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Systematic Literature Review: Digitalization of Rural Tourism Towards Sustainable Tourism

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ABSTRACT

In the context of rural tourism, the internet is crucial. It is vital to create and implement new technology in order to assist digital tourism in tourist communities and undeveloped, frontier, and remote locations. The utilization of big data can enhance the precision of predicting tourist flows, providing valuable insights to assist and enhance destination management, planning, and advertising. It can also ease mobility and encourage visitors to be distributed according to time. In addition to supporting visitors with specific access needs and keeping management informed about visitor behavior, artificial intelligence (AI) and automation can also be very helpful in the tourist industry by enabling those with limited mobility to travel the world. In this sense, as the sharing and gig economies grow along with technology, we have more options in our everyday lives—as long as they are properly set up and maintained. Therefore, this paper aims to study the research on internet criteria based on AlUla framework to achieve sustainable tourism in rural areas and to identify the key journals, articles and authors. The findings in this research are that there has been an increase in the number of journals post COVID19, where the country that produces the most journals is China and the author that is most cited is Pesonen JA. To achieve the goal of sustainable digital rural tourism, infrastructure is needed in the form of internet penetration, internet speed and usability, and internet security level.

1. Introduction

People's livelihoods in rural economies are frequently dominated by the agriculture sector. However, a number of external factors, including the cost of fertilizer, the seeds used, and the agricultural products that are produced downstream, have an impact on conventional agricultural systems. We need to diversify our sources of livelihood in order to boost rural economic growth. Diversifying one's source of income is a tactic frequently used to get beyond financial difficulties and is crucial in reducing poverty [1] . The process through which rural households create a variety of businesses to boost their socioeconomic capacity and raise their level of life is known as livelihood diversification.

Research indicates that expanding one's sources of income outside agriculture might help households become more financially secure, enhance their food security, and boost agricultural output by providing them with easier access to capital [2].

One rural potential that can be maximized to boost the resilience of rural households is the capacity for culture and the environment. The tourism industry is drawn to the area's distinctive culture and scenic beauty. Increased community empowerment can be achieved through the tourism industry, allowing rural communities to diversify their sources of income. Increasing community empowerment through tourist sector optimization leads to sustainable local economic development. In this instance, the community actively manages tourism in addition to being its object.

One of the many initiatives the government is making to promote the expansion of the country's economy is the promotion of tourism through tourist villages. In order to promote the social, cultural, and economic transformation of villages, the creation of tourist villages is a means of expediting integrated village development. The government is creating tourist towns in accordance with tourism development goals, with the intention of boosting economic growth, promoting social welfare, eliminating poverty and unemployment, protecting the environment and natural resources, and advancing culture.

In order to promote the social, cultural, and economic transformation of villages, the creation of tourist villages is also a means of expediting integrated village development. In order to deliver added value advantages and generate high productivity to enhance the welfare of the local population, each region and village must therefore pay attention to its potential to be developed.

All industrial sectors, particularly Indonesian tourism, are suffering greatly as a result of the COVID-19 pandemic. Thankfully, advances in technology allowing the creative economy and the tourism sector to thrive in the face of the pandemic. In order to thrive during a pandemic, actors in the tourism and creative economies must possess strong adaptability, inventiveness, and teamwork skills. With digital tourism, these three competencies are beginning to be applied. However, there are a number of obstacles that could make it difficult to establish digital tourism in tourist villages in reality. Low levels of knowledge and human resources are among these difficulties, as is the absence of a supporting digital infrastructure [3]. In actuality, the locals are welcoming groups with stunning natural settings that have the potential to become popular tourist attractions.

Following the end of the Covid19 pandemic, the rural tourism industry has currently adapted to the growing demands of local visitors. Local tourists are becoming aware of and paying attention to a growing number of new rural tourism locations. The growing demand for new tourist sites is partly attributed to the trend of social media sharing of travel experiences. The shift in tourism patterns, which are no longer exclusively concentrated in cities, gives rural areas more room to grow and becomes less dependent on the production of agricultural goods. There are a lot of potentials that need to be investigated, but the implications are not all the same.

In the context of rural tourism, the internet is crucial. The internet is now one of the most significant forces in driving economic growth, transforming livelihoods in the region, bringing new life to the local economy, and creating new opportunities [4].

New technologies must be created and implemented in order to enable digital tourism in tourist communities and undeveloped, frontier, and remote locations. Artificial intelligence (AI)-powered service robots, automation, contactless payments, and machine learning for data-based marketing are all examples of how digital tourism is developing. These developments are drastically altering the business models of the tourism industry and could pick up even more speed after COVID-19 [5]. This technology is thought to be a significant source of efficiency and innovation, drastically altering the provision and use of tourism services. They also contribute significantly to social transformation since, in theory, they enable social and economic inclusion and empowerment by giving

underprivileged communities access to business opportunities and tourism services that they were previously denied.

The development of communities and inclusive tourism may and should benefit greatly from new technologies. The utilization of big data by destination management/marketing organizations (DMOs) can improve the precision of tourist flow forecasting, which is useful information for destination planning, promotion, and management. It can also ease mobility and encourage time-based visitor dispersal. This will offer fresh data on tourism-related social activities and mobility, improving comprehension of community well-being and enabling more precise trend and connection identification.

Virtual and augmented reality can be utilized in tourism to help persons with limited mobility travel the world, and AI and automation can also be very helpful in helping travelers with particular access needs and keeping managers informed about visitor behavior. In this sense, as the sharing and gig economies grow along with technology, we have more options in our everyday lives—as long as they are properly set up and maintained. Additionally, it can promote social innovation and entrepreneurship, which enables previously excluded people to participate actively and successfully in the tourism industry. This promotes inclusive growth, competitiveness, and productivity. Therefore, this paper aims to study the research on internet criteria based on AlUla framework to achieve sustainable tourism in rural areas and to identify the key journals, articles and authors.

2. Research Methodology

Systematic literature review was conducted in order to conduct this research (SLR). Through a review approach that provides the findings in a more logical and structured manner, this research seeks to locate, synthesise, and analyse earlier works [6] .

This systematic quantitative literature review was produced using a three-stage technique. The first step is to choose relevant and precise keywords. Numerous scientific databases are searched using these terms. Creating a research database structure with analytical categories and selection criteria is the focus of the second stage. The third and last step is to generate a summary table for analysis purposes and enter the data into the research database. This method's exclusive reliance on internet search results is one of its drawbacks. But since the majority of papers are available online, prejudice in this instance is not very noticeable [7].

3. AlUla Framework for Inclusive Community Development through Tourism

At the 2020 G20 event held in Saudi Arabia, the World Tourism Organization (UNWTO) and the G20 Tourism Working Group have developed a Framework AlUla for Inclusive Community Development through Tourism to help fulfill the potential of the sector to contribute and achieve development inclusive communities and the Sustainable Development Goals. This framework provides guidance and inspiration to all governments, as well all other key stakeholders in the tourism sector included regional and local governments, the private sector, industry associations, civil society, communities and tourists – with the aim of fostering truly holistic tourism. and an integrated approach to community development.

Figure 1. AlUla Framework for Inclusive Community Development through Tourism [30]

In pillar 3, prosper, the first program is strengthens the role of innovation, digitalization and entrepreneurship in the national tourism strategy and the third program develops, maintains and updates tourism infrastructure which can become the basis for action in the field of information technology in carrying out tourism innovation. Meanwhile, to become a potential tourist, there are at least several criteria that must be met, namely as follows.

To achieve the outcomes of these pillars, several criteria related to information technology need to be met so that tourism potential can be maximized, including :

1. internet penetration
2. internet speed and usability
3. internet security level.
4. Result and Discussion

This research uses databases from Scopus and the Web of Science. Searches use keywords and are limited to title, abstract, and/or keywords in the first stage. The keywords used are "rural tourism" and "rural internet". The second step is to use filtering using two exclusion criteria, namely determining only articles in English and published during the period 2013–2023. Based on analysis on bibliometricshiny as of September 4, 2023, a search using these two keywords resulted in 137 journals.

Table 1. Data Documents

Years	Total Document
2013	3
2014	2
2015	11
2016	3
2017	6
2018	5
2019	6
2020	9
2021	20
2022	50
2023	22
Totals	**137**

The number of journals has drastically increased, particularly in 2021 and 2022, as can be seen in the accompanying table. This is thought to be the result of COVID-19, as many travellers are searching for places to visit that are free of crowds, outdoors, and away from traffic.

China, with 70 journals, Spain, with 13, Poland, the USA, with 7 periodicals each, and the UK, with 5 journals, are the countries that publish the most journals about rural tourism and rural internet. One or two periodicals are contributed by other nations. The following are the papers with the highest number of citations, where Pesonen has the most relevant and most cited articles.

Table 2. The Most Cited Article

Paper	Title	Keywords
Pesonen Ja, 2015, J Travel Tour Mark [9]	targeting rural tourists in the internet: comparing travel motivation and activity-based segments	segmentation, travel motivations, travel activities, ICT, Internet, rural tourism
Moghaddam Bk, 2013, Telecommun Policy [10]	factors affecting ict adoption among rural users: a case study of ict center in iran	ICT, Adoption, ICT Center, Rural Development, Iran
Polo Pena Ai, 2013, J Travel Tour Mark [11]	impact of customer orientation and ict use on the perceived performance of rural tourism enterprises	Rural tourism, customer orientation, ICT use, outcomes, scale
Krol K, 2019, J Hosp Tour Technol [12]	forgotten agritourism: abandoned websites in the promotion of rural tourism in poland	Abandoned websites, Agritourism websites, Forgotten internet, Historical function, Promotion of agritourism
Pesonen Ja, 2017, J Vacat Mark [13]	activity-based market segmentation of rural well-being Tourists: comparing online information search	Activity segmentation, Finland, information search, market segmentation, rural tourism, well-being
Zhu W, 2021, Ecol Inform [14]	rural smart tourism under the background of internet plus	internet plus, rural tourism, smart tourism, system construction
Wei H, 2021, J Ambient Intell Humaniz Comput [15]	integrated development of rural eco-tourism under the background of artificial intelligence applications and wireless internet of things	Artifcial intelligence · Wireless internet of things · Eco-tourism · Integrated development

Tourism development has been seen as a solution capable of creating positive change through the idea of sustainable tourism [16]. Sustainable tourism has played an important role in identifying ways to gain positive benefits, as well as existing regulatory and development control approaches [17]. In addition, Liu[18] defines sustainability as the important role of the state in preparing steady progress in living conditions for future generations. In this case, Liu further defines sustainable development as a process related to managing change that leads to improved conditions for those involved in the development. Meanwhile, sustainable tourism is defined as all types of tourism that are compatible with or contribute to sustainable development. Sustainable tourism requires tourism growth that contributes to the economic sustainability of society and the sustainable use of environmental resources [18].

Rural tourism grows and develops as an integral part of the environment, in a sustainable way, maintaining local identity and restoring lost activities such as subsistence farming [19]. The sustainability of rural tourism lies in the fact that it is compatible and complementary with traditional activities and does not replace previous income. In addition, rural tourism preserves the entire habitat, values and lifestyle of the village. Considering the busyness of urban life, rural tourism has become a preferred and suitable alternative for tourists, especially for tourists from developed countries. To society in the 21st century, large hotel chains and entertainment centers increasingly look similar and inadequate. Urban tourism lacks identity and does not have special added value from the natural

landscape or environment. This is what then becomes the advantage of the rural environment. This is a great opportunity for rural communities to supplement their sources of income from the agricultural sector. In addition, with the development of rural tourism, this will increase demand for infrastructure improvements which will provide benefits to the people living in the area [20].

Since 2000 information and communications technology (ICT) has changed the tourism industry [21] and in particular how tourists search for information. Understanding the composition of information available to online travelers enables the development of successful marketing programs [22]. However, segmentation in the context of ICT is still rarely discussed in tourism research literature [9]. As more and more consumers use the internet as an important source of information in searches, it becomes important to develop a segmentation plan to promote and market products using the internet. Generally, rural tourism businesses are micro and small and medium enterprises characterized by part-time tourism activities, limited financial resources, limited entrepreneurial skills and low commitment to long-term business development plans [23].

Despite these drawbacks, reaching rural tourism customers using the internet is a cost-effective and efficient strategy. Websites, according to Beldona and Cai [24], offer the appropriate resources to complement the primary marketing techniques used in rural tourism. A cursory examination of prior research indicates that rural tourism has not made the best use of online marketing tools [9]. Pesonen's research examined Facebook usage patterns for rural tourism in Finland and contrasted the findings with those of major travel agencies. Consequently, it was discovered that, in comparison to huge corporations, Facebook sites for rural tourism had less important pages and had less engagement. Pesonen added that marketing presents a significant challenge for companies engaged in rural tourism. Beldona and Cai [25] analyzed 50 United States rural tourism websites and found that rural tourism websites were mostly driven by vertical content and showed poor interactivity.

ICT development has been successful in enhancing livelihoods, particularly by expanding local populations' income prospects. ICT is regarded as a tool for community development and livelihood assistance. Moghaddam and Abadi developed a conceptual model that takes into account a number of variables, including technological, individual, and environmental aspects, when building ICT centres in rural regions [26].

The cloud data center is the technical basic part of smart tourism construction, and provides data sources for the construction and application of business application systems of various components of rural smart tourism. The construction of the smart tourism cloud data center is centered on co-construction, sharing, and interconnection [14].

A fundamental technological component of smart rural tourism is the cloud data centre, which offers data sources for the creation and deployment of different business application systems that are part of the tourism's components. Co-construction, sharing, and interconnection are key components in the building of a cloud data centre for smart rural tourism. Cloud data for smart tourism classifies and manages all of the databases that comprise smart tourism using data warehouses and cloud computing technology [27]. Cloud computing technology is used to supply information and computing service data for different application systems through a shared service platform, based on data integration management. Cloud data centres have introduced new techniques for processing, storing, transmitting, and gathering data.

Data transmission in a cloud data centre is the process of sending information from one electronic file to another. Data streaming over a channel or point-to-point is used to accomplish this. Data centre storage refers to the hardware, systems, and computer solutions that allow data and application retention within data centre buildings. A data processing centre is a place where the necessary

information is processed using contemporary digital and telecommunications technology [28]. Virtualized computing power is usually shared by users, while cloud services grant them exclusive use of certain computer programmes, memory, and network hardware [29].

The decision support system architecture for smart tourism marketing includes four levels [30] :

1. Data warehouse management layer
2. Data layers
3. Decision analysis layer

4. Application layer.

A cloud database is a structured collection that is supplied as a management solution on a cloud platform for analysis, scalability, and ease of use. The data layer is a common entity that gathers data from websites, including online chat, maps, and statistics (Fig.2).

Information technology configurations in tourism are becoming more and more widespread due to the quick development of smart tourism. The antiquated nature of rural tourism has been successfully altered through the application of information technology. A smart rural tourism system would modernise rural tourism further, make it easier for travellers to enjoy rural travel, and promote the industry's continued growth. F. Shang and Zhu [31] .

4.1 Internet Penetration

Digital penetration, entrepreneurial passion, and social network relationships act as positive mediators in the relationship between digital penetration and villagers' tendencies toward entrepreneurial behavior in tourism, serving as opportunity, motivation, and capability factors, respectively. Digital penetration has a direct positive impact on villagers' tendencies toward entrepreneurial behavior in tourism [31]. A number of facets of rural socioeconomic life are being rebuilt by the digitization, networking, and intelligence of new infrastructure and technological frameworks. Digital products are becoming an essential component of villagers' everyday lives, and digital technology is being incorporated into their routines. Digital technologies, facilities, and platforms have become more popular and widely used in rural tourism as a result of their extensive penetration into these areas.

Travelers are the primary service objective of the planning of rural tourist areas. Its goal is to provide tourists with a better tour experience by developing a range of cultural tourism initiatives that integrate rural and regional cultural traits and are tailored to local requirements [14]. The business can increase its earnings and unit size with the help of the Internet. The tourism destinations business, which has been running in the traditional way, needs a new design to help adapt to the Web development trend.

4.2 Internet speed and usability

Research indicates that there are still differences in broadband availability between urban and rural locations, despite significant advancements in rural broadband availability and use in recent years [32]. A greater number of people in remote areas now have access to the Internet thanks to the efforts of local governments and ISPs. However, due to the demand for Internet traffic, many networks are unable to provide the basic quality of service required to run even basic applications, let alone more complex ones like video chats and fintech services. While total Internet access varied little geographically between rural and urban regions of Britain, Farrington et al. [33] observed that

significantly differing connection speeds led to continuous variations between Internet use in deep rural and urban areas, which offered evidence of of an urban-rural digital divide and ways in which this divide was manifested.

4.3 Level of internet security

Nowadays, trust is a crucial component of any online transaction. As a result, maintaining credibility should be a top priority for the internet travel industry, particularly in developing and consequently more vulnerable areas like naval tourismF. As a result, both suppliers and visitors need to be certain that the information and data they offer is secure. In fact, in a direct cyberattack, identity theft using stolen personal data is possible if the target is the data owner. Since the public cannot trust a system that jeopardizes their financial assets, there is a clear correlation between trust and secure e-commerce transactions in the first example.

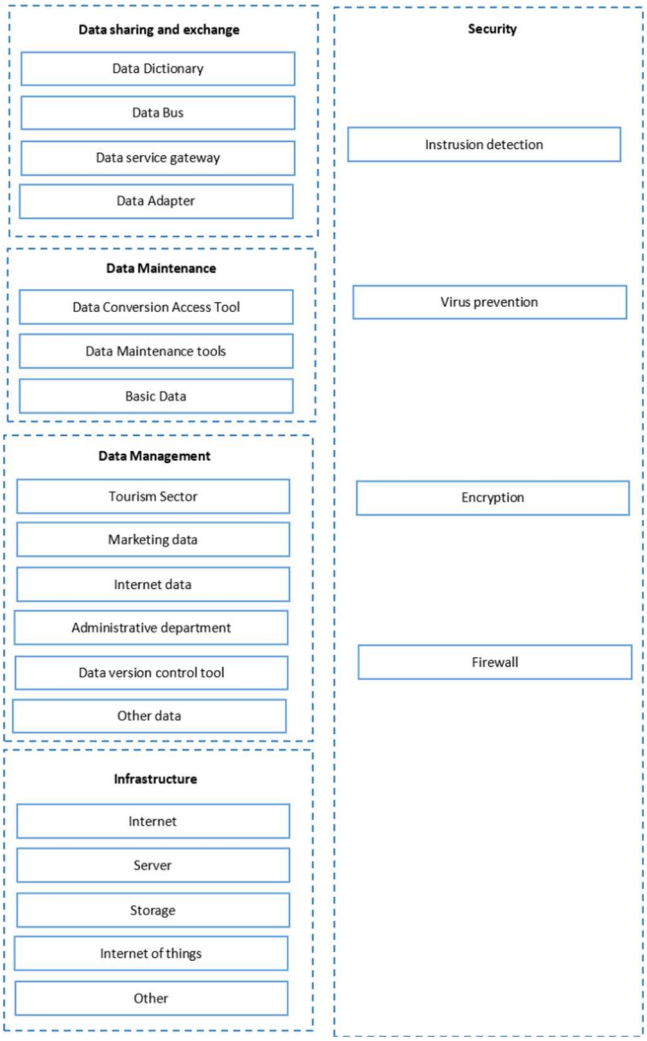

Figure 2. System Architecture for smart rural tourism cloud data center

5. Conclusions

Based on the results of analysis of research related to digital rural tourism, there has been a significant increase from year to year with peak increases in 2021, 2022 and 2023. This increase is due to the post-Covid19 pandemic bringing a different form of tourism. China is the country with the most publications related to digital rural tourism with the most cited paper being from author Pesonen Ja

with the research title targeting rural tourists on the internet: comparing travel motivation and activity-based segments. To achieve sustainable digital rural tourism, there are at least several factors related to internet infrastructure that must be met, namely internet penetration, internet speed and usability, and internet security level.

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