.

Hess	Options for formulating a digital transformation strategy	2016	MIS Quarterly Executive	Digital strategy, agility	<p>Organizational agility is achieved through digital transformation</p> <p>There are four key dimensions for formulating a digital transformation strategy:</p> <ol style="list-style-type: none"> 1. The use of technologies reflects the approach and ability of the company to explore and exploit new digital technologies, 2. The impact of digital transformation on the value of the company, 3. Structural changes related to changes in organizational structures and changes in processes necessary to deal with new technologies, 4. The ability of the company to finance the digital transformation venture.
McCamley & Gilmore	Aggravated fragmentation: A case study of SME behaviour in two emerging heritage tourism regions	2017	Tourism Management	SMEs, tourism, innovation, authenticity	SMEs can increase the innovation of the tourism industry by providing a sense of authenticity if they participate in the implementation of digital transformation.
Dredge <i>et al.</i>	Digitalisation in Tourism	2018	Aalborg University report	Digitalization, stakeholders	Digitalization has transformed the traditional roles of tourism producers and consumers and can bring SMEs to the "virtual table" so that all stakeholders can co-manage.
Hinings <i>et al.</i>	Digital innovation and transformation	2018	Information and Organization	Institutional change, digital transformation	A new definition of digital transformation. Three types of new institutional arrangements crucial for digital transformation have been identified: digital organizational forms, digital institutional infrastructures, and digital institutional building blocks.

Author(s)	Title	Year	Source	Key Concepts	Main Findings
Visvizi & Lytras	Sustainable Smart Cities and Smart Villages Research: Rethinking Security, Safety, Well-being, and Happiness	2018	Sustainability	Smart tourism, ICT	Digital transformation is crucial in promoting the design of a tourist product. Information and communication technologies play an increasingly important role in tourism and are spreading to rural areas.
Popescu	The Digital Transformation of Tourism SMEs in the European Union: Challenges, Opportunities, and Support	2019	Projekter. Aau. Dk	SMEs, challenges, sustainability	The goal of rural tourism is the revitalization of rural resources for local socio-economic benefits and sustainability through the inclusion and empowerment of the local community. Due to the lack of resources, SMEs are not competitive.
Viswanathan & Telukdarie	A systems dynamics approach to SME digitalization	2019	Procedia Computer Science	Productivity, digitization, skills, SD model, innovation hub	Digitization with a focus on productivity, finances and workforce skills is important for the survival of SMEs. System Dynamics (SD) modelling provides strategic business support to small businesses. It represents an approach to supporting small and medium-sized enterprises that includes skills development and digitization through the innovation hub.
Vitera <i>et al.</i>	On the Importance of Digital Transformation for SME - Results from a Survey among German SME	2022	CEUR-WS	Growth, efficiency, costs, new business opportunities	Digitization enables growth due to the opening of new business opportunities and consequently increases the demand for new products and services. Costs can be reduced through digitization, and the ability to measure and analyse efficiency leads to business optimization. Digitization is therefore attractive both for SMEs and for larger companies.

Kumar & Shekhar	Technology and innovation: Changing concept of rural tourism-A systematic review	2020	Open Geosciences	Trends, rural tourism, digital technologies	It is important to understand new trends in tourism, especially the application of digital technologies. Characteristics that exist in rural areas include agriculture as the leading source of income and low population density. The primary doubt related to the development of rural tourism is, on the one hand, how to increase its popularity, and on the other hand, how to prevent it from turning into a mass tourism industry.
Tien, Trai, Quyet	The impact of digital transformation on tourism sustainable development: a case of SMEs in Vietnam	2020	International Journal of Entrepreneurship and Small Business	Sustainability, SMEs, global sustainable tourism development	The concept of sustainable development of rural tourism is one of the leading research topics in the context of global sustainable tourism development.
Jurakić <i>et al.</i>	Rural development and digital transformation	2021	Proceedings of the 1st International Scientific and Professional Conference	Digitization is a social and political phenomenon, globalization	Digitization is a social and political phenomenon specific to a particular country and economic and political environment, but it operates in conditions of globalization.
Dana & Salamzadeh	The coronavirus (COVID-19) pandemic: challenges among Iranian startups	2021	Journal of Small Business & Entrepreneurship	Crisis, digitalization, ICT tools	After the COVID 19 pandemic, business models in rural tourism are drastically shifting to digitization thanks to the latest available and affordable ICT tools.
Verhoef <i>et al.</i>	Digital transformation: A multidisciplinary reflection and research agenda	2021	Journal of Business Research	Digital technology, statistical data, SMEs	Thanks to digital technology that integrates statistical data, it is possible for SMEs to obtain large databases of customers, so they analyse the market more successfully and faster.

Author(s)	Title	Year	Source	Key Concepts	Main Findings
Lee & Lee	Cognitive appraisal theory, memorable tourism experiences, and family cohesion in rural travel	2021	Journal of Travel & Tourism Marketing	Experience economy, cognitive appraisal theory, memorable tourism experiences (MTEs)	One of the leading current trends is the tendency of tourists to maximize emotional experiences. This study brings cognitive appraisal theory and highlights the category of memorable tourism experiences (MTEs) in order to examine the emotional impact of rural travel on family cohesion. The study proves the positive effect of MTE on family cohesion. The results also define the impacts of key elements of the experience economy in rural tourism: involvement has the strongest effect; arousal and meaningfulness have a similarly significant effect; novelty has a relatively weak effect; and refreshment has no significant effect.
Istanti	Rural Tourism Perspectives on Digital Innovation: Small Enterprises in Indonesia	2021	Case study	Infrastructure, barriers, technology	Despite the positive direction, the digital development of rural tourism and digitization continues to cause concern because rural areas often lack the digital infrastructure and technology needed for digital transformation, while the high costs of implementing digital innovations appear.
Bouncken <i>et al.</i>	Knowledge- and innovation-based business models for future growth: digitalized business models and portfolio considerations	2021	Review of Managerial Science	Innovation, business models	Digital transformation (knowledge and innovation) should be included in existing business models and business portfolio; it deals with something greater than the technological changes and affects all business segments.

Kraus <i>et al.</i>	Digital Transformation: An Overview of the Current State of the Art of Research	2021	Sage Open	Definitions, complexity	There is no established definition of digital transformation. Disruptions and changes in the market do not only occur at the company level, but also have environmental, social and institutional implications.
Sia, Saidin & Iskander	Systematic review of mobile travel apps and their smart features and challenges	2022	Journal of Hospitality and Tourism In	Smart tourism, personalization, deeper experience	The trend of smart tourism meets the need for personalization and a deeper experience, so the digitization of large data systems along the value chain is necessary.
Maon <i>et al.</i>	Youth and digital tech	2023	Advances in Social Sciences Research Journal	Technology adoption	Companies in tourism use cutting-edge technologies with modern features.
Trang	Sustainable integration in Vietnam's tourism industry	2023	World Review of Entrepreneurship Management and Sustainable Development	Participation, co-creation, multidimensional interaction	There is a trend of direct participation of tourists in the process of designing tourist services, which creates a multidimensional interaction with many objects and entities in the tourism industry.
Kargas <i>et al.</i>	Reviewing and Mapping the Digital Transformation Process of SMEs	2025	Applied Sciences	Digital transformation, SME performance, automation	Digital transformation can improve SME performance by automating processes and reducing costs
Ndlovu <i>et al.</i>	A bibliometric analysis of the nexus between digitalisation and sustainability in rural small, micro, and medium tourism enterprises (SMMTEs)	2025	Studia Periegetica	Digital transformation, sustainability, digital divide	Supports sustainable development by reducing the digital divide and encouraging the use of more accessible technologies.

Source: prepared by the author

The presented chronological analysis includes articles that also cover the broader context of the researched topic, such as ICTs. As shown in Table 4, earlier studies were mainly focused on the role of ICT, while more recent research increasingly addresses digital transformation and its implications for business operations.

Based on the presented review, it can be concluded that the conceptual framework of digital transformation in rural tourism has not yet been fully developed, especially from the perspective of small and medium-sized enterprises. However, research points out that digital transformation should be included in existing business perspectives, since it goes beyond technological change and affects multiple business segments (Bouncken *et al.*, 2021).

Successful digital transformation is achieved by simultaneously exploiting and exploring its potential, such as cost reduction and improved efficiency, in order to achieve organizational agility (Hess *et al.*, 2016). Although there is a growing focus on digital transformation in the literature, there is still no universally accepted definition, and authors interpret this concept in different ways (Kraus *et al.*, 2021). Among the more recent definitions, Hinings *et al.* (2018) stand out by emphasizing the broader structural and organizational changes associated with digital transformation.

Furthermore, the table indicates that there is still a lack of research on the optimal use of technology in rural tourism. The literature suggests that technology should be applied in a way that creates value for all stakeholders, from local providers to tourists. At the same time, concerns related to sustainability are frequently highlighted, particularly regarding the potential loss of local culture and the risk of developing mass tourism (Kumar & Shekhar, 2020).

The development of rural tourism cannot be separated from the role of SMEs, which support both economic activities and the overall tourism experience. SMEs not only perform core business activities but also represent an important part of the tourist offer (Istanti, 2021). However, their position is becoming increasingly challenged due to globalization and the need for adaptation. In this context, digitalization plays an important role, especially in terms of productivity, financial resources, and workforce skills (Viswanathan, 2014).

Finally, although many digital innovations are present in the tourism sector, traditional ways of creating and delivering tourism products still remain important. Therefore, the process of digital transformation should start from the core business activities while maintaining a balance between innovation and tradition.

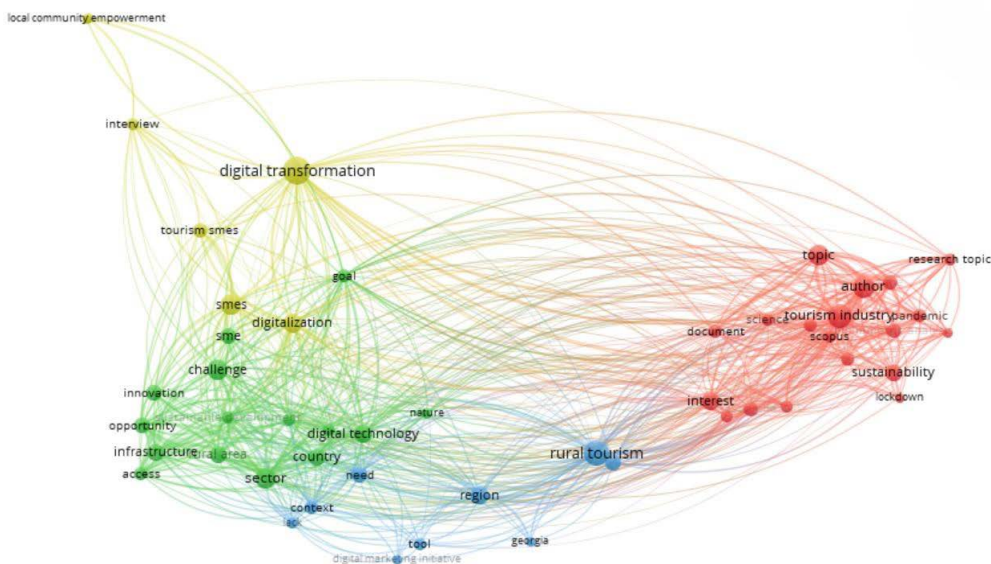
4.2 Bibliographic network analysis

The analytical tool VOSviewer was used to analyse the bibliographic network. The significance of keyword co-occurrence analysis in bibliometrics lies in the intuitive understanding of popular topics in the field of research through the frequency and relevance of terms (Jiang & Phoong, 2023). Each sphere (node) or cluster on the network map indicates a keyword, and the size of the sphere represents the number of keywords that appear. The bigger

the sphere, the higher the frequency of the keywords. Likewise, the higher the rate of co-occurring links between terms, the thicker the curve between keywords. In addition to the above, on the network map, different groups of colours reflect different thematic collections, while the same colour represents similar words (Loureiro & Nascimento, 2021). The same colour indicates a close relationship between keywords. The red network group or cluster in the relevant research is focused on the following categories: tourism, sustainability and research topic, the blue network group (cluster) refers to rural tourism, region, green to digital technology, SMEs, infrastructure and yellow to digital transformation, interview, local community empowerment. By researching the literature, as well as its visualization, it is concluded that digital transformation in rural tourism, especially in rural SMEs, is a topic of increasing research interest.

Table 5 shows the explanations of keyword clusters in VOSviewer. In order for the data to be as relevant as possible and to show exactly which keywords are researched and used in the scientific literature on the researched topic, three different numbers of occurrences of terms within the researched literature proposed by the program were selected and the most relevant keywords were selected according to the number of repetitions in the selected literature, as shown below.

Figure 2. VOSviewer keyword co-occurrence network



Source: Author's research

In Figure 2, the red cluster highlights the key words: tourism industry and sustainability, which are related to papers on the researched topic. In the blue cluster the term rural tourism was used the most, in the green cluster the most used key words in the research are: digital technology, challenge, SME, innovation, infrastructure and the key words in the yellow cluster are: digital transformation, tourism SMEs, local community empowerment and digitalization.

Figure 4 shows the three most important clusters of words, the red group highlights which keywords were used in connection with the expressions rural tourism, region, context and area, green is associated with digital transformation, rural area, innovation and SMEs and blue with tourism industry, research, tourism SMEs and digitalization, sustainability and strategy.

Table 4. Keyword clusters

Figure	Red cluster (keywords)	Blue cluster (keywords)	Green cluster (keywords)	Yellow cluster (keywords)
Figure 2	Tourism industry, sustainability	Rural tourism	Digital technology, challenge, SME, innovation, infrastructure	Digital transformation, tourism SMEs, local community empowerment, digitalization
Figure 3	Tourism, SMEs, collaboration, rural area, nature, digital transformation, management, local community empowerment	Digital technology	Development, rural tourism, digital marketing, initiative	Innovation, digitalization, challenge, tourism SMEs
Figure 4	Rural tourism, region	Tourism industry, tourism SMEs, digitalization, research, sustainability, strategy	Digital transformation, SMEs, rural area, innovation	/

Source: Author's research

5. DISCUSSION

Building on the previously presented chronological analysis of the literature and the overview of selected studies (Table 4), as well as the density visualization network map created in VOSviewer, it can be concluded that rural tourism, development, digital transformation, technology, SMEs and sustainable tourism represent key research areas of significant interest. The keyword analysis further supports these findings, with the most frequently occurring terms grouped into four main categories. The first group includes digital technology, digital transformation and digitalization; the second group refers to SMEs and tourism SMEs; the third group includes rural tourism and rural areas; while the fourth group relates to local community empowerment, sustainability and challenges.

These results are consistent with the findings of the chronological literature review, which showed a shift from a technology-oriented perspective towards a broader understanding of digital transformation that includes organizational, social and sustainability aspects. In particular, the increasing presence of the concept of local community empowerment,

although previously less represented, indicates a growing recognition of the importance of including local stakeholders in the process of digital transformation.

Furthermore, the bibliometric analysis confirms the results of the qualitative review, showing a continuous increase in the number of published papers and the development of multiple interconnected research clusters. This supports the earlier finding that digital transformation is a dynamic and complex process, characterized not only by technological change but also by significant economic and social implications. As highlighted in the literature, digital transformation should therefore be observed in a broader context, as it influences business models, stakeholder relationships and the overall strategic positioning of tourism enterprises.

In the context of rural tourism, this complexity is even more pronounced due to the ecological and social sensitivity of rural areas and the central role of SMEs. As previously indicated in the literature review, SMEs represent key actors in rural tourism development, but at the same time face significant challenges related to limited resources, skills and adaptation capacities. This further confirms that digital transformation in rural tourism should not be viewed solely as a technological process, but as a multidimensional phenomenon that requires the integration of economic, social and environmental considerations.

The findings of this study also suggest that the existing conceptual framework of digital transformation in rural tourism is still evolving and not yet fully defined. This is in line with earlier observations from the literature, which pointed to the lack of a unified theoretical approach and the diversity of perspectives in defining digital transformation.

Based on the analysis, it can be concluded that digital transformation in rural tourism represents not only an economic necessity, but also a broader social process that contributes to sustainable development. However, this process requires careful management, particularly in terms of preserving the socio-cultural identity of rural communities and respecting the carrying capacity of rural destinations.

In line with these findings, future research should focus on comparative analyses of digital transformation processes in different socio-economic contexts, as well as on examining the opportunities and risks of digitalization in relation to sustainable tourism development. Particular attention should be given to the role of SMEs, the development of innovative tourism products within the experience economy, and new models of digital communication adapted to the specificities of rural tourism.

Also, further research is needed on stakeholder network development, the repositioning of SMEs, and cross-sectoral collaboration in rural areas. A multidisciplinary approach would contribute to a better understanding of the effects of digital transformation on both the natural environment and the socio-economic structure of rural communities.

Finally, the complexity and interconnection of the topics related to digital transformation and sustainable rural tourism development represent both a scientific and practical challenge. Continued research efforts are therefore necessary to further develop the conceptual

framework and provide clearer theoretical and practical implications for the strategic development of rural tourism.

6. CONCLUSION

This study confirmed the research assumption that the conceptual framework of strategic development of rural tourism through digital transformation, particularly in the context of rural SMEs, remains insufficiently defined in the existing literature. Through a systematic bibliometric analysis, the paper identified key research trends, dominant themes, and underexplored areas within this field.

The main contribution of this study lies in providing a structured overview of the existing body of knowledge and highlighting research gaps that require further investigation. In addition, the findings offer useful insights for both researchers and practitioners by emphasizing the growing importance of digital transformation in shaping the strategic development of rural tourism.

From a practical perspective, the results may support stakeholders, especially rural entrepreneurs, local communities, and policymakers, in better understanding the role of digital tools and strategies in enhancing competitiveness and sustainability in rural tourism.

However, this study has several limitations. The analysis is based on a selected database and specific bibliometric criteria. Furthermore, the research focuses on secondary data, without empirical validation.

Future research should focus on empirical studies, particularly at the level of rural SMEs, in order to validate the identified trends and further develop the conceptual framework. Additionally, comparative and longitudinal studies could provide deeper insights into the dynamics of digital transformation in rural tourism.

NOTE

The research results were presented at the 11th International Scientific Conference New Frontiers in Economics and Tourism 2024.

REFERENCES

- Beerli, A. and Martin, J. D. (2004) Factors influencing destination image, *Analysis of Tourism Research*, 31(3), pp. 657-681. <https://doi.org/10.1016/j.annals.2004.01.010>
- Bocarando, J. C., Perez, J. and Ovando, C. (2017) Tourism SMEs in a digital environment: Literature review, *European Scientific Journal*, 13(28), pp.429-451. <https://doi.org/10.19044/esj.2017.v13n28p429>
- Bouncken, R. B., Kraus, S. and Roig-Tierno, N. (2021) Knowledge- and innovation-based business models for future growth: Digitalized business models and portfolio considerations, *Review of Managerial Science*, 15(1), pp. 1-14. <https://doi.org/10.1007/s11846-019-00366-z>

- Buhalis, D. (1998) Strategic use of information technologies in the tourism industry, *Tourism Management*, 19(5), pp. 409-421. [https://doi.org/10.1016/S0261-5177\(98\)00038-7](https://doi.org/10.1016/S0261-5177(98)00038-7)
- Buhalis, D. (2003) *E-tourism: Information technology in strategic tourism management*. Prentice Hall. https://www.researchgate.net/publication/270392994_Buhalis_D_2003eTourism_information_technology_for_strategic_tourism_managementPearson_Financial_TimesPrentice_Hall_London_ISBN_0582357403_https://doi.org/10.1016/j.tourman.2003.08.001
- Butler, R. (1991) Tourism, environment, and sustainable development, *Environmental Conservation*, 18(3), pp. 201-209. <http://www.jstor.org/stable/44521393>
- Choi, S. Y. (2018) A study on the digital competency for the fourth industrial revolution, *The Journal of Korean Association of Computer Education*, 21(5), p. 1. <https://doi.org/10.32431/kace.2018.21.5.003>
- Clemente-Almendros, J. A., Nicoara-Popescu, D. and Pastor-Sanz, I. (2024) Digital transformation in SMEs: Understanding its determinants and size heterogeneity, *Technology in Society*, 77, <https://doi.org/10.1016/j.techsoc.2024.102483>
- Dana, L. P. and Salamzadeh, A. (2021) The coronavirus (COVID-19) pandemic: Challenges among Iranian start-ups, *Journal of Small Business & Entrepreneurship*, 33(5), pp. 489-512. <https://doi.org/10.1080/08276331.2020.1821158>
- Dredge, D., Phi, G., Mahadevan, R., Meehan, E. and Popescu, E. S. (2018) *Digitalisation in tourism: In-depth analysis of challenges and opportunities*. Aalborg University. <https://ehrl.ee/wp-content/uploads/2019/01/Digitalisation-in-Tourism-Report-2018.pdf>. (Accessed: 31. 03. 2026)
- Dung, H. T., Vu, N. T. and Duc, L. D. M. (2019) Risks of unsustainable tourism development in Vietnam, *International Journal of Research in Finance and Management*, 2(2), pp. 81-85. <https://www.doi.org/10.33545/26175754.2019.v2.i2a.40>
- Hess, T., Benlian, A., Matt, C. and Wiesböck, F. (2016) Options for formulating a digital transformation strategy, *MIS Quarterly Executive*, 15(2), pp. 123-139. https://www.researchgate.net/publication/291349362_Options_for_Formulating_a_Digital_Transformation_Strategy (Accessed: 15.12. 2025)
- Hinings, B., Gegenhuber, T. and Greenwood, R. (2018) Digital innovation and transformation: An institutional perspective, *Information and Organization*, 28(1), pp. 52-61. <https://doi.org/10.1016/j.infoandorg.2018.02.004>
- Istanti, L. N. (2021) Rural tourism perspectives on digital innovation: Small enterprises in Indonesia, *Advances in Economics, Business and Management Research*, 193, pp. 70-75. https://www.researchgate.net/publication/356775898_Rural_Tourism_Perspectives_on_Digital_Innovation_Small_Enterprises_in_Indonesia (Accessed: 10.11. 2024)
- Jiang, C. and Phoong, S. W. (2023) A ten-year review analysis of the impact of digitization on tourism development (2012-2022), *Humanities and Social Sciences Communications*, 10(1). <https://doi.org/10.1057/s41599-023-02150-7>
- Jurakić, M., Franc, S. and Barišić, P. (2021) Digital transformation', In Jurakić, M. et al. (Eds.) 1st International Scientific and Professional Conference for the Development of Rural Tourism 2020, Sustainable and Responsible Development in Rural Tourism. Sisak, 25 November 2020. Sisak: Vimal Academy, pp. 100-113. <https://www.cabidigitallibrary.org/doi/pdf/10.5555/20230260071>
- Kargas, A., Drosos, D., Komisopoulos, F., Katsianis, D., Chaniotaki, E., Rokkas, T., Andriopoulos, A., Argyroulis, V., Filios, S., Loumos, G., Kokkinis, D., and Alvertos, K. (2026). Reviewing and Mapping the Digital Transformation Process of SMEs. *Applied Sciences*, 16(2), 833. <https://doi.org/10.3390/app16020833>
- Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., and Roig-Tierno, N. (2021) Digital transformation: An overview of the current state of the art of research, *SAGE Open*, 11(3), pp. 1-15. <https://doi.org/10.1177/21582440211047576>

- Kumar, S. and Shekhar, A. (2020) 'Technology and innovation: Changing concept of rural tourism - A systematic review', *Open Geosciences*, 12(1), pp. 737-752. <https://doi.org/10.1515/geo-2020-0183>
- Lapuz, M. C. M. (2023) The role of local community empowerment in the digital transformation of rural tourism development in the Philippines, *Technology in Society*, 74. <https://doi.org/10.1016/j.techsoc.2023.102308>
- Lee, K. J. and Lee, S. Y. (2021) Cognitive appraisal theory, memorable tourism experiences, and family cohesion in rural travel, *Journal of Travel & Tourism Marketing*, 38(4), pp. 399-412. <https://doi.org/10.1080/10548408.2021.1921094>
- Leković, K., Tomić, S., Marić, D., and Ćurčić, N. V. (2020). Cognitive Component of the Image of a Rural Tourism Destination as a Sustainable Development Potential, *Sustainability*, 12(22), p. 9413. <https://doi.org/10.3390/su12229413>
- Loureiro, S. M. C. and Nascimento, J. (2021) Shaping a view on the influence of technologies on sustainable tourism, *Sustainability*, 13(22), p. 12691. <https://doi.org/10.3390/su132212691>
- Madzik, P., Falát L, Copuš L and Valeri M. (2023) Digital transformation in tourism: Bibliometric literature review based on machine learning approach, *European Journal of Innovation Management*, 26(7), pp. 177-205. <https://doi.org/10.1108/EJIM-09-2022-0531>
- Maon, S. N., Ali, S. A. M., Azizam, N. A. and Omar, E. N. (2023) Youth digital technology attitudes, *Advances in Social Sciences Research Journal*, 10(62), pp. 248-258. <https://doi.org/10.14738/assrj.106.2.15018>
- McCamley, C. and Gilmore, A. (2017) Aggravated fragmentation: A case study of SME behaviour in two emerging heritage tourism regions, *Tourism Management*, 60, pp. 81-91. <https://doi.org/10.1016/j.tourman.2016.11.016>
- Muller, H. (1994) The thorny path to sustainable tourism development, *Journal of Sustainable Tourism*, 2(3), pp. 131-136. <https://doi.org/10.1080/09669589409510690>
- Ndlovu, N., Sifolo, P. P. S. i Tshipala, N. N. (2025) A bibliometric analysis of the nexus between digitalisation and sustainability in rural small, micro, and medium tourism enterprises (SMMTEs). *Studia Periegetica*, 47(1), 2067. <https://doi.org/10.58683/sp.2067>
- Paresishvili, O., Kvaratskhelia, L. and Mirzaeva, V. (2017) Rural tourism as a promising trend of small business in Georgia, *Annals of Agrarian Science*, 15(3), pp. 344-348. <https://doi.org/10.1016/j.aasci.2017.07.008>
- Popescu, E. S. and Phi, G. (2019) *The digital transformation of tourism SMEs in the European Union*. <https://projekter.aau.dk> (Accessed: 10.11. 2024)
- Reddy, A. A., Rani, C. R., Cadman, T., Reddy, T. P., Battarai, M., and Reddy, A. N. (2016) Rural transformation of a village in Telangana, *International Journal of Rural Management*, 12(2), pp. 143-178. <https://doi.org/10.1177/0973005216665944>
- Servidio, R. and Ruffolo, I. (2016) Exploring the relationship between emotions and memorable tourism experiences, *Tourism Management Perspectives*, 20, pp. 151-160. <https://doi.org/10.1016/j.tmp.2016.07.010>
- Shen, J., Shen, J. and Mei, T. (2016) Landmark re-ranking for smart travel guide systems, *IEEE Transactions*, 46(11), pp. 1492-1504. <https://ieeexplore.ieee.org/document/7434056>
- Sia, P. Y. H., Saidin, S. S. and Iskandar, Y. H. P. (2022) Systematic review of mobile travel apps, *Journal of Hospitality and Tourism Insights*, 6(5), pp. 2115-2138. <https://doi.org/10.1108/JHTI-02-2022-0087>
- Tien, N. H. Van Trai, D. and Quyet, N. X. (2020) The impact of digital transformation on tourism sustainable development: a case of SMEs in Vietnam, *Int. J. Entrepreneurship and Small Business*, 10(Y), pp. 1-16. https://www.researchgate.net/publication/377715107_The_impact_of_digital_transformation_on_tourism_sustainable_development_a_case_of_SMEs_in_Vietnam (Accessed: 07.10. 2024)
- Trang, T. (2023) Sustainable integration in Vietnam's tourism industry, *World Review of Entrepreneurship*, 1(1), p.1, https://www.researchgate.net/publication/369590648_Sustainable_integration_in_Vietnam's_tourism_industry (Accessed: 20.09.2024)

- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N. and Haenlein, M. (2021) Digital transformation: A multidisciplinary reflection and research agenda, *Journal of Business Research*, 122, pp. 889-901. <https://doi.org/10.1016/j.jbusres.2019.09.022>
- Viet, P. Q., Ng, T., Phan, Q. V., Nguyen, M. D. and Vo, T. T. (2021) Sustainability of tourism development in Vietnam's coastal provinces, *World Review of Entrepreneurship*, 17(5), pp. 579-598. <https://doi.org/10.1504/WREMSD.2021.117443>
- Visvizi, A. and Lytras, M. (2018) It's Not a Fad: Smart Cities and Smart Villages Research in European and Global Contexts, *Sustainability*, 10(8), 2727. <https://doi.org/10.3390/su10082727>
- Viswanathan, R. and Telukdarie, A. (2019) A systems dynamics approach to SME digitalization, *Procedia Computer Science*, 180, pp. 816-824. <https://doi.org/10.1016/j.procs.2021.01.331>
- Vitera, J., Hörcher, F., Griesch, L., Goltz, K., Rößler, J., Meyer, J. and Sandkuhl, K. (2022) On the importance of digital transformation for SMEs, *CEUR Workshop Proceedings*, pp. 56-69. <https://ceur-ws.org/Vol-3223/paper6.pdf> (Accessed: 20.09.2024)
- White, M. (2012) Digital workplaces: Vision and reality, *Business Information Review*, 29(4), pp. 205-214. <https://doi.org/10.1177/0266382112470>
- Zahro, Y. and Hartiningsih, S. (2025) Strategies for empowering small and medium enterprises to promote sustainable tourism in tourist villages: A systematic literature review. *Global Economic, Social and Development Review*, 29(1), str. 29-40. <https://doi.org/10.24123/gesdr.v29i1.7786>



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DIGITALNA TRANSFORMACIJA MALIH I SREDNJIH PODUZEĆA U RURALNOM TURIZMU: SUSTAVNI BIBLIOMETRIJSKI PREGLED

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SAŽETAK

Digitalna transformacija postala je strateški pokretač konkurentnosti, inovacija i održivosti u ruralnom turizmu, osobito za mala i srednja poduzeća (MSP) koja čine okosnicu ovog sektora. Iako je sve veća akademska pažnja usmjerena na ulogu digitalizacije u ruralnom turizmu, sveobuhvatno i sustavno razumijevanje postojećih istraživanja i dalje je ograničeno. Ova studija provodi bibliometrijsku analizu 44 znanstvena rada preuzeta iz relevantnih akademskih baza podataka, s ciljem ispitivanja razvoja, ključnih tema i intelektualne strukture istraživanja digitalne transformacije u MSP-ovima u ruralnom turizmu. Analiza identificira dominantne istraživačke pravce, utjecajne autore, institucije i mreže suradnje, kao i ključne tematske klustere povezane s usvajanjem tehnologije, potporom digitalnim politikama, inovacijskim kapacitetima i strateškim razvojem. Na temelju dobivenih rezultata, studija predlaže konceptualni okvir koji objašnjava odnos između digitalne transformacije, konkurentnosti MSP-ova i razvoja ruralnog turizma. Također se ističu ključne unutarnje i vanjske determinante digitalne transformacije u MSP-ovima, uključujući organizacijsku spremnost, infrastrukturu, mreže dionika i podršku javnog sektora. Studija dodatno identificira postojeće istraživačke jazove i predlaže smjernice za buduća istraživanja, osobito potrebu za većim brojem empirijskih i longitudinalnih studija, kao i pristupima usmjerenima na javne politike. Sveukupno, rezultati doprinose jasnijem razumijevanju uloge digitalne transformacije u oblikovanju uspješnosti MSP-ova i razvoja ruralnog turizma, uz istovremeno pružanje praktičnih implikacija za istraživače, donositelje politika i turističke stručnjake.

Ključne riječi: ruralni turizam, digitalna transformacija, mala i srednja poduzeća, bibliometrijska analiza

