

Digitalization models and indicators for tourism marketing

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Abstract:

The goal of this study is to assess the function of digital tourism in supporting tourism economy and importance of tourism sector in enhancing the economy. The study employed the objective and quantitative analysis of online curricula content methodology to examine the most important statistical indicators of modern tourist data trends using data from worldwide statistical organizations. The results of study determined impact of tourism digitization on sector based on the study rate-use of environmental travel, virtual reality, Internet of Things (IoT) and artificial intelligence. Moreover, measuring the contribution of personalization to tourism experience according to customer's desires and expectations, the effectiveness of virtual reality during decision-making stage of customer's journey, as well as role of engaging and participating in local culture of tourism trends and benefiting from artificial intelligence and the uses of robots to be able to deal with inquiries and assist customers. The study's most noteworthy findings included the integration of Internet of Things and artificial intelligence with tourism. This technologies enables sustainable, cost-effective, and personalized travel. Furthermore, the construction of a secure and resilient technology infrastructure necessitates significant financial commitment and organizational preparation. Provides unprecedented prospects to improve operational efficiency.

Keywords: *tourism economy; Virtual Reality; Internet of Things (IoT); Artificial intelligence.*

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1. INTRODUCTION

The tourism economy is regarded as the most important supporting component of the economy, with numerous advertising efforts carried out by individuals and groups responsible for various tourism activities. The tourist industry is regarded one of the branches of the economy by examining, studying, and assessing its role in reviving the country, boosting employment possibilities, and strengthening the purchasing power of local currencies.

The tourism industry process has become one of the methods and means used in a modern way as a result of the world's rapid development in the field of information technology. The role of the tourism industry in improving the tourism economy is reflected positively on sectors, public facilities, and structures.

Major advances in the development of modern tourism through the use of tourism information is a key component of the client relationship with numerous businesses, and voice command and intelligent technology can be a modern form of tourism methods, as some hotels have installed interactive robots to deal with the receptionist and introduce the concept of "luxury hostels".

Virtual reality is one of the main tourist practices related to the industry, and leveraging technology can give an edge in the market, as having just one trip is no longer rare and modern tourism habits increasingly reflect. As the younger generation gains market relevance, the principles that guide what they buy are manifesting in novel tourism patterns such as eco-travel.

The tourism industry might be in for another turbulent moment as winter approaches and traveler attitude deteriorates, given the increase in COVID-19 instances in several regions of the world, particularly Europe. The new Omicron form has spread quickly, raising fears in recent days and prompting many nations to reimpose COVID restrictions. The scenario is especially unclear because recent months have seen improved hotel performance as vaccination advances, which has led to a resurgence in demand, less restrictions, and the reopening of numerous international borders. Adoption of hygienic and safety regulations has been given first priority, and local tourism—particularly intangible services—has been promoted.

By addressing the topic, we will try to answer the next crucial query:
How does digitization help the travel and tourism sector?

By discussing the follow, study Hypotheses:

1. Eco-travel impacts the measurement of the contribution of personalization to the tourism experience during the decision-making stage of the customer journey
2. Virtual reality impacts the measurement of the contribution of personalization to the tourism experience during the decision-making stage of the customer journey
3. IoT and AI impact the measurement of the contribution of personalization to the tourism experience during the decision-making stage of the customer journey

Related literature:

The study (Richard , Mark , & Nandana , 2024) addresses the need for digital transformation for hospitality and tourism companies to rapidly build and continuously upgrade their digital transformation competitiveness and specific digital business capabilities. Using objective and quantitative analysis of online curricula content from top universities worldwide, we investigate the extent to which these digital capabilities are integrated into hospitality and tourism management curricula, as well as the approaches used to integrate them. The literature review provides empirical evidence of levels of integration, by identifying different curricular integration approaches, and discussing the strengths and weaknesses of their integration. The study contributes to the industry's readiness for digital transformation.

(Francesco , Daniela , & Giovanni, 2024) Focuses on the quickly evolving digital landscape, where innovation laboratories have emerged as crucial change agents, but little known about how they may use in the travel industry. Several case studies and a tourism-focused action research project they employed in this study to close this gap. According to the findings, innovation laboratories greatly increase tourism firms' potential for business model innovation, digital innovation, and digital transformation.

(Giray , Chi Keung , Zhibin , & Yan , 2024) Examine the suggested governance framework highlights their potential to democratize technology and innovation, particularly for SMEs, and offers helpful advice for

successful implementation. These results highlight the importance of innovation laboratories as major forces behind innovation and offer insightful information to practitioners and scholars alike.

This study uses a panel dataset of 151 countries from 2000 to 2019 to examine how digital governance affects inbound tourism. Estimates of fixed effects and system-generated moments demonstrate that internet shutdown procedures and capacity lower incoming tourism. Inbound tourism is further hampered by strict social media surveillance. Tourism operations are found to be adversely affected by governance capability and the results of practical monitoring. There is also discussion of many policy implications for appropriate regulation of digital communications.

Study importance:

The significance of digital transformation in the travel and tourism sector has become clear in recent years, as the industry has undergone dramatic transformations, mostly driven by technological advancements and the pervasive impact of digital transformation. The development of the internet and mobile technology has transformed the way people plan, book, and experience travel, resulting in increased efficiency and a more enjoyable travel experience for travelers. Understanding how digital transformation benefits the travel and tourism industry is critical for understanding current trends and potential. Unprecedented access to information is one of the biggest effects of digital transformation on the travel sector. Travelers can learn more about various locations, lodging options, and experiences by using online resources including social media, travel blogs, and review websites.

Additionally, digitization has made the booking process easier to use and more efficient, allowing for flexibility in making last-minute decisions and adjusting to shifting plans.

Personalization is also important. Big data and analytics are being used more and more by hotels, airlines, and travel companies to customize their products to suit the tastes of their customers. Businesses can offer individualized marketing and travel recommendations by examining customer behavior and preferences. Social media's ascent has changed how travel agencies interact with their clientele. Through real-time interactions on social media platforms,

businesses can rapidly answer consumer questions, get feedback, and create a sense of community among passengers. Building trust and understanding through an open channel of communication is essential in market extremely competitive. In the travel and tourism sector, sustainable practices are crucial. Online resources promote environmentally beneficial decisions by emphasizing eco-friendly lodging and travel choices. Travelers can lessen their environmental effect by using digital tools to make informed decisions.

Literature Review:

2. The significance of the tourism economy and its concept:

One of the economic sectors that is regarded as one of the primary pillars of the state is the tourism industry, which is typically dependent on it for the growth of the economy as a whole. Because there are not any natural resources or oil wells, the tourist industry is typically thought of as the sole way to control the economy. This is commonly done by organizing travel and working to give residents a lot of offers.

One of the most important resources for nations and the economy at large is the tourism sector, which typically accounts for 20% of GDP and offers a large number of job opportunities to citizens, which in turn causes the economy to move and money to enter markets. Generally speaking: tourism and its various sectors drive the nation's economy, which encourages investment and helps draw in a large number of investors. This boosts employment opportunities, revitalizes the nation, and increases the purchasing power of local currencies—all of which are indicators of a robust tourism economy.

2.1 The tourism industry and its role in improving the economy:

Countries sometimes look for new and advanced ways to increase turnout and revitalize the tourism movement in their country or region, and research, planning, and analysis are usually conducted to find such ways, as it is regarded as one of the new and modern ways to activate and develop tourism while also contributing to increased revenues and financial profits.

Many countries have incorporated new tourist destinations and utilized many tourist areas, which has resulted in generating many profits for these areas. For example, the Dubai Expo, which was held in the United Arab Emirates, introduced some key ideas such as the search for new ways of

transportation, as well as the search for new ways of water and energy sustainability.

3. Main trends in the development of modern tourism

3.1 The notion of "comfort hostels" arrives: The idea of a "premium" or "chic" hostel considered a complete absurdity. These budget hotels built for poor tourists, especially young people and students. However, unexpectedly for many, in the past year, the demand for hostels has increased. Many tourists are willing to sacrifice a comfortable stay. Furthermore, this is due to the potential for fascinating acquaintances in dorms where forward-thinking youth sleep, not to pointless money saving. In the Western press, the definition of "filth" is becoming increasingly popular, which is gradually replacing hostels in many cities around the world.

The Postel is not a typical hostel, but a budget hotel with an original design of the rooms. By the way, the rooms in these items are quite cheap, and the furniture selected in a minimalist style. Visitors to the post provided with a minimum of services, but free Wifi is required. For example, Casa Grasia, a post in Barcelona, Spain, became very popular in 2014. Local young people willingly come to this hotel to meet foreign tourists and have fun in the evening.

3.2 Lunches at cheap home restaurants: In Europe, websites are becoming more widespread, which offer services to find locals in different cities willing to provide tourists with a delicious and inexpensive home-cooked meal. Such meals rarely exceed the cost of 5-7 dollars per person. Tourists are offered a lunch of three traditional national dishes. At the same time, tourists have the opportunity to see how ordinary people live in the country where they came to rest and have time to talk and learn interesting traditions. Some owners of "home restaurants" are ready not only to feed their guests delicious food, but also to arrange an excursion to the sights of the city for a purely symbolic fee.

3.3 Booking airplane and train tickets and hotel rooms online:

This is not a new trend; for several years in a row, many travel agencies around the world have provided such services to their regular customers. But in 2016, a real "fashion boom" is expected for this type of service. Travel companies experiencing the crisis in their own countries, ready to conclude contracts with hotels, restaurants and airlines. Only in this way, by banding

together, can you survive the crisis. According to experts' forecasts, about 35% of tourists in 2016 will use online booking services. Over the next two years, the trend will develop, due to the release of new mobile applications and devices. For example, Travel agencies are anticipating the arrival of a smartwatch that will allow them to manage ticket bookings, hotel rooms, tables in restaurants and even use such watches as personal keys to hotel rooms. Naturally, when using the devices, tourists will be provided with good travel discount systems.

3.4 Voice inquiries and voice surveillance: As smart speakers and mobile assistants like Siri, Google Assistant, and Bixby become more and more common in homes, more and more tourists are using voice search. It's crucial for people in the tourism sector to draw in these visitors by structuring website content appropriately to show up in voice search and enable voice reservations. For many businesses, providing tourist information is a crucial aspect of the client experience, and in this case, voice control and artificial intelligence can be quite helpful. Additionally, smart speakers or other voice-activated IoT devices can be installed in hotel rooms, making it easier for guests to switch settings or turn equipment on and off.

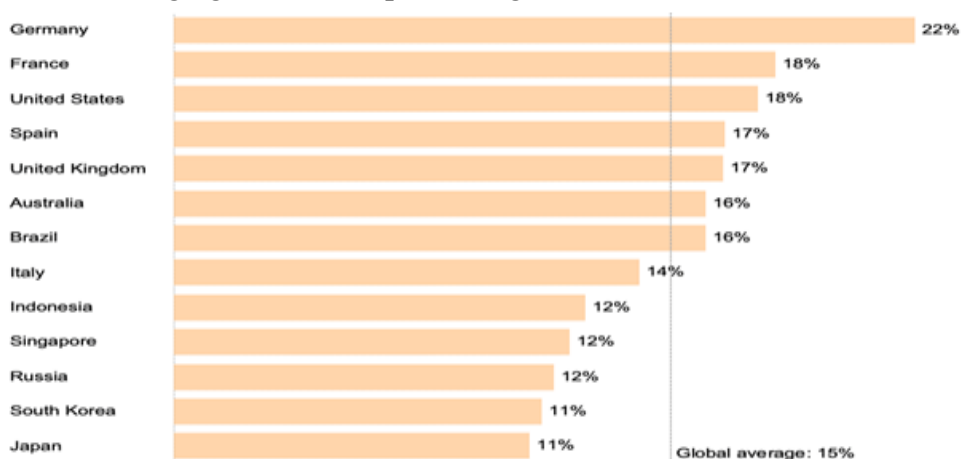
3.5 VR-related tourism developments: One of the biggest trends affecting the travel business is virtual reality, and using the technology can give you an edge over rivals who haven't embraced it yet. Customers can experience outdoor attractions, restaurant interiors, hotel interiors, and more from the comfort of their own homes using virtual reality tours. Most importantly, they may accomplish this during the customer journey's decision-making phase. VR is especially helpful in the context of COVID, where consumers may have different ideas and may require additional encouragement to proceed with their plans. This might be the difference between customers completing a booking or canceling. Additionally, the majority of contemporary VR tours are web-based, so any standard web browser can access them. VR headsets can then be used to further improve the VR tour's quality and level of immersion.

3.6 Traveling Alone: In the past, vacation travel was typically done by couples or as a family. Even though many people still do this, an increasing number of people are opting to go it alone. Traveling alone is becoming more and more common, and this is reflected in travel patterns. Solo

travelers have a variety of needs. Some people just like to travel alone, free from the interruptions of a partner. Young singles who wish to meet people or find a partner are among them. Some elderly widows opt to remain in luxurious hotels or on cruise ships instead of receiving the usual elder care. These travel inclinations will only increase.

3.7 Green-travel: The norms and concerns of the clientele have a significant impact on tourism trends. New tourist trends are being created by the values that motivate the younger generation's purchase decisions as their market share increases. One of the tourism trends that reflects the increased interest of modern tourists in sustainable and ethical travel options is eco-travel. Simple adjustments like offering carbon credits while making travel arrangements or allowing customers to hire electric cars rather than conventional ones are examples of eco-tourism. There are more complicated instances, such as voluntary tourism, working in a nature reserve, or conservation activities. This is shown in the figure below.

Figure01: Average green travel percentages



Source: (Gen & Beyond, 2019)

3.8 Regional Knowledge: Today's tourists don't want to be in a cultural bubble and cut off from the places they visit. They wish to become fully immersed in the culture of the area. Local experiences, such as dining locally and celebrating area holidays and festivals, are expected to emerge as one of the most popular travel trends. Visiting Japan during one of the major festivals, renting traditional Japanese attire, dining on local cuisine, and taking part in customary games or cultural events are a few examples of

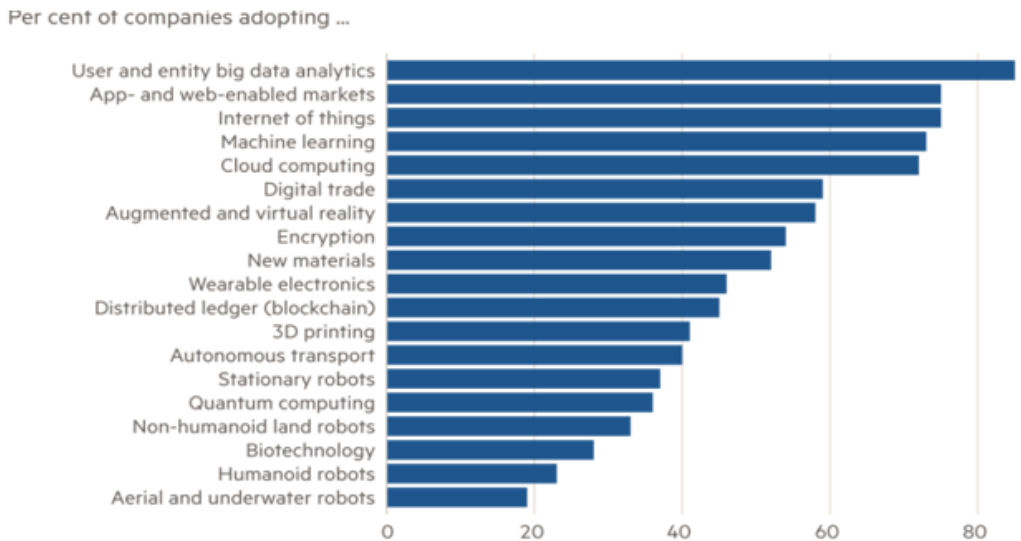
popular local experiences. An longer stay with a host family in the country of travel could be another option to gain additional cultural knowledge.

3.9 Individualization: You may be accustomed to seeing advertisements on social media and other websites that are related to items you have browsed or purchased online. This is but one instance of customization. Personalization can be used to improve tourism marketing and enhance all facets of the visitor experience. Today's consumers demand experiences that closely match their own interests, from travel locations to lodging options to the kinds of activities they will partake in. Customers are more likely to return and use the same service again if the experience is more closely customized to their preferences and expectations.

3.10 Automation, chat-bots, and bots: Connie, a robot concierge for the Hilton hotel company, is a striking illustration of these specific travel patterns. The concept of robot employees has also been adopted by other hotels, which have installed interactive bots to do specific welcome tasks or even serve guests food and beverages. There are other creative applications as well, though. Nowadays, a lot of consumers utilize online chat(bots, particularly artificial intelligence (AI), to book their travel and lodging when human operators are unavailable. AI can answer questions and provide customers with helpful information.

3.11 Artificial Intelligence: In addition to the chat-bots mentioned above, as mentioned above, AI is playing a bigger role in the travel sector. Since AI makes it easier to customize the process of researching and scheduling trips and excursions, machine-learning technology already deeply ingrained in the marketing of the travel industry. AI is also becoming more and more useful in situations like smart hotel rooms, where it can detect possible visitor demands and adjust the surroundings and amenities to the visitor's tastes. AI is used in everything from security to customer service. Self-driving cars and virtual tour guides could be future AI tourist phenomena to look out for. According to the Financial Times, the influence of AI and its applications, whether for machine learning or the Internet of Things, are depicted in the following figure.

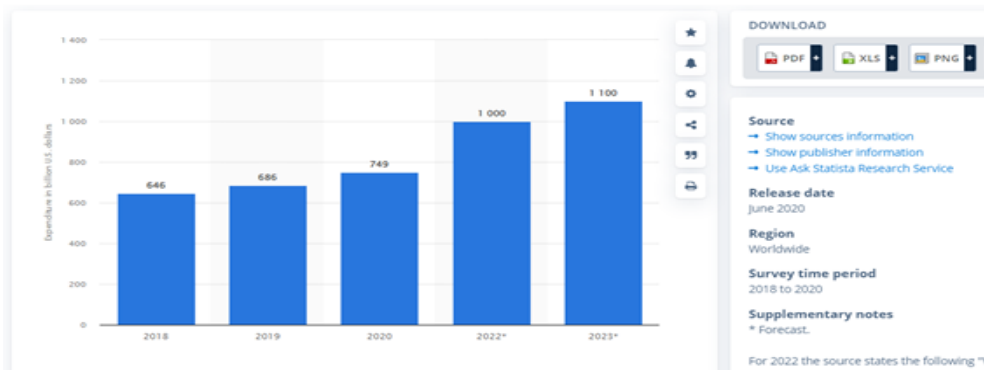
Figure02: The most widely used technologies in 2022



Source: (Lucy, 2020)

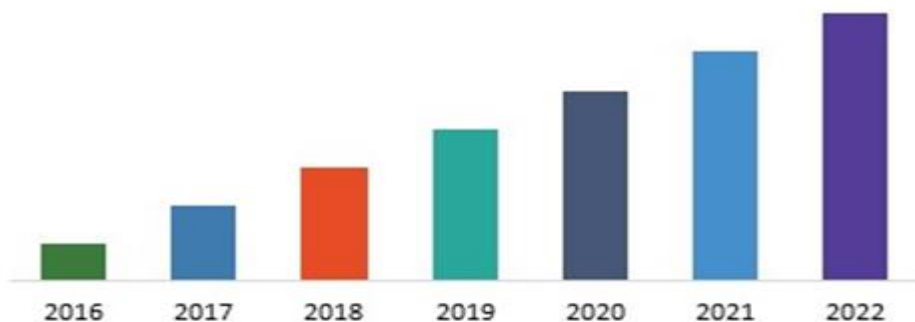
3.12 Recognizing Technology: One of the major travel and tourism developments that is beginning to permeate many different industries is recognition technology. The bank of automatic gates at some borders is one of the most well-known uses of RFID technology. Using a camera and facial recognition technology, the gates can scan the information on a traveler's ID card or passport and compare it to their face. One of the tourist megatrends in the hospitality sector is identification technology, with voice recognition growing in popularity as a way to operate smart hotel rooms.

3.13 Internet of Things (IoT): The Internet of Things closely relates to numerous tourism themes. IoT devices are gadgets that can connect to the internet and be controlled because they have a microprocessor and some kind of digital communication. "Smart" hotel rooms are the result of IoT gadgets, such as entertainment systems, heating and cooling systems, and other fixtures frequently seen in hotel rooms. By enabling visitors to schedule activities (such as a spa treatment, a swim in the pool, a workout at the gym, etc.) or place orders for extra services like room service through a hub or smartphone app, IoT is also being utilized to integrate services into the hospitality industry. The global IoT spending prediction through 2023 is displayed in the following figure.

Figure 03: Global IoT spending forecast for 2022

Source: (Claire, 2021)

3.14 Augmented Reality (AR): 3.14 Augmented Reality (AR): Augmented reality blends virtual and real-world aspects, while virtual reality replicates entire worlds and experiences. Pokémon Go, a smartphone game that overlays real-time footage of the player's surroundings with imaginary monsters, is a well-known example. It goes without saying that this is very helpful in the tourism industry: Rather than imaginary monsters. Apps for augmented reality smartphones can provide visitors with information about the place they are visiting. These could include lists and menus of nearby restaurants and entertainment places, or historical information about buildings and sites. Museums are using augmented reality (AR) more and more to show items in their original form as a virtual overlay. Internet-enabled virtual maps could be one of the other AR uses. The following figure shows the forecast for the tourism VR and AR markets from 2016-2022:

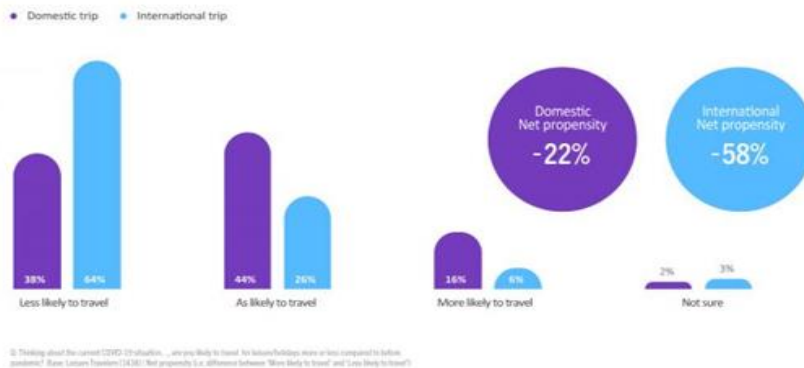
Figure 04: Tourism Virtual and Augmented Reality Market Forecast 2016-2022

Source: (Dependar, 2021)

3.15 Proper and green food: Many tourists have the misconception that healthy food and the kind of food they eat are mutually exclusive, with vacations typically serving as a chance to indulge in forbidden foods and break the diet. Travelers today are aware that being tasty and nourishing are not mutually exclusive. New travel trends are being driven by the desire for fine dining with an eye on improved nutrition. Today's traveler wants to know that the food they consume is both tasty and healthful. The organic food revolution is also influencing travel trends, as more restaurants and hotels are offering organic options. Other particular diets were also featured.

4. "associated" travel trends to COVID-19: The tourism industry might be in for another turbulent moment as winter approaches and traveler attitude deteriorates, given the increase in COVID-19 instances in several regions of the world, particularly Europe. Many nations have reinstated COVID limitations as a result of the new Omicron variant's rapid proliferation, which has further increased uncertainty in recent days. The scenario is especially unclear because recent months have seen improved hotel performance as vaccination advances, which has led to a resurgence in demand, less restrictions, and the reopening of numerous international borders.

Figure 05: Propensity to travel compared to before the pandemic



Source: (Increasing COVID-19 cases dent consumer travel sentiment, 2021)

4.1 Sanitation and safety Trends in tourism: Since the COVID outbreak, safety and hygienic requirements have been crucial for many types of establishments, including hotels, restaurants, cruise ships, and airplanes. In light of this, some tourism trends have been linked to it, including more cleaning, socially isolated seating, the provision of hand gel, and the use of

masks in certain locations. Nowadays, this is also an essential component of tourism marketing since companies must clearly communicate their safety and hygiene regulations as well as the precautions they are doing to keep patrons safe. They will need to persuade people that they are secure because the coronavirus threat makes people less likely to travel and visit popular tourist destinations.

4.2 Greater emphasis on leisure time: While many businesses are urging staff to work from home and use video calls, the coronavirus has compelled nations to impose travel restrictions. Consequently, business events have been particularly negatively impacted, and a change in focus towards leisure clients has been one of the consequent tourism trends. Many folks are in dire need of a holiday because the pandemic has been difficult for them. If your company usually caters to business clients, you might want to think about ways to alter this strategy, at least temporarily. During this process, businesses will most likely need to modify their marketing messaging and possibly the distribution channels they use to generate sales.

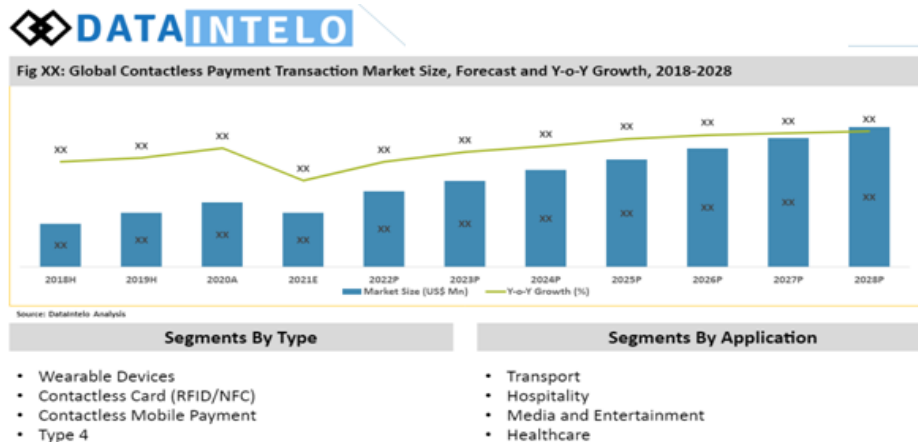
4.3 Shift from international to local: 4.3 Transition from international to local: Many in the tourist business are compelled to concentrate on domestic clients rather than foreign ones due to a variety of travel restrictions and the hesitancy of many individuals to travel elsewhere. This does not imply that foreign tourists should be totally abandoned, but it will probably necessitate a shift in fundamental marketing tactics. When it comes to hotels, it might be preferable to emphasize the kinds of amenities that might appeal to the local market, such Wi-Fi, restaurant and fitness centers, and even the fact that hotel rooms are perfect for working remotely. It might also be necessary for airlines and tourism management to change course and give preference to domestic travelers.

Notably, local clients are unlikely to cancel either because they simply need to observe local regulations and won't likely need to stay in quarantine following their visit.

4.4. Growth of rapid payments: Although contactless payments have long been a mainstay of tourism technology, the introduction of services like Apple Pay and Google Pay has helped to advance this. This means that clients can pay for food, lodging, transportation, and other services without ever

carrying a debit or credit card. Allowing contactless payments has allowed tourism companies to reduce friction and improve the speed of check-in and checkout. Additionally, it implies that payments for items can be made promptly, which promotes impulsive purchasing. Due to the coronavirus, contactless payments are more popular than ever because both customers and employees would rather not handle currency.

Figure 06: International Market Expectations and Intangible Spending



Source : (Soy & Coconut, 2021)

5-Methodology:

The travel industry has seen a revolution in customer service as a result of the integration of AI and IoT, allowing for personalized experiences that greatly increase customer satisfaction. In this regard, focus groups are an essential method of qualitative research, facilitating a nuanced understanding of consumer expectations and preferences.

This essay addresses the reasons for using focus groups in research design, data collection methods, and analytical techniques for synthesizing insights related to the integration of AI and IoT, as well as potential limitations inherent in this approach. Focus groups are vital in the research design process because they facilitate interactive discussions that reveal rich qualitative data, allowing researchers to assess participants' perceptions of AI and IoT applications in customer service, revealing the experiential and affective dimensions of user involvement. Researchers can get a comprehensive picture of consumer demands by bringing together a broad group of participants, including tourists from different demographics, this helps guide the creation of individualized services.

5-1-Research Design: A thorough grasp of the topic is made possible by the

research's mixed-methods methodology. Examining how AI and IoT technology can be used to improve client customisation in travel services is the main goal. The research is divided into two stages: the exploratory stage, which involves conducting qualitative focus groups with professionals in the field, and the confirmatory stage, which include giving passengers quantitative surveys.

5-2-Data Collection Methods

A. Qualitative Data Collection:

Analysis Focus Groups: Conversations with travelers aid in understanding their experiences and expectations with regard to AI- and IoT-enhanced tailored services. Focus group data collection techniques have several benefits. Focus groups' conversational format allows members to express their ideas in a group setting, which frequently yields unexpected discoveries that quantitative approaches might miss. This interactive environment enables researchers to go further into participants' answers, guaranteeing that minute details pertaining to customer service customisation are thoroughly examined. Additionally, focus groups enable lively conversations that uncover societal perceptions of technology, shedding light on how AI and IoT might affect consumer.

Understanding of customer service customisation can be further improved by combining analytical methods with focus group results. Researchers can classify information about AI and IoT characteristics that consumers value most by using thematic analysis to find recurrent themes and patterns in the data. Furthermore, coding frameworks can be created to methodically quantify qualitative data, allowing for a thorough assessment of client attitudes and bridging the gap between qualitative and quantitative analysis.

The usage of focus groups has several drawbacks despite all of their advantages. Because of the small sample size and the possibility of groupthink—where dominant voices obscure less outspoken participants—the results of focus groups could not be applicable to the whole customer base. Additionally, Data may also be skewed as a result of people changing their answers to conform to perceived societal norms. Therefore, in order to assure solid, trustworthy, and representative views on the integration of AI and IoT in customer service, it is essential to complement focus groups' rich qualitative insights with data from other sources, such as surveys or observational studies.

To sum up, focus groups are a useful tool for investigating how the tourism industry is utilizing AI and IoT to personalize client care. These groups' interactive format makes it easier to fully comprehend customer

preferences, and the right analytical methods can extract important themes from the data. Nonetheless, researchers need to be aware of the inherent drawbacks of this approach, making sure that focus group results are validate conclusions and improve the effectiveness of service personalization initiatives, findings are triangulated with complementary data sources.

Analysis Techniques: First, a thematic analysis is used to examine qualitative information gathered from focus groups and interviews. This technique entails coding the data to find recurrent themes about personalization, like responsiveness, user interface design, and the customization offered by AI and IoT technology.

B. Analysis of Statistics: Statistical techniques are used to analyze the quantitative survey data. While inferential statistics, such regression studies, show the connection between customer satisfaction levels and the adoption of AI and IoT technology, descriptive statistics give an overview of traveler demographics and preferences.

The study attempts to present a comprehensive picture of the customization of customer service in the travel industry by utilizing this multidimensional research design. It draws attention to the significant ways that AI and IoT technologies shape user experiences and suggests possible directions for future innovation in this quickly changing sector. The results not only enrich scholarly understanding but also provide useful advice for companies aiming to improve customer service using cutting-edge technology.

6-Result and Discussion:

The major players operating in the global AR VR in Travel and Tourism Market Ecosystem are as follows:

Table01:

Company	Ecosystem Positioning	Total Revenue 2018	Industry	Region
Apple	Products, Parts and Devices, Services & Solutions	US\$ 265.59 Bn	Consumer Electronics	Global
Facebook	Products, Parts and Devices	US\$ 55.83 Bn	Social Networking	Global
Microsoft Corporation	Products, Parts and Devices	US\$ 110.36 Bn	AR VR	Global
The Hub Hotel (Premier Inn)	End-user	US\$ 2.61 Bn	Travel and Tourism	Global
HTC Corporation	Products, Parts and Devices	US\$ 0.73 Bn	Consumer Electronics	Global

Source: (All The Research, 2020)

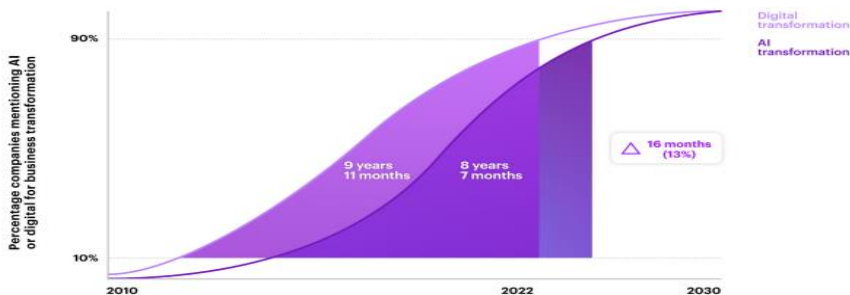
Interconnectivity with other markets, such as AR and VR, is quite rare. The main hubs of many markets are the subject of our Interconnectivity module. Among our most investigated markets are those for 3D printing, chatbots, 5G technology, artificial intelligence, and beacon technology (All The Research, 2020).

Artificial intelligence (AI) is applied in a variety of ways in the tourism sector, and its impact is particularly obvious. Globalization, traveler tastes, and new technology have all resulted in substantial changes in the industry that are closely matched with the research objectives, proving the importance of the digital tourism function in sustaining tourism economy.

AI has the potential to improve a number of tourism-related jobs, including booking engines, hotel concierge services, airport wayfinding apps, baggage screening, and travel planning. AI investments have the potential to improve visitor experiences, increase operational effectiveness, empower employees, simplify logistics, and produce a number of other advantages. Implementing AI change in the tourism industry happens, on average, 16 months faster than transformation with digital technology in general, per an Accenture study.

Figure 07: Ai transformation in tourism industry

Figure 1: We project that AI transformation across industries including Travel will take less time than digital transformation



Source: Accenture Research

Source : (Nicole , 2024)

Between 2018 and 2021, the percentage of tourism businesses' revenue that was considered "AI-influenced" grew by almost 50%. It is also expected to almost triple in the near future. It demonstrates the importance of the digital tourism function in bolstering the tourism sector and is closely in line with the research aims.

The study's findings support the first hypothesis about how eco-trips affect the assessment of how much personalization adds to the travel

experience at the stage of decision-making in the customer journey through Eco-tourism is the result of modern travelers' increased interest in ethical and sustainable travel options, which depends on environmental conservation efforts, volunteer tourism, or labor in a wildlife reserve. Which is in line with the research (Gen & Beyond, 2019).

Since virtual reality is one of the major trends influencing the travel industry, the study's findings also supported the second hypothesis about how virtual reality affects the measurement of the contribution of personalization to the tourism experience during the decision-making stage of the customer journey. This technology can give businesses an advantage over rivals by allowing customers to experience hotels' indoor and outdoor attractions and more from the comfort of their homes, particularly with regard to COVID-19, this is compatible with findings of (Dependar, 2021).

The results of the study also supported the third hypothesis, which was that AI will play a bigger role in the travel industry and that the Internet of Things and AI will have an impact on how much personalization contributes to the tourism experience during the decision-making phase of the customer journey. Machine learning technology is already widely used in travel sector marketing to personalize the trip and excursion search and scheduling process. AI is also becoming more and more helpful in settings like smart hotel rooms, where it can identify possible guest needs and modify the facilities and environment to suit the preferences of the guests. AI is being applied to everything from customer service to security. AI in the future could be used in self-driving automobiles and virtual tour guides. What the study of (Raja, Raul, Nagaraj, & Bharath, 2022) says. Study results also support the use of Internet of Things is integrated into hospitality industry, even though it is closely related to many tourism-related topics because it allows travelers to schedule activities or request extra services like room service through a hub or smartphone app. What is the conclusion of (Claire, 2021)'s study.

6. CONCLUSION

In conclusion, there is a lot of promise for integrating the Internet of Things with tourism. Travel that is sustainable, cost-effective, and able to be customized are all made possible by this technology. In order to improve consumer and staff satisfaction, businesses in the tourism industry will leverage the Internet of Things to automate and optimize time-consuming routine processes at airports, hotels, museums, railroads, and other locations. But in order to enjoy these advantages, you must correctly apply the

technology and extract insights. You must be able to evaluate expenses and use technology to solve particular business tasks in order to fully benefit from the Internet of Things.

As global economic progress accelerates, tourism has emerged as a significant cultural and economic force, opening new avenues for consumption and lifestyle choices among diverse populations. With this burgeoning demand, it is imperative that the tourism industry adopts effective management frameworks to enhance operational efficiency and customer satisfaction. The evolution of smart tourism, underpinned by the Internet of Things (IoT), presents transformative opportunities for attracting and retaining visitors. This is particularly notable in the context of smart hotels that leverage advanced connectivity and comprehensive management systems. While developed nations have embraced technological advancements, developing countries are steadily working to enhance their tourism offerings. With the help of technological advancement, smart tourism is set to transform the travel sector and draw in a wider range of customers.

Artificial intelligence (AI) has been increasingly prevalent in the travel and tourism industry in the last few decades. As innovative technologies proliferate, the tourism industry is projected to achieve substantial growth. Market research indicates that the global travel technology sector, encompassing AI applications, is anticipated to expand at a compound annual growth rate (CAGR) exceeding 9% from 2010 to 2023. This growth trajectory is bolstered by the robust performance of the travel and tourism industry, which is increasingly reliant on new technologies.

Despite the myriad benefits associated with the implementation of AI in tourism, the transition presents considerable challenges. Establishing a secure and robust technological infrastructure demands substantial financial investment and organizational readiness. Furthermore, the growing reliance on robots, chat-bots, and similar AI technologies may inadvertently hinder authentic human interactions, which are often a cornerstone of the tourism experience. To mitigate these complexities, marketers and tourism operators must ensure seamless integration of technology while maintaining a focus on user-friendly applications that enhance, rather than replace, the human aspect of service.

In conclusion, the tourism industry stands at a pivotal juncture, where the amalgamation of smart tourism and technological innovations promises to reshape its future trajectory. The Internet of Things and artificial intelligence offer unprecedented opportunities for improving operational efficiency, elevating customer satisfaction, and fostering sustainable growth within the sector. As developed nations continue to refine their approaches and developing nations seek to catch up, the emphasis on smart tourism will likely define the competitive landscape in the years to come. Ensuring successful implementation requires a balanced strategy that aligns technological advancements with the quintessential human touch that makes tourism a unique and fulfilling experience.

7-Implications and Potential Applications of Digital Transformation in the Travel and Tourism Sector

Numerous industries have seen significant changes as a result of the digital revolution, with the travel and tourism industry being one of the main winners. This change has wide-ranging effects on consumer satisfaction, operational effectiveness, and general market dynamics. We can investigate its possible uses by looking at these ramifications, which could spur innovation and expansion in the industry.

First and foremost, operational efficiency has been greatly improved by digital transformation. Booking management and customer service procedures have been made more efficient by the use of cutting-edge technologies like artificial intelligence, data analytics, and the Internet of Things. Additionally, data analytics enables businesses to derive insights into consumer behavior, facilitating focused marketing campaigns.

Additionally, businesses can use data analytics to gain insights into consumer behavior, which enables more focused marketing campaigns that increase conversion rates. In a market that is becoming more and more competitive, such operational improvements not only lower costs but also promote a more responsive service environment.

Improving client experiences is another way that digitalization has consequences. Online resources give tourists the ease of having a multitude of information at their fingertips, enabling them to make well-informed choices. Customized travel suggestions based on user preferences and historical usage increase consumer loyalty and engagement. Applications for virtual reality also offer captivating sneak peeks at locations, which enhances the planning process. Since younger generations are more

interested in individualized and interactive travel experiences, these technologies can be very helpful in drawing them in.

Digitalization in travel and tourism has equally important social and environmental ramifications. The importance of sustainable practices is increasing as climate change awareness rises. A company's carbon footprint may be tracked more easily thanks to digitalization, which also promotes the use of greener practices like supporting eco-friendly lodging and transportation choices. This change is in accordance with international sustainability goals as well as consumer demands for sustainability.

Digitalization has enormous potential applications that might completely change the travel and tourist business, with far-reaching ramifications. Digitalization has dramatic prospects, ranging from improving operational efficiency and personalizing services to encouraging sustainable habits. Stakeholders must actively welcome these changes as the industry develops in order to fully realize the potential of digital technologies, ultimately leading to a more innovative, competitive, and sustainable travel experience.

8-Acknowledging Limitations and Suggesting Directions for Future Research: Recognizing the Drawbacks and Offering Ideas for Future Research on the Function of Digitalization in the Travel Industry.

Table02: Current Research Limitations

A. Inadequate empirical evidence	B. Variability in technology
1. Insufficient case studies 2. Insufficient long-term research	1. Digital tools that are evolving quickly 2. Variations in user experiences by demography
C. Disparities in geography	D. Restrictions on methodology
1. An excessive focus on developed markets 2. Emerging economies are underrepresented.	1. Qualitative studies predominate 2. Inadequate interdisciplinary approach integration

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