

AN INTEGRATED ANALYSIS OF IMPACT OF MOBILE TOURISM APPS FROM 2013-2022

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Abstract

Given the extensive number of empirical studies pertaining to this subject, a bibliometric study was required to create an overview of the literature on mobile tourism apps. The study's goal is to identify the most reliable sources, most relevant authors who have made contributions to the field of mobile tourist apps, the most popular search terms, and the countries that have produced the most research on mobile tourism apps. To examine the comprehensive analysis of the research articles pertaining to mobile tourist apps, three research questions were devised. This study examines and summarises the pertinent literature from 2013 to 202 for the integrated analysis. The bibliometric analysis used in this work is assisted by the programmes biblioshiny R and VOSviewer. From the dataset of 56 documents, various bibliometric analysis tools were used to make insightful information. The paper provides an all-around intellectual structure for the literature.

Keywords: Tourism, mobile tourism apps, bibliometric analysis, integrated analysis, technology.

I. INTRODUCTION

The advent of Information and Communication Technology (ICT) and the Internet has undeniably revolutionized the travel industry and reshaped consumer behaviors within the tourism sector. Scholars such as Buhalis and Law (2008), Gretzel, Fesenmaier, and O'Leary (2006), and Werthner and Klein (1999) have highlighted the substantial impact of ICT and the Internet on this domain. The transformative influence of these technologies has been further accentuated by the rapid development of mobile technology, as evidenced in the work of Fesenmaier & Xiang (2014), Gretzel (2010). This shift is exemplified by the proliferation of smartphones, which symbolize the ongoing technological metamorphosis in the travel sector, propelling the surge in the market for mobile applications or "apps," as asserted by Kennedy-Eden and Gretzel (2012).

The mutual symbiosis between mobile technology and the travel industry is evident from the substantial benefits it has brought to both travelers and tourism managers. Travelers can conveniently access a wealth of travel-related information, while managers can effectively promote their offerings, as affirmed by Kuo et al., (2019). As technology evolves, the convergence of mobile tourism (m-tourism), wearable devices, and the "Internet of Things" is increasingly discernible, giving rise to a cohesive ecosystem catering to the travel sector. Despite the remarkable potential mobile apps offer for enhancing customer experiences and boosting business efficiency, scholarly attention on this topic within the tourism literature has remained relatively limited, an observation made by Tan et al., (2017). Specifically, the factors influencing tourists' intentions to adopt mobile apps for travel purposes have not received the comprehensive scrutiny they deserve, as noted. While some strides have been made in adopting a broader perspective on tourism offerings through mobile apps, there remains a significant gap in comprehensive research in this sphere, inviting further

exploration, as highlighted by Tan et al., (2017). Furthermore, a dearth of research exists that delves into the motivations driving consumers to embrace applications tailored to tourism products and services, as outlined by Kuo et al., (2019).

A substantial body of research has illuminated the pivotal role of mobile technology in propelling sustainable and smart tourism endeavors, as underscored by the work of Kim et al., (2017). Equally compelling are investigations that delve into the realm of user interaction and sentiment analysis surrounding mobile tour applications. This significant pursuit has been passionately undertaken by Afzaal et al., (2019), unveiling valuable perspectives on user experiences.

Another authors have explored the potential of mobile technology to act as a compass for older adults navigating unfamiliar terrains. shedding light on how technological innovations can empower a demographic often overlooked. Erceg et al., (2020) study laid the groundwork for understanding the potential benefits and challenges of integration of blockchain technology within the tourism domain. Aliperti and Cruz (2020) have meticulously examined the consumer perspective, deciphering how mobile taxi services reshape the traditional contours of the transportation landscape. A final note of inquiry resides in the realm of disaster preparedness and response among tourists, where innovative mobile applications are being championed. Wang et al.'s work stands as a testament to the growing recognition of technology's capacity to empower and safeguard travellers in times of crises. This collective body of research serves as an invitation to further engage with the ever-evolving intersection of mobile technology and tourism, shaping a future where innovation and travel unite harmoniously.

Broadus (1987, p. 376) succinctly defines bibliometrics as the quantitative examination of tangible published units or their bibliographic counterparts. On the other hand, another author characterizes bibliometrics as a systematic analysis that involves classification and quantitative assessment of publication patterns, inclusive of author contributions, employing mathematical and statistical tools. This methodological approach, known as bibliometrics, serves as a potent instrument for unraveling the evolutionary pathways of disciplines, delving into their intellectual, social, and conceptual structures (Zupic & Čater, 2015). In the context of tourism research, bibliometric indicators have played a significant role in gauging thematic progress (e.g., Lucas & Deery, 2004; Yoo & Bai, 2013). Such studies have not only tracked the trajectory of specific themes but also proposed novel frameworks and research agendas (e.g., Kandampully et al., 2015; Ashworth & Page, 2011; Law et al., 2010). However, relying solely on discursive bibliometric structures within the tourism domain may fall short in capturing hidden patterns that shape the evolution of knowledge, collaborations, and contextual advancements (McKercher & Tung, 2015).

Their arises a compelling need to augment the discourse on the epistemological and ontological dimensions of knowledge creation in the domain of impact of mobile tourism applications grounded in the intent to drive robust theoretical progress within the domain. Delving into the domain of mobile tourism apps, a bibliometric investigation bears immense value. Firstly, it stands to unveil paramount journals, luminaries, and pivotal publications published within this subject. Secondly, a bibliometric inquiry promises to weave a cartography of the intellectual and thematic contours within the sphere of mobile tourism apps. Lastly, its potential lies in discerning critical gaps that warrant further exploration, thereby facilitating the charting of new trajectories in research.

Purpose of the Study:

The following research issues are addressed by the study:

RQ1: What is the current state of impact of mobile tourist app research?

RQ2: What are the most relevant authors, journals, countries in the literature on mobile tourist apps impact?

RQ3: What are the research gaps in knowledge on impact of MTA?

The study is organized as follows: It begins with a concise literature review, followed by an outline of the research methodology, presentation of findings, and subsequent discussion. The analysis kicks off with a productivity assessment of influential journals, authors, articles, and countries. This is succeeded by a scientometric examination aimed at revealing the intellectual and thematic framework of the field. Various techniques such as keyword Co-occurrence network analysis, authors bibliographic coupling of documents and co citation analysis of authors references are employed. The study concludes by summarizing key insights and proposing potential avenues for future research.

II. METHODOLOGY

This study employs bibliometric analysis supported by biblioshiny R and VOSviewer software version 1.6.16 (Van Eck and Waltman, 2010). Bibliometric analysis involves quantitative techniques to analyze academic literature within a specific field over a defined period. In the domain of tourism studies, bibliometric analysis has gained prominence.

Bibliometric analysis is a quantitative research methodology that utilizes data from publications, sources, years, countries, and citations to provide indicators of research production in a given area over time. It allows researchers to map and identify patterns within the collected data. Researchers can choose specific databases, journals, or sources, along with keywords to analyze, thereby organizing relevant information like articles, journals, researchers, institutions, and countries. This approach offers various advantages, such as insights into specific domains, understanding network structures around research topics, and evaluating research impact through rankings and influence. Consequently, bibliometric analysis is recognized as a dependable methodology in diverse research domains (Osareh, 1996; Sigala and Christou, 2006).

The methodological process adopted in this study follows these steps: database identification, keyword search, relevant article identification, relevant article evaluation and segmented content analysis of chosen articles. Initially, the researchers identified and selected electronic databases, focusing on the widely used ones. Scopus online database was selected for the research. Scopus is widely recognized as a prominent resource for identifying institutional research output. It is commonly utilized as a bibliometric data reference for extensive analyses (Bass et al., 2020). Additional references were traced through cross-citations within the articles. Next, relevant keywords for the study were identified and discussed, taking cues from the approach of Leung., (2013). Keywords such as "Impact of mobile tourism apps" were recognized as pertinent, and all subject areas were applied to ensure relevance to the research field of travel, tourism, and hospitality. Further refinement of criteria resulted in 64 articles that met the inclusion criteria, only considering peer-reviewed journals, books, and conference proceedings. Law et al.,

(2009) argue that professional journals, books, and conference proceedings adhere to a distinct peer-review process, involving multiple review rounds before acceptance. To ascertain relevance, keywords like "Systematic Literature Review", "Conceptual Framework", "Structural Equation Modelling", "Case-studies", "Case Study," "Bibliometrics Analysis" "Bibliometrics" "Bayesian Best-worst Method" "Best Worst Method", "Analytic

Hierarchy Process" Event Study" Entry Order" "English" "User Study" were excluded to select for relevant articles in academic journals, books, and conference proceedings. Only English language publications were considered for further processing. This rigorous screening yielded a focused set of 58 papers meeting the criteria. The complete query is as follows:

(TITLE-ABS-KEY(mobile AND tourism AND apps AND impact) AND (LIMIT-TO (DOCTYPE,"ar") OR LIMIT-TO (DOCTYPE,"cr") OR LIMIT-TO (DOCTYPE,"cp") OR LIMIT-TO (DOCTYPE,"re") OR LIMIT-TO (DOCTYPE,"ch") OR LIMIT-TO (DOCTYPE,"bk"))) AND (EXCLUDE (EXACTKEYWORD,"Systematic Literature Review") OR EXCLUDE (EXACTKEYWORD,"Conceptual Framework") OR EXCLUDE (EXACTKEYWORD,"Structural Equation Modelling") OR EXCLUDE (EXACTKEYWORD,"Case-studies") OR EXCLUDE (EXACTKEYWORD,"Case Study") OR EXCLUDE (EXACTKEYWORD,"Bibliometrics Analysis") OR EXCLUDE (EXACTKEYWORD,"Bibliometrics") OR EXCLUDE (EXACTKEYWORD,"Bibliometric Analysis") OR EXCLUDE (EXACTKEYWORD,"Bibliometric") OR EXCLUDE (EXACTKEYWORD,"Bayesian Best-worst Method") OR EXCLUDE (EXACTKEYWORD,"Best Worst Method") OR EXCLUDE (EXACTKEYWORD,"Analytic Hierarchy Process") OR EXCLUDE (EXACTKEYWORD,"Event Study") OR EXCLUDE (EXACTKEYWORD,"Entry Order") OR EXCLUDE (EXACTKEYWORD,"English") OR EXCLUDE (EXACTKEYWORD,"User Study"))) AND (EXCLUDE (LANGUAGE,"Italian"))). The title, abstract and keywords of the selected articles were further inspected for relevance to the subject of research which resulted in further exclusion of 2 articles and final list of 56 articles for review.

Various bibliometric analysis tools were employed to extract valuable insights from the dataset comprising 56 documents. The authors harnessed VOSviewer (version 1.6.15), and Biblioshiny (version 2.0) to visualize networks encompassing journals, researchers, and individual publications. These tools facilitated the identification of citation relationships as well.

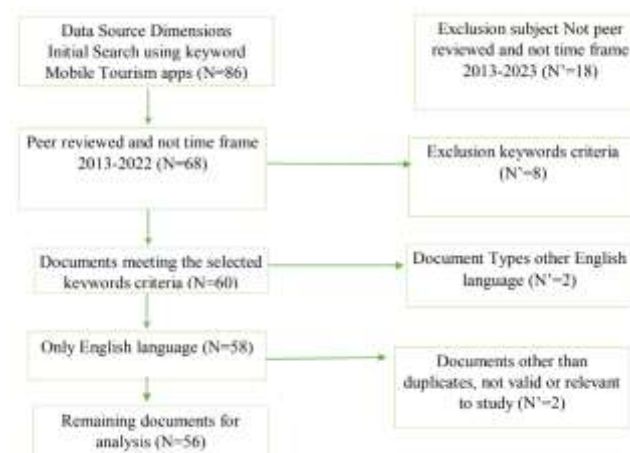


Fig. 1: Data Extraction Using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Approach

A. Data Interpretation and Analysis

The trend analysis (Figure 2,0) reflects a continuous and increasing interest among researchers and scholars in investigating the impact of Mobile Tourism Applications. The significant growth in recent years suggests that this area of research holds substantial potential for contributing to the advancement of both the tourism industry and academic knowledge. The average annual growth rate of publications on the impact of MTA over the given years is approximately 10.83% in this research area.

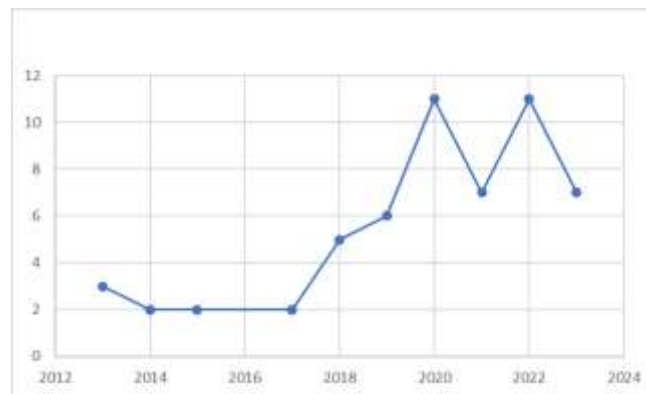


Fig. 2: Publication Trend

B. Most Relevant Sources

The impact of Mobile Tourism Applications (MTA) has been explored within the context of various disciplines such as computer and information science, information technology, interactive mobile technologies, hospitality and tourism technology, networks and systems, smart trends, sustainability, and innovation indicating the inter disciplinary nature of the research field. Computer Science subject area signifies the technological aspect of MTA, including app development, algorithms, and technical innovations that enable the creation and functioning of mobile tourism applications. The sources from Information systems emphasize the role of information systems in MTA, exploring how data, technology, and information management play a critical role in enhancing the tourism experience through mobile applications. The subject of tourism is central to the sources, indicating a focus on understanding how MTA influences and shapes different aspects of the tourism industry, from traveler behavior to destination management. The subject area of hospitality suggests a focus on how MTA impacts the hospitality sector within the broader context of tourism, encompassing areas such as accommodation, dining, and guest services. The broader technological landscape in which MTA operates, considers the integration of various technologies beyond just mobile devices, such as wearables and the Internet of Things (IoT). The presence of sustainability-related sources suggests that researchers are exploring how MTA can contribute to sustainable tourism practices, considering environmental, social, and economic impacts. The subject area of networks and systems emphasize the networked nature of MTA, including how various systems and platforms interact to deliver seamless mobile experiences to travelers. Interactive Mobile Technologies focuses on the interactive and user-centric aspects of MTA, exploring how mobile technologies engage travelers and enhance their interactions with destinations and services. Smart Trends in Systems, Security, and Sustainability points to a focus on the cutting-edge developments in smart technologies that align with MTA, including considerations of security and sustainability within these systems.

TABLE I. RELEVANT SOURCES

| Sources | Articles |
|---|----------|
| COMMUNICATIONS IN COMPUTER AND INFORMATION SCIENCE | 2 |
| INFORMATION TECHNOLOGY AND TOURISM | 2 |
| INTERNATIONAL JOURNAL OF INTERACTIVE MOBILE TECHNOLOGIES | 2 |
| JOURNAL OF HOSPITALITY AND TOURISM TECHNOLOGY | 2 |
| LECTURE NOTES IN NETWORKS AND SYSTEMS | 2 |
| PROCEEDINGS OF THE WORLD CONFERENCE ON SMART TRENDS IN SYSTEMS, SECURITY AND SUSTAINABILITY, WS4 2020 | 2 |
| SMART INNOVATION, SYSTEMS AND TECHNOLOGIES SUSTAINABILITY (SWITZERLAND) | 2 |
| 2018 IST-AFRICA WEEK CONFERENCE, IST-AFRICA 2018 | 1 |
| 26TH EUROPEAN MODELING AND SIMULATION SYMPOSIUM, EMS 2014 | 1 |

C. Most Relevant Authors

The fractionalized values provide insights into the extent of contribution by each author in the collaborative articles. Authors with fractionalized values of 1 indicate that they are sole authors of their respective articles, while fractionalized values less than 1 suggest collaborative authorship.

The common theme in these articles is the integration of mobile app technology in the tourism industry, emphasizing its impact on enhancing tourism experiences, organizational performance, and innovation. The articles explore the effectiveness and acceptance of mobile apps in various geographic contexts, including Oman, KSA, UK, and PRC. They delve into innovative trends like IoT-based solutions and augmented reality, examining how these technologies promote museum engagement, interactive site experiences, and e-marketing for tourism products.

TABLE II. MOST RELEVANT AUTHORS

| Authors | Articles | Articles Fractionalized |
|-----------------|----------|-------------------------|
| SUYOTO | 2 | 1 |
| ABOU EL-SEOUD S | 1 | 0.5 |
| AFSAHHOSSEINI F | 1 | 0.5 |
| AHMAD H | 1 | 0.2 |
| AL-HAZMI NM | 1 | 1 |
| AL-KOFAHI O | 1 | 0.2 |
| AL-MULLA Y | 1 | 0.5 |
| ALIPERTI G | 1 | 0.5 |
| ALLAN M | 1 | 0.2 |
| ALTENBUCHNER J | 1 | 0.5 |

D. Most Relevant Sources

The scientific production in the field of tourism and technology is distributed across various countries, as indicated by the frequency of publications from different regions. Italy and China lead in scientific output with 23 and 22 publications respectively. This could be attributed to their strong emphasis on research and innovation in the tourism and technology sectors, supported by active academic and research institutions. The United Kingdom (UK) and the United States (USA) both have 16 publications each, reflecting their historically significant roles in academic research and technological advancements. Malaysia, India, and Portugal follow suit with 12, 10, and 10 publications respectively, showcasing their growing contributions to the field. The presence of Indonesia with 8 publications highlights its emerging interest and engagement in this interdisciplinary domain. Egypt, Brazil, and other

countries exhibit relatively fewer publications, possibly reflecting varying levels of focus and investment in the intersection of tourism and technology. Overall, the distribution of scientific production across these countries underscores the global nature of research in this field, influenced by a combination of technological infrastructure, academic expertise, and regional priorities.

TABLE III. MOST RELEVANT COUNTRIES

| Region | Freq |
|-----------|------|
| ITALY | 23 |
| CHINA | 22 |
| UK | 16 |
| USA | 16 |
| MALAYSIA | 12 |
| INDIA | 10 |
| PORTUGAL | 10 |
| INDONESIA | 8 |
| EGYPT | 4 |
| BRAZIL | 3 |

E. Keyword Co-occurrence Analysis

Co-occurrence analysis identifies patterns and relationships between keywords that frequently appear together, providing insights into the underlying themes and topics within the research literature. By examining how often specific keywords appear in conjunction with each other, the authors can uncover the most prominent and interconnected concepts in the field. This methodology helps to identify the key themes, trends, and relationships that exist within the body of literature, offering valuable insights into the research landscape and informing further exploration and analysis. The threshold selected was 2 occurrences. 34 keywords of the 326 keywords met the threshold.

These integrated themes explore the intricate relationships between keywords that define key areas of transformation within the realm of tourism and technology. The first theme, "Revolutionizing Tourism Marketing through Mobile App Technology and Artificial Intelligence in the Hospitality Industry," highlights the synergistic impact of AI and mobile apps on personalization, marketing, and guest experiences. The second theme, "Empowering Cultural Heritage Preservation and Sustainable Tourism Development through Technology Adoption and Innovation," emphasizes how technology and sustainable practices intersect to conserve cultural heritage and promote responsible tourism. The third theme, "Revitalizing Travel Experiences in the Era of COVID-19 through Mobile Apps, Technology, and Performance Enhancement," focuses on the role of technology in reshaping travel post-pandemic for safety, convenience, and performance. The fourth theme, "Enhancing Mobile Experiences through Augmented Reality and Mobile Applications in the Age of Mobile Computing," explores the transformative role of AR and mobile apps in merging the digital and physical worlds. The fifth theme, "Cultivating Sustainable Smart Tourism through Effective Information Management in Cultural Tourism," investigates the potential of information management, smart tourism, and sustainability to create meaningful travel experiences. The sixth theme, "The Digital Confluence: Unveiling the Power of Information and Communication Technology, Internet, and Mobile Communication," underscores the

interconnectedness of ICT, the internet, and mobile communication in shaping contemporary communication and connectivity. Each theme represents a unique facet of how technology shapes the future of tourism, enriching experiences, preserving heritage, and driving sustainable growth.

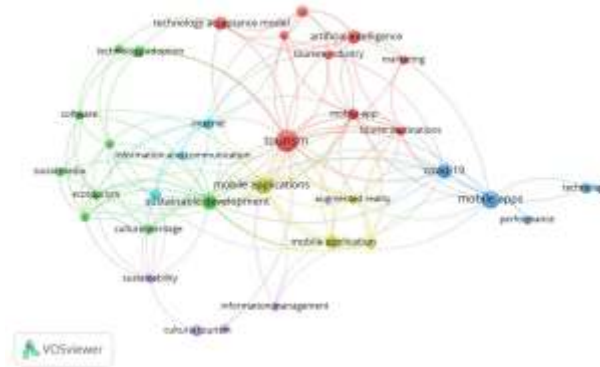


Fig. 3: Keywords Co Occurrence Analysis

TABLE IV. KEYWORD CO-OCCURRENCE ANALYSIS

| Cluster | Keywords | Integrated theme |
|---------|---|---|
| Red | artificial intelligence hospitality industry marketing mobile app smartphones technology acceptance model tourism tourism industry tourist destinations | <p>"Revolutionizing Tourism Marketing through Mobile App Technology and Artificial Intelligence in the Hospitality Industry" This integrated theme delves into the synergistic relationship between these keywords, illustrating how their interplay redefines the traveler experience and transforms the way tourist destinations are presented and perceived.</p> <p>Artificial Intelligence stands at the vanguard of change, infusing predictive analytics, machine learning, and data-driven insights into the Hospitality Industry. This technological revolution augments personalization, enabling establishments to tailor experiences to individual preferences, enhancing guest satisfaction, and fostering customer loyalty. Mobile apps act as portals to seamless experiences, offering access to real-time information, personalized itineraries, and instant interactions with services. Smartphones, ubiquitous companions of travelers, empower them to explore tourist destinations through interactive digital mediums, connecting them to local culture, attractions, and services. Central to this theme is the Technology Acceptance Model (TAM), which examines the factors influencing the adoption and usage of technology. In the context of tourism marketing, TAM underscores the pivotal role of user experience and perceived value in the success of mobile app deployments and AI-driven services. Marketing takes on a dynamic new dimension as AI-driven insights guide targeted promotional efforts. The alignment of AI-driven recommendations with tourists' preferences allows for highly relevant content delivery.</p> |

Green

cultural heritage
ecotourism
mobile phone
social media
software
sustainable development
sustainable tourism
technology adoption
tourism development

enhancing engagement and driving informed decision making. The profound impact of these technologies extends beyond industry realms, influencing how Tourist Destinations position themselves. Tourism Industry stakeholders harness AI and mobile apps to present unique narratives, tapping into virtual reality, augmented reality, and immersive experiences that captivate potential visitors.

"Empowering Cultural Heritage Preservation and Sustainable Tourism Development through Technology Adoption and Innovation". The seamless integration of technology and sustainable practices has become a catalyst for the preservation of cultural heritage and the advancement of sustainable tourism development. This integrated theme examines the dynamic interplay among these keywords, highlighting how technology adoption and innovation drive cultural conservation and holistic tourism growth. Cultural Heritage forms the heart of the theme, representing the valuable legacies of societies. In this context, technology serves as a powerful tool to document, restore, and share cultural treasures with the world, fostering a deep sense of identity and continuity. Ecotourism aligns harmoniously with the sustainable ethos, emphasizing responsible travel that contributes positively to environmental conservation and local communities. Integrating technology into ecotourism practices enhances engagement and educates travelers about the delicate ecosystems they encounter. Central to this integration are Mobile Phones and Social Media, modern conduits connecting travelers to destinations and cultural experiences. Mobile phones serve as gateways to educational content, interactive guides, and digital storytelling, while social media platforms enable global connectivity and engagement, amplifying the significance of cultural heritage and sustainable tourism initiatives. Software emerges as the backbone of these advancements, powering applications that deliver immersive experiences and facilitate efficient tourism management. Software solutions also aid in monitoring and managing the footprints of visitors, mitigating the impact on cultural sites and natural habitats.

The crux of the theme is the pursuit of Sustainable Development through Sustainable Tourism, encapsulating responsible practices that support local economies, empower communities, and safeguard ecosystems. Technology adoption catalyzes this endeavor, enabling destinations to innovate while preserving their essence. By embracing technological tools while respecting cultural heritage, destinations pave the way for Tourism Development that harmonizes economic growth, social empowerment, and environmental conservation.

Blue
 COVID-19
 mobile apps
 performance
 technology
 travel experience

"Revitalizing Travel Experiences in the Era of COVID-19 through Mobile Apps, Technology, and Performance Enhancement"

This integrated theme delves into the harmonious interplay among keywords, illustrating how mobile apps, technology, and performance enhancement contribute to the resurgence and elevation of travel experiences in the post-pandemic landscape. COVID-19 forms the backdrop of this theme, signifying the seismic shift that has reshaped travel dynamics.

Navigating these new realities necessitates innovative solutions that prioritize safety, adaptability, and enhanced experiences.

Mobile Apps serve as versatile tools for contactless transactions, real-time updates, and information dissemination. These apps not only enable seamless planning but also provide on-the-go guidance, ensuring travelers' peace of mind in uncertain times. Innovative solutions such as contactless check-ins, virtual tours, and health tracking systems redefine the travel journey, enhancing efficiency while safeguarding health. High-performance services encompass not only functional aspects but also emotional well-being, offering reassurance and delight to travelers.

The crux of the theme is the concept of the Travel Experience, which undergoes a metamorphosis to align with safety measures and evolving expectations. A comprehensive travel experience encompasses convenience, safety, cultural immersion, and emotional fulfillment. By harnessing the potential of Mobile Apps, embracing cutting-edge Technology, and committing to exemplary Performance, the travel industry adapts and thrives in the face of adversity. The traveler embarks on a journey that transcends geographical borders, insuring safety, comfort, and enriching encounters. In this transformation, the role of technology not only shapes experiences but also underscores the industry's commitment to safeguarding the wellbeing of both travelers and the places they explore.

Yellow
 - augmented reality
 - mobile application
 - mobile applications
 - mobile computing

"Enhancing Mobile Experiences through Augmented Reality and Mobile Applications in the Age of Mobile Computing"

This integrated theme delves into the dynamic relationship among these keywords, spotlighting how their interplay transforms the way we engage with mobile devices and the digital world.

Mobile Computing serves as the backdrop of this theme, reflecting the ubiquitous presence of mobile devices and their pivotal role in modern interactions. These devices have become extensions of our lives, enabling access to information and experiences anywhere, anytime. Mobile applications cater to diverse needs, spanning from communication and entertainment to productivity and learning. AR overlays virtual elements onto the real world, enriching experiences and offering new dimensions of engagement. The crux of this theme lies in the fusion of Augmented Reality with Mobile Applications, amplifying the potential for immersive interactions. AR-infused mobile applications transcend traditional boundaries, unlocking new forms of entertainment, education, retail, and more. The integrated theme embodies a future where digital and physical realms coalesce seamlessly. With Augmented Reality and Mobile Applications as guides, the landscape of mobile computing expands to embrace multisensory encounters, from informative visualizations to interactive simulations. The theme emphasizes that as Mobile Computing continues to evolve, the collaborative potential of Augmented Reality and Mobile Applications will usher us into an era where our interactions with technology are not just functional, but magical.

Purple
 - cultural tourism
 - information management
 - smart tourism
 - sustainability

"Cultivating Sustainable Smart Tourism through Effective Information Management in Cultural Tourism"

The intersection of cultural tourism, information management, smart tourism, and sustainability constitutes a transformative landscape for the travel industry. This integrated theme explores the dynamic interplay among these keywords, highlighting the potential to harness information, technology, and cultural assets to create sustainable and enriching travel experiences. Cultural Tourism forms the heart of the theme, representing the quest to explore and appreciate the cultural heritage of diverse destinations. It emphasizes immersion in local traditions, history, arts, and values.

Information Management emerges as the linchpin of this evolution, enabling the efficient organization, dissemination, and utilization of information. Effective information management ensures that cultural narratives are accurately conveyed and appreciated by travelers. Smart tourism leverages data and digital platforms to create seamless and personalized journeys. Central to this theme is the core principle of Sustainability, which transcends mere environmental considerations. Sustainability in cultural tourism encompasses ethical engagements with local communities, preservation of cultural assets, and economic empowerment.

Effective Information Management ensures that cultural narratives are shared authentically and engagingly. Smart tourism integrates this information into travelers' journeys, enriching their experiences while fostering a deeper appreciation for local cultures. This evolution aligns with the broader ethos of Sustainability, ensuring that the interactions

between travelers, communities, and cultural sites are ethical, responsible, and mutually beneficial. Sustainability is not just an ideal, but a cornerstone of meaningful and enduring cultural tourism experiences. The integrated theme encapsulates the journey towards a future where travelers are connected with cultural heritage through the smart use of information and technology. As the travel industry evolves, the collaboration between Cultural Tourism, Information Management, Smart Tourism, and Sustainability promises to create a harmonious convergence of traveler satisfaction, cultural preservation, and economic prosperity for both destinations and communities.

Light
Blue

- information and communication technology
- internet
- mobile communication

"The Digital Confluence: Unveiling the Power of Information and Communication Technology, Internet, and Mobile Communication"

This integrated theme delves into the dynamic relationship among these keywords, highlighting how their convergence shapes communication, connectivity, and the very fabric of our lives. Information and Communication Technology (ICT) serves as the foundational pillar of the theme, embodying the hardware, software, and networks that facilitate data exchange and communication. ICT weaves the digital infrastructure upon which the other two keywords rely. Internet emerges as the global conduit that interlinks individuals, businesses, and governments, transcending geographical boundaries. It is the gateway through which the world's knowledge is accessible, communication is established, and services are delivered.

Mobile Communication represents the mobile revolution, empowering individuals with constant connectivity and communication on-the-go. Mobile devices have become essential tools, enabling real-time interactions, information access, and content creation. ICT propels the digital realm, underpinning the platforms that enable the internet and mobile communication to thrive. The internet provides the virtual landscape where information is exchanged, services are accessed, and communities are formed. Mobile communication complements this ecosystem, allowing seamless engagement regardless of location. The integrated theme embodies a future where connectivity knows no bounds, where information flows effortlessly across networks, and where mobile devices serve as conduits for limitless possibilities. It highlights the pivotal role of technology in democratizing access to knowledge, fostering global dialogue, and enabling innovation.

F. Keyword Co-occurrence Analysis

Bibliographic coupling is a methodology commonly used in bibliometrics and scientometrics to analyze and measure the relationships between academic documents, such as research articles, based on their shared references. This method examines the common references cited by multiple documents to identify patterns of intellectual influence and collaboration within a specific field of study. Bibliographic coupling operates on the premise that if two documents share a significant number of references, they are likely to be related in terms of subject matter or research focus.

In bibliographic coupling, a co-occurrence matrix is constructed, where rows and columns represent individual documents, and the cells of the matrix indicate the number of shared references between pairs of documents. By analyzing this matrix, researchers can identify clusters of related documents, influential papers, research trends, and potential collaborations between authors and research groups. The resulting network of coupled documents can be visualized using various techniques, such as co-citation maps or network diagrams, to provide insights into the intellectual structure of a research field and the connections between different areas of study. The threshold selected for minimum number of citations per document was 2. Out of the 56 documents, 35 met this threshold.

The presented integrated themes explore the transformative role of technology in shaping various aspects of the tourism industry. In the theme "Revolutionizing Tourism Experiences Through Mobile Apps and Smart Media Technologies," the integration of mobile apps and smart media technologies is examined in its capacity to enhance co-creative hotel service innovation, empower genealogy tourists, elevate spiritual experiences of pilgrims, and impact smart tourism through cloud management systems. This theme underscores how technology enhances personalization, connectivity, spirituality, and management in the tourism realm.

In "Digital Transformation in Cultural Tourism," the integration of digital technology is explored as it revolutionizes business models, augments reality, enhances cultural experiences, and fosters local development. The theme reflects the ongoing digital

transformation of cultural tourism, where digital strategies, augmented reality, cultural routes, and local engagement converge to shape an innovative and sustainable landscape.

"Unveiling User Adoption Dynamics of Mobile Applications in the Hospitality and Travel Sectors through Extended Acceptance Models" delves into the intricate web of user adoption dynamics, highlighting how extended technology acceptance models, experience constructs, and motivational factors influence the integration of mobile apps into the hospitality and travel sectors. This theme underscores the integral role of user experiences, motivations, and acceptance models in shaping the adoption of mobile applications.

"Mobile Technology in Tourism" examines the profound impact of mobile technology on user behavior, market segmentation, and millennial experiences in the tourism industry. The theme reflects how mobile technology has redefined behavioral intentions, market understanding, and generational engagement, becoming a catalyst for transformative shifts in the tourism landscape.

Technology-Driven Enhancements in Tourism: Disaster Preparedness and Wine Destination Branding through Mobile Applications" showcases the versatile use of mobile apps in enhancing tourists' safety during disasters and promoting wine destination branding. This theme underscores how technology-driven solutions empower both tourists and destinations, offering safety measures and enhancing the allure of unique places.

These integrated themes emphasize the pivotal role of technology in redefining tourism experiences, from personalization and engagement to disaster preparedness and destination branding. In the evolving landscape of tourism, technology serves as a catalyst for innovation, connectivity, and sustainable growth. The intellectual structure of the presented integrated themes revolves around the central theme of technology's transformative impact on various aspects of the tourism industry. Each integrated theme explores different dimensions of this overarching concept, highlighting specific areas where technology driven advancements are reshaping the landscape of tourism.

From the integration of mobile apps and smart media technologies to the adoption of digital strategies in cultural tourism, the exploration of user adoption dynamics, and the influence of mobile technology on behavior and experiences, the themes collectively paint a comprehensive picture of technology's multifaceted role. The intellectual structure is characterized by a multidisciplinary approach, drawing insights from areas such as information technology, hospitality management, marketing, cultural studies, and more. The themes foster a holistic understanding of the intricate relationships between technology, user experiences, industry practices, and the evolving expectations of travelers. The intellectual structure highlights the collaborative nature of research in the field of technology and tourism. Authors reference one another's studies, building upon existing knowledge and contributing to a collective body of work that informs industry practices and guides further research. The intellectual structure showcases the dynamic and symbiotic relationship between technology and tourism. It reflects the industry's ongoing evolution as it leverages technology to enhance customer experiences, innovate business models, and ensure sustainability in an ever-changing global landscape.

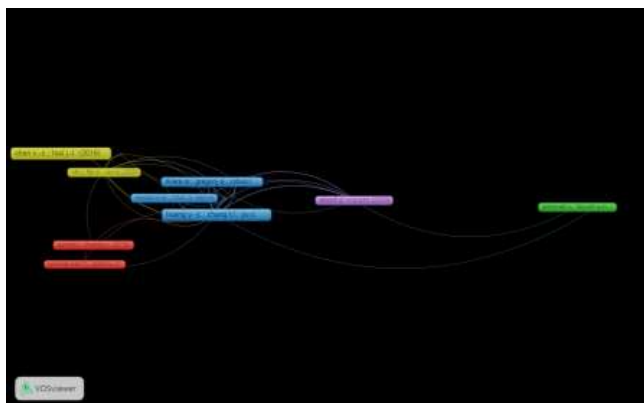


Fig. 4: Bibliographic Coupling

TABLE V. BIBLIOMETRIC COUPLING OF DOCUMENTS

| Cluster | Document | Theme |
|---------|--|--|
| Red | <ul style="list-style-type: none"> -kamboj s.; gupta s. (2020) -kennedy-eden h.; gretzel u. (2021) -qurashi j.; sharpley r. (2018) -yin f.; yin x.; zhou j.; zhang x.; zhang r.; ibeke e.; iwendi m.g.p.; shah m. (2022) | <p>"Revolutionizing Tourism Experiences Through Mobile Apps and Smart Media Technologies"</p> <p>The integration of mobile apps and smart media technologies stands as a transformative force in shaping tourism experiences. This integrated theme explores how these tools enhance co-creative hotel service innovation, empower genealogy tourists, elevate spiritual experiences of pilgrims, and impact smart tourism through cloud management systems. The utilization of Smartphone Apps in co-creative hotel service innovation, as studied by Kamboj and Gupta (2020), demonstrates the potential to engage guests in shaping their experiences, leading to personalized and innovative services. This emphasizes the role of mobile technology in fostering co-creation and enhanced guest satisfaction. Kennedy-Eden and Gretzel (2021) examine the use of mobile devices and apps by genealogy tourists, encapsulating the concept of "My Heritage in My Pocket." This exploration showcases how technology bridges the past with the present, offering travelers access to their ancestral heritage and historical context. Qurashi and Sharpley (2018) delve into the impact of SMART Media Technologies (SMT) on the spiritual experience of Hajj pilgrims, revealing how technology can amplify the spiritual journey through digital engagements and enhanced connectivity. Another author contributed to the theme by presenting the concept of a Tourism Cloud Management System, showcasing the influence of smart tourism on cloud computing. This system underscores the transformational capacity of technology to manage, analyze, and enhance tourism experiences at a larger scale. The integrated theme underscores the common thread of technology's influence in redefining tourism dynamics. The utilization of mobile apps and smart media technologies enhances personalization, connectivity, spirituality, and management in the tourism realm. These studies exemplify how technology's integration enhances both traveler experiences and industry operations. In summary, this theme encapsulates a future where technology seamlessly enhances the way we explore, engage, and manage our travel experiences. The journey is no longer confined to physical spaces, rather, it's enriched by the digital dimension that mobile apps and smart media technologies bring to the forefront.</p> |
| Green | <ul style="list-style-type: none"> -ammirato s.; felicetti a.m.; linzalone r.; carlucci d. (2022) -anand k.; arya v.; suresh s.; sharma a. (2023) -macleod n. (2013) -roque m.i.; forte m.j. (2017) | <p>"Digital Transformation in Cultural Tourism: Business Models, Augmented Reality, Cultural Experiences, and Local Development"</p> <p>The integration of digital technology has revolutionized the landscape of cultural tourism, reshaping business models, enhancing experiences, and fostering local development. This integrated theme explores the interconnected relationships among the provided references, highlighting the evolution of cultural tourism through digital lenses. Ammirato et al. (2022) delve into Digital Business Models within cultural tourism, illustrating how technology has enabled new avenues for value creation, engagement, and monetization. This exploration underscores the pivotal role of digital strategies in driving innovation and growth in cultural tourism. Anand et al. (2023)</p> |

contribute by exploring the Quality Dimensions of Augmented Reality-based Mobile Apps in smart tourism. The study underscores how augmented reality apps heighten customer satisfaction and influence reuse intention, emphasizing the fusion of technology and traveler experiences. An author provides a foundational perspective by examining Cultural Routes and their influence on the experience of place. This insight underscores how digital technology enhances narratives, connectivity, and engagement with cultural heritage along these routes. Roque and Forte (2017) explore Digital Strategies for Local Cultural Tourism Development, showcasing the transformative impact of technology on local projects. The study underscores how digital strategies empower local communities to engage visitors, share cultural narratives, and enhance sustainable development. The integrated theme underscores the ongoing digital transformation of cultural tourism, where digital business models, augmented reality, cultural routes, and local strategies converge. This confluence signifies a paradigm shift where digital technology serves as an enabler of innovation, engagement, and sustainable development in the cultural tourism landscape. In essence, the theme reflects a future where cultural tourism is not bound by traditional boundaries, but is enhanced by digital technology. The fusion of technology and cultural experiences fosters an ecosystem where visitors engage, locals thrive, and heritage is sustained in a dynamic and digitally enriched tapestry.

Blue
 - huang y.-c.; chang l.l.;
 yu c.-p.; chen j. (2019)
 - medeiros m.; ozturk a.;
 hancer m.; weinland
 j.;
 okumus b. (2022)
 - rivera m.; gregory a.;
 cobos l. (2015)
 - zhou t.; song y.; zhou p.
 (2022)

"Unveiling User Adoption Dynamics of Mobile Applications in the Hospitality and Travel Sectors through Extended Acceptance Models"

The integration of mobile applications into the hospitality and travel sectors has revolutionized consumer experiences. This integrated theme delves into the intricate web of user adoption dynamics through an exploration of extended technology acceptance models, experience constructs, and motivational factors. Also literature review included the adoption of mobile applications by hotel consumers, extending the Technology Acceptance Model (TAM) to include the experience construct. This perspective sheds light on how user experiences shape the adoption of mobile apps in the hospitality context. Medeiros et al. (2022) offer a comprehensive view by integrating Self Determination Theory and UTAUT2 to understand the usage of travel tracking mobile applications. The study underlines how motivational factors and perceived usefulness interplay to influence users' adoption and engagement with travel tracking apps. An author explored the influence of technology experience, usefulness, and attitude on behavioral intentions in the context of a mobile application tailored for the timeshare industry. This study highlights the role of technology experience in shaping users' attitudes and intentions. Other authors contributed to the theme by delving into the continued use intention of travel apps, focusing on the perspectives of control and motivation. The study underscores how user control and motivation factors contribute to sustained engagement with travel applications. The integrated theme revolves around the intricate dynamics of user adoption and engagement with mobile applications in the hospitality and travel sectors. It underscores the importance of user experiences, motivational

| | | |
|--------|--|--|
| Yellow | <ul style="list-style-type: none"> - chen c.-c.; tsai j.-l. (2019) - falção r.p.q.; da costa filho m.c.m.; ferreira j.b. (2019) - shi j.; fan a.; cai l.a. (2020) | <p>factors, and technology acceptance models in shaping the trajectory of adoption. the theme reflects a future where mobile applications cease to be mere tools, they become integral to users' journeys, enhancing experiences, and catering to individual needs. The interplay between technology, experience, and user motivations orchestrates a digital transformation that reshapes the way travelers interact with services, information, and destinations.</p> <p>"Mobile Technology in Tourism: Unraveling User Behavior, Segmentation, and Millennial Experiences"</p> <p>The integration of mobile technology into the tourism landscape has reshaped user behavior, market segmentation, and the experiences of the millennial generation. This integrated theme delves into the interconnected web of factors through an exploration of determinants of behavioral intention, mobile purchase behavior segmentation, and the impact of mobile technology on leisure mobility experiences. Some probed the determinants of behavioral intention to use personalized location-based mobile tourism applications. By integrating the Technology Acceptance Model (TAM) with the Information System Success Model (ISSM), the study offers insights into the complex interplay of factors that drive users' intentions to adopt such applications. Some contributed to the theme by delving into the segmentation of Brazilian travelers' mobile purchase behavior. Their research underscores the diverse behaviors and preferences that influence mobile-based purchase decisions, offering a comprehensive view of market segmentation in the context of tourism. Shi et al. (2020) focus on the leisure mobility experiences of Chinese millennials, showcasing the impact of mobile technology on this influential demographic. This study underscores the transformative influence of mobile technology on the way millennials engage with leisure travel and experiences. The integrated theme underscores the profound shifts in user behavior, market understanding, and generational experiences that stem from the infusion of mobile technology into the tourism sector. Whether in behavioral intention, market segmentation, or generational engagement, mobile technology has become a key catalyst for change. The theme reflects a future where mobile technology is deeply intertwined with the very fabric of tourism. Its influence extends from shaping intentions and purchase behavior to redefining how millennials experience and explore leisure travel. This evolution underlines the importance of understanding these dynamics for both industry stakeholders and researchers as they navigate the evolving landscape of mobile-enhanced tourism experiences.</p> |
| Purple | <ul style="list-style-type: none"> - aliperti g.; cruz a.m. (2020) - dimitrovski d.; joukes v.; rachão s.; tiberio m.l. (2019) | <p>Technology-Driven Enhancements in Tourism: Disaster Preparedness and Wine Destination Branding through Mobile Applications" This integrated theme delves into the transformative impact of mobile applications on different facets of the tourism industry. Through an exploration of two diverse studies, the theme encapsulates the utilization of technology in promoting disaster preparedness and branding for wine tourism destinations. Aliperti and Cruz (2020) focus on the role of Built-for-Disaster-Purpose Mobile Applications in enhancing tourists' safety and preparedness during potential disasters. The study underlines the importance of interdisciplinary efforts in</p> <p>increasing the adoption rate of such applications, highlighting the integration of technology with disaster management strategies. Another author contributed by exploring the utilization of Wine Tourism Apps as instruments for wine destination branding. Their study delves into the content and functionality of these applications, showcasing how technology is harnessed to enhance the perception and engagement of wine tourism destinations.</p> <p>The integrated theme underscores the diverse ways in which mobile applications are transforming the tourism landscape. From disaster preparedness to destination branding, technology-driven solutions empower tourists and destinations alike. The theme paints a picture of a future where technology is integral to every aspect of the tourism journey. From ensuring safety during disasters to enhancing the allure of unique destinations, mobile applications are at the forefront of innovation, reshaping the experiences and interactions that define the realm of tourism.</p> |

F. Co-Citation (Cited References)

Co-citation analysis is a bibliometric methodology that involves analyzing the citations within a set of documents to identify relationships between cited references. In co-citation analysis, two or more documents are considered co-cited when they both cite the same third document. This approach helps identify the intellectual connections between different works based on their shared citations. The minimum threshold selected for this study is 3 citations of a cited reference. Of the 2848 cited references, 12 meet the threshold.

The intellectual structure within the integrated themes of "Exploring User Acceptance and Technology Adoption in Tourism through Theoretical Frameworks and Practical Implications" and "User Acceptance and Mediating Role of Mobile Technology in Tourism

Experiences: Insights from Structural Equation Models and Unified Views" revolves around the interplay of user acceptance, technology adoption, and their implications in the context of tourism. These themes draw upon various theoretical frameworks, empirical studies, and practical applications to elucidate the multifaceted relationship between technology and tourism experiences.

The intellectual structure can be summarized as follows:

1. Theoretical Foundations:

- Ajzen's Theory of Planned Behavior: Understanding individual intentions and their impact on technology adoption.
- Davis's Technology Acceptance Model (TAM): Highlighting the role of perceived usefulness and ease of use in determining technology adoption.
- Flow Theory: Exploring user engagement and immersive experiences.
- Unified Views: Providing holistic perspectives on user acceptance and technology adoption across diverse contexts.

2. Empirical Insights:

- Application of TAM to Online Consumer Behavior: Investigating the role of perceived usefulness and ease of use in online contexts.
- Longitudinal Studies: Studying the evolving nature of technology adoption and user behaviors over time.
- Implications of Virtual Reality Technology: Showcasing the transformative impact of virtual reality on tourism marketing.
- Smartphone Apps in Travel: Exploring the capabilities and scope of smartphone apps in enhancing travel experiences.
- Continuance Usage of Mobile Social Apps: Examining factors that sustain technology usage over time.
- Smart Tourism Destinations: Focusing on personalization of services and communication technologies for enhanced tourist experiences.

3. Mediating Role of Mobile Technology:

- Structural Equation Models: Understanding relationships between latent constructs in user acceptance and technology adoption.
- Model of Traveler Acceptance of Mobile Technology: Examining multidimensional aspects of user acceptance in travel context.
- Mobile Technology as Mediator: Exploring how smartphones bridge the gap between tourists and destinations, shaping mediated experiences.

4. Implications and Real-World Applications:

- Transformative Marketing Strategies: Leveraging innovative technologies like virtual reality for reshaping marketing approaches.
- Enriching Travel Experiences: Demonstrating how smartphone apps enhance practical aspects of travel journeys.
- Long-Term Technology Adoption: Identifying factors that contribute to sustained usage of mobile technology within tourism.
- Personalization and Engagement: Showcasing how technology personalizes services and information, elevating the tourist experience.

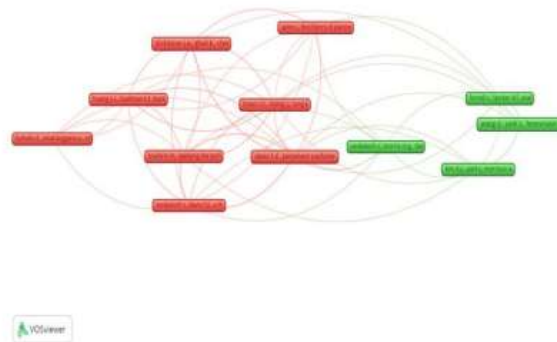


Fig. 5: Co-Citation Network Analysis

TABLE VI. CO-CITATION NETWORK ANALYSIS

| Red | | |
|-----|--|---|
| | <ul style="list-style-type: none"> · ajzen i., the theory of planned behavior, organizational behavior and human decision processes, 50, 2, pp. 179-211, (1991) · buhalis d., amarangana a., smart tourism destinations enhancing tourism experience through personalisation of services, information and communication technologies in tourism 2015, pp. 377-389, (2015) · davis f.d., perceived usefulness, perceived ease of use, and user acceptance of information technology, mis quarterly, 13, 3, pp. 319-340, (1989) · dickinson j.e., ghali k., cherrett t., speed c., davies n., norgate s., tourism and the smartphone app: capabilities, emerging practice and scope in the travel domain, current issues in tourism, 17, 1, pp. 84-101, (2014) · hsiao c.h., chang j.j., tang k.y., exploring the influential factors in continuance usage of mobile social apps: satisfaction, habit, and customer value perspectives, telematics and informatics, 33, 2, pp. 342-355, (2016) · huang y.c., backman k.f., backman s.j., chang ll., exploring the implications of virtual reality technology in tourism marketing: an integrated research framework, international journal of tourism research, 18, 2, pp. 116-128, (2016) · koufaris m., applying the technology acceptance model and flow theory to online consumer behavior, information systems research, 13, 2, pp. 205-223, (2002) · venkatesh v., davis f.d., a theoretical extension of the technology acceptance model: four longitudinal field studies, management science, 46, 2, pp. 186-204, (2000) | <p>"Exploring User Acceptance and Technology Adoption in Tourism through Theoretical Frameworks and Practical Implications"</p> <p>The integrated theme navigates the landscape of user acceptance, technology adoption, and their implications in the realm of tourism. These references span a range of theoretical frameworks, empirical studies, and practical applications, providing a holistic view of how technology shapes tourism experiences. Ajzen (1991) lays the foundation with the Theory of Planned Behavior, underscoring how individual intentions influence behavioral outcomes. This theoretical framework establishes the groundwork for understanding users' decisions to adopt technology in the context of tourism.</p> <p>Davis (1989) contributes with the Technology Acceptance Model (TAM), focusing on the interplay between perceived usefulness and perceived ease of use in determining technology adoption. This model becomes a cornerstone in unraveling user acceptance of information technology, including within tourism. Literature review extends the discourse with the application of TAM and Flow Theory to online consumer behavior. This perspective deepens the understanding of how users' engagement and immersive experiences influence their technology usage, a concept with implications for the tourism industry. An author talked about theoretical extension of TAM through longitudinal field studies, emphasizing the dynamic nature of technology adoption. This longitudinal approach captures the evolving perceptions and behaviors of users over time, which is crucial in understanding technology's enduring impact on tourism. Another study from literature review emphasizes the factors that sustain technology usage, which has direct implications for the longevity of technology adoption in tourism.</p> <p>The integrated theme captures the spectrum of theoretical underpinnings, empirical insights, and practical applications in the intertwining spheres of technology and tourism. From theories predicting user</p> |

- behavior to studies dissecting real-world technology implementations, the theme embodies the synergy of scholarly thought and real-world impact that technology brings to the forefront of modern tourism experiences.
- Green
- fornell c., larcker d.f., evaluating structural equation models with unobservable variables and measurement error, *journal of marketing research*, 18, 1, pp. 39-50, (1981)
 - kim d.y., park j., morrison a.m., a model of traveller acceptance of mobile technology, *international journal of tourism research*, 10, 5, pp. 393-407, (2008)
 - venkatesh v., morris m.g., davis g.b., davis f.d., user acceptance of information technology: toward a unified view, *mis quarterly*, 27, 3, pp. 425-478, (2003)
 - wang d., park s., fesenmaier d.r., the role of smartphones in mediating the touristic experience, *journal of travel research*, 51, 4, pp. 371-387, (2012)
- "User Acceptance and Mediating Role of Mobile Technology in Tourism Experiences: Insights from Structural Equation Models and Unified Views"
- The integrated theme delves into the intricate dynamics of user acceptance, the role of mobile technology, and the mediation of tourism experiences.
- The integrated theme encapsulates the amalgamation of statistical foundations, theoretical frameworks, and empirical studies to offer a holistic view of user acceptance and the mediating role of mobile technology in tourism experiences. The interplay between user acceptance, technology mediation, and tourist experiences fosters a dynamic and digitally enriched tapestry where engagement, satisfaction, and memories intertwine in new and exciting ways.

III. FUTURE RESEARCH DIRECTION

1. Revolutionizing Tourism Marketing through Mobile App Technology and Artificial Intelligence in the Hospitality Industry". In depth research in Advanced AI-Powered Personalization is suggested because as AI algorithms become more complex, understanding their effectiveness and potential biases becomes crucial. Elaborate studies can investigate the impact of incorporating diverse data sources, such as social media activity and sentiment analysis, on the accuracy of personalized recommendations. This could lead to more relevant and engaging content for users.

b. Ethical Implications of AI: there's a need to understand the ethical implications of AI. Elaborate research can dive into the transparency of AI decision-making and its potential biases. This could lead to industry guidelines for ensuring fairness and transparency in AI-powered marketing, enhancing consumer trust. Research can focus on developing ethical frameworks and guidelines for the responsible use of technologies, ensuring tourists' privacy and consent are respected.

2. "Empowering Cultural Heritage Preservation and Sustainable Tourism Development through Technology Adoption and Innovation" Research can explore the challenges and opportunities of integrating digital technologies into culturally sensitive contexts, ensuring that digital experiences respect local traditions and values.

a. Community Engagement and Technology: involving local communities in digital heritage preservation ensures authenticity and cultural representation. In-depth research can explore methodologies to engage communities in creating digital content, preserving their voices and narratives, while also evaluating the long-term sustainability of such projects.

b. Economic and Social Impact Assessment: Conducting comprehensive research into the economic and social impacts of technology-driven sustainable tourism is crucial for informed decision-making. Elaborate studies can quantify the benefits in terms of job creation, community empowerment, and conservation efforts. This could provide a solid basis for policymakers to support such initiatives.

3. "Revitalizing Travel Experiences in the Era of COVID-19 through Mobile Apps, Technology, and Performance Enhancement" Studies can explore whether these changes are temporary or will have lasting effects on how travelers interact with technology.

a. Long-Term Impact Analysis: the pandemic's effects on travel behavior might extend beyond its immediate impact. Longitudinal research can provide insights into whether technology-driven changes like virtual experiences and contactless services will remain

popular even as travel returns to normalcy, influencing industry strategies.

b. User Experience and Accessibility: In-depth research is needed to ensure that technology-driven solutions are inclusive and user-friendly for all traveler demographics. Elaborate studies can explore design principles, accessibility features, and user centered testing methodologies to create technologies that cater to a diverse range of travelers.

4. "Enhancing Mobile Experiences through Augmented Reality and Mobile Applications in the Age of Mobile Computing". research can investigate their potential to create immersive and educational tourism experiences. This might include exploring the impact of XR on learning outcomes, emotional engagement, and memory retention.

a. AR in Cultural and Historical Contexts: how augmented reality can reshape historical and cultural site experiences is relevant area of future research. In-depth case studies can analyze visitors' emotional engagement, knowledge retention, and overall satisfaction, shedding light on how AR can contribute to a deeper understanding of heritage.

b. User-Generated AR Content: researchers can explore the potential of user-generated content to enhance authenticity and interactivity. Elaborate research can examine the impact of allowing visitors to contribute their own AR content, fostering a sense of ownership, creativity, and community participation.

5. "Cultivating Sustainable Smart Tourism through Effective Information Management in Cultural Tourism" This might involve studies on the use of smart technologies to monitor and reduce resource consumption, or the potential of virtual experiences to offset physical travel's carbon footprint.

a. Data Privacy and Security: In-depth research can lead to the development of comprehensive guidelines and protocols that protect tourists' personal information while enabling technology-driven smart tourism experiences.

b. Measurement and Metrics for Sustainability: This research direction is justified as sustainable tourism involves multiple dimensions. Elaborate research can lead to the creation of standardized metrics that encompass economic, environmental, and social sustainability aspects, allowing destinations to measure and compare their impact accurately.

6. "The Digital Confluence: Unveiling the Power of Information and Communication Technology, Internet, and Mobile Communication"

a. Emerging Technologies: emerging technologies like 5G and blockchain have the potential to reshape the travel landscape. Elaborate research can explore the practical implications of these technologies, such as enhanced connectivity and secure transactions, and their role in creating seamless and secure travel experiences.

b. Digital Divide and Inclusion: It is important to ensure that the benefits of technology-driven tourism are accessible to all. In depth research can propose strategies to bridge the digital divide, such as community technology centers or tailored training programs, to empower marginalized populations and promote equitable tourism growth. Future research can focus on designing smart tourism solutions that cater to individuals with disabilities, enhancing inclusivity in travel experiences.

IV. THEORITICAL IMPLICATIONS

The integrated themes contribute to the theoretical landscape by expanding existing frameworks, introducing interdisciplinary perspectives, and challenging traditional theories in light of technological advancements. some of the key theoretical implications are as follows: The themes consistently emphasize the application of TAM and its extensions in understanding user adoption of technology in the tourism context. Theoretical models like TAM provide a foundation for predicting and explaining users' intentions to adopt technology. The implications lie in refining and adapting these models to accommodate the

evolving nature of technology and the unique characteristics of the tourism industry. Several themes integrate multiple theoretical frameworks, such as TAM, Flow Theory, and Self-Determination Theory. These integrations demonstrate the complex interplay of factors that influence technology adoption and usage in tourism. The theoretical implication is the need to develop more comprehensive and multidimensional models that capture the diverse range of influences on user behavior. The recognition of technology as a mediator between tourists and their experiences offers theoretical insight into understanding the transformative impact of technology. This highlights the need to explore the mediating mechanisms through which technology shapes and enhances various aspects of tourism experiences.

The theme centered around cultural heritage preservation and sustainable tourism challenges traditional theories of cultural heritage management. It introduces the role of technology as a catalyst for conservation efforts and reshapes our understanding of how cultural heritage can be sustained in the digital age. The exploration of how technology affects different generations of travelers connects with generational theories, such as Baby Boomers, Generation X, Millennials, and Generation Z. These themes offer insights into how technology preferences, behaviors, and experiences evolve across generations, contributing to generational theory and consumer behavior research. The integration of augmented reality in tourism experiences has theoretical implications for spatial cognition, environmental psychology, and embodied experiences. These themes contribute to the discourse around how technology alters spatial perceptions and enhances immersion.

The emphasis on sustainable practices, responsible tourism, and ethical considerations in technology-driven tourism experiences aligns with sustainability theories. These themes underline the need for ethical frameworks that guide the responsible integration of technology without compromising cultural, social, and environmental values. The themes that incorporate longitudinal studies provide insights into the dynamic nature of technology adoption and usage over time. These studies contribute to the theoretical understanding of how technology evolves and adapts to changing user needs and preferences. The exploration of the digital confluence and the role of information and communication technologies aligns with communication theories. These themes contribute to our understanding of how digital communication reshapes connectivity, information sharing, and the way tourists engage with destinations.

V. CONCLUSION

The study provides a comprehensive summary of current state of research in impact of MTA on tourism in literature. 56 selected articles from online scopus database were analyzed using biblioshiny and VosViewer software to map the most relevant authors, sources and countries and the intellectual structure of the research area through key words co occurrence analysis, bibliographic coupling of documents and co citation analysis of references. There is a gradual growth in publications indicating an increasing interest and knowledge creation. The impact of Mobile Tourism Applications (MTA) spans across diverse disciplines such as computer science, information systems, tourism, hospitality, and technological landscapes. These sources reflect an interdisciplinary nature, ranging from technical app development to information management in enhancing tourism experiences. MTA's influence on traveler behavior, destination management, and sustainability is evident. It also extends to hospitality services. The integration of technologies like wearables and IoT, alongside considerations of networks, interactivity, and smart trends, underlines MTA's comprehensive reach. This convergence signifies a dynamic field addressing technological innovation, user engagement, and sustainable practices within the realm of mobile-enhanced tourism. The articles published by most relevant authors share a central focus on integrating mobile app

technology in global tourism. They investigate its impact on enhancing experiences, organizational performance, and innovation, across locations like Oman, KSA, UK, and PRC. Exploring IoT and augmented reality, they highlight museum engagement, interactive site experiences, and e marketing. Scientific production in tourism and technology spans globally, with Italy and China leading with 23 and 22 publications respectively, reflecting research emphasis and innovation. The UK and USA follow with 16 publications, showcasing historical research roles. Malaysia, India, and Portugal contribute 12 and 10 publications each. Emerging interest is seen from Indonesia (8), while Egypt, Brazil, and others show fewer publications, possibly due to varied focus. This distribution underscores global research influenced by infrastructure, expertise, and regional priorities.

The integrated themes delve into the multifaceted relationship between technology and tourism, showcasing diverse dimensions of transformation. From AI-driven marketing and mobile app enhancements to cultural heritage preservation, pandemic-driven travel changes, augmented reality experiences, and sustainable smart tourism, each theme highlights a distinct aspect of technology's influence. The thematic structure provides a comprehensive picture of how technology reshapes tourism, encompassing personalization, sustainability, connectivity, and innovation, while acknowledging the pivotal role of information and communication technologies in shaping contemporary travel experiences

The intellectual structure within "Exploring User Acceptance and Technology Adoption in Tourism through Theoretical Frameworks and Practical Implications" and "User Acceptance and Mediating Role of Mobile Technology in Tourism Experiences: Insights from Structural Equation Models and Unified Views" revolves around the interplay of user acceptance, technology adoption, and their tourism implications. The structure encompasses theoretical foundations like Ajzen's Theory of Planned Behavior and Davis's TAM, empirical insights into online behavior and VR technology, the mediating role of mobile tech, and real-world applications. This structure offers a comprehensive view of how these elements intertwine, demonstrating the transformative impact on tourism by enhancing marketing, experiences, engagement, and sustained usage of technology.

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