

Cybersecurity Challenges for Ethnotourism Operators: Strategies for Protection

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Abstract. A specific type of cultural tourism known as "ethno-tourism" is where visitors come primarily to learn about and engage with other ethnic communities. The goal of ethnotourism is to understand the cultural customs of the places they visit. By doing this, they hope to maximise the social and economic advantages of their visit to the local communities while also embracing or promoting their cultural legacy. Therefore, ethno-tourism entails visitors interacting closely with the actual indigenous population. The visitors stay in their houses, dine with them, and take in their customs, including festivals, dances, and ceremonies. Ethno-tourism aims to provide visitors with a deeper understanding of the customs, economy, and culture of the original people through direct interaction. Even while ethno-tourism has many benefits, it is wise to remember that the tourism sector is extremely unstable and easily impacted by a wide range of outside variables. Therefore, the main focus of this research is on how ethnotourism affects the original cultures of indigenous peoples in terms of both the economy and culture. Critics of ethnotourism's detrimental impacts abound, nevertheless. Applications based on information and communication technology (ICT) are becoming increasingly important to the tourism industry's operations, but hackers and other online intruders are jeopardizing their benefits. In the context of tourism, remarkable little research has been done to comprehend the experiences and perceived vulnerability. As a result, the study concentrated primarily on travelers' perceptions of their vulnerability and experiences with cyberattacks.

Keywords. Ethnotourism Operators, Cyber-attack, Information and Communication Technology (ICT).

INTRODUCTION

The goal of ethnotourism, a developing trend in cultural tourism, is immersive experiences in local communities. On the other hand, specific cyberthreats that affect ethnotourists include cultural appropriation, online harassment, and data breaches [1]. This study examines the need for cyber awareness among ethnotourists, identifies hazards, and offers safe online participation guidelines [2-6]. Ethnotourism contributes significantly to job creation and revenue generating. It also strengthens the cultural identity of the surrounding people. Cultural values and identities have been undermined by the mass urbanisation of most countries, coupled with strong influences from the West [7]. Ethnotourism encourages the preservation of cultural identities and values by pushing people to support traditional cultural knowledge and skills, which they subsequently impart to the ethnotourists [9]. Many different crimes target tourists, such as theft, rape, robbery, assault and even murder and kidnapping [8].

Additionally, it promotes creative enterprises such as the production of traditional songs and dances by ethno-tourists and gives local musicians and dancers a major stage on which to showcase their cultural traditions and abilities. The visual arts and crafts sector and the ethno-tourism sector are closely intertwined [10]. Ethno-tourism businesses provide handcrafted goods created in the area, enhancing visitor experiences and boosting earnings. Ethno-tourism unites people from different cultural backgrounds by showcasing the native way of life and culture of the area to tourists from those backgrounds. This is made possible by interpersonal ties, which enhances communication and cross-cultural learning [11-12]. As a result, there is an improvement in cultural tolerance and comprehension. For example, ethnotourism encourages the presentation of South Africa's many cultures by bringing together individuals with different language and cultural backgrounds to recreate local villages. These multicultural

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establishments promote mutual understanding and tolerance among the varied populations in the South African subregion [13]. Cyber-attack in Various Sector shown in fig. 1.

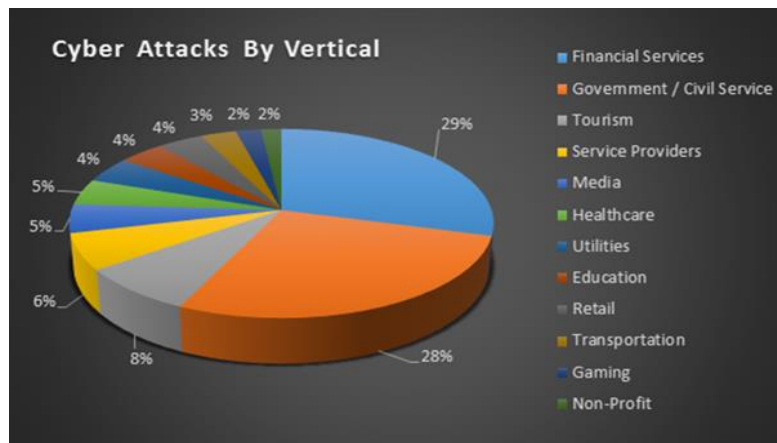


FIGURE 1. Cyber-attack in Various Sector

In addition to emphasising indigenous lifestyles and customs, ethnotourism also depends on the inherent skills and expertise of indigenous groups. Because of this, this sector offers nearby towns a special opportunity to acquire new skills and break into the mainstream tourism market. Ethno-tourism enhances the distribution of revenue in the surrounding community. Businesses that cater to ethnotourism usually use their earnings to fund community development programs including health care, education, and water distribution [14]. For example, El Descanso, located in the Rio Grande De Terraba river basin, is managed by the indigenous Asodint organization [16]. It features peaceful surroundings, traditionally styled cabins, and traditional cuisine and beverages are provided. Visitors are welcome to explore the several local towns, the ancient petroglyphs, and the Terraba and Catarata rivers. In addition, they can buy locally made handicrafts, learn about the medicinal herbs these people use, and play traditional native games. The proceeds from tourism are then reinvested in projects aimed at community development [15]. Effective management of community funds can yield significant benefits and enable the community to satisfy its requirements in ways that would not be feasible without them. Building institutional capability is actively promoted by enterprises engaged in ethnotourism [17]. In places where local communities are involved, ethnotourism can be a major focus point for building local community organisations and promoting community cohesion. Ethno-tourism also facilitates information access for local communities. Poor individuals frequently lack adequate access to information, particularly in remote rural regions. Effectively managed tourism benefits these local communities by improving communication with visitors and providing easier access to information through external contacts. The ethno-tourism sector generates jobs in the immediate area of local communities by lowering both domestic labour force migration and urban labour migration.

LITERATURE REVIEW

Many different crimes target tourists, such as theft, rape, robbery, assault, and even murder and kidnapping. Adam and Adongo assert that because tourist-related crimes receive so much attention—especially in digital media—all Destination Management Organisations (DMOs) need to be concerned about them. Despite the fact that research on crime against tourists is not new, travellers should be aware of the wide range of crimes, including cybercrime, that can occur against them. According to Magliulo A destination's competitiveness is influenced by a lot of things, including safety. This explains why the findings of Holcomb and Pizam's study that tourists avoid places that are perceived as dangerous or having a high crime rate. Osei-Bryson and Ngwenyama claim that information and communication technologies (ICT) are becoming more and more important globally for enhancing people's quality of life and the places they call home. As a result, many industries, including the tourism industry, are embracing information and communication technology (ICT). According to Cox, the industry is recognised for being information-intensive, and Visitors' experiences are now being mediated by ICTs, making them more creative than ever. Gretzel and Jamal claim that the widespread use of mobile devices and other portable smart computers

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has made ICTs indispensable to the creative lifestyles and travel experiences of contemporary tourists. A variety of tourist experiences have been shown to be impacted by the use of ICT, particularly smartphones, including information search, smartphone use by travelers while waiting for buses, on-site decision making, documentaries, and sharing experiences. Travellers utilise ICT in the same ways that everyday people do, utilising credit cards, cellphones, laptops, hard drives, the internet, and Wi-Fi when at their destinations. When they are on vacation, this makes them feel more content. Two drawbacks of technology include information loss and data breaches. Other issues include system failures, computer-assisted fraud, espionage, sabotage, vandalism, and hacking are now feasible due to the advent of the cyberspace Cobanoglu and Demicco. In claim that persons who are looking to take shortcuts to increase their power and wealth often use information technologies and their devices as tools for criminal activity. This is the point at which "cybercrime" is relevant Odilov, Khaydarova, Bobojonova.

THE IMPORTANCE OF TECHNOLOGICAL PROGRESS IN THE TOURISM SECTOR

Similar to other service sectors, the tourism business handles a great volume of sensitive consumer data, including payment and reservation details as well as traveller profiles. The majority of tourists worldwide are noticeably more tech-savvy than they were in the past due to technology's rapid development. The tourism business has grown and developed thanks to information technology, which supports the internal operations of major players in the hotel, food service, and transportation sectors. Cyber Threat Intelligence Landscape shown in fig. 2.

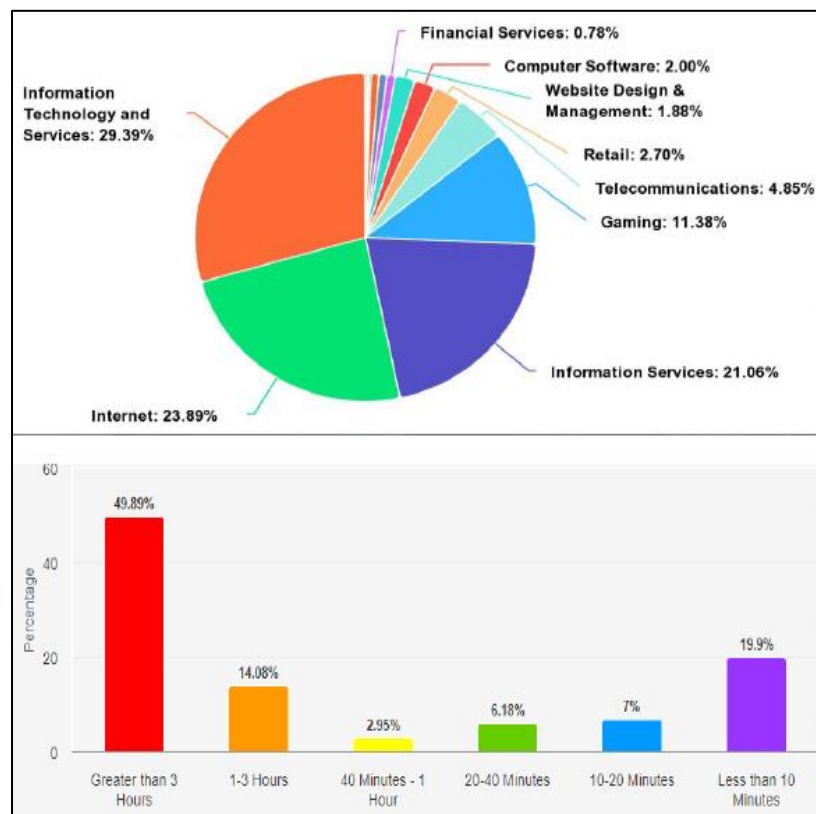


FIGURE 2. Cyber Threat Intelligence Landscape

In order to meet the need for tourism and endure throughout time, there is no other choice than to integrate technology and improve market interaction. The travel information system has developed into an essential conduit between passengers and business entities, but it is not without risk, including the possibility of cybercrime.

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ICTs, according to enable travellers to make bookings and obtain accurate and dependable information in a fraction of the time and at a fraction of the expense. ICTs have the ability to improve service quality and raise customer happiness, claim. The "new" tourist, who is constantly looking for great value for money and time, is empowered by the development of ICTs, particularly the Internet. Travellers on packaged trips are more interested in pursuing their own schedules and preferences than in following the herd. This is due to the fact that sophisticated, well-traveled, and inexperienced tourists must communicate with suppliers via online travel agencies like Expedia, search engines like Google and Kayak, meta-search engines like Kayak, destination management systems like visitbritain.com, social networking and web 2.0 portals like Wayn and TripAdvisor, price comparison websites like Kelkoo, individual suppliers and intermediaries sites, and so forth in order to meet their particular requirements and preferences..

THE CHALLENGES OF CYBER SECURITY

The vast network of interconnected ICT hardware and software infrastructure, which includes mobile devices, data, and the Internet, is referred to as "cyberspace". There are four categories of risk:

- **Cybercrime:** Any illegal activity carried out via the internet, encompassing identity theft, data or intellectual property theft, and other types of cyberfraud.
- **Online Spying:** Gathering an excessive amount of data that isn't necessarily useful for business.
- **Cyberterrorism:** Taking use of system flaws to further political objectives.
- **Cybercrime:** Acts committed with the goal of obtaining a military edge.

There are cyberattacks that are conducted for financial gain: They discuss cybercrimes mostly. Other attacks are primarily focused on the other categories and have an ideological bent. We call them "Hacktivism"¹ because it is challenging to determine the scope and cost of the phenomena due to specialists' continued use of a variety of techniques and operators' reluctance to divulge information about attacks they have encountered.

Travellers are more vulnerable to cybercrime as they get closer to their destination because they utilise Wi-Fi in a range of locations, including airports, resorts, hotels, theme parks, and shopping centres. According to the dependence of the hotel and tourism sector on wireless communications makes it more vulnerable to security breaches. The usage of the internet and networks that are wireless, like Bluetooth and Wi-Fi puts travellers' privacy at risk at the location by opening doors for cybercriminals and permitting unauthorised entry of privacy hackers. Suggested Framework shown in fig. 3.

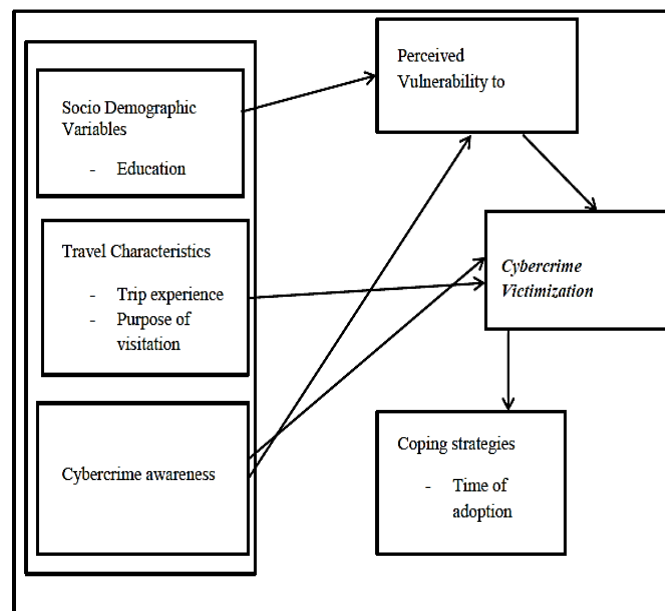


FIGURE 3. Suggested Framework

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After drug use and official corruption, cybercrime has the third-highest economic impact on the world economy. This is because it has a minimal risk of high rewards and impacts everyone. The impact of cybercrime, with a few notable exceptions, exceeds the GDP of such countries. In terms of the worldwide internet economy, cybercrime was projected to have cost \$4.2 trillion in 2016. As a result, cybercrime may be seen as a 14 percent tax on economic growth. An expert stated in September 2016 at the Information Security Congress (ISC) in Orlando, Florida, that cybercriminals are causing their victims mental, physical, and financial harm. Howard said, "You would be surprised at the levels of trauma suffered by cybercrime victims" as she spoke to the audience at the conference. She went on to say, "People feel victimized, that they've suffered a traumatic experience," "Victims often feel that there has been an invasion of their privacy," and "Victims often feel that there has been an invasion of their privacy." exactly the same emotions experienced by those who survived an attack. In addition to feelings of guilt, the sufferers may also have trouble eating and falling asleep. Information from friends and family, the internet, news and media, marketing materials, and travel companies are all factors that influence travelers' perceptions of a given location.

DISCUSSION

Travellers will benefit from being aware of the issue even though real experiences and perceived susceptibility are low. Cybercrime is necessary since new technologies are always growing. The government should create public education programs for radio, television, the internet, and other media. on the consequences of cybercrime, possibly including short case studies that outline some well-known examples and testimonies from individuals who have been affected. Furthermore, it is recommended that, in accordance with the precautionary measures put forth by tourists, all travellers should have access to the information on all platforms, such as the GTA website and brochures, so they can become knowledgeable about the different types of crimes mentioned and the methods used by cybercriminals to commit them. This will enable them to come up with strategies for safeguarding their personal information from cybercriminals. In other words, it is important to motivate people to take preventative action.

CONCLUSION

Cyberspace awareness is essential for ethnotourists to stay safe and show respect for the cultures they visit. By being aware of these risks and adopting safe internet habits, ethnotourists can enrich their cultural experiences while keeping themselves and the communities they visit safe. This describes any illegal action or crime where the target or medium is computing equipment, such as laptops, smartphones, or other ICTs, such as credit cards and their associated networks, WiFi, or internet apps. foreigners visiting Ghana for leisure, business, or other relevant purposes for a maximum of one year and a minimum of one day. Tightening security measures is also necessary to guarantee the country's tourism industry's growth and viability, as crimes against tourists are not a recent occurrence but rather are linked to the sector's expansion. As a result, the goal of this study is to give managers and planners of destination areas a better understanding of cybercrime and its many different patterns.

REFERENCES

1. K. Rice, "Rights and Responsibilities in Rural South Africa: Gender, Personhood, and the Crisis of Meaning," Indiana University Press (2023).
2. A. Fradkin, "Single Reviews," *American Anthropologist*, **110**(1) (2008).
3. T. B. Falkowski, and S. A. Diemont, "Cultural ecosystem services in agroforests," *Agroforestry and Ecosystem Services*, 361-387 (2021).
4. L. Caviglione, S. Wendzel, A. Mileva, and S. Vrhovec, "Guest Editorial: Multidisciplinary Solutions to Modern Cybersecurity Challenges," *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications*, **12**(4), 1-3 (2021).
5. M. Pásková, and J. Zelenka, "Case Studies of Social Responsibility in Tourism," *In Social Responsibility in Tourism: Applications, Best-Practices, and Case Studies*, 137-158 (2024).
6. B. A. Odilov, A. Madraimov, O. Y. Yusupov, N. R. Karimov, R. Alimova, Z. Z. Yakhshieva, and S. A. Akhunov, "Utilizing Deep Learning and the Internet of Things to Monitor the Health of Aquatic Ecosystems to Conserve Biodiversity," *Natural and Engineering Sciences*, **9**(1), 72-83 (2024).

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7. S. Khaydarova, Y. Khujamova, M. Toshbaeva, D. Muhitdinov, G. Mamanazarova, O. Tukhtakulova, and N. Karimov, "The Vital Role of Libraries in Enriching Tourism Experiences," *Indian Journal of Information Sources and Services*, **14**(2), 11–16 (2024).
8. Surendran, D., Arulkumar, V., Aruna, M., Sangamithrai, K., & Thangadurai, N. Improving the quality of education through data analytics and big data contributions. *In AIP Conference Proceedings*, (2742)1, 2024.
9. Guruprakash K.S, Siva Karthik P,Ramachandran A,Gayathri K, "Crop pest identification using deep network based extracted features and MobileENet in smart agriculture", *Land Degradation and Development*, (35)11, 3642–3652, (2024).
10. Cherukuri, Bangar Raju, and V. Arulkumar. "Optimization of Data Structures and Trade-Offs with Concurrency Control in Multithread Software Structures Using Artificial Intelligence." *IEEE International Conference on Computing, Power and Communication Technologies (IC2PCT)*. (5)1, 2024.
11. T.M. Nithya, P. Rajesh Kanna, S. Vanithamani, P. Santhi, "An Efficient PM - Multisampling Image Filtering with Enhanced CNN Architecture for Pneumonia Classification", *Biomedical Signal Processing and Control*, (86)2, 1746-8094, (2023).
12. D. Bobojonova, N. Karimov, O. Masalieva, and A. Pardaev, "Traditions and History of Librarianship in Central Asia," *Indian Journal of Information Sources and Services*, **14**(2), 70–77 (2024).
13. H. A. Friedl, "Western Money for Southern Sympathy: How the Tuareg from Timia Are Instrumentalizing Tourists to Support Their 'Exotic' Village", *In Tourism Development: Growth, Myths and Inequalities*, 39-51 (2008).
14. A. Parsons, "Purveying Provincial Attitudes: Tourism Workers and the Creation of Commodifiable Culture in Nova Scotia," (2018).
15. A. Surendar, V. Saravanakumar, S. Sindhu, and N. Arvinth, "A Bibliometric Study of Publication-Citations in a Range of Journal Articles," *Indian Journal of Information Sources and Services*, **14**(2), 97–103 (2024).
16. M. Pásková, N. Budinská, and J. Zelenka, "Astrotourism–Exceeding Limits of the Earth and Tourism Definitions?," *Sustainability*, **13**(1), 373 (2021). <https://doi.org/10.3390/su13010373>.
17. S. Nyhlén, S. Skott, and K. Giritli Nygren, "Haunting the Margins: Excavating EU Migrants as the 'Social Ghosts' of Our Time," *Critical Criminology*, 1-18 (2024).
18. T. Saravanan, "Tailored Image District Processing Precision and Written Appreciation," *Middle-East Journal of Scientific Research*, **20**(11), 1615-1625 (2014).
19. M. E. Ohsfeldt, "To Play with Spirits: Fluidity and Distinction in Role-Playing Game Shamans", Doctoral dissertation (2017).
20. O. Ulturgasheva, and M. Stelmaszyk, "Embracing Uncertainty: Porous and Actionable Responses to Climate Change at the Borders of Indigenous and Scientific Expertise(s) in Siberia," *Journal of the Royal Anthropological Institute* (2024).
21. D. Justice, "The Festival of World Sacred Music: Creating a Destination for Tourism, Spirituality, and the Other," *In the Changing World Religion Map: Sacred Places, Identities, Practices and Politics*, 2833-2849 (2015).