RESEARCH PAPER

Unlocking the Potential of Rural Homestays in Sikkim: A Study on ICT Adoption and Digitalization

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ABSTRACT

The study examines the effects of adopting Information and Communication Technology (ICT) and digitalizing rural homestays in Sikkim, India. Employing a convenience sample of 251 participants, the research explores how ICT usage varies across geographic locations. Independent T-tests reveal a significant difference in ICT utilization between rural and urban areas. Further analysis using regression analysis and moderation techniques with software like SPSS and AMOS demonstrates a positive and significant relationship between digitalization level and customer satisfaction. Interestingly, the study finds that the level of ICT competence among homestay service providers moderates this relationship. Homestays with higher ICT skills benefit more from digitalization initiatives in terms of customer satisfaction. These findings highlight the importance of considering both geographic location and ICT competence when implementing digitalization strategies to unlock the full potential of rural homestays in Sikkim.

Keywords: Rural Homestays, ICT adoption, Digitalization, Customer satisfaction, Digital Divide.

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1 INTRODUCTION

For generations, people have been turning their homes into profitable businesses by renting them out as bed and breakfasts. But in the past 20 years in particular, this has taken on new dimensionsas a result of extensive remodeling of certain rooms of the house to accommodate guests while the owners continue to reside there. Often referred to as "homestays," these resident-host home sharing arrangements have introduced a new layer to the sharing economy and the cultural exchanges between guests and hosts in a fresh light. Moreover, the goal of the homestays is to provide guestswith a cheap place to stay, a feeling of belonging, an opportunity to meet people, and a taste of theculture without breaking the bank(Kuhzady et al., 2022)(Kulshreshtha & Kulshrestha, 2019).

According to (Novandi & Adi, 2019), homestays are quickly becoming a well-liked substitute forthe conventional hotel industry. Younger travelers especially favor homestays since they give them the chance to see the host country's real culture and unspoiled natural settings. Selecting a homestay is also frequently viewed as practical because it is less expensive and free of various taxes and additional expenses. Sustainable rural tourism is booming, and this product is just gettingready to become a hotspot for host-guest interactions (Walter et al., 2018). Environmental, cultural, and local job preservation are the key objectives of sustainable community-based tourism, and it is well-positioned to achieve all three.

The increasing attention that academic interventions have received over the past ten years also suggests the growing significance of homestay hosting. Janjua et al. (2021) (Janjua et al., 2021) conducted a thorough literature assessment and found that between 2010 and 2020, more than 100 publications were published in 35 prestigious academic journals. The writers also made an effort to record the important topics that are rarely spoken or studied, such as homestay operator development, entrepreneurship, branding, and information and communication technology (ICT) proficiency. The focus of academic involvement has primarily been on the advantages and difficulties of homestay tourism, particularly in light of its potential to become a mass market commodity and the

inevitable degradation of authenticity, neither of which have gotten much attention up to this point. Additionally, it was seen that homestay operators, in particular, in rural areas lacked critical branding and marketing skills.

Technological advancements have brought about major changes in the way homestays operate and have enabled homeowners to sell their rooms to a worldwide customer base. Travelers now have more freedom to plan, book, and suggest destinations to others thanks to digital technology tools, but there are new hurdles for destination managers and marketers as well as other supply chain participants. Nonetheless, the most notable consequence of the technological disruptors, known as online travel agencies (OTAs) in the travel industry, was redistributing the market's power to the advantage of travelers and the platforms in charge of data ownership and control.

An enterprise operating in two or more-sided markets that makes use of the web to enable communication across distinct yet interconnected user communities to create value for at least one of the groups is referred to as a "online platform." (Union European). A middleman or agent whosells travel-related goods and services, including airlines, auto rentals, cruise lines, hotels and accommodations, trains, and holiday packages on behalf of suppliers via the internet is known as an online travel aggregator (OTA) in India. They create an internet marketplace and profit from the supplier's discounts, often called commission. (Tourism Ministry, 2018). It may be argued that homestays give the locals a chance to participate in profitable side ventures, while also allowing visitors to visit areas without official hotels and spend valuable time with the locals.

1.1 Concept of homestays

A "home stay" is a visit to someone's home in a far-off country where visitors are allowed to rent aroom from a neighboring family in order to make arrangements to become fluent in the language, culture, and way of life of the area. It could be a lifestyle choice promoted by a have-or have- family that entails staying in their furnished home. A domestic visitor would be lodging in a community that resembles a house and has communal living areas, amenities as well as etiquette. Stay period may be day-by-day, week-by-week, month-to-month, or indefinite, and utilities and meals are usually included unless they have waterways specified otherwise. Rivers, cut off from ease of access, Domestic Remain offers a series of activities that provide guests a unique chance to engage with the specific culture of the area.

Activities will vary based on the region and from one family to another. Providing morning alms to monks, studying silk or cotton weaving, working in the fields, going on nature hikes, and acquiring a skill used by the local population, like crafting handicrafts or cooking Thai food, are just a few of the things you can do during a home stay in Thailand. In Japan, the craft of dollmakingis taught.

Many homestays in Kerala, India, provide canoe journeys down the contract canals and houseboat excursions in the backwaters. Some Rajasthani homestays provide tours of the surrounding countryside by vehicle or horseback, where guests may see tribal villages and wildlife preserves. Manor and slope stations offer guided walks through timberlands and aromatic gardens, as well astrekking opportunities for guests. Many families, depending on their needs, will volunteer to have guests see the town's attractions while imparting local knowledge and an experience that goes beyond the typical visitor walk. Domestic remains are an occasion aim in and of itself; they're not really a basis from which to explore the surrounding area for several days. (Budhathoki, 2013) described the homestay as beingrun by a tourist or as a traveling study assistant who is helped by a local family. Homestays can occur anywhere in the world, and the people who live in homestay-friendly nations encourage homestays to help build their countries' tourism economies. Furthermore, the idea of homestays unites people from many backgrounds under one roof and provides an ideal setting for long-term fellowships.

1.2 Homestay in Sikkim

Sikkim is a small, steep state in the Eastern Himalayas that stretches 64 km in length and 114 kmin length from North to South. Geologically, the area from east to west adds up to 7096 sq km. Six districts make up the state, with sixteen subdivisions as well as eight municipalities rounding out the administrative structure. Under the shadow of the third-highest peak in the world, Mount Kanchendzonga (8598 m), lies Sikkim, the 22nd state of India. The State is endowed with an abundance of typical assets. Sikkim has a distinct culture and customs. The Lepcha, Bhutia, and Nepali communities are three significant Sikkimese communities. It's one of the most tranquil statesin the union. There is a strong feeling of communal living and a clear commitment from each personto support society.

To encourage ecotourism and social tourism in the mountainous areas of South and Central Asia, the Sikkim-Himalayan Domestic Reserve was proclaimed by UNESCO. The Government of Norway backs it with the backing of Andorra's territory. In order for local inhabitants to fully participate in the job possibilities and income-generating activities that tourism provides, The Extended seeks to encourage engagement among nearby communities, national and international non-governmental organizations, as well as visitor groups.

Promoting community-based tourism and making sure surrounding communities completely benefit financially from low-impact tourism are the goals of Sikkim Himalayan Domestic Tours. Furthermore, they may have their unique environments and social legacies maintained for future generations, while local populations can have their needs met via tourism. One potential non- governmental organization (NGO) in the state of Sikkim that prioritizes sustainability and preservation is the Ecotourism and Conservation Society of Sikkim (ECOSS). To that aim, this study sets out to examine and make sense of how rural homestays in Sikkim could benefit from the widespread use of digital tools and ICT. The study intends to uncover potential and problems related to technology integration in the hospitality sector by examining the present state of ICT usage and digitalization practices among rural homestay owners and operators. The project aims to offer insights and suggestions for utilizing ICT tools to improve the visibility, accessibility, and sustainability of rural homestays through empirical research and analysis, thereby promoting the socioeconomic development of rural communities in Sikkim.

1.3 Tourism Industry of Sikkim

There has been substantial growth in domestic and international tourists in Sikkim over the last three decades. Tourists from all over the world are flocking to different destinations. The yearly growth rate of visitors was around 12% from 1980 to 2013. There are primarily two seasons for trekking: March–May and September–November. Europe is the state's largest tourist market sincemost international trekkers originate from the United Kingdom, the United States, Germany, France, Australia, the Netherlands, and Switzerland. The financial benefit accrued from the tourism sector is indirect. Nevertheless, the department has collected a total revenue of Rs. 372.52lakhs during the tenth plan period from various assets of the government. The tourist industry in Sikkim has been winning national awards for the North East region's finest performance for quitesome time.

The number of tourists visiting Sikkim had just begun to rise when the state merged with India. Even following the merger, the rise in the growth rate remained low until the 1980s since many mountainous locations were still off-limits to visitors or had other restrictions on access. As additional regions became exempt from the permission regime in the most recent 10 years of the century and Sikkim acquired recognition as an up-and-coming tourist destination, tourism growth increased significantly. Between 2010 and 2017, A state's population is either beyond or equal to the number of visitors, indicating a notable boom in tourism. Stunning landscapes abound in Sikkim, from verdant valleys to snow-capped mountains.

Initially starting in the east districts (Gangtok), mostly tourism centers and circuits slowly expanded to Lachen, Pelling, Rabong, Yuksom, etc. “Trekking along the Yuksom- Dzongri-Goechala trail”, which had started to gain popularity in the days prior to the merger, is now a popular type of adventure tourism. In 1988, the state government decided to open Tsomgo Lake to visitors. Since Gangtok, the state’s capital is just 35 km away, it quickly became the most convenient place for visitors from West Bengal to see snowfall. Following this, Nathula was made accessible, allowing travelers to go all the way to the old mountain pass’ Chinese border. Similarly, relaxing permissions in “West Sikkim, Zuluk in East Sikkim, Gurudongmar Lake, Yumthang Valley, and Yumesamdong in North Sikkim” saw an increase in tourist traffic. These were watershed moments in Sikkim’s tourist history. This was additionally supported by the decision of the government in 2010 to permit central government employees to take advantage of leave travel concessions by air to the “Northeast region (NER)”, as only in recent years has the government extremely appreciative “Go East Policy” has attempted to break-down the barriers to NER socio-economic development (Das, 2019).

1.4 Objectives

- To assess the significance of the difference in ICT utilization between rural and urban areasof Sikkim.
- To investigate the relationship between digitalization level and customer satisfaction in thecontext of rural homestays in Sikkim.
- To investigate the moderating role of ICT competence in the relationship between digitalization level and customer satisfaction.

1.5 Hypothesis

- (H_0): There is no difference in the ICT utilization between rural and urban areas of Sikkim.
- (H_1): There is a significant difference in the ICT utilization between rural and urban areas of Sikkim.
- (H_0): There is no significant relationship between digitalization level and customer satisfaction.
- (H_2): There is a significant relationship between digitalization level and customer satisfaction.

2 (H_3): The competence of ICT moderates the relationship between digitalization level and customer satisfaction LITERATURE REVIEW

2.1.1 ICT Utilization

A growing number of academic institutions are studying the impact of IT on the tourist industry. Research is being conducted on the technologies themselves as well as their use by tourism experts, tourist locations, and travelers themselves. After analyzing data from 18 different European nations' internet user populations, researchers found a robust correlation between ICT and the volume of online bookings. (Ramos & Rodrigues, 2013). An analysis of EU member states in the Mediterranean region revealed a definite positive correlation between Internet usage and traveler arrivals. (Mavri & Angelis, 2009)

(Buhalis, 2003) gives several instances of how the tourism industry has developed in relation to global ICT, including but not limited to: computerized reservation and management systems; airlines; hotels; tour operators; travel agencies; and other related fields. There is currently little proof that ICT is being used in Slovenia's tourist industry. As a result, we provide some information on the many kinds of planning and booking websites that are accessible for industrialized nations, some of which have already been adopted or are very likely to be done so in the near future in the Slovenian tourism industry. (Adeola & Evans, 2020) analyzed the data from 1996 to 2016 to determine the correlations between infrastructure, information and communication technology, and the expansion of Africa's tourist industry. Increases in information and communication technology (ICT) and infrastructure development are positively and statistically associated with an increase in tourism, according to their research. Thus, ICT and infrastructural development have created enormous prospects to boost African tourism.

A study by (Lee et al., 2021) discovered that secure web servers, mobile subscriptions, and fixed broadband subscriptions all had a good effect on the arrival of overseas visitors, but that tourism receipts in countries with the highest revenues are negatively affected by mobile and, in particular, computer-based communications and subscriptions. (Amaro et al., 2021) gave a summary of how ICTs are used in religious tourism, demonstrating their value in this sector of the travel business as well. The article discusses many uses of ICT for religious tourism as well as efficient management strategies for religious locations, occasions, and pilgrimages.

This generation is also known for its high degree of travel, which is a result of their openness, curiosity, and eagerness to discover new and varied experiences. This generation is heavily reliant on technology, they mostly purchase travel-related goods online, where they may also get travel-related information. (Giovannini et al., 2015).

2.1.2 Digitalization level

The fast development of digital technology has caused the tourist sector to experience fundamental changes. Digitalization has permeated various aspects of the tourism business, from marketing and customer interactions to operations and service delivery. With any luck, this literature review will provide a concise summary of the present studies on the degree of digitization in the tourist industry. Numerous studies have examined how digitization affects the long-term viability of the tourist sector from both a social and economic perspective. According to a survey that spanned a decade, A great deal of study has focused on the digitalization of sustainable tourism's social component, taking into account the viewpoints of both visitors and locals(Jiang & Phoong, 2023). Nevertheless, studies that thoroughly investigate how sustainability in society and economy mightbe integrated are few.

Eight major themes emerged from a bibliometric analysis of 3,683 articles published between 2013 and 2022 that dealt with digital transformation in the tourist industry. Among these topics are digital marketing of destinations, cultural heritage, social media, data analytics, city and urban planning, smart tourist management, digital marketing of destinations, and ecologically friendly and economic development. The poll also revealed seven topics connected to COVID-19, the most prominent of which were smart analytics, marketing tactics, and sustainability. (Madzík et al., 2023)

The convergence of the internet and service sectors has created a new tourist economic environment, according to studies. Digital technology usage is booming, with an average yearly growth rate of 72.2%, according to a poll of top tour operators as

well as hotels in Ukraine. Someof the most popular technologies nowadays include virtual reality (VR), chatbots, smartphone apps, mobile registration, and contactless payments. (Boiko et al., 2022)

Both Russian and international scientific discourses have noted a growing interest in digital tourism. Sensors that record visitors' interactions with their surroundings are the backbone of whatis known as "digital tourism," which aims to bridge the gap between the digital and physical realms. While several perspectives on "digital tourism" have emerged in academic and popular discussions, no universally accepted definition of the word has emerged as of yet.(Kononova et al.,2021)

2.1.3 Customer Satisfaction

According to Sadeh et al. (2012), Ensuring client happiness has become crucial for the success ofany company, particularly those in the tourism industry. Service encounters and their effects on consumers' level of satisfaction are two-way streets, the notion of customer satisfaction is not a straightforward procedure. When we talk about customer happiness, we mostly mean them as customers. Hence, in consumer-focused meetings, advertising, and vision and purpose statements, businesses should pledge to make customers happy. Customers' negotiating power rises as the number of firms and items they may choose from increases, giving them more options. Customersare becoming more worried about a product or service's utilization. Accordingly, the client plays a pivotal role in gauging the efficacy of the business's offerings (Kotler & Keller, 2009). According to Chen and Tsai (2007), customer satisfaction is a psychological notion that encompasses the well-being and joy that customers experience as a consequence of receiving goods and services that meet their expectations.

Additionally, according to Van Vuuren et al. (2012), tourists' emotional responses to service performance expectations versus actual performance perceptions gained through physical interaction with goods and services businesses make up their level of satisfaction. Customer satisfaction is directly correlated to the degree to which real service meets or exceeds expectations. The consumer will be very pleased if the service they got is comparable to what they anticipated. It will be very pleasant, nonetheless, if the anticipated service exceeds the actual service that is provided.

Profits and revenues for service companies may rise when visitor satisfaction rises. According to Dmitrović et al. (2009), an increase in brand equity, word-of-mouth advertising, repeat purchases, and a willingness to pay a premium are all significant outcomes of satisfied tourists, which in turn have important implications for management. Among the many advantages of customer satisfaction are the following: isolating clients from rivals, developing a sustainable advantage, lowering the cost of failure, attracting returning consumers, driving loyalty, generating a campaignwith positive word of mouth (WOM), and lowering the cost of acquiring new customers. (Lovelock & Wright, 2005)

2.1.4 Competence of ICT

There are three main types of information and communication technology (ICT) competencies: a) digital literacy, which deals with basic skills like using computers to research topics, create and edit presentations, and share and receive information; b) implementation, which involves creating and managing complex projects, solving real-world problems, working with others, and utilizing information and expert networks; and c) ethical, legal, as well as accountable use of ICTs (UNESCO, 2008).

The United Nations Organizations (UNO) addressed the role of ICT in its sustainable developmentagenda of 2030. Promoting and attaining the 17 objectives as well as 169 targets of UNO's sustainable economic growth, ICT is playing a significant role. Information and communication technology competence is defined as the degree to which an organization understands and effectively utilizes ICT to manage its own data. The three parts of information and communication technology competence deal with resources that show how well the company understands and can utilize the procedures and tools that are anticipated to handle consumer and market data (Tippins & Sohi, 2003).

IT Objects, IT Operations, and IT Knowledge make up an IT competent tourism business. The conceptualization of ICT objects is computer software, hardware, and support people (Tippins & Sohi, 2003). ICT operations are conceptualized as the degree to which a firm uses ICT to oversee market and customer data (Tippins & Sohi, 2003). ICT Knowledge is conceptualized as the degree to which a firm has specialized computer- based systems knowledge(Tippins & Sohi, 2003).

2.2 Hypothesis Development

H1: There is a significant difference in the ICT utilization between rural and urban areas of Sikkim

(Chakraborty & Chakma, 2016) examines rural economic and social development at the level of the Gram Panchayat Unit (GPU), with a particular emphasis on the Gyalshing sub-division. Key factors in social growth, according to the results, include population density and level of education.

(Appalla Nag Shankar, 2021) examines the impact of ICT on students in B-Schools in Sikkim, focusing on their perception and behavior. A paradigm for understanding pedagogy, attitude, and ICT usage is the Unified Theory of Acceptance with usage of Technology (UTAUTH). The study also examines the association between students' perception and behavior with demographic attributes. The results suggest that students are generally vigilant about blended ICT materials and talks. (Pandit & Pandit, 2011) The report emphasizes the benefits of ICTs for governments, such as improved transparency, efficiency, and cost-effectiveness. IT applications facilitate access, storage, processing, organization, and data transfer, ensuring quick and reliable information for citizens. (Bala, 2020) Delves into the significance of ICT in alleviating poverty in India. They imply that information and communication technology (ICT) has the ability to expand people's access to healthcare, schools, and government programs, but that realizing this promise is difficult.Researchers in the Ratnagiri area of Maharashtra discovered that rural farmers there have been slow to embrace ICT. (Cecchini & Scott, 2003). The usage of information and communication technology tools was not considerably impacted by factors like gender, land ownership, or preferred technology. According to the research, in order for farmer groups to effectively utilize ICT, it is essential to encourage and support their usage of tools like the internet as well as home phones. Improving access to market information might also be achieved by establishing IT-basedinformation centers in rural regions.

H2: There is a significant relationship between digitalization level and customer satisfaction.

(Al-Shorman et al., 2021) explores customer expectations, experience, and satisfaction in the UAE's digital telecommunications industry, finding a strong correlation, in keeping with the theories of evaluation consistency and expectation-disconfirmation. (Zouari & Abdelhedi, 2021) analyzes how Islamic banks' customers are faring as a result of digitization. It adds two dimensions, digitalization and compliance, to the SERVQUAL model. All aspects of service quality (excluding tangibles) correlate positively with customer satisfaction. The study suggests that Islamic banks must adapt to the digital era for customer satisfaction. (Hadjielias et al., 2022) study explores strategic agility in tourism, focusing on customer, partnering, and operational agility capabilities. It highlights how these capabilities enable organizations to effectively utilize digital technologies for customer value creation and delivery. (Demirel, 2022) explores the role of customer-centered management systems in CRM using digital services, revealing positive relationships between service quality and customer satisfaction, suggesting that high satisfaction can enhance firm performance.

H3: The competence of ICT moderates the relationship between digitalization level and customer satisfaction.

(Wang et al., 2020) examines how digital transformation strategies (DTS) affect Chinese organizations' performance from a variety of angles, including "Skewed conflict," "minority dissent theory," as well as "too-much-of-a-good-thing." Multiple linear regression analysis and empirical data are used to test hypotheses in the study. The results reveal that cognitive conflict moderates the beneficial association between DTS and both immediate and long-term financial success. With an emphasis on corporate strategy and the micro-psychological processes behind DTS's influence, the study offers a fresh theoretical viewpoint for future studies in IT/IS, DTS, and digital strategy. Kohtamäki et al. (2020) investigates how industrial organizations' bottom lines have been affected by digitalization and servitization. It casts doubt on the linear assumption and points to an interaction effect with a nonlinear U-shaped profile. The impact is unfavorable for low to moderate digitalization and improves for moderate to high digitalization. The study highlights the importance of digital servitization in driving financial performance and demonstrating data- driven manufacturing companies. (Li et al.,2023) investigates the mediation of brand competency and warmth, regulated by brand familiarity, in the link between brand digitization and market performance. Brand familiarity moderates the effect of digitalization on brand performance in the market. Based on consumer familiarity, the report recommends that brand managers use digital technology into brand management and create communication strategies that highlightdigitalization. Furthermore, it clarifies how consumer brand reaction relates to digital technology use.

3 METHODOLOGY

3.1 Research Design

With the use of quantitative technique, this research sought to identify the demographic parameters linked to the use of ICTs in rural homestays. A cross-sectional design was implemented to collect data at a single point in time from participants representing different demographic backgrounds.

3.2 Sampling

The participants in the research were chosen using a convenience sampling approach. A sample size of 251 respondents was chosen based on feasibility and resource constraints. Participants were recruited from various rural homestays across different regions of Sikkim.

3.2.1 Random Sampling

Each and every one of the people who may be a part of a sample has an equal shot of getting chosen via random sampling. Picking a subset of a population at random usually yields results that are moreindicative of the whole. When collecting information from a big population, random sampling is one of the easiest methods to use.

The following is the formula for random sampling when just one sample is taken from the population:

$$P = 1 - \left(\frac{N-1}{N}\right)\left(\frac{N-2}{N}\right)\ldots\left(\frac{N-n}{N-(n-1)}\right)$$

3.3 Data Collection

3.3.1 Primary Data Collection:

- Surveys: Use structured questionnaires to gather firsthand information from homestayowners, managers, and employees.
- Interviews: Conduct semi-structured interviews to explore participants' perspectives andexperiences in depth.
- Observations: Directly observe homestay operations to understand how ICT tools are usedin practice.

3.3.2 Secondary Data Collection:

- Literature Review: Review existing research on rural tourism and ICT adoption forbackground information and theoretical frameworks.
- Industry Reports: Consult reports from tourism organizations and government agencies forstatistics and trends in rural tourism and technology adoption.
- Online Databases: Search academic libraries and research repositories for relevant datasetsand articles.
- Official Records: Access government records and documents for data on homestayregistrations and policy frameworks.

3.4 Softwares used

- **SPSS (Statistical Package for the Social Sciences):** Data management, descriptive statistics, as well as inferential statistical analyses (including regression and independent t-tests) were all carried out using SPSS. It offers a user-friendly interface and a wide range of analytical tools suitable for quantitative research in social sciences.
- **AMOS (Analysis of Moment Structures):** In this work, moderation analysis was carriedout using AMOS, a statistical package for structural equation modeling (SEM). AMOSis apowerful tool for testing complex theoretical models and examining relationships among multiple variables through path analysis, mediation, and moderation.

3.5 Data Analysis

Statistics programs SPSS and AMOS were used to examine the gathered data. Several analytical techniques were employed, including:

- Independent T-test: Demographic factors including gender, age, marital status, income, education level, and place of residence were analyzed to see whether there were any disparities in the adoption and digitalization of ICT.
- Regression Analysis: In order to investigate the potential correlation between demographic variables and the use of ICT in rural homestays, regression models were employed. For the purpose of determining how various demographic factors affect technology adoption, multiple regression analysis was used.
- Moderating Analysis: Using a moderation analysis, we looked at the link between ICT adoption in rural homestays and other demographic characteristics (such as age and education level) to see whether any of them moderated the others.

3.6 Inclusion and Exclusion

Inclusion Criteria

- Participants involved in the management or operation of rural homestays in Sikkim.
- Individuals of all ages, genders, occupations, marital statuses, income levels, and educationlevels are eligible.

Exclusion Criteria

- Individuals unwilling to participate or who do not meet the specified inclusion criteria areexcluded.

3.7 Ethical Considerations

- • The rights and anonymity of participants were protected by adhering to ethicalprinciples all through the study procedure.
- • All participants provided their informed permission, and we took precautions to protecttheir privacy and identity.

4 RESULTS AND ANALYSIS

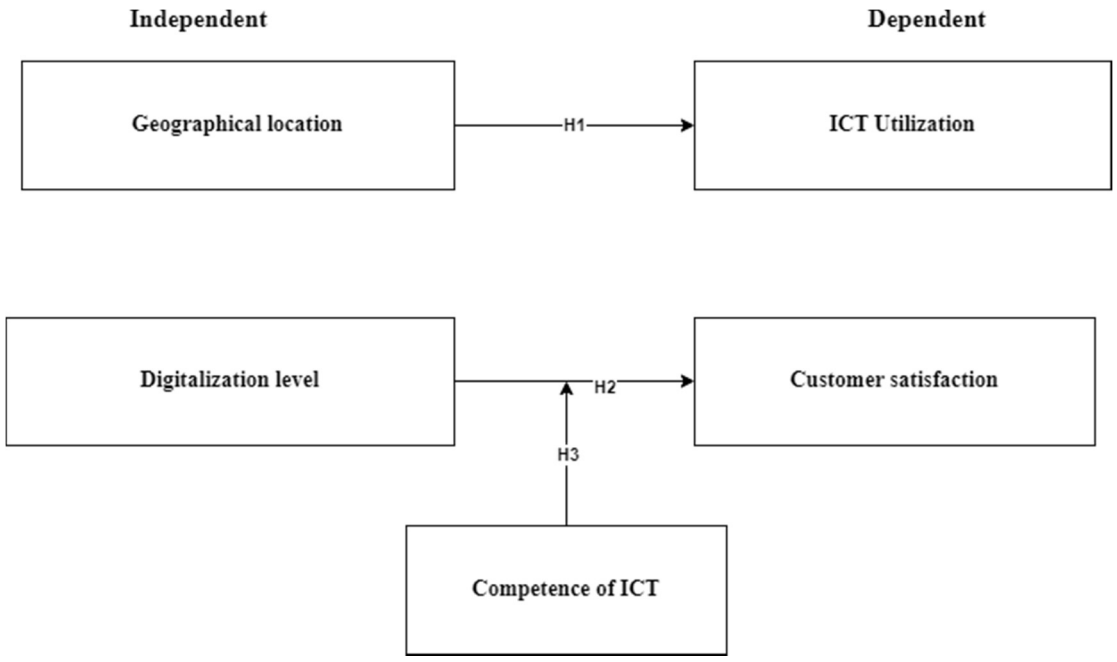


Figure 1 Conceptual Framework

4.1 Demographic Variables

Gender		**Frequency**	**Percent**	**Mean**
	Male	130	51.8	1.48
	Female	121	48.2	
	Total	251	100.0	
Age		**Frequency**	**Percent**	**Mean**
	25-34 Years	69	27.5	2.54
	35-44 Years	52	20.7	
	45-54 Years	55	21.9	

	Above 55 Years	75	29.9	
	Total	251	100.0	
Occupation		**Frequency**	**Percent**	**Mean**
	Entrepreneur	61	24.3	2.56
	Private Sector Employee	55	21.9	
	Self-Employed	68	27.1	
	Homemaker	67	26.7	
	Total	251	100.0	
Marital Status		**Frequency**	**Percent**	**Mean**
	Single	82	32.7	1.99
	Married	88	35.1	
	Others	81	32.3	
	Total	251	100.0	
Income Level		**Frequency**	**Percent**	**Mean**
	Less than Rs1,00,000/-	56	22.3	2.86
	Rs.2,00,000/- to Rs.3,00,000/-	55	21.9	
	Rs.3,00,000/- to Rs.4,00,000/-	51	20.3	
	Rs.4,00,000/-to Rs.5,00,000/-	46	18.3	
	Above Rs.5,00,000/-	43	17.1	
	Total	251	100.0	
Education Level		**Frequency**	**Percent**	**Mean**
	Secondary School	66	26.3	2.52
	High School Diploma	57	22.7	
	Bachelor's Degree	59	23.5	
	Master's Degree	69	27.5	
	Total	251	100.0	
Location		**Frequency**	**Percent**	**Mean**
	Rural	128	51.0	1.49
	Urban	123	49.0	

	Total	251	100.0	

This table indicates the gender distribution of participants based on their gender. Among the 251 participants, 130 were male (51.8%) and 121 were female (48.2%). On average, participants were scored at 1.48 on a scale related to gender, where higher scores might indicate a particular gender identification.

The age categorizes participants into different age groups. Among the 251 participants, the largest group was those aged above 55 years, comprising 75 individuals (29.9%), followed by 25-34 years with 69 individuals (27.5%), 45-54 years with 55 individuals (21.9%), and 35-44 years with 52 individuals (20.7%). The average age score was 2.54, suggesting a moderate age range across participants.

This classifies participants according to their occupation. Among the 251 participants, the highest percentage was self-employed individuals, accounting for 68 participants (27.1%), followed by entrepreneurs with 61 participants (24.3%), private sector employees with 55 participants (21.9%), and homemakers with 67 participants (26.7%). The mean occupation score was 2.56, indicating a diverse representation of occupations.

The marital status distribution of participants. Among the 251 participants, the majority were married, constituting 88 individuals (35.1%), followed by single individuals with 82 participants (32.7%), and others with 81 participants (32.3%). The mean marital status score was 1.99, suggesting a balanced distribution across marital statuses.

The participants based on their income levels. Among the 251 participants, the largest proportion fell into the income bracket of less than Rs1,00,000/-, comprising 56 individuals (22.3%), followed by Rs.2,00,000/- to Rs.3,00,000/- with 55 individuals (21.9%). The mean income level score was 2.86, indicating a moderate income level across participants.

The education level represents the educational attainment of participants. Among the 251 participants, the highest percentage held a master's degree, with 69 individuals (27.5%), followed by secondary school graduates with 66 individuals (26.3%), bachelor's degree holders with 59 individuals (23.5%), and high school diploma holders with 57 individuals (22.7%). The mean education level score was 2.52, indicating a relatively high level of education among participants.

The location categorizes participants based on their residence. Among the 251 participants, 128 resided in rural areas (51.0%), while 123 resided in urban areas (49.0%). The mean location score was 1.49, indicating a balanced representation of participants from rural and urban areas.

4.2 Proposed Hypothesis

Null Hypothesis (H_0): There is no difference in the ICT utilization between rural and urban areas of Sikkim

Alternate Hypothesis (H_1): There is a significant difference in the ICT utilization between rural and urban areas of Sikkim

Table 1 Group Statistics

	Location	N	Mean	Std. Deviation	Std. Error Mean
ICT_Utilization	Rural	128	3.3451	1.05807	.09352
	Urban	123	3.6450	.97439	.08786

Table 1 presents group statistics for ICT (Information and Communication Technology) utilization categorized by location, distinguishing between rural and urban areas. Based on data from 128 respondents, the mean score for ICT use in rural places is 3.3451, with a standard deviation of 1.05807 as well as a standard error mean of.09352. On the other hand, a somewhat higher mean ICT use score of 3.6450 was found in urban regions, with 123 respondents. The standard deviationwas lower at.97439 and the standard error mean was.08786. This table provides a snapshot of the distribution of ICT utilization scores across different geographic locations, offering insights into potential variations in technology adoption and usage patterns between rural and urban populations.

Table 1 displays the results, it appears that urban areas exhibit slightly higher ICT utilization compared to rural areas. The mean ICT utilization score in urban locations (3.6450) is slightly higher than that in rural areas (3.3451). However, further analysis, such as inferential statistics, would be necessary to determine if this difference is statistically significant.

Table 2 Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
ICT_Utilization	Equal variances assumed	7.025	.009	-2.334	249	.020	-.29993	.12853
	Equal variances not assumed			-2.337	248.555	.020	-.29993	.12832

The table below displays the results of an independent samples test that contrasted the usage of ICT in rural and urban areas of Sikkim. To begin, we checked whether the two groups' variances in ICT use ratings were equivalent using Levene's Test for Equality of Variances. The test yieldeda significant result (F = 7.025, p = 0.009), indicating unequal variances between rural andurban areas. Afterwards, ICT use was found to be significantly different between rural and urban regions,according to a t-test for Equality of Means that assumed equal variances (t = -2.334, df = 249, p =0.020). The mean difference in ICT utilization between rural and urban areas was -0.29993, with a standard error of 0.12853. Similarly, Even without assuming equal variances, the t-test revealeda statistically significant difference in the use of information and communication technologies (ICT) between the two regions (t = -2.337, df = 248.555, p = 0.020), with comparable means and standard errors. Accordingly, the findings disprove the null hypothesis and show that rural and urban Sikkim do, in fact, use information and communication technologies differently.

Null Hypothesis (H_0): There is no significant relationship between digitalization level and customer satisfaction.

Alternate Hypothesis (H_2): There is a significant relationship between digitalization level and customer satisfaction.

Table 3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.897[a]	.805	.804	.46845
a. Predictors: (Constant), Digitalization_Level				

The regression study that looked at the correlation between the degree of digitization and customer satisfaction is summarized in Table 3. According to the goodness-of-fit statistics of the model, a large portion of the variance in customer satisfaction may be attributed to the independent variable, digitalization level. The coefficient of determination (R^2) of 0.805 indicates that variations in digitalization level may explain about 80.5% of the variation in customer satisfaction. The model's predictive power is robust and not inflated by the introduction of extra variables, as shown by the high adjusted R^2 value of 0.804, which accounts for the number of predictors in the model. The average discrepancy between the anticipated and actual levels of consumer happiness, known as the standard error of the estimate, is 0.46845. Overall, these findings suggest that the regression model, with digitalization level as the predictor, fits well with the data and sheds light on the correlation between digitization efforts and consumer happiness.

Table 4 ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	225.538	1	225.538	1027.773	.000[b]
	Residual	54.641	249	.219		
	Total	280.180	250			
a. Dependent Variable: Customer_Statisfaction						
b. Predictors: (Constant), Digitalization_Level						

According to Table 4, the regression model that looked at the correlation between digitalization degree and customer satisfaction had an analysis of variance (ANOVA) for its findings. Both the regression model and the residual error contribute to the overall variation in customer satisfaction,which is broken out in the ANOVA table. The regression model demonstrates a statistically significant effect on customer satisfaction, as evidenced by a large F- statistic of 1027.773 (p <
0.001). This indicates that the variation in customer satisfaction explained by the regression model is significantly greater than what would be expected by chance alone. The sum of squares for the regression model shows that the predictor variable of digitalization level accounts for 225.538 of the variance in customer satisfaction. The residual sum of squares, representing unexplained variance in customer satisfaction, is 54.641.

The results show that there is a substantial association between the amount of digitalization and customer happiness, this necessitates accepting the alternative hypothesis rather than the null.
Hypothesis 3: The competence of ICT moderates the relationship between digitalization level and customer satisfaction.

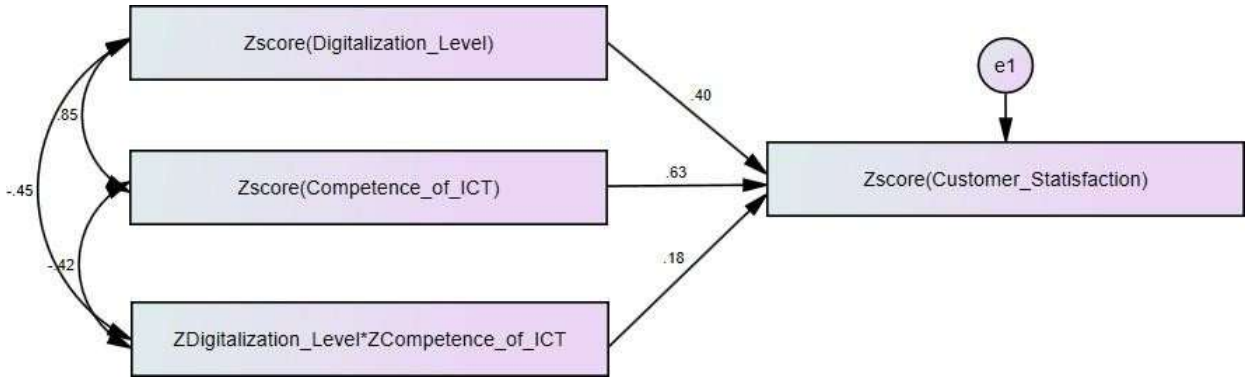


Table 5 Regression Weights: (Group number 1 - Default model)

Path			Unstandardized Estimate	S.E.	Standardised Estimate	C.R.	P
ZCustomer_Statisfaction	<--	ZCompetence_of_ICT	.672	.049	.628	13.739	***
ZCustomer_Statisfaction	<--	ZDigitalization_Level	.430	.050	.402	8.669	***

ZCustomer_Satisfaction	<--	ZDigitalization_Level*ZCompetence_of_ICT	.106	.015	.184	6.920	***

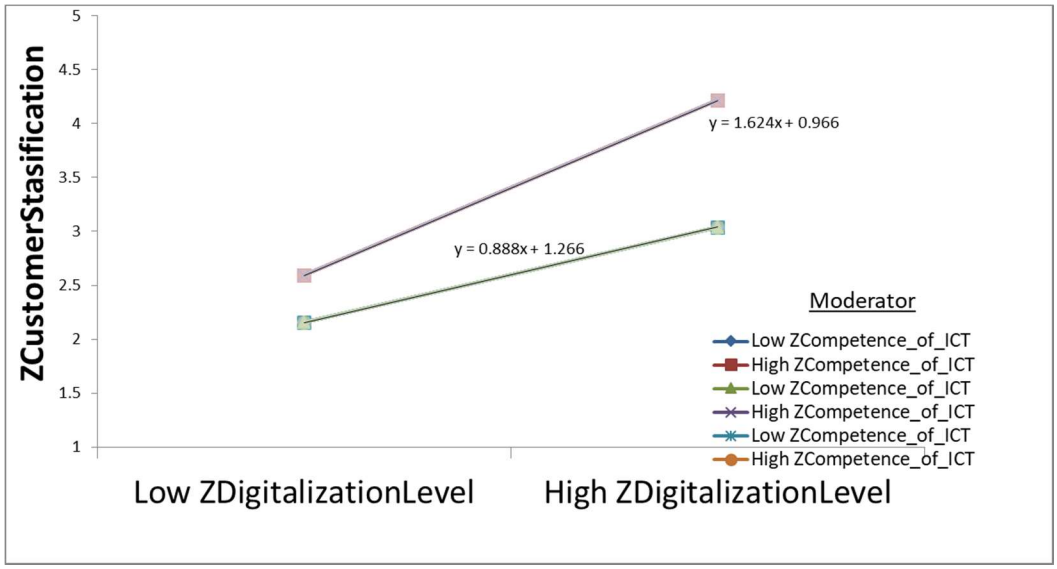
Table 5 presents the regression weights for the default model, looking at how the model's variablesare related to one another. All of the model's paths are laid out in the table, along with their respective unstandardized estimates, standard errors, standardized estimates, critical ratios, and p-values. The first path indicates the relationship between competence of ICT and customer satisfaction, showing a significant positive association with an unstandardized estimate of 0.672 ($p < 0.001$), suggesting that customer happiness is positively correlated with ICT competency levels. According to the second route, there is a strong positive correlation between the amount ofdigitization and customer happiness, with an unstandardized estimate of 0.430 ($p < 0.001$), suggesting that higher levels of digitalization are linked to increased customer satisfaction. The third path represents the interaction effect between digitalization level and competence of ICT oncustomer satisfaction, demonstrating a significant positive association with an unstandardized estimate of 0.106 ($p < 0.001$), implying that the competency of ICT moderates the effect of digitalization degree on consumer happiness.

4.3 Moderation testing:

In order to conduct the moderation analysis, the dependent variable is (Zscore Customer Stasification), the independent variable is (Zscore Digitalization Level,) and the moderator variable is (Zscore Competence_of_ICT). The outcomes are computed through the utilization of SPSS to generate interaction terms from the standardized scores of variables.

Table 6 Regression Weights

Path			Unstandardized Estimate	S.E.	Standardized	C.R.	P
ZCustomer_Satisfaction	<--	ZDigitalization_Level*ZCompetence_of_ICT	.106	.015	.184	6.920	***



The graph shows the relationship between z-competence and z-digitization level. The y-axis showsthe z-competence, which ranges from 1 to 5, with higher values indicating greater competence. The x-axis shows the z-digitization level, labelled as "Low" and "High". Two lines are plotted on the graph. The steeper line, labelled "High ZCompetence_of_ICT" (y = 1.624x + 0.966) shows that with increasing z-digitization level, there is a greater increase in z-competence. The shallowerline, labelled "Low ZCompetence_of_ICT" (y = 0.888x + 1.266) shows that that with increasing z- digitization level, there is a smaller increase in z-competence.

4.4 Discussion

The findings from the data analysis offer significant insights into the dynamics of ICT adoption and digitalization within the context of rural homestays in Sikkim. A comprehensive overview ofICT utilization scores across rural and urban areas, highlighting potential disparities in technologyadoption and usage patterns. While both rural and urban areas demonstrate substantial ICT utilization, urban areas exhibit slightly higher mean scores, suggesting a nuanced relationship between geographic location and technology adoption. These disparities are further substantiated by the results presented in Table 2, where there are significant disparities in the use of ICT between urban and rural regions. The rejection of the null hypothesis implies that the digitalization landscape in Sikkim is characterized by distinct patterns across different geographic contexts.

Moving beyond descriptive statistics, the regression analyses presented in Tables 3, 4, and 5 delvedeeper into the relationships between digitalization level, ICT competence, and customer satisfaction. High R-squared values and statistically significant ANOVA findings demonstrate that

the regression model is robust, highlighting the significance of digitization activities in determining customer satisfaction outcomes. Furthermore, the moderation analysis outlined in Table 5 elucidates the interactive effects of digitalization level and ICT competence on customer satisfaction. The significant positive association between the interaction term and customer satisfaction highlights the nuanced nature of the relationship, wherein the impact of digitalization initiatives on customer satisfaction is contingent upon the level of ICT competence exhibited by service providers. The graphical representation of the moderation effect in the form of a scatterplot provides a visual depiction of the relationship between ICT competence and digitalization level. The differential slopes observed for high and low levels of ICT competence underscore the moderating role of ICT competence in shaping the impact of digitalization initiatives on service quality and customer satisfaction. This nuanced understanding can inform tailored strategies for enhancing digital literacy and technological proficiency among service providers, thereby maximizing the benefits of digitalization in rural tourism contexts.

5 CONCLUSION

The study investigated the relationship between ICT adoption, digitalization, and customer satisfaction in rural homestays of Sikkim. Data was collected from 251 people from diverse backgrounds using a convenience sample strategy. The results revealed that while both rural and urban areas showed considerable ICT utilization, urban areas had slightly higher scores. Compared to metropolitan areas, rural areas made much less use of information and communication technologies, indicating a variation in technology adoption across geographic areas. Regression analysis showed that digitalization level had a positive and significant relationship with customer satisfaction. Digitalization degree and customer happiness were both mediated by ICT expertise, according to the research. This means that the degree to which service providers are competent with information and communication technologies determines the effect of digitalization on consumer happiness. Homestays with higher ICT competence benefited more from digitalization initiatives in terms of customer satisfaction. These findings highlight the importance of considering geographic location and ICT competence when implementing digitalization strategies in rural homestays. By improving ICT competence among service providers, remote homestays may get an edge in the tourist market and improve client satisfaction via technology.

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