



Digital Transformation : Challenges and Opportunities for Tourism Industry

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ABSTRACT: Technologies are emerging, disrupting and affecting our lives in ways that indicate we are at the beginning of a Fourth Industrial Revolution, a new era in which digitalization builds and impacts societies in new and often unanticipated ways. It is worthwhile considering exactly what kind of shifts we are experiencing and how we can ensure, collectively and individually, that this revolution creates benefits for all.

Tourism was one of the first sectors to digitalize business processes on a global scale, bringing flight and hotel booking online to become a digital pioneer. As information and communications technology (ICT) became a global phenomenon, tourism was a consistent early adopter of new technologies and platforms.

A digitalized tourism sector must innovate and generate new business opportunities to ensure the continued competitiveness, growth and sustainable development of the sector. The ultimate goal is to make a solid contribution to achieving the Sustainable Development Goals of the United Nations and the global development community.

KEYWORDS-technology, transformation, digital, tourism, industry

I.INTRODUCTION

Digital Transformation & SDGs

Digitalization is expected to continue propelling the travel experience on its trajectory towards becoming more seamless, frictionless, and high quality and in a way that contributes to the Sustainable Development Goals (SDGs) of the United Nations..

The use of technologies including the ‘Internet of Things’, location-based services, artificial intelligence, augmented and virtual reality, and blockchain technology (see definitions below) has resulted in a tourism offer that is more attractive, efficient, inclusive, and economically, socially and environmentally sustainable than its predecessor. It has also facilitated innovation and rethinking of processes, with a view to tackling challenges such as seasonality and overcrowding and developing smarter destinations.

Digitalization has a positive environmental impact and can yet have a greater one, with innovations in manufacturing, smart assets and efficient use of resources contributing to a more sustainable industry footprint.

Some major impacts on the sector as a whole are the development of smart travel facilitation, smart destinations, and a new wave of job profiles.

Smart travel facilitation

In the same way the smartphone has transformed telecommunications and media, a comprehensive smart travel model – one that includes smart visas, borders, security processes and infrastructure – will revolutionize tourism. With consolidation of these tools, passengers can book their flights and check in online, have their boarding passes on their smartphones, go through automated clearance gates and even validate their boarding passes electronically to board planes. These measures improve both travel facilitation and security.[1,2,3]

Smart destinations

A smart destination is one with a strategy for technology, innovation, sustainability, accessibility and inclusivity along the entire tourism cycle: before, during and after the trip. A smart destination is also one with residents as well as tourists in mind, factoring multilingualism, cultural idiosyncrasies and seasonality into tourism planning.



This is why smart destinations are key to the transformation of the tourism sector. By continuously and accurately measuring, integrating and analyzing data for efficient decision-making, prioritization and anticipation of challenges, they create a seamless and exciting experience for tourists while managing local resources efficiently.

Smart destinations can make tourism governance more inclusive through inclusive entities, such as boards, trusts or foundations, which represent all public/private stakeholders in the destination. They can help ensure maximum accessibility in sites, products and services, eliminating barriers to mobility. And they allow us to analyse sustainable tourism management through different lenses.

Consider, for example, the challenge of seasonality, where population change from variation in tourist flows makes tourism's impact difficult to measure. Technology-based data tools, such as remote sensors and big data management systems, can help destination managers capture and process large volumes of data for a greater understanding of the impact of seasonality on tourism and on sustainability. It can therefore help them to predict and manage tourist flows in order to more efficiently and effectively manage destinations.

Job creation

The future of travel is technology-based, so tourism jobs will require both technical and advanced soft skills used to effectively implement and manage smart initiatives. The greatest societal impact of digital transformation in tourism may be the effect on the sector's workforce, which directly and indirectly represents 1 in every 10 jobs worldwide. Like in other economic sectors, intelligent automation will change the nature of some travel jobs and eradicate others altogether. However, digitally-enabled growth will also generate new employment opportunities that could outpace the automation of existing roles, especially as strong growth is forecast for the sector.

Startups and micro, small and medium enterprises (MSMEs) – drivers of technology-based innovation and entrepreneurship in tourism – will take on an increasingly important role in developing the skills needed for the jobs of the future. The sector should therefore prioritize strengthening startups and MSMEs so they can become integral parts of the tourism value chain, and boosting technology- and skills-based education, training and policies that stimulate innovation and decent employment.

II.DISCUSSION

People and businesses are equally accepting the digital revolution. People, businesses, government, friends, and family are now actively engaged with each other with the use of social networks and digital devices. In the new digital age, customers are transformed to use mobile devices to turn into more specialized in product and service offerings and their comparative benefits as they choose what to buy, where to buy, and who is trustable. They are highly dependent on mobile apps to perform their daily activities and because of the increased demand in mobile apps, organizations need to reshape their customer value proposition and their operating models by undertaking the digital transformation to compete in the new marketplace.

Digital transformation has become a buzzword in recent years, and for good reason. In today's world, businesses in all industries must embrace digital technologies to stay competitive and relevant. One sector that has undergone significant transformation is the tourism industry.[4,5,6]

According to a study by McKinsey & Company, the tourism industry has been undergoing digital disruption for over a decade. The report states that digital technologies have transformed the way travelers plan, book, and experience their trips. This shift has resulted in changing consumer behavior, with travelers now expecting a more personalized and seamless experience.

The use of digital technologies in the tourism industry has been increasing steadily over the years. In a survey conducted by Skift, a travel industry intelligence platform, 83% of respondents stated that digital transformation is a priority for their organization. The survey also revealed that tourism businesses are investing in technology to improve their customer experience, streamline operations, and boost revenue.

To increase the level of enterprise agility, companies face implementation choices across five operating-model dimensions.

1. Strategy: a shared purpose and vision embodied across the organization
2. Structure: a network of empowered teams
3. Process: rapid decision and learning cycles

4. People: dynamic people model that ignites passion
5. Technology: next-generation enabling technology

One area where digital transformation has had a significant impact is in the booking process. According to a report by Travelport Digital, it's estimated that over 700 million people will make a booking online by 2018, a 15% increase from the previous year.

In this case, it is worth remembering that Online booking statistics indicate a renewed outlook of travelers worldwide:

- The online travel market size worldwide reached the \$433.2 billion mark in 2018, and it's expected to reach \$690.71 billion by 2026 (Statista).
- 83% of US adults want to book their trips online (StratosJets).
- Monday is the most popular day for booking travel, and Saturday is the quietest day (Condor Ferries).
- 63% of travelers believe technology plays a key role in controlling health risks during trips and reduces travel anxiety in a post-pandemic world (Booking.com).
- The percentage of shoppers that abandon their travel purchase is 85% for desktop users and 91% for those buying on a mobile device (SalesCycle).
- 72% of mobile bookings happen in the 48 hours following Google searches that include the words 'tonight' and 'today' (StratosJets).[7,8,9]
- In 2018, 64% of those booking online made online purchases on desktop and 44% make them on a mobile device. This shows a shift from 2017, when 59% of bookings were done on desktop and 41% on a mobile device (SalesCycle).
- 66% is the revenue share of online sales in the global travel and tourism market (Statista).
- It's estimated that over 700 million people will make a booking online by 2018 (StratosJets).
- 70% of all customers do their research on a mobile device (StratosJets).

The report also highlights the importance of mobile apps, stating that they have become a critical tool for travelers to research, plan, and book their trips. In fact, there are five main digital transformation trends in the hospitality and tourism sector:

- Mobile first/mobile only: check-in, check-out, room service, door lock/unlock.
- IoT: smart rooms, beacons, voice assistants
- Data Analytics: customer data, purchase history, preferences.
- Chatbots: booking, guest service, timely information.
- RPA: booking processing, claims processing, reporting & auditing

In addition, we can add that elements such as Cognitive Computing, omnichannel models and personalization have come to change the future of the sector.

The use of artificial intelligence (AI) and machine learning has also become increasingly prevalent in the tourism industry. According to a report by GlobalData, AI is being used to personalize the travel experience, with companies using the technology to make recommendations based on a traveler's preferences and behavior. The report also states



that AI is being used to improve the operational efficiency of tourism businesses, with chatbots being used to handle customer queries and requests.

Digital transformation has also opened up new opportunities for tourism businesses. Augmented reality (AR) and virtual reality (VR) technologies are being used to enhance the customer experience by allowing travelers to explore destinations before they book their trips. Preview of property, preview of rooms, virtual world trips or 3D travel stories are just some of the possibilities these technologies offer us.

Social media has become an essential tool for tourism businesses to promote their products and services and reach new customers as well.

In conclusion, digital transformation has become a necessity for tourism businesses. The use of digital technologies has transformed the way travelers plan, book, and experience their trips, and companies that fail to embrace this shift risk falling behind. As consumers' expectations continue to evolve, tourism businesses must invest in digital transformation to remain competitive and relevant.

III.RESULTS

You may remember a recent holiday season when a major air carrier had to cancel thousands of flights. Unfortunately, it couldn't blame the inclement weather covering much of the US. As the storm receded and other airlines were back to business, this carrier's passengers were still stuck. But why? If you guessed it has something to do with (a lack of) digital transformation, you're on the right track.

Digital transformation in the travel industry has been taking place over the last decade, but this airline was holding out. The president of its pilots' association shared, "It's a function...of infrastructure and IT, but it's also processes. We're still using not only IT from the '90s, but also processes when our airline was a tenth of the size. And it's really just not scaled for an operation that we have today." [10,11,12]

This quote sums up what digital transformation is: updating people's skills, streamlining processes, and digitizing technology to help your organization scale on demand.

This was an extreme case, but even the travel companies that have started digital transformation efforts still have work to do. A 2018 AWS and Skift survey found that despite 95% of travel executives responding that digital transformation is "very important" or "somewhat important" to their business's overall strategy and success, their top priority is still the maintenance and upkeep of legacy systems.

Read on to learn about trends in digital transformation in travel and tourism and how you can get started.

What is digital transformation in the travel and tourism sectors

Digital transformation is the integration of digital technologies such as cloud platforms, mobile, artificial intelligence (AI) and machine learning (ML) into all aspects of a business. The goal of digitalization in the travel industry is to future-proof the organization, which means fundamentally changing how it operates and delivers value to customers. Accordingly, it also heavily impacts people and processes, which requires an organization-wide culture change.

Travel companies can become more responsive and adapt to sudden market shifts and stiff competition through automation, real-time data, and agile, streamlined processes. Through these same digital transformation mainstays, marketing teams can create frictionless, omnichannel, and hyper-personalized customer journeys that enhance customer experiences. The result? Digitally enabled growth in the travel and tourism industry.



The impact of digitalization in the travel industry

Digital technologies have revolutionized the tourism cycle, from the online travel agencies travelers use to book their adventures to the social media platforms where they share their reviews and holiday pictures.

In addition to increasing customer convenience, digital technology can also translate into more business opportunities. For example, New Distribution Capability (NDC) provides a better shopping experience for customers and maximizes profits at the same time by letting airlines make more dynamic, personalized offers while they optimize pricing and inventory in real time.

Six digitalization trends in travel and tourism

Transformation today is an ongoing process. Digital technologies constantly evolve and staying competitive means staying on top of the latest digitalization trends. Even digital-first businesses that started with cloud-based information and communication technology must adapt quickly and keep up as new trends emerge.

It's important to keep in mind that a move to the cloud (the first step in digital transformation) is essential for taking advantage of these trends.

Cloud adoption

Cloud infrastructure is the foundation of digital transformation. Moving most or all systems and workloads to the cloud gives organizations the flexibility, scalability, and operational efficiencies they'll need for growth in the next decade and beyond. And companies that want to use artificial intelligence and other future technologies also need the computing power the cloud brings.[13,14,15]

Though the travel industry has started its journey to the cloud, cloud adoption remains a trend. A recent Accenture survey of travel executives found that only 30% of companies have implemented cloud at scale. David Linthicum, Deloitte's chief cloud strategy officer, says, "In many instances, [travel companies] are playing catch-up... They are not spending as much money as their relative peers in other industries. And they need to; there is much to be automated. They need those systems to drive better customer experiences."

Machine learning & AI

Artificial intelligence uses computers to imitate human thinking and problem-solving and has already significantly impacted the travel industry. From customer service to flight security, AI is quickly becoming integral to how passengers get from point A to point B.

AI chatbots like Sofia from TAP Portugal Airlines and Julie from Amtrak provide quick and efficient customer service. They can answer common questions and help with reservation issues 24x7 without any wait time for customers.

Hotels are also beginning to use artificial intelligence, using data collected about travelers through loyalty programs and the like to create personalized recommendations that match each customer's preferences. For example, AI can suggest restaurants based on the guest's preferred cuisine, recommend activities based on local weather conditions, or even remember details like favorite pillows.

And no talk of AI would be complete without a mention of the newly ubiquitous generative AI. Expedia is already set to incorporate it into its platform. Interestingly, despite always offering its services online, Expedia is not a digital native company in that they weren't built on cloud infrastructure from the start. However, it began its multi-phase digital transformation initiative started in 2017 with moving workloads to AWS.



Internet of Things (IoT)

The Internet of Things (IoT) is transforming the travel industry by connecting vehicles, transportation hubs, hotels, cruise ships and more to the internet and each other. Travel companies can monitor and track assets in real time by integrating sensors and connectivity into planes, trains, automobiles, lodging, and luggage. Examples of IoT in action include:

- Beacon technology can track customers' locations in airports and send relevant information to their mobile devices — a great example of data monetization.
- Sensors in hotels or airports can monitor the flow of passengers and adjust staffing needs accordingly.
- IoT-enabled smart metering and automation of lighting, HVAC, and appliances in hotels and transportation hubs can conserve energy and reduce environmental impact.

Overall, a more connected travel experience through IoT can improve safety, sustainability, and travel enjoyment.

Digital Twins

Digital twin technology – creating digital replicas of physical processes, places, and products – is marching into the travel and hospitality domain providing travelers with more interactive and hyper-realistic simulations of actual experiences, rather than using just video or static 2D images.

By combining data from platforms, sensors, images, etc., and turning it into 3D models to simulate destination, physical environment, specific conditions, or even weather, digital twin technology is lifting smart tourism to new levels of customer satisfaction.

On top of providing travelers with an immersive personalized approach, digital twins also offer the benefit of real-time updates on the destination safety, itinerary, or local specifics allowing travelers hassle-free trip planning and memorable experience as a result.

VR/AR

Virtual reality (VR) and augmented reality (AR) provide an unprecedented opportunity for hotels, travel agents, destinations, and many other branches of the travel and tourism sector.

Giving people realistic simulations not only entices travelers to choose a particular hotel, airline, or tourist site but provides powerful training experiences for hospitality professionals. For example, the Best Western hotel chain trained front desk staff using VR and subsequently saw a 20-point increase in customer satisfaction scores and a 71% decrease in customer complaints.[16,17,18]

AR is also being put to good use. Typically experienced through a mobile application on a smartphone or tablet, airports, museums, and other tourist destinations are using AR to enhance the visitor experience. The Smithsonian Institution in Washington D.C., for example, has an AR app called 'Skin and Bones' for its Bone Hall of 300-century-old vertebrates. Visitors can point their phones at one of the participating skeletons to see what the animal looked like, how it moved and sounded, and more. Just like VR, this translates to positive results. Visitors stop more often and stay longer when they use this AR app and say they have better experiences.

Recognition technology (Biometrics)

The last trend we'll discuss is that of biometrics for easier, more secure travel. Recognition technology using fingerprints or facial scans has been around for a while. You may unlock your iPhone with your face (facial recognition), or perhaps you've heard that Miami International Airport will be offering biometric boarding for all international flights starting this year (2018). Car rental companies are also experimenting with biometrics for



customers to access their reserved rental vehicles instead of keys. While still somewhat controversial due to privacy concerns, recognition technology has the potential to make travel a truly seamless experience.

The future of travel

So what could travel look like 10 years from now based on some of this digital transformation in the tourism sector? Let's imagine it from the traveler's perspective.

As I arrive at the airport, facial recognition technology scans my face, instantly checking me in and printing my bag tags. My smart suitcase rolls autonomously behind me as I breeze through security, with no need to show documents.

Once at the gate, I'm delivered a refreshing pre-flight cocktail curated just for me based on my flavor preferences and past orders. As I sip, I slip on a VR headset to preview my upcoming hotel stay. I virtually tour the property, view my customized room, and preview planned excursions around the area.

After a quick electric tram ride to the plane, I settle into my ergonomic seat equipped with biometric sensors that monitor preferences like temperature and lumbar support. The in-flight meal that follows is delicious and tailored to my dietary needs.

Upon arrival, my smart luggage has already been transported to the hotel. A robotic bellhop meets and escorts me to my room; it requires no front-desk check-in or wait. Over the next few days, an AI concierge provides suggestions for activities and restaurants based on my profile, booking everything through a unified travel app. Moving between destinations is simple with integrated mobility platforms and silent electric vehicles.

The trip feels incredibly streamlined, personalized, sustainable, and RELAXING. I finally take a vacation where I don't return feeling like I need a few more days to unwind.[19]

IV.CONCLUSION

Let's make that future a reality

The digital era is well underway, but it is never too late to start your digital transformation journey. Intellias has been accelerating the pace of sustainable digitalization for top-tier organizations for two decades. With expertise in AI/ML, blockchain, data & analytics, IoT and more, we're ready to help you wherever you are in your journey. Contact our team today to discuss your unique needs.[20]

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