



MSTourHer

master in sustainable
tourism development:
cultural heritage,
environment, society



School of Environmental Studies, Geography and Applied Economics
School of Digital Technology



Department of School of Management Science



IREST (Institut de Recherche et d'Études Supérieures du Tourisme)
Université Paris I Panthéon – Sorbonne

New technologies and their implications for Greek Tourism

Master Thesis

Konstantinos Eleftherakis

Athens, 2023



MSTourHer

master in sustainable
tourism development:
cultural heritage,
environment, society

Examining Committee

Theano S. Terkenli

Professor, Department of Geography, University of the Aegean

Marianna Sigala

**Professor, Department of Service Sector Management, Sheffield Hallam
University, GB**

Konstantinos Abeliotis

**Professor, Department of Environment, Geography and Applied Economics,
Harokopio University**

Ethics and Copyright Statement

I, Konstantinos, Eleftherakis hereby declare that:

- 1) I am the owner of the intellectual rights of this original work and to the best of my knowledge, my work does not insult persons, nor does it offend the intellectual rights of third parties.
- 2) I accept that Library and Information Centre of Harokopio University may, without changing the content of my work, make it available in electronic form through its Digital Library, copy it in any medium and/or any format and hold more than one copy for maintenance and safety purposes.
- 3) I have obtained, where necessary, permission from the copyright owners to use any third-party copyright material reproduced in the Master Thesis while the corresponding material is visible in the submitted work.

Table of Contents

Table of Contents	3
Abstract in Greek	4
Abstract in English.....	5
List of Figures	6
List of Tables	7
Abbreviations	9
Introduction	10
Ch. 1: The Birth of Technological Production	12
1.1. The Concept of Industry 4.0	12
1.2. The Components of Industry 4.0.....	13
Ch. 2: Tourism and Crises.....	16
2.1. The Global Landscape.....	16
2.2. Crises.....	18
2.2.1 The Pandemic	18
2.2.2 The Invasion of the Ukraine	19
2.2.3 Climate Change.....	20
Ch. 3: Greek Tourism.....	23
3.1. Early Crises: Financial & Refugee Crises (2009-2014)	23
3.2. Recent Struggles & Aftermath.....	26
Ch. 4: Tourism and Technology	30
4.1. Applications in the Tourism Sector	31
4.2. Greece and Technology	39
4.3. Digital Transformation Phase	40
Ch. 5: Empirical Research.....	45
5.1. Research Planning	45
5.1.1 Creation of The Survey Tool and Survey Implementation	46
5.2. Presentation and Analysis of Results	48
5.2.1 Questionnaire Responses and SWOT analysis	18
Conclusions	52
References	59
Figures References.....	59

Abstract in Greek

Ο κεντρικός στόχος αυτής της διπλωματική εργασίας είναι να εξετάσει και να κατανοήσει την αναπτυσσόμενη αλληλεπίδραση του ελληνικού τουρισμού με τις Νέες Τεχνολογίες, μέσω μιας έρευνας των εμπειρογνομόνων/ενδιαφερομένων/ακαδημαϊκών μελών, αποσπώντας απόψεις για τον αναμενόμενο μελλοντικό αντίκτυπο αυτών των τεχνολογιών στην τουριστική βιομηχανία και συγκεκριμένα στον ελληνικό τουρισμό. Η μεθοδολογία της έρευνας αποτελείται ερωτηματολόγιο που εφαρμόζεται βάσει των εθνογραφικών μεθοδολογιών των Κοινωνικών Επιστημών με τη μορφή ημιδομημένων συνεντεύξεων σε βάθος και ομαδοποίηση των ερωτηθέντων βάσει της ασχολίας ή/και της επίγνωσης της θεματικής. Όσον αφορά την ανάλυση δεδομένων, η μελέτη ακολουθεί τη διαδικασία αποκωδικοποίησης και οργάνωσης των δεδομένων η οποία με τη σειρά της οδηγεί σε μια SWOT ανάλυση που συμπληρώνει την αναλυτική μας διαδικασία. Τα κύρια τελικά σημεία σχετικά με την κατάσταση και τις επιπτώσεις της 4ης Τεχνολογικής Επανάστασης στον ελληνικό τουρισμό, όπως προέκυψαν από τις απαντήσεις των συμμετεχόντων ήταν τα ακόλουθα: Πρώτον, επιβεβαιώθηκε η φτωχή κατάσταση του τεχνολογικού τομέα στην Ελλάδα, μια παράμετρος που ανασκοπεί το τρέχον επίπεδο τεχνολογικής ανάπτυξης στον τουριστικό τομέα της Ελλάδας. Δεύτερον, το σύνθετο πλαίσιο του τουριστικού τομέα της Ελλάδας προέκυψε μέσω της έρευνας μέσω των ανησυχιών που εκφράστηκαν στις απαντήσεις των ερωτηθέντων σχετικά με τις επιδόσεις και τις μελλοντικές προοπτικές του τουριστικού τομέα της Ελλάδας. Τέλος, η επιτακτική ανάγκη για ανάπτυξη υποδομών για την εφαρμογή Νέων Τεχνολογιών, αποτελεί μια κρίσιμη σύνδεση μεταξύ των άλλων δύο αναδυόμενων θεμάτων, όπου απεικονίζονται οι βασικές δυσκολίες στην εφαρμογή τους στον τουρισμό. Το κύριο στοιχείο από τις απαντήσεις που λάβαμε στην έρευνα είναι ότι, πέραν της χρήσης καθιερωμένων τεχνολογιών όπως τα μέσα κοινωνικής δικτύωσης, οι ιστοσελίδες και οι πλατφόρμες αξιολόγησης (όπως αυτές που σχετίζονται με την Booking.com) για σκοπούς μάρκετινγκ και κρατήσεων, οι χρήσεις των τεχνολογιών της Βιομηχανίας 4.0 στην Ελλάδα είναι πρακτικά ανύπαρκτες. Εκτός από τη σποραδική εφαρμογή της εικονικής πραγματικότητας σε πολυτελή ξενοδοχεία, οι υπόλοιπες τεχνολογίες βρίσκονται σε πρωτόλειο επιχειρηματικό πλάνο. Επιπλέον, οι αδυναμίες στην εκπαίδευση του προσωπικού, ο αργός ψηφιακός μετασχηματισμός και η κακή γενική κατάσταση των απαραίτητων υποδομών επιβραδύνουν κάθε πιθανή ανάπτυξη και καινοτομία για τον ελληνικό τουρισμό.

Key Words: Ελληνικός τουρισμός, Βιομηχανία 4.0, Νέες τεχνολογίες

Abstract in English

The central objective of this Master's Thesis research is to examine and understand the developing interrelationship of Greek tourism with New Technologies, through an expert/stakeholder/academic survey, also eliciting opinions on the anticipated future impact of these technologies on the tourism industry, and more specifically on Greek tourism. The methodology of the research constitutes of a survey implementing the qualitative ethnographic methodologies of the Social Sciences in the form of semi-structured in-depth interviews with survey participants grouped into categories based on the ways they are involved in, or knowledgeable about the role of New Technologies in the tourism industry. The interviewees were selected to complement each other for the purposes of receiving a complete view of Greek tourism's relation with New Technologies, through their survey responses. As for the data analysis, the study will follow the procedure of data decodification and organization, which, in turn, will also facilitate a SWOT analysis that complements our analytical process. Based on the analysis of our survey findings, the main final points to be made about the state and implications of the 4th Technological Revolution for Greek tourism as derived from the participant's responses were the following: First, there was an affirmation of the poor state of technology in Greece, a take that reviews the current level of technology development in Greece's tourism sector. Secondly, the complex context of Greece's tourism sector emerged through the survey as concerns in interviewees' opinions regarding the performance and future outlook of Greece's tourism sector. Finally, the urgency for infrastructure development for the implementation of New Technologies constitutes a crucial point of interest, as it presents a link between the other two emerging themes, where the basic struggles of technology implementation in tourism are depicted. The main takeaway from the answers we received in the survey is that, apart from the uses of well-established technologies like social media, rating websites and platforms (such as those related to Booking.com) that are commonly implemented for marketing and reservation purposes, the advanced Industry 4.0 technology uses implemented in Greece are practically non-existent, i.e. Besides the sporadic implementation of VR in luxurious hotels, the rest of these technologies appear only in prototype business plans. Furthermore, deficiencies in staff education, slow digital transformation, and the poor overall state of necessary infrastructure are slowing down any potential development and innovation for the Greek Tourism sector.

Keywords: Greek tourism, Industry 4.0, New technologies

List of Figures

Fig.1: The Tourism Impact Chart	34
Fig.2: The <i>City Guide Tours</i> Interface.....	35
Fig.3: The UI of Google/Apple Maps.....	36
Fig.4: The Interface of <i>Pokémon Go</i> where a user tried to catch a <i>Pokemon</i> , in the actual <i>physical environment/setting</i>	36
Fig.5: The <i>Faroe Islands</i> interactive Virtual Tour.....	38

List of Tables

Table 1: The performance of Greek Tourism during the financial crisis.....	24
Table 2: The position of Greece in the T&T Competitiveness Report.....	24
Table 3: The Pros and Cons of Greek Tourism 2011-2019.....	25
Table 4: The Projects of the digital Transformation Bible.....	41
Table 5: List of interviewed participants.....	47
Table 6: The outlook of the implementation of New Technologies in Greek Tourism: A SWOT analysis perspective	51

Abbreviations

ArcGis	Geographical information system software
AI	Artificial Intelligence
AR	Augmented Reality
BBC	British Broadcasting Corporation
DW	Deutsche Welle
EU	European Union
EPRS	European Parliamentary Research Service
GDP	Gross Domestic Product
NTOG	Greek National Tourism Organization
DESI	Digital Economy and Society Index
ICT	Information and Communication Technologies
IoT	Internet of Things
INSETE	Institute of the Association of Greek Tourism Enterprises
SETE	Association of Greek Tourism Enterprises
SMEs	Small and Medium-Sized Enterprises
SWOT	Strengths, Weaknesses, Opportunities, Threats
T&T	Travel and Tourism
VR	Virtual Reality
VT	Virtual Tourism
UNWTO	World Tourism Organization
WEF	World Economic Forum
3D	Third Dimension
3S's	Sun, Sea, Sand

Introduction

This research belongs in the scientific field of Social Sciences, in particular Tourism Studies, Tourism Geography and Cultural Studies, as well as Computer Sciences such as New Technologies and specifically those of Industry 4.0. The main objective of this Master's Thesis research is to explore and contribute to an understanding of the developing interrelationship of Greek tourism with New Technologies through an expert/stakeholder/academic survey, also eliciting opinions on these technologies' anticipated future impact on the tourism industry in Greece.

The methodology of the research constitutes of a survey implementing the qualitative ethnographic methodologies of the Social Sciences in the form of semi-structured in-depth interviews with survey participants grouped into categories based on the ways they are involved in, or knowledgeable about, the role of New Technologies in the tourism industry. This method is designed to complement the answers of each group for the purposes of receiving a complete view of Greek tourism's relationship with New Technologies through the interviewees' answers. As for the data analysis, the study will implement the procedure of data decodification and organization which also facilitates the SWOT analysis that complements our analytical process. This research has scientific, practical, and academic value, and is potentially useful to Tourism and Technology researchers, tourism experts, entrepreneurs, and all parties (such as public officials) involved in tourism development in Greece and elsewhere, because the trends under study are rapidly expanding globally and therefore it is important to know the perceptions, attitudes, opinions and visions of all parties involved in this regard.

Chapter.1: The Birth of Technological Production

1.1. The Concept of Industry 4.0

1.2. The Components of Industry 4.0

Ch. 1: The Birth of Technological Production

The world is rapidly changing due to the rise of modern capitalist trends in the globalized economy and the new age of technology and information (Terkenli, 2006), as customers have vast access to information; details on items and experiences they like to follow and convey, and have multiple angles to digest it (Samson et al., 2014). According to Terkenli (2006), technology plays a major role in this conversion, opening new horizons and breaking down the barrier of physical limited space, as information and communication move more directly and in bigger figures. The creation, reproduction, distribution of ideas or goods and the breaking of the old model of production have thusly escaped spatial constraints leading to new “cultural apprehensions, visions, and constructs of space and landscape” (Terkenli, 2006, p. 3). That generates experiences and goods in a realm that surpasses the physical, and creates multiple unexplored directions for the consumer through the use of Information and Communication Technologies (Pine & Gilmore, 1998). These offerings are reproducible, easy to adjust and distribute in such a way that induces new opportunities for innovation and co-creation, and approachable by multiple markets (Lang et al., 2009); consequently, we can deduce that Information and Communication Technologies (ICT) are indeed important for modern-day operations. As Farkhondehzadeh et al. (2013) state, ICT “empower[s] consumers to identify, customize, purchase products and support the globalization of the industry by providing tools for developing, managing and distributing offerings worldwide” (p. 67), giving more tools and methods both for destinations and enterprises, rendering them a “key determinant of organizational competitiveness” (p. 67). This cycle facilitated the production of digital goods and services for enterprises and led into a new cycle of tools in order to extend the options for creation and distribution (Industry 4.0).

1.1. The Concept of Industry 4.0

Built as an answer to the deadlock that the financial crisis of 2008 brought on the global economy (Avkopashvili et al., 2019), the term *Industry 4.0* is used to explain the vast changes “in the design, manufacture, operation and service of manufacturing systems and products” (Davies, 2015, p. 2), and it composes the 4th Industrial Revolution that introduced new methods of producing and contributing assets. Sukhodolov (2019) defines the concept as a “new industrial model, peculiar for self-organization and self- management of fully automated, self-teaching, and interactive production systems” (p. 7), in which ICT and Digital Technologies are the main pillars, changing the role and approach of the human on the overall process (versus the opposite in traditional

industrial practises) as “new competences, accompanied by social changes” (p. 7) are needed. According to EPRS’s Ron Davies, Industry 4.0 is characterized by these technologies:

1. ICT
2. Cyber systems
3. Data/big Data
4. Simulation
5. Network Communications (Davies, 2015)

Industry 4.0 according to Carvalho and Cazarini (2020) additionally offers:

- The replication of the physical world, efficiently providing information and data, allowing the handlers to work on a virtually identical environment.
- Adaptability in any scenario with limited to zero consequences (as production and costs are reduced), with a service oriented approach supporting that “everyone can have access to useful services, products, and information about the industry using virtual and digital platforms available at all times” (p. 7).

Industry 4.0 impacts multiple components in the business, the economic and social life of modern-day world with notable refinements on how to adapt, educate, qualify and consume, as the concept “has a potential for changing the existing technological mode”(Sukhodolov, 2019, p. 8), creating new spheres that alter the global standards and practices in the process. Of course, not all technologies we will mention are directly related to the scope of this paper, but a number of them are valuable enough to allow tourism to grow and operate in a more sustainable manner.

1.2. The Components of Industry 4.0

Industry 4.0 consists of several types of technologies and tools that are used to improve different aspects of the day-to-day activity in a cohesive method; continuing Davies’ foundational words we are presenting the main examples of Industry 4.0:

Internet of Things (IoT): The Internet of Thing is a network where devices and humans exchange and acquire data through smart technologies (IBM, n.d.-b). That includes devices with ‘self-identification capabilities’ that can sensor, process and adjust the findings to benefit the user (Martinelli et al., 2021).

Big Data – Analytics: As the landscape of data capabilities gets bigger through the evolution of the technology, so does the capacity of data collection; therefore, Big Data is created (Hrehova,

2018). Big data collection allows enterprises and organizations to speed up project processes, raise awareness on different matters and draw up more complicated, efficient and sophisticated strategies, creating drastic changes to sectors such as transport, health and public management (European Commission, 2015).

Augmented Reality (AR): By using the latest software and hardware capabilities, augmented reality (or AR) “overlays digital content onto real-life environments and objects” (SAP, n.d. "Augmented reality definition", para. 2). This overlay offers an abundance of potential for engagement with the current environment on the user’s side, enriching one’s knowledge but also informing one about several details depending on the object of observation’s fundamental nature; as the user can observe an ‘enhanced’ version of the real world whereas in Virtual Reality, as we’ll discover further down the list, the user observes a complete replication of it in a ‘synthetic environment’ (Furht, 2006).

Virtual Reality (VR): Virtual reality platforms and functions such as “computer technology, touch screen, 360-degree panoramic experience technology, 3D animation technology” (Wu, 2020, p. 19) present a plethora of final products and options. These options can be accessed by enhanced or basic means, although the preferred method for full immersion, is to use something more like a computer-like headset, VR glasses, etc. (Fredericks, 2021).

Cloud manufacturing: Cloud computing is an ‘on-demand access’ that uses the internet to open or store various forms of data and sources that are kept in the Cloud Centre against a subscription fee or free trial (IBM, n.d.-a). The Cloud is created by various components such as software, a network connection and servers (IBM, n.d.-a)

Artificial Intelligence (AI): Artificial Intelligence or AI, is the creation of computer-based applications that aim to solve problems that human intelligence couldn’t initially solve. There are several paradigms of AI: autonomous devices, language learning programs, and several customer oriented services (Ziyad, 2019).

Chapter.2: Tourism and Crises

2.1. The Global Landscape

2.2. Crises

2.2.1 The Pandemic

2.2.2 The Invasion of the Ukraine

2.2.3 Climate Change

Ch. 2: Tourism and Crises

In this part, we'll address the basic concepts and definitions of tourism according to the International Recommendations for Tourism Statistics Report of 2008 by UNWTO, and this section will allow us to set a basic foundation for the next chapters and themes of this research.

Travel and Tourism: Travelling is the action of moving from various areas and spaces under any circumstance/time, and tourism is respectively therefore 'a subset of travel', as it also comprises the activities visitors involve themselves in during travelling (United Nations Statistical Division & World Tourism Organization, 2010).

Traveller and Visitor: A traveller is someone who moves between places. Depending on their form they can be classified as Domestic, Inbound and Outbound. A visitor (or tourist) stays for longer than a single night and less than a full year for any reason, and their trip is defined as a 'tourist trip' (United Nations Statistical Division & World Tourism Organization, 2010). Like with the connection between travel and tourism, the visitor is a subtype of traveller.

Forms of travel and Tourism:

Domestic: Refers to the travel of residents inside their own country: Domestic tourism "comprises the activities of a resident visitor within the country of reference either as part of a domestic tourism trip or part of an outbound tourism trip" (United Nations Statistical Division & World Tourism Organization, 2010, p. 15).

Inbound: Involves the non-resident's arrival in a country: Inbound tourism is "the activities of a non-resident visitor within the country of reference on an inbound tourism trip" (United Nations Statistical Division & World Tourism Organization, 2010, p. 15).

Outbound: Involves the movement of residents away from their country: More specifically outbound tourism involves "the activities of a resident visitor outside the country of reference, either as part of an outbound tourism trip or as part of a domestic tourism trip" (United Nations Statistical Division & World Tourism Organization, 2010, p. 15).

2.1. The Global Landscape

International tourism has been on a rise since the 2010s (the period is chosen as the de facto recovery from the financial crisis of 2008) as tourist arrivals decreased by 4.2% during 2008-09, the year when the initial collapse occurred, this was a period that according to the World

Economic Forum motivated travellers to choose domestic more so than international travel (World Economic Forum, 2011). On the contrary, from 2017 to 2019 international tourism reached its zenith, the highest number being a record-setting 1.4 billion arrivals worldwide in 2019. Tourism grew because this period was highlighted by the following:

- International openness with more countries accepting travellers worldwide
- Quality air infrastructure with various routes
- Digitalization, that made traveling easier and more accessible for the visitor, and gave more options for marketability for destinations and businesses
- Finally; affordability, as traveling and booking costs were reduced thanks to the aforementioned factors

According to WEF, the biggest regional contributors to international tourism are the Europe and Eurasia regions, Asia-Pacific following them, as it underwent rapid growth over the last year. On the other hand, the last contributor place is occupied by Sub-Saharan Africa, and includes many developing countries that lack in aspects that other regions have abundance of (World Economic Forum, 2017, 2019). As stated by UNWTO's International Tourism Highlights Report of 2020, Europe showed a positive growth in arrivals and receipts (4% each), Southern Mediterranean Europe presenting positive results and effectively leading the way in regards to all destinations (the Balkans, Greece, Italy etc.), a factor that highlights the importance of the Mediterranean Basin in the region (World Tourism Organization, 2021b). Furthermore, the Travel and Tourism Competitiveness Report of 2019 adds more specific and enriched findings with its scoring report, allowing us to focus on varied points of view regarding the infrastructure, the overall environment and the tourism business as a whole in each region/country:

- Europe welcomed 50% of the international arrivals worldwide, and also accounted for half of the international tourist arrivals and a bit over 40% of the international receipts, rendering it the most competitive region by far (World Economic Forum, 2019).
- The secret to this success are the "abundant cultural resources, which are concentrated primarily in Southern and Western Europe" (World Economic Forum, 2019, p. 38). This, along with the adequate number of hospitality facilities, exceptional infrastructure, as well as good ICT readiness (that allows travellers to move as they choose and personalise the process) demonstrates why Europe is such a strong pillar in the industry.

- Western Europe (consisting of noteworthy countries like Germany, France, the United Kingdom and Holland) is the most efficient area of the region by being the biggest contributor in multiple categories including spending (domestic and international), infrastructure, business environment, and health and hygiene (World Economic Forum, 2019).
- Southern Europe is the second-most efficient area in the region, with rich cultural and environmental resources that attracted most international arrivals in the entirety of Europe. In order to achieve the aforementioned milestone, advancements were made in terms of service infrastructure. This, in conjunction with certain improved areas such as ICT readiness, price competitiveness through the constant focus on the (tourism) sector as either one of or, in other cases, the core pillar of the economy. Spain is the leading country of the subregion, combining both cultural and environmental assets, with Italy and Portugal closing the top three of the subregions' ranking.

2.2. Crises

2.2.1 The Pandemic

In 2019, the world was struck by the virus Covid-19, a disease that caused a massive outbreak and brought great distraught worldwide. Originating in Wuhan China, the virus gradually made its presence known in other countries, forcing the World Health Organization to announce the start of the Covid-19 pandemic on 11 March 2020 (World Health Organization, n.d.). The impact of the pandemic was felt on multiple scales, as the World Bank (2022) highlighted, "The COVID-19 (coronavirus) pandemic sent shock waves through the world economy and heightened concerns about high levels of private and public sector debt." (p. 50).

According to the annual UNWTO International Tourism Highlights Report (2021), tourism had a significant rise of 4% from 2018, the year before the pandemic, more specifically showing that the industry counted 1,460 million international arrivals, which translated to 1,481 billion dollars (World Tourism Organization, 2021b). However, after 2019 the world shifted due the pandemic, bringing drastic changes to the standards and practices in the tourism industry as according to Sigala (2020) the pandemic "resulted in numerous socio-cultural, economic and psychological impacts on various tourism stakeholders, some of them for years to stay" (p. 319). During its initial period, the pandemic led to a great collapse of the worldwide economy in multiple scales, as UNWTO recorded a drop of 1 billion (-74%) in international arrivals that translated into a loss

of 1.3 trillion dollars (World Tourism Organization, 2021a). Europe recorded a drop of 66% from its record year, 2019, Southern Europe being the most affected area, as most of the countries in this subregion rely heavily on tourism and hold it amongst their top priorities, Greece included. Many believe that 2022 landmarked the starting point of tourism's recovery cycle as international arrivals recovered 57% of pre-pandemic numbers, tripling their respective amounts of the previous year, 2021, with Europe and Middle East recording the quickest recovery. The UNWTO points out that there is a possibility to reach the pre-pandemic numbers again in 2024, effectively replicating the season of 2019 (World Tourism Organization, 2022b). Despite these expectations, tourism trends have already shifted according to the Organization, as consumer behaviour showed more responsible, eco-friendly approaches, consequently opting for different types of alternative forms of tourism as "the tourists' experiences and/or exposure to others' experiences [...] can have a significant impact on their travel attitudes, intentions and future behaviours" (Sigala, 2020, p. 315).

2.1.2 The Invasion of the Ukraine

On the 24th of February 2022, Russian forces began invading the capital of the Ukraine, Kyiv, starting a war still active to this day (Bigg, 2022). Russia's actions brought on great levels of inflation and high prices for electricity and gas, leading the EU to announce certain measures that would address the current crisis by erasing Russia as a trading option, and on that account look for new markets (European Council, 2022a; IEA, 2022), while Ukraine's position as a major provider in the global food market added more repercussions with big drops in exports, resulting in higher prices and food supply issues worldwide (European Council, 2022b).

Like the pandemic, the Ukrainian crisis impacted tourism, adding more struggle to an industry still trying to recuperate its long-lost numbers of 2019. According to UNWTO's report of 2022 on the consequences of the Ukrainian crisis, the Organization defines the conflict as 'a downside risk' with an estimated loss around 14 billion dollars, as both countries account for 3% on the global scale with regards to spending in international tourism (World Tourism Organization, 2022a). Moreover, the report shows that:

- The conflict boosted unwillingness towards international travel, a trend that began during the pandemic especially in the US and Asian markets, as they prefer avoiding risky movements.

- The global energy crisis sparked rapid changes in prices by upping inflation rates in a way that travel cost also became pricier, and as a result travellers and business are more sceptical about their future spending; but the restart of the business due to laxer travel restrictions affords a sliver of optimism for the future.

2.2.3 Climate Change

Climate change is a vital system of problems that keeps getting exacerbated due to the stalemate countries find themselves in, for lack of taking more drastic measures against it. One of biggest challenges worldwide nowadays creating severe environmental issues are:

- An increased in temperature on land and sea surfaces worldwide
- Anomalies in water allocation (extreme droughts or precipitation)
- Ocean toxic pollution (Center for Climate Change and Health, 2016)

According to the *One Planet Sustainable Programme*, tourism has an interactive relationship with the phenomenon, as “tourism depends on environmental resources, since climate defines the length and quality of tourism seasons” (One Planet Sustainable Tourism Programme, n.d., no page). On the other hand, tourism is a significant contributor of CO2 emissions with some forecasts predicting a 25% increase from it alone by 2030. In order to counter this situation, the Paris Agreement was signed in 2016 with the aim to implement a plan that seeks to control the global warming effect and limit its increase by reducing emissions effective immediately, with the EU being one of the most outspoken members by setting the milestone to bring emissions down to 55% by 2030 (United Nations, 2015). Aside of the Paris Agreement, the *Glasgow Declaration* was also created by the *One Planet Sustainable Tourism Programme* (2021) in an effort to “unite all stakeholders in transforming tourism to deliver effective climate action” (p. 1) through a 5-step process that includes:

- Limiting travel and tourism-oriented emissions
- The decarbonization in all sectors of tourism industry
- An attempt to rejuvenate the ecosystems and “help visitors and host communities experience better balance with nature” (p. 2)
- Financially supporting the stakeholders in order to achieve these changes
- Engaging all stakeholders to meet these changes in a cooperative manner

With this overview, we can now proceed to present Greece's place in the European tourism sector and how much the country's tourism product has evolved during the years from the perspective of one of the most turbulent Western economies over the last decades.

Chapter.3: Greek Tourism

3.1. Early Crises: Financial & Refugee Crises (2009-2014)

3.2. Recent Crises and Aftermath

Ch. 3: Greek Tourism

Greece's tourism sector has undergone a lot of changes in order to get established as one of the most prominent destinations of the European region since the 1950s, when the arrivals were just above 30,000, to the record-breaking 31 million in 2019 (Buhalis, 2001; SETE, n.d.). By relying on the 3's model, Greece adopted a method that was "characterized by economic monoculture, abandonment or exploitation of the actually deficient natural resources, uncontrolled urban growth, and unforeseen changes in land use" (Galanos, 2013, p. 134), creating an unbalanced growth that was centred around the islands and generally coastal areas of Greece, a growth rate that hit a record revenue in 2019 (INSETE, 2021b). Greece's approach, even though mainly successful, showing satisfactory yearly achievements (excluding the peak pandemic years), lacks in a number of ways which we are going to explore over specific periods.

3.1. Early Crises: Financial & Refugee Crises (2009-2014)

In 2009 Greece faced the most significant crisis of the EU's modern history because the financial crisis of 2008, that originated in the United States and was a phenomenon that arose due to the helplessness of lenders to pay their mortgages (Varoufakis et al., 2011), made its presence known in the Greek economy. Unfortunately, Greece suffered greatly from this recession, recording historical lows, entering a period of great uncertainty that stigmatized the better part of the 2010s, in which Greece lived in a state of almost exclusion from the international markets, having an 'objective inability' to meet its financial needs (Varoufakis et al., 2011). For Papatheodorou and Arvanitis, the Greek financial crisis translated into losses of markets, decrease of tourism growth, and prioritization on certain types of products and services (Papatheodorou & Arvanitis, 2014). This turn of events resulted in a state of monopoly for several years in sectors like air transport (with the buyout of *Olympic Air* by *Aegean Airlines*). During the middle stages of the financial recession, another crisis emerged; that placed additional pressure on the country: in 2015 the North Aegean region saw the influx of thousands of refugees who were looking to advance to central Europe (Pallister-Wilkins & Anastasiadou, 2020). Several islands, especially Lesbos, accounted for the main bulk of refugees and asylum seekers from Syria, Afghanistan, Iraq, and beyond (Hernandez, 2016). At the peak of this period, various media outlets – most notably BBC, New York Times, The Guardian, DW and many universally known figures in journalism – produced many takes on the matter, condemning the situation (DW, 2021). Unfortunately, this situation re-appeared on a greater scale in April 2023 when the New York Times released a video of Greek coastal authorities stopping a migrant boat from entering the country with the intention

of returning it to the Greek-Turkish borders and abandoning it in the process (Stevis-Gridneff, 2023).

According to Cuduraš (2014), big markets and their consumers forced to change the expenditure habits in a change of choices that tended to favour a more constricted approach in spending during the financial crisis of 2008 (Guduraš, 2014). Despite the unstable economic and political environment, tourism was one of the most important catalysts for the Greek economy, something acknowledged by Galanos, seeing that tourism was the main sector that financially supported Greece in 2011, since it contributed significantly to the GDP and employment rates (Galanos, 2013). Below are the relevant figures at the start and during peak years of the crisis:

Year	Arrivals (International) Millions	Receipts (Billions)
2009	14,9	10,4
2010	15*	9,6*
2011	16,4*	10,5*
2012	15,52*	10,02*
2013	17,9*	11,7*
2014	22*	13*
2015	23,6*	13,6*

Table 1: The performance of Greek Tourism during the financial crisis: (Source: SETE) *Cruise numbers are excluded from the marked figures

We can see that Greece's tourism industry recorded an adequate number of arrivals and receipts but, according to Papatheodorou and Arvanitis (2014), "the importance of tourism for the Greek economy became widely acknowledged and understood by policymakers in the aftermath of the recent economic recession" (p. 184). We can verify this statement through the Tourism and Travel Index Report, as the position of Greece fell dramatically during the crisis peak years:

Period	Position (Global)
2009	24
2011	29
2013	32
2015	31
2017	24
2019	25

Table 2: The position of Greece in the T&T Competitiveness Report: (Source: World Economic Forum)

Subsequent scores show that Greece's situation improved as the country moved upwards by 6 positions (25th in 2019). The fact that Greece's overall position fell during the peak years of the

financial crisis is unmistakable, and we will address the multiple reasons for that with a comparative approach:

Year	Pros	Cons
2011	Tourism Infrastructures Prioritization of Tourism Natural & Cultural Resources Health & Hygiene Air Transportation	Safety and security Price competitiveness Policy and regulations Education and training of Labor Force Natural resources (*based on the protection policies)
2013	Tourism Infrastructures Prioritization of Tourism Natural & Cultural Resources Health & Hygiene Air Transportation	Safety and security Price competitiveness Policy and regulations Education and training of Labor force Environmental Sustainability
2015	Tourism Infrastructures Prioritization of Tourism International Openness Natural & Cultural Resources Health & Hygiene Air Transportation	Business Environment Safety and security Price competitiveness Policy and regulations Education and training of Labor force Environmental Sustainability
2017	Tourism Infrastructures Prioritization of Tourism International Openness Natural & Cultural Resources Health & Hygiene Air Transportation Environmental Sustainability	Business Environment Price competitiveness Policy and regulations Education and training of Labor force ICT readiness
2019	Tourism Infrastructures Prioritization of Tourism & International openness Cultural Resources Environmental Sustainability ICT (Users, Usage)	Business Environment Price competitiveness Natural Resources Human Resources and Labor Market Safety and Security ICT (B2B, B2C)

Table 3: The Pros and Cons of Greek Tourism 2011-2019 (Source: World Economic Forum, 2011, 2013, 2015, 2017, 2019)

After the presentation of this comparative table, we can deduce the following:

- Greece's Business Environment and regulations were creating several roadblocks to tourism growth: bureaucracy in Greece constitutes one of the most consistent issues throughout Greece's history and it also affects price competitiveness due to high taxation.
- Although safety and security levels in Greece were for the most part average, the reports expressed high uncertainty in the event of a potential terrorist act; this can be explained by the events of the refugee crisis of 2015 that created major concern in EU around public safety.
- Greece's environmental policy has been unstable over the years, even though the country presents a rich variety of flora and fauna; policies and guidelines around them have been unsatisfactory leading to various events that resulted in loss of species and a decline in the health and hygiene sector, for example the wildfire at Mati that got dubbed as one of Greece's biggest natural catastrophes (Smith, 2019).
- The main source of success was natural environment resources, placing a strong emphasis on the seasonal-oriented tourism product thus leading to the constant situation of dependency on the same resources, causing sustainability concerns (INSETE, 2021b).
- Negative aspects aside, the numbers show that Greece has recovered well from both crises, due to the established infrastructure in accommodation and aerial transportation, the willingness to be open to international arrivals, and the abundance of cultural resources that keep demand high every year.

3.2. Recent Struggles & Aftermath

Greece's overall economy showed improvements after recession years, but a number of events imposed a downward trajectory on the steady rise of the economy's achievements and brought Greece's inflation numbers to negative levels, identical to those of the 90s (Stergiou, 2022). The Institute of SETE-INSETE showcased in its pandemic report a decrease of 76,5% in arrivals and 76,8% in revenues, although resilience was shown by enterprises with only a 10% drop in employment during that particular period (INSETE, 2021c). The numbers get better in 2021 and 2022 due to tendencies on the part of Greece's authorities not to enforce strict travel measures in the favourable tourist periods in order to generate more arrivals (Athens Voice Newsroom, 2020; Ethnos Newsroom, 2021, 2022), with the overall tourism inflow revenues boosting the recovery after the hit Greece's GDP suffered in 2020 (Adamopoulou et al., 2022). The Ukrainian invasion and subsequently energy crisis lead the domestic economy to a cycle of turbulence, with

the inflation rate rising to levels unparalleled in the last 20 years (12,1% in July of 2022), consequently hindering the competitiveness of Greek tourism (INSETE, 2022). Additionally, according to Kathimerini that published relevant research by *Alpha Bank*, the Greek tourism industry faced the following problems after the polarization between the EU and Russia (Kathimerini Newsroom, 2022):

- The absence of Russian tourists.
- The decline in the spending power of Greece's target group countries due to the emerging energy crisis
- The resulting high operating costs that impacted on the profits of Greece's tourism enterprises.

Finally, for Mediterranean countries like Greece, the climate crisis is top priority, as the current course of action according to the *United Nation's Environmental Programme* will severely impact the region's areas and health/ safety conditions (*Climate Change in the Mediterranean / UNEP MAP*, n.d.), in a number of ways, including:

- The rise of sea level that will affect coastline (including heritage sites)
- Erosion, floods, wildfires
- Increased water demand
- 'Water hotspot' by 2100
- Risk of losing a number of species
- Rise of temperature (20% faster than in other regions)

Greece recovered most of the losses of the pandemic period in 2021 and the Ukrainian crisis in 2022 with INSETE reporting a difference of 11,2% between 2019 and 2022 in arrivals (27,8 million arrivals in 2022) but only of 3% in receipts as spending per person increased only by 9,7%. Overall, Greece would stand to gain 17,6 billion euros with a difference of 592 million from 2019 (18,2%) with the majority of this loss (392,1 million) due to the huge absence of Russian tourists (-93,8%) stemming from the events in Ukraine (INSETE, 2023). Moreover, the 3S's destinations gained a lot of traction as a lot of them (Cyclades +33, Ionian Islands +12,7) saw their numbers increasing versus those of 2019, but on the other hand big cities like Athens (-13,4%) and Thessaloniki (-15,6%) recorded significant tourism drops. It is safe to conclude that travellers made decisions affecting a big part of their trip based on hygiene/safety criteria relating to the pandemic, and

that 3S's destinations were a still prime contributors to Greek tourism, despite the compromised nature of this period (INSETE, 2023).

Finally, over the last few years the EU saw a conservative shift in its political ecosystems as a result of all the previously presented crises, which intensified Euroscepticism ideas as the constant demoralising factor that led people to lose hope in the social pro-parties, opting for more closed, anti-openness and strict politics ones, with most extreme examples being Hungary, Italy, Poland and Austria (Constantini, 2022; Wolf, 2022). Greece is no exception to this political shift, as the multiple obstacles (most notably the pandemic, the ongoing refugee crisis and the potential new economic recession) resulted in the historic re-election of conservative Government *Nea Dimokratia (New Democracy)* on the May 21st and June 25th 2023 elections, alongside with the inclusion of several far-right parties in Parliament (Kirby, 2023; Psaropoulos, 2023). It is still unclear how this overall trend will impact on Greece's tourism product, insofar as the country has indeed recovered pretty good economic numbers post-pandemic, but with the tension held by Europe's current status quo, along with the social shift in openness and internationalism, there is a scenario where localism and aversion towards travelling aboard on a regular basis should be considered.

Chapter.4: Tourism and Technology

4.1. Applications in the Tourism Sector

4.2. Greece and Technology

4.2. Digital Transformation Phase

Ch. 4: Tourism and Technology

Tourism and Technology have always been closely related, as various social economic and environmental factors led to innovations and changes that subsequently made an impact on tourism. This statement is underlined also by Sigala (2018) as technologies “are also a transformational driver of the industry structure and operations as well as the role and functions of its stakeholders” (p. 151). It would be fitting to analyse two theories that bring together these pillars of human activity accordingly: The Knowledge Economy and the Experience Economy, theories that explain the changes tourism services and products went through with the development of technological innovations. As we established previously, the economic crisis of 2008 brought great distraught on the global economy and consequently a new way of performance was needed, leading us to the emergence of Industry 4.0. The Knowledge Economy was a catalyst for the development of Industry 4.0 in terms of its usage and creativity, as an economic theory that aimed to create a sustainable environment in order to prevent a financial relapse (Avkopashvili et al., 2019). This term is useful for us in order to understand the change of scope that entrepreneurs in all categories (including tourism) had to adapt to, changing the economic landscape as a whole. It is fundamentally connected to Industry 4.0 and Information Society, their main principles being innovation and prioritization of the human capital, as “favorable conditions are created for opening human potential, material and non-material needs of consumers are satisfied” (Avkopashvili et al., 2019, p. 61). This leads to a more experiential world that offers more options and sometimes even eliminates the concept of materiality (Avkopashvili et al., 2019). Moreover, the main priority on the world economy is being uptaken by that of experience instead: For Pine and Gilmore (1998) experience is “not an amorphous construct; it is a real offering as any service, good, or commodity” (p. 98), as a result of it being composed by two aspects; participation and connection:

- Participation includes both active and passive displays from the consumer’s point of view, as experiences can be designed accordingly, erasing any ‘quality’ distinctions between them, so that the consumer can both be educated and gratified through them. (Pine & Gilmore, 1998).
- Connection is about the immersion of the consumer in the setting of the experience, therefore an effective environment can lead to a satisfying experience, exceeding the consumer’s expectations through the aesthetics and entertainment that are provided to him/her (Pine & Gilmore, 1998).

In relation to the tourism sector, Sternberg (1997) claims that tourism mainly promotes a rather 'staged' experience as its primary priority is the "creation of the touristic experience" (p. 954). This, alongside the fact that the Experience Economy for Pine and Gilmore consists of an active (education, gratifying escapism) and a passive (entertainment, aesthetics) aspect, intertwines these fields, the words of Oh et al. (2007) providing us with a pertinent overview of the subject:

- In an educating experience, the tourist can digest the information about the destination (physical or not) by "actively participating through interactive engagement of the mind and/or the body" (p. 121).
- In an aesthetic experience, the tourist is getting immersed into the setting of the destination's environment without any involvement or interaction on his part.
- An entertaining experience gets achieved "when the tourist passively observes activities and/or performances of others" at the selected destination (p. 121).
- A gratifying escapist experience has the characteristics of all the previous categories embedded in it, in order to captivate the tourist as he "affects actual performances or occurrences in the real or virtual environment" (p. 121).

On account of these points, we can pinpoint the connections between Tourism and the New Technologies: Tourism benefits from the constant flow of new alternative products and services that widen the range of possibilities, whereas New Technologies perceive Tourism as the ideal environment for innovation and execution with both direct, and indirect methods. Therefore, as Sigala states (2018) there is a "a transformative conceptualization whereby tourism markets and actors [...] both shape and are shaped by technology" (p. 151).

4.1. Applications in the Tourism Sector

The relationship between Technologies and Tourism has proceeded to create new forms of experiences, one of them being *Digital Tourism* that according to Benyon et al (2014). "can be defined as the digital support of the tourist experience before, during, and after the tourist activity" (p. 522). Many businesses and organizations have implemented this strategy "recognizing that change is essential to the preservation and improvement of competitiveness nowadays" (Happ & Ivancsó-Horváth, 2018, p. 11), as stated by the EU in April 2018 where the need for funding and support in the sector was recognized (Niestadt, 2018) and led to the production of the online *Tourism Business Portal* for SMEs (available at: single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/business-portal_en).

This portal contains information and advises on various digital practices, along with the appropriate supporting toolkits as “it aims to ensure SMEs stay informed and up-to-date with the continuous transformation of the EU tourism sector” (European Commission, n.d. " Develop your business and enhance your skills" para. 1). Through these initiatives, the EU supported and prepared stakeholders (especially small and medium enterprises) in order to be fully capable to manage the new capacities digitalization provided, making the tourist sector of the EU more compelling, flexible, and competitive (Niestadt, 2018). According to Wu, Digital Tourism includes various elements (both travel and other sectors, like entertainment) that engage and influence the users (Wu, 2020). From sharing their thoughts on social media and other travel platforms to booking their own travel and stay, and eventually enhancing and making their stay easier with ‘real-time software’ that keeps them updated, providing them with sufficient information, Digital Tourism has contributed significant changes to the landscape of tourism, creating a new generation of travellers worldwide (Niestadt, 2018). Moreover, Wu (2020) notes that digital tourism offers a variety of options for tourist businesses, from “image display” to “services on accommodation, transportation, tourism, shopping and entertainment” etc. (p. 18). Linke examined how landscapes are transformed through the internet, thus becoming an interpretation of the landscape that internet users create, and not a straight representation of reality, seeing as most were ‘created’ for marketing reasons (Linke, 2020). Through various searches in Google Images, Linke (2020) noticed that most of the results showed “romanticized and idyllic landscapes” (p. 145) that presented her with ‘beautiful’ areas, with colourful visuals, strong editing effects in order to appeal to people’s eyes and ‘move’ them aesthetically. The author also noted the absence of a more realistic depiction of these landscapes in Google Searches as these are far down the list of results, showing that more stereotypical approaches have been chosen in order to soften and attract the user (Linke, 2020). Another source of influence in the digital realm is social media, with various platforms providing ample space for operators, destinations and organizations to accelerate marketing campaigns; especially for the more tech-friendly generations where the aforementioned stakeholders can attract consumers for their offerings through various media techniques (ads, or multimedia posts). This, alongside the fact that most of these ages cohorts are used to making multiple transactions through the internet, gives providers more space to operate (Şchiopu et al., 2016). Of course, this also means that providers should be careful with what is getting posted/offered, as users may become unhappy if details are lacking or end up being false, thus leading them to condemn the offer through comments, reviews, posts etc. With the refugee crisis as an example, Ritchie emphasizes

the importance of media coverage, due to these events being widely accessible to the public: depending on the way that the coverage exhibits the situation, the results may come as either catastrophic or beneficial as in any case, the response must be quick and clear (Ritchie, 2004). In the example of the North Aegean, negative coverage determined tourist behaviour as they were reluctant to visit the destination, making as a result any tourism development and planning even more difficult (Tsartas et al., 2019).

The pandemic also tested tourism actors' communication skills, as the subsequential lockdowns lead people mainly to stay at home, increasing their internet presence. In their research on how the outbreak affected tourism destinations, communications and planning, Pachucki et al.(2022), found that lingual expressions tended to be unbalanced, reassuring, emotionally driven, less detailed, alongside with a heavy focus on first-person storytelling (especially during the lockdown phase when interaction was at its highest), a practice that (in times of crisis) attracts more consumer engagement and reaction as "the absence of actual travel opportunities [...] helps consumers to virtually connect with tourism destinations" (Pachucki et al., 2022, p. 7). Therefore, the latter author suggested to future practitioners to avoid affective and specific (on the destination) wordplay, as the consumer's behaviour may be impacted in future crises, so escapism is the key communication process during these periods. After reviewing all these examples, we can deduce that Digital Tourism is the starting point for Industry 4.0's insertion into the Tourism field, as many technologies were built on the initial promise of digital evolution with some expanding even further. Here are some examples from the usage of these technologies:

Artificial Intelligence

Artificial Intelligence is one of the most widely used and significant technologies in the industry right now, with travel assistance bots being implemented by the biggest booking and travel companies in the world: *Skyscanner* and *Booking.com* have already initialized online reservations through Facebook and Skype chatbots that can search, book and redirect the customer to the payment pages to complete their reservations. They also provide information and additional options to travellers, and make suggestions to shorten the thinking process (Booking.com, 2017; Skyscanner, 2016). Also, robots with multilingual capabilities have been enlisted in order to help passengers over questions regarding their flight in multiple languages, freeing airport staff members from this process, in order to attend to matters of a more complex nature. A number of airports worldwide have implemented this tactic (Berlin, Seoul, Tokyo) with some examples being also the ability to conduct health and security checks (Heathrow Airport), as the overall

aim for AI-generated robots is to completely take over the checks and many more functions, like cleaning, etc. (Hornyak, 2020; Youd, 2021).

Big Data

As we previously saw, Big Data is a valuable component of enterprises’ understanding of the multiple factors that impact their performance and discovering new ways of improvement. According to *NIRIIS Tourism S.A.*, tourism businesses have multiple ways of being brought into the scope of the customers’ choice over correspondence via mail, calls, surveys, listing options, reservation history and combo offerings (if they operate a loyalty system for repeat customers), as well as social media interactions for data collection. These data can be used for effective price arrangement in stays and services, targeted marketing campaign adjustments based on weather or significant trends that currently impact tourist on activities (NIREIS SA, 2015). A prime example is Tourism 4.0’s award-winning *Tourism Impact Model*, a tool serving as “an objective picture of the impact of tourism in a certain micro-location” (“tourism impact model”, para. 1), by getting data from various actors of tourism using the method of extensive inquiry, posing multiple questions regarding the environmental, social, economic and cultural condition of the area selected. The aggregated score classifies it into one of four categories, based on tourism’s impact has and the consumption of resources required, thus trying to promote the ethical and/or sustainable destinations within the area of choice (*Tourism Impact Model – Tourism 4.0*, n.d.).

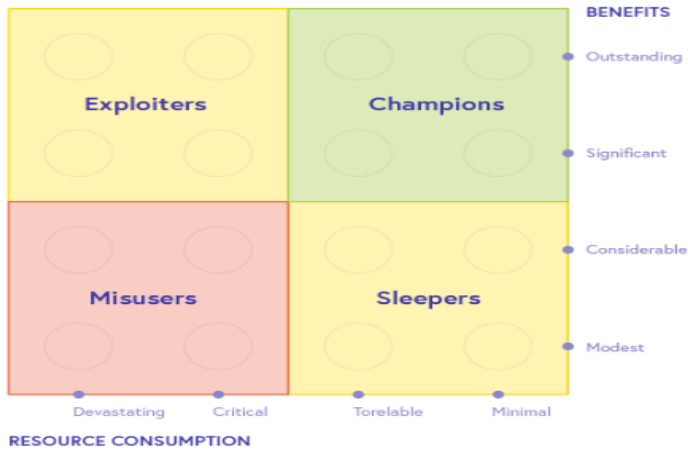


Fig. 1: The Tourism Impact Chart (Source: <https://tourism4-0.org/tim/>)

Augmented reality

The industry was aware of the capabilities of AR’s immersive techniques and therefore, many initiatives were made to produce apps that were going to accompany the tourist after the pandemic period (Marr, 2021). Right now, it seems there are not many pertinent, strictly tourism-

only AR apps in the market, but in the following segment we will present some of the most interesting examples:

- *City Guide Tours* is a mobile application that provides details about certain points of interest. The application gives the user information about locations such as museums, statues, landmarks etc., and rewards one with points for every location tracked, thus motivating users to extensively explore areas in order to compete with other users within the app, and also develop holistic knowledge about their particular destination. The application still seems to be available in Prague and Dubai, but one hampering issue is that it is only available for IOS users.

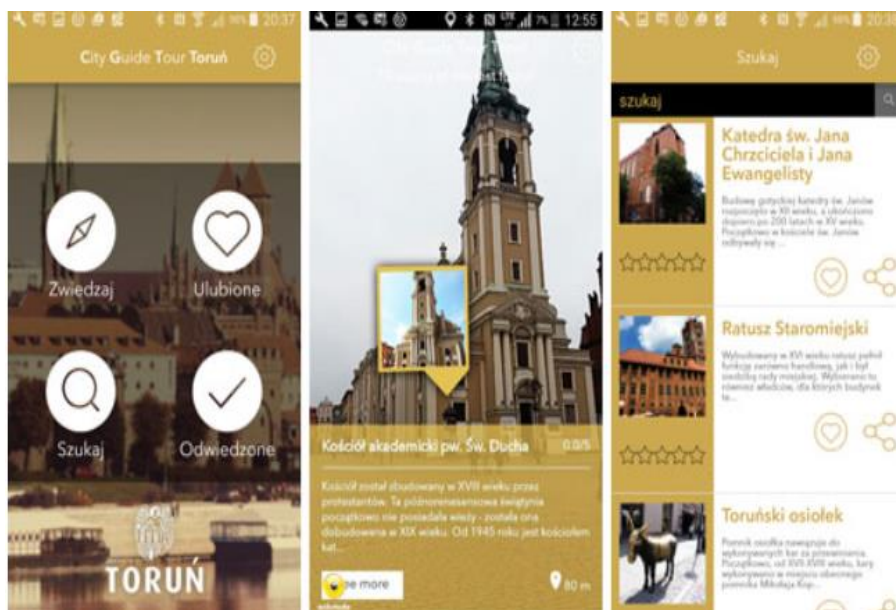


Fig. 2: The *City Guide Tours* Interface (Source: geoforum.pl)

- Google/Apple Maps: Google and Apple Maps have enabled AR options for selected devices and locations, hence the tourists for whom these features are available experience a more interactive and detailed navigation when traveling to points of interest during their trips. However, there are limitations as both versions seem not to be widely available, especially in Greece right now.

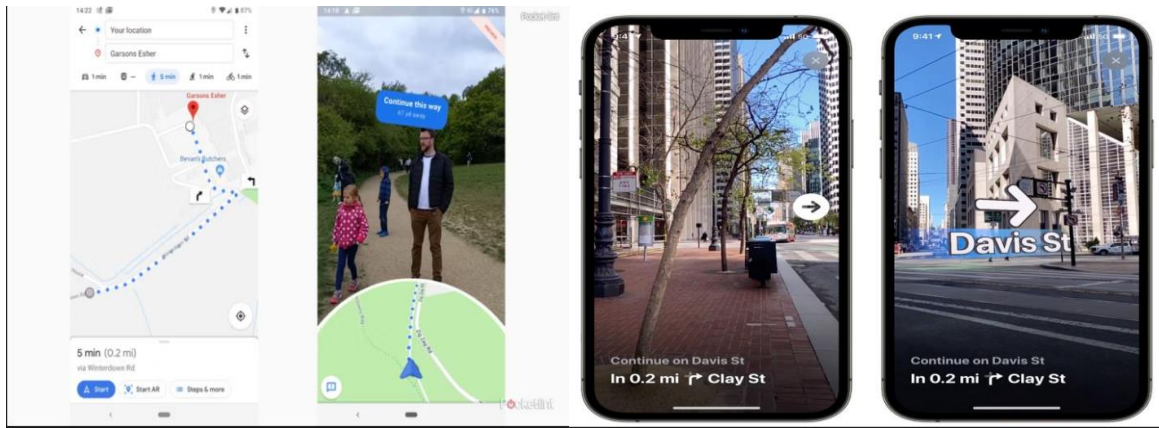


Fig. 3: The UI of Google/Apple Maps (Source: Poketlink.com/MaRumors)

- Pokémon Go*: A game based on catching *Pokémon* on-site, in a location-based game that includes maps of over 153 countries with over a billion downloads. The game has unique capabilities, as certain *Pokémon* are available at locations with certain environmental aspects and that motivates users to search for them and add them to their collection when traveling to destinations with these particular characteristics. The motivation that the game offers can of course be considered an enhancement for the tourism industry and that is why UNWTO partnered with the developer of the game, *Niantic*, with ambitions of making the “World a Better Place by Motivating People to Discover New Places, Exercise and be Social” as these would be in consonance with UNWTO’s values on sustainability and responsibility (UNWTO, 2020, “Why did you partner with UNWTO?”, para. 10).



Fig. 4: The interface of *Pokémon Go* where a user tries to catch a *Pokémon*, in the actual physical environment/setting (Source: UNWTO)

Virtual Tourism

Perhaps one of the newest forms of tourism (late 90's), Virtual Tourism seems to be at the forefront of the tourism sector since the pandemic, as its accessibility and cost-effectiveness made many destinations available "to millions of people who may otherwise not [have been] able to afford to travel" (Fredericks, 2021, "What are the benefits of virtual tourism?", para. 4), connecting people with unique experiences they never thought they would have opportunities to access. It is no wonder that Virtual Tourism seems to have been a significant alternative to the leisure industry of the pandemic world, so we can consider it as the most implemented technology among the Industry 4.0 technologies (Fredericks, 2021). World Economic Forum's writer Anu Pillai suggests that a plan around New Technologies in tourism will benefit all stakeholders that depend on tourism for economic reasons (Pillai, 2021), as the pandemic affected the whole world with drastic changes in all of our realities and everyday lives (working remotely, online education, etc.). Lu et al.(2022) in their study on VT potential in recuperating the tourism industry's losses acknowledged that "virtual tourism could be a useful tool to reduce transmission of the coronavirus for those countries who are still undergoing serious impacts from the pandemic via reinforcing the stay-at-home order" (p. 453) and also presents an alternative, as virtual tourism "is a practical and valuable option for mass tourism [...] and can replace mass tourism after the pandemic" (Akhtar et al., 2021, p. 1), because the presentation and tools of manipulating and recreating the landscape with a plethora of options offers a feasible option for sceptical tourists (Akhtar et al., 2021). To conclude, Virtual Tourism is a legitimate sector in the sector by presenting a greener, sustainable, all-inclusive experience with multiple options for users in order to enjoy leisure, gratifying escapism and even inspiration from potentially travelling in the chosen destination, thus contributing to the image and appeal of it (Fredericks, 2021). VR and its components are becoming a useful tool for the recreation or representation of landscapes visualizations (Vetter, 2020). This can lead to enhancing and re-promoting landscapes that have sustained sufficient damage or that have completely vanished altogether, resulting in a reignite interest in them, as "3D visualization can boost the attractiveness or can create a new potential of these sites"(Hronček et al., 2020, p. 1). For the realization of the latter project, various tools were used for the construction and remodelling of the landscape, a prime example being the *ArcGis* software. After the process was completed, the makers successfully recreated the details of a vanished mining area in Slovakia with the inclusion of mining vein paths based 18th and 19th century maps (Hronček et al., 2020). Through this particular process, the 3D implementation shows "examples of new possibilities for the presentation of mining sites in the

mining tourism” (Hronček et al., 2020, p. 11), creating many opportunities for visitors to explore safely similar areas that were revitalized through the use of modern digital tools, reinstating their historical and touristic value with the enhanced exposure, and setting the example for other Heritage & Natural Landscapes to follow their example with similar methods. This concept comes in line with Bec et al., plan of creating the opportunities for “second-chance’ tourism (Bec et al., 2021). The concept is centred around offering “another life to destinations experiencing deterioration or [are] at risk of future destruction”, presenting the users of digital recreational experiences with an opportunity that can be bought through online platforms (Bec et al., 2021). Apart from landscape preservation and recreation, Virtual Tourism can also be simulated through Virtual Tours for strictly marketing purposes. Virtual tours are widening the customer pool, using various practices to attract people, as “visualization helps to promote destinations’ positive image that leads to their economic development due to the growing number of visitors” (Voronkova, 2018, p. 4). An interesting campaign was constructed for the Faroe Islands in 2020 using VR elements in order to provide travellers with an alternative option to explore the islands’ sites. As stated in their website, the officials created:

- A virtual tool that allows users to connect with any device and experience an interactive virtual tour of the Faroe Islands offer.
- This tool allowed the user to direct the movements and actions of the islander in several views and landscapes across the islands’ locations (The Faroe Islands, no date).

This is a very innovative take on the relation between humans and landscape, as people get to explore individually whatever are they like around the island. The inclusion of game-based logic makes the experience more interactive and gives to the user freedom in their choices.



Fig. 5: The Faroe Islands interactive Virtual Tour (Source: <https://www.remote-tourism.com/about-the-project>)

Tourism 4.0 project: As previously stated, actors in the Tourism field are always looking for innovation, therefore leading to the creation of a relative new trend called Tourism 4.0, a project that incorporates the concept of Industry 4.0 in the tourism field. On their article on the matter, Peceny et al. (2019) highlight the potential of tourism in “establishing a collaborative ecosystem involving local inhabitants, local authority, tourists, service providers and government, [that] can co-create an enriched tourism experience in both the physical and the digital world” (p. 1). We can track the birth of the concept in Slovenia, where the aim was to combine multiple stakeholders, who were local residents, government and tourism providers into creating a sustainable environment of tourism development (Peceny et al., 2019). The model required multiple technologies of Industry 4.0, and data collecting that selects several environmental, tourism and social oriented details in order to assemble an appropriate system that accompanies and advises tourist on activities, providing them with virtual tours, and encouraging responsibility and proactiveness by rewarding them through tokens of blockchain technology that they could use in multiple tourism-oriented activities, thus boosting the local economy and promoting a holistic view of the chosen destination (Peceny et al., 2019).

4.2. Greece and Technology

Greece is a country with adequate technological implementations, but there's still need for improvement on multiple levels: the president of SETE in 2018 described Greece as being at the bottom of digital practice amongst other European countries, in need of a strategic plan towards digital transformation; an urgent matter with tourism at its forefront beneficiary. This position was also supported by the placement of Greece in the 26th position on the Digital Economy and Society Index (DESI) of 2019. According to the report, Greece made slight improvements but still lacked overall in most Connectivity-related departments, broadband internet being the most notable factor (European Commission, 2019; Oikonomaki, 2018). Regarding the tourism industry, according to the T&T Competitiveness report of 2019, Greece's score on the ICT score is 5.2 (out of 10) keeping her above Turkey (with 4.6) but below the total average of Europe and Eurasia (5.4), or other competitive markets such as Spain (5.8), Cyprus (5.8), France (5.9) and Italy (5.8), showing that Greece needs to explore more advanced options in order to keep up with the rest of the competitors (World Economic Forum, 2019). Another example is INSETE'S 2019 report for Greece's competitiveness in Northern Europe, where the interviewees focused on the absence of information providing methods, such as info centres and mobile apps (INSETE, 2018). From 2020 onward, there are two significant reports that aimed on progressing the digital evolution of

Greece's tourism product. First, The Ministry of Digital Governance with the *Digital Transformation Bible 2020-2025* in 2019 and finally, INSETEs' *Greek Tourism Action Plan 2030* in 2021. Both reports outline Greece's digital status at the time, and the necessary steps for improvement in the field of technology moving forward.

4.3. Digital Transformation Phase

According to *Eurobank*, digital transformation consists of "all the changes that [...] are offered by the internet, digital media and new technologies. It is an ongoing process that creates opportunities for businesses, but requires training and infrastructure" (*Eurobank*, n.d, para. 1). The Ministry of Digital Governance of Greece released the *Digital Transformation Bible 2020-2025* in July of 2019, which presented the necessary guidelines to achieve the completion of project 'Digital Greece'. According to the report, the aim of the project was to introduce and implement a strategic plan to process the digital maturation of the country, which would proceed to provide the best service possible to both public and private sectors, but also create more tools for financial prosperity (Ministry of Digital Governance of Greece, 2021). This plan included:

- Safe and efficient accessibility for all
- Improvements for technological readiness
- A fully capable digital state, providing the best experience and service to citizens
- Support on technological initiatives
- Preparation for the digitalization of businesses
- The inclusiveness of modern technology in all aspects of economy

When describing the transformation of the tourism field, the *Digital Transformation Bible 2020-2025* summarises the plan by stating that the digital transformation of the Greek tourism industry is underachieving compared to other EU members, characterizing it as 'digitally deficient'. The report concludes by stating the following: "The technological developments in the field of tourism, combined with the growing tourist demands for personalized, engaging and quality experiences and services, [force] the intensification of efforts for the integration of new digital technologies [in the tourism field]" (Ministry of Digital Governance of Greece, 2021, p. 394). The following table presents these projects and also details as to their status according to the page of the Ministry of Digital Governance, with the final update being on the 25th of December 2022 on the Bible's online page:

Project	Timeline	Completion
Digitization of promotion and support of the Greek tourist product	Short Term	Scheduled
Unified system of electronic registration of arrivals and departures in the country's tourist accommodations	Medium term	Ongoing
National Observatory of Sustainable Tourism Development	Medium term	Ongoing
Creation of an intelligent tourism platform	Medium term	Ongoing
Development of a website and application for mobile devices to highlight the accessible nature of tourism in Greece	Medium term	Scheduled
Digitization for Greek tourism, creation of a repository and semantic annotation of content	Medium term	Scheduled
Digital applications for the Olympic Park of Olympians in Ancient Olympia	Medium term	Scheduled
Development of a website and application for recommendations of destinations and activities for children	Medium term	Scheduled
Collection and Presentation of Tourist Interest Data	Medium term	Scheduled
Culinary map platform	Medium term	Scheduled
Creation of an e-MHTE platform and interoperability with State registers and systems	Medium term	Scheduled
Development of an innovative system for visitor information	Medium term	Scheduled
Digitization of procedures for zoning, licensing of tourist ports and identification of tourist facilities	Medium term	Scheduled

Table 4: The Projects of the *Digital Transformation Bible 2020-2025* (Source: *Digital Transformation Bible 2020-2025*)

Through INSETE's report, although maybe relatively outdated due to certain intervening events (governmental measures for the pandemic and the Ukrainian crisis and its side effects included), we can extract a relatively well-outlined direction towards which Greece's digital transformation is heading that agrees with the Bible on more than one occasion; the report's suggestions were the following:

- Creation of online portals for every Greek region that connect to other tourism and public portals.
- Creation of digital apps that support enterprises, public service, tourism marketing and capitalize on new technologies like AI big data etc.

- Development of 5G connection, free Wi-Fi in high demand tourist areas and creation of smart tourism practices.
- Creation of a national data hub for research handling and analysis of all aspects relating to the Greek tourism product (INSETE, 2021b).

Recently, Greece showed improvements proceeding into the digital age at last, but with lots to be still desired, as in 2022 Greece had a similar position (25th) amongst EU countries to that of 2019 (26th) but, unlike according to the previous report, the European Commission Greece acknowledged the fact that Greece had covered a lot of the area in the digital field with notable progress (European Commission, 2022a). This was highlighted in the improvement on connectivity and technological readiness, but on the other hand a lack of performance in the digital public services was noted (even though significant steps were taken with the development of the gov.gr platform). The latter, in conjunction with the lack of integration of Digital Technology, especially in Small and Medium Enterprises (SMEs), was what kept the country at the same position (as other countries had more established new technology foundations (European Commission, 2022a). On the ICT scale, the T&T report granted Greece a score of 5.6, above the region score (5.5), surpassing Italy (5.5), Turkey (5.2) and Croatia (5.5), but still below Cyprus (5.9), France (6.2), Spain (5.9), and Portugal (5.7), and the total sub region score of Southern Europe (5.7), (World Economic Forum, 2022), a fact that validates our previous comments.

A lot of projects have been scheduled for the digital evolution of Greece, but most of them have not yet been completed, therefore we cannot offer a reflection on their implementation and use. Despite that, we can acknowledge the needs that these projects satisfy, as they are aiming on multiple levels of tourism, like accessibility, sustainability, promotion, crowd flow tracking, gastronomy etc... Adamopoulou et al.'s research on the trends Greece needs to aim for in the future regarding the evolution of the Greek product, stated that these changes should consist of 'greener' policies to combat climate change, the adaptation of digital technologies and the handling of social distancing after the pandemic (Adamopoulou et al., 2022).

What we can understand on the basis of all the facts presented above is that Greece needs to incorporate more flexible options in order to sustain a quality infrastructure and resources according to the demands of its tourism product, and these of course need to be complemented or supported by the New Technologies that enable shortcuts, ways of monitoring and planning of concerning Greek Tourism. In conclusion, Greece is considered to be one of best-known

tourism destinations worldwide with a strong basis that was afforded by the unique landscape and plethora of summer destinations. As we saw, this overreliance on the base format of 4's was proven effective during the unexpected financial and refugee crises of 2009 and 2014 but after the technological leaps of Greece's competitors and the emergence of new potential threats, Greece is at a point now where technological progress is essential in order for its tourism sector to avoid the negative spiral that started with the pandemic and exposed its weaknesses at multiple scales.

Chapter.5: Empirical Research

5.1. Research Planning

5.1.1 Creation of the Survey Tool and Survey Implementation

5.2. Presentation and Analysis of Results

5.2.1 Questionnaire Responses and SWOT analysis

Ch. 5: Empirical Research

5.1. Research Planning

The main objective of the research is to examine and understand the developing interrelationship of Greek tourism with new technologies, through an expert/stakeholder/academic survey, also eliciting opinions on these technologies' anticipated future impact on the tourism industry, and more specifically on Greek tourism, followed by a SWOT analysis of these opinions. The research methodology is based on a survey, a qualitative ethnographic methodology of the Social Sciences, specifically that of semi-structured in-depth interviews of the survey participants grouped into categories according to their knowledge of the importance of new technologies in the tourism industry, specifically selected to complement each other for the purposes of our deriving a holistic view of Greek Tourism's relation with New Technologies. It is the answers of the interviewees that we rely on for the collection of primary data necessary for the investigation of our research goals and for the SWOT analysis, which are as follows:

- **Why are the uses of new technologies (more generally and specifically in Greece) essential in the tourism industry?**
- **What are the positive and the negative impacts of the introduction of these new technologies in the Greek tourism sector so far and in which ways did they impact it if at all?**
- **What is the future outlook for the Greek tourism sector through this technological revolution?**
- **Which are the main issues or problems in the future implementation of these new technologies in the Greek tourism sector?**

The qualitative method was chosen because, according to Bryman (2012): "The social world must be interpreted from the perspective of the people being studied, rather than as though those subjects were incapable of their own reflections on the social world" (p. 399). As for the data analysis, the study will follow the procedure of data decodification and organization for purposes of analysis, interpretation and extraction of conclusions. Furthermore, this assignment of data into relevant themes/categories will facilitate a SWOT analysis on the outlook of the implementation of New Technologies in Greek Tourism, whereby the 4 categories of Strengths, Weaknesses, Opportunities and Threats, will be addressed. SWOT analyses complement analytical processes, allowing for a more comprehensive and holistic overview of the research

findings. This codification method provides the chance to analyse, make sense of and organize our transcripts into a number of themes that suit our overall purpose of investigating the interrelations between Greek Tourism and the New Technologies, how this relationship came about, and where it is heading (Bryman, 2012). Using these methods, we hope to deliver a deeper and comparative understanding of the survey participants' situation in order to draw an overall conclusion on our research questions and main objective.

5.1.1 Creation of the Survey Tool and Survey Implementation

The survey interview guide consisted of 7 broad, open-ended questions, grouped into 3 categories (Introductory Questions; industry 4.0 and New Technologies in Greek tourism; and Recent Crises and Trends in the Greek Tourism Sector). All of the interviewees answered the same questions, as the structure was designed to be applicable to all categories of our selected experts/stakeholders/academics, in an effort to secure a pool of answers that suited our study purpose. Additionally, some questions were made up when necessary during the actual interviews in order to extract important information based on the participants' distinct circumstances and orientations/ inclinations vis-à-vis our subject matter. The questionnaire was constructed as follows:

Introductory Questions

1. Can you tell us a bit about your professional experience with Greek tourism?
2. According to your opinion, which technologies are essential for Tourism and why?
3. Have you noticed any trends or shifts in the global tourism industry that could affect Greece in the future?

Industry 4.0 and New Technologies in Greek tourism

1. Do you think the Greek tourism industry is keeping up with the latest technological advancements? Why or why not? What is the technological readiness level in Greece in comparison to other countries?
2. In your opinion, how have new technologies (such as AI, IoT, VR, AR etc.) so far impacted Greek tourism?

Recent crises and trends in the Greek Tourism sector

1. Greece was ranked 106th in price competitiveness on the WEF report in 2021. In your opinion, how have recent crises affected Greek tourism (recession, energy crisis, climate change)?

2. Which steps need (new laws, infrastructure, training, education) to be taken in the field on new technologies for Greece to become more prominent as a destination?

In total, 9 out of 12 invited participants responded to our request, 7 out of 9 conducted the interview via phone call and the rest through Zoom and Viber video calls, everyone giving us the relevant permissions for digital storage of their input, afterwards. The interviews were conducted by the researcher himself in the period between 10th and the 19th of September 2023 in Greek, the average length being around 17 minutes, with some interviews as long as over 30 minutes. Regarding the list of interviewees, an effort was made to select a diverse group of actors, as it was of great importance to us to tap into different perspectives on the tourist product

Hoteliers & General Hotel Managers	
1	Former General Manager of <i>Grecohotel</i> and <i>Lauda – Itas</i> , Tourism Business Consultant (Corfu)
2	General Manager of <i>Chandris Hotels</i>
3	Owner of <i>Achillion</i> and <i>Filon Hotels</i> (Piraeus)
4	Owner of <i>Adonis Hotel</i> (Athens)
Tour Operators & Transport Professionals	
1	Founder of <i>SUNSPOTS TOURIST ENTERPRISES</i> , (Tour operators & Tourism business consultants, Corfu)
2	Owner of <i>Mundo Travel</i> (Athens)
3	Taxi Driver partnered with tour agencies (port and airport transportations) and 18300 (Athens)
Academic Professors	
1	Professor of Tourism Development at the Department of Economics and Sustainable Development of the Harokopio University of Athens
2	Assistant professor at the Department of Tourism Economics and Management of the University of the Aegean

Table 5: List of interviewed participants

5.2. Presentation and Analysis of Results

In the following section, we will present and analyse the survey participants' responses by interview question for every mentioned category in our questionnaire. Afterwards we will devote a period to translate these findings in a SWOT analysis on the outlook of the implementation of New Technologies in Greek Tourism.

5.2.1 Questionnaire Responses and SWOT analysis

1) According to your opinion, which technologies are essential for Tourism and why?

Most of the interviewees (including both Tour Operators and Academic Professors, plus the Transport Professional), referred to social media and platforms (such as Booking.com and Free Now), as the current leading technologies in the tourism sector, with businesses using social media frequently for marketing purposes alongside platforms that also serve as reservation tools (especially in SMEs). Other collective opinions expressed by a smaller number (one out of two General Hotel Managers, the Transport Professional and one out of two Academic Professors) mentioned the standalone rating sites or those ratings integrated on the platforms (Booking, Free now etc.), where the importance of keeping an adequate score is essential to sustaining a good image—accordingly, customers pay a significant amount of attention to them during their evaluation process. Singular opinions referred to the evolution in Greece's digital tax operations, while the second General Hotel Manager did not offer any specific examples on this question.

2) Have you noticed any trends or shifts in the global tourism industry that could affect Greece in the future?

Sustainability and climate change were the most mentioned themes (supported by one out of two Hoteliers, General Hotel Managers and Academic Professors), as tourists begin to change their type and season of travel, adapting to more alternative ways of tourism, something that Greece could use as a solution to its seasonality problem. These opinions were not shared by the second General Hotel Manager, as his belief was that Greece is and will stay focused on 3S's in the foreseeable future. Other issues expressed by both Tour Operators and the other Academic Professor regarded the struggle that Tour Operators are experiencing due to the increasing technological autonomy of tourists to book and reserve their own services, similar concerns also having been raised for taxi transportations, whereas certain platforms were described by the Transport Professional as altering their typical form of clientele and leading to a change in their mode of operation (like Uber in 2016). Finally, some interesting answers addressed the

capitalization of the phenomenon of digital nomads and the rise of new competitors (Albania for example) as destinations, an issue that was also mentioned in answers to a different question by some of the survey participants (one out of two Academic Professors and both Tour Operators). Finally, the issues of promotion and self-branding that were discussed by one of the Hoteliers, especially as regards Greece's dependence on third-party services (such as the aforementioned platforms and big Tour Operators) for exposure and promotion.

1) Do you think the Greek tourism industry is keeping up with the latest technological advancements? Why or why not? What is the technological readiness level in Greece in comparison to other countries?

Opinions were split regarding Greece's technological level. The participants with positive viewpoints (one out of two General Hotel Managers, Hoteliers and both Tour Operators) stated that Greece is active on search machines and social media, while tourism businesses and hotels of 3 stars and above are trying to keep up to date with the luxury accommodations that are already up to par with their international counterparts. On the other hand, negative answers centred around poor internet connection with installation difficulties, and the technological gap between businesses as most SME's are struggling to progress due to 1) absence of important governance backing, 2) subpar level of training/education in public tourism training schools that exports half-learned professionals and 3) low technical readiness levels from both staff members and management in SME's. We can trace some differentiation within and between groupings as both General Hotel Managers' and Hoteliers' opinions were split into two camps, while both Tour Operators and Academic Professors were in complete agreement among themselves in their respective takes.

2) In your opinion, how have new technologies (such as AI, IoT, VR, AR etc.) so far impacted Greek tourism?

Almost all participants agreed that New Technologies had not been incorporated in their business or in Greek tourism in general (besides a mention on VR that represented the digital showcase for hotels). According to the answers received, most technologies are at early stages of planning for some businesses, and non-existent or irrelevant to other. Moreover, there was reluctance regarding AI by three of the participants (one out of two General Hotel Managers, Hoteliers, and the Transport Professional) as it was deemed 'unknown territory' and "a threat to the working force". At the same time, the use of Big Data was regarded as essential by one hotelier, who

nonetheless asserted that not many tourism professionals utilize it properly. Lastly, the second General Hotel Manager responded in a more generalised way, thus not offering any specific answer on the matter.

1) Greece was ranked 106th in price competitiveness on the WEF report in 2021. In your opinion, how have recent crises affected Greek tourism (recession, energy crisis, climate change)?

A mix of answers was provided by the interviewees regarding the reasons behind Greece's pricing status. Several participants (both Hoteliers and Tour Operators along with one Transport Professional), agreed that the energy crisis and the economic recession doubled the cost of business operation and impacted their total revenues, while an Academic and a General Hotel Manager attributed the problem to the quality and variety of the tourist product that Greece needs to offer. This is an important concern, because both participants foresee Greece becoming an expensive destination, signalling a permanent transition from the 'value-for-money' market format. Additionally, both operators raised concerns about Greece's competitors like Albania and Turkey, who have taken advantage of Greece's excessive pricing policies and practices and have offered cheaper solutions, while a General Hotel Manager attributed this course of events to the absence of good entrepreneurs that led to many unsuccessful businesses with serious debts. Conversely, only the second Academic Professor differed from the majority's negative point of view on the matter, as he did not see any negative aspects to Greece's price competitiveness and forecasted a gradual improvement that will see Greece succeeding at presenting a variety of experiences with corresponding prices over time while also moving away from the 'value-for-money-market', as he said that Greece's tourism sector at times tended to be cheaper than it should.

2) Which steps need (new laws, infrastructure, training, education) to be taken in the field of new technologies for Greece to become more prominent as a destination?

Better training and education in academia, public schools and in businesses (top-down) was almost universally agreed on by all participants for Greece to innovative towards New Technologies. It was suggested that the government needs to support the field with adequate backing and stricter admission policies regarding potential candidates on public tourism schools and so producing skilled graduates, contained with the relevant skills to contribute on the tourism sector. Contrary to the majority's opinion, the second General Hotel Manager stated that

Greece’s overall tourism staff is well prepared, attributing the problem to the fact that entrepreneurs create an undesirable environment characterised by an uncompetitive payment/reward system, which creates an indifferent working environment.

Besides education, wider and better promotion to expand seasonality in an effort to alleviate the unilateral focus on the 3S’s was noted by one out of two Hoteliers, Academic Professors, Tour Operators and the Transport Professional, whereas the need of tax relief policies for SME’s to battle price raises were deemed crucial by both Hoteliers, with a Tour Operator supporting tracking more international markets through bigger agencies that can be attracted to competitive prices with low taxation. Finally, one General Hotel Manager noted the need for tourism policymaking to pass from governmental aid to tourism experts and technocrats for steadier and more practical decisions, while his counterpart did not offer any proposals, as he claimed that Greece’s tourism sector should not rely on any governmental policies as trust levels towards the State are very low, thus emphasizing that only entrepreneurial resourcefulness is going to move the sector forward.

After the conclusion of our questionnaires’ answer pool, we can thus proceed by setting these findings into a SWOT analysis, summarizing this process into four categories (Strengths, Threats, Weaknesses, Opportunities), outlining the outlook of the implementation of New Technologies in Greek Tourism

Strengths	Weaknesses
<ul style="list-style-type: none"> • The Greek brand is established worldwide with rich touristic & cultural history. • Luxury hotels are up to date regarding technological features. • Loyal tourists who want to return multiple times ignoring factors such as weak infrastructures etc. • Effective use of branding via social media both for tourism enterprises and public organizations (NTOG). 	<ul style="list-style-type: none"> • Uneven production on the regional level and strong geographical polarization/ inequalities in tourism development. • Overreliance of SMEs on third party platforms for reservations and marketing (Booking.com, Hotels.com, etc.). • Seasonality & 3S’s market domination with no real alternatives. • Infrastructure deficiencies (transportation, fast internet). • Gap between big and small hotels in terms of resources & opportunities. • Public tourism schools are not supporting their graduates with appropriate skills to be fully capable professionals (not enough State funding) and overall absence (number-wise) of professionals in the sector.

	<ul style="list-style-type: none"> • Difficulty in securing employment due to poor pay, bad working conditions & seasonality. • Scepticism of the tourism-supply side around New Technologies & AI hindering tourism growth.
--	--

Opportunities	Threats
<ul style="list-style-type: none"> • Rapid rise in New Technologies and increasingly integrated programs in multiple aspects of the touristic activity (cultural activities, hotels, transportation, sites). • Rising tourists' and locals' levels of technical readiness (especially among younger ages). • Use of tourism data (via NTOG) in tourist information databases (landmarks, hospitality, gastronomy etc.). • Augmented infrastructure possibilities for accessible and fast Internet, and safer, more regulated transportation. • Readiness of most stakeholders in handling existing technologies well willingness to explore more. • Take advantage of digital nomad market • New Technological applications in cultural goods' virtual representation and visitor interaction (AR and VR apps on cultural sites, etc.). • Diversification strategies for the Greek tourism product through promotion of alternative forms of tourism and recreational activities (VR presentations, awareness-raising campaigns on the seasonality effect with stats by IoT Technologies on social media and websites). 	<ul style="list-style-type: none"> • Risk of being overtaken by more advanced countries with better New Technologies' infrastructures. • Business and properties being bought by foreign funds, leaving local enterprises behind without many resources. • Centralized tourism governance, policies not leaving crucial issues to entrepreneur's individual resourcefulness with no significant State backing. • Risk of producing professionals with low technical capabilities due to ineffective tourism training programs. • Tour Operator dominance/ overrepresentation in tourism sector. • Slow rates of digital transformation in most areas of Greek economy, translating into lost opportunities in innovation, hospitality, and transportation services.

Table 6: The outlook of the implementation of New Technologies in Greek Tourism: A SWOT analysis perspective

Conclusions

After our data analysis, we can safely return to the research questions of our exploratory study in order to attempt to answer them based on the responses of our survey interviewees. In this

way, we may be able to fulfil the initial purpose of our research design, to begin to develop an understanding of the interrelationship. The following points answer each one of our established research questions:

1. Why are the uses of new technologies (more generally and specifically in Greece) essential in the tourism industry?

Most participants did not see any uses of New Technologies in Tourism besides the sporadic use of VR in hotels, as a showcase of their facilities to potential customers.

2. What are the positive and the negative impacts of the introduction of these new technologies in the Greek tourism sector so far and in which ways did they impact it if at all?

No particular positive or negative impacts were reported on the implementation of New Technologies in Greek tourism as most enterprise representatives stated that they are on prototype business plan with no specific integration strategy. Some of our survey participants said that they were reluctant to embrace an introduction of New Technologies to their respective operations (especially of AI).

3. What is the future outlook for the Greek tourism sector through this technological revolution?

It seems that an overall technophobia surrounds the sector, therefore most of the direct answers related to potential job losses and the substitution of human presence in several aspects of tourism operation through the introduction of the relevant technological counterparts.

4. Which are the main issues or problems in the future implementation of these new technologies in the Greek tourism sector?

Inadequate education/ training (staff, entrepreneurs), deficient infrastructure (internet, tourism schools) and unequal governmental backing among tourism business (SMEs versus luxurious hotels) were the most notable stated examples hindering the future implementation of New Technologies in the tourism sector in Greece.

Based on the analysis of our research findings, the main overall conclusions about the state and implications of the 4th Technological Revolution for Greek tourism, as derived from the

participant's responses and the SWOT analysis, were the following: First, there was an affirmation of the poor state of technology in Greece, a take that reviews the current level of technology development in Greece's tourism sector. Secondly, the complex context of Greece's tourism sector emerged through the survey as concerns in interviewees' opinions regarding the performance and future outlook of Greece's tourism sector. Finally, the urgency for infrastructure development for the implementation of New Technologies constitutes a crucial point of interest, as it presents a link between the other two emerging themes, where the basic struggles of technology implementation in tourism are depicted.

1) The poor state of technology in Greece

Although there was differentiation in our interviewee opinions, it became clear that the current level is sub-par and needs improvement in multiple aspects. From their perspective, the SMEs participants underlined the lack of sufficient governance and State backing, as most of the investing opportunities centred on big enterprises or the fact that the specific managerial technologies were not suited for their businesses. According to one Hotelier, there was some action around the initiative *Digital Care 2.0*, which offered the opportunity for an upgrade to SMEs, but it is still unknown if the move is a successful one with another Hotelier deeming it inadequate, as it will not effectively bridge the existing technological gap. From their part, both General Managers stated that this issue boils down to low technical readiness and bad business implementation by SMEs owners who do not know how to properly run their day-to-day operations. Additionally, there was the stance of some participants that New Technologies could either affect labour relations, replacing the human factor, or completely put their business at risk, especially in the case of Tour Operators who seemingly receive a direct hit: as the customer's technical readiness and desire to find the best solution for their accommodation and transportation services becomes greater, the role of "the middleman" seems to diminish-- something that was mentioned both from the professors' and the operators' points of view. There was understandable doubt and scepticism among stakeholders regarding whether New Technologies will benefit their business, and that is why a specialized campaign should be implemented in order to provide full information to all parties interested in both their potential benefits and the opportunities that these technologies provide.

2) The complex context of Greece's Tourism sector

Greece is a strong tourism brand as revealed by our literature review whereby Greece showed resilience after the pandemic (INSETE, 2023): This fact was backed by our interviews, with a Tour

Operator claiming that “people are choosing Greece for its places and physical environment [...] They are generally very pleased and willing to travel there again”. On the negative side, most of the interviewees across all categories depicted the economy of Greece as heavily influenced by the recent energy crisis and subsequent economic recession (stemming from the Ukrainian invasion) coming in line with the INSETE report (2023). More precisely, in the period:

- Costs doubled, an issue that affected guest experiences and operational costs for a number of businesses.
- In the competitive field, Albania and Turkey were noted as the most eminent competitors, due to low prices.
- Finally, some participants forecasted Greece becoming an expensive destination.

Along these future outlooks, there was the forecast of emerging changes, related to, climate change and sustainability. Several of the survey participants noted that tourists are changing behaviour in the way they select their trips and experiences, choosing fewer commercial sites and activities (going on city breaks off-season), and also adjusting their stays (selecting eco-friendly accommodations, request to not have their bedding changed every day, etc.). This is why the need to diversify branding beyond the 3S’s model is vital for Greece, in order to overcome seasonality and instigate sustainability in its tourism sector. Other Mediterranean countries, like Greece, are already experiencing extreme climatic events that need to be taken under severe consideration, in future planning, since Greece’s overall environmental policies were already depicted as lacklustre in the past (World Economic Forum, 2019, 2022). Another interesting take referred to the opening up of the digital nomad market, which, as previously stated, has already received some incentives through relevant governance benefits (Touhtidou, 2021). Finally, as already mentioned in our literature review, Greece’s technology status is in a better place than that of its competitors like Turkey and Croatia (World Economic Forum, 2022), and taking advantage of these opportunities by progressing the implementation process of new technologies, can:

- 1) Create more tourism products and experiences.
- 2) Engage with new markets.
- 3) Diversify Greece’s image around responsibility ethics and environmental consciousness.

3) Urgency for infrastructure development for the implementation of New Technologies

Some elements crucial for the upscaling, development and instigation of New Technologies appeared to be absent from Greece's tourism sector through the interviews we conducted. From SME Hoteliers and five-star General Hotel Managers to Academic Professors and a Tour Operator, the absence of appropriately trained professionals was reportedly the most noticeable problem within Greek tourism. A Hotelier deemed it crucial for business innovation, while a Tour Operator noted that it is very hard to employ such trained personnel, due to the seasonal effect that leads people to search for steadier jobs. Also, the lack of well-structured tourism education in public schools, inadequately prepares graduates and exports low-level professionals: "there was a point of view in which it was assumed that Greece should not become 'subservient' to the Europeans. Thus [...] there was a gradual depreciation of tourism. So [working in tourism] was considered a temporary occupation and that's how we ended up with schools even in places that have nothing to do with tourism, with low standards", states one general manager, "So it is not possible to have the tourist product in the hands of academically inapt citizens, the lack of dedication is evident". This issue also pertains to the Academic formation of tourism graduates and its relationship with New Technologies, as one researcher concludes that "There must be an incorporation (theoretical or practical) of New Technologies into tourism faculties/ curricula as it is impossible not to have a field that has to do with New Technologies without the relevant training". Another crucial issue that emerged from this research study was the slow internet and the problem of optical fibre installation, making things difficult especially for enterprises in faraway places to operate daily. We observe therefore that, without proper infrastructure, there is not enough prospect for innovation and more forward-looking tools/strategies, an issue that was also depicted on the DESI scale (European Commission, 2022a). Finally, there is the subject of transportation, airports and roads with no overall crowd-flow monitoring or easy visitor accessibility facilities, especially during high season when tourist flow creates overcrowding in popular areas. These issues should be taken under consideration seriously by all involved actors and stakeholders, in order for Greece to take a decisive step forward in all aspects of tourism, as her forecasted status shift into a pricier destination requires offering a number of experiences that create high customer satisfaction, thus justifying this transition.

The main understanding that emerged from this study was that uses of well-established technologies like social media and reservation platforms (as Booking.com and Free Now) are commonly used by tourism entrepreneurs, intermediaries and tourists alike, for marketing and

reservation purposes. Also, the acknowledged effect of rating systems, underlines the risk factors bad reviews can cause, which is in agreement with Ritchie's and Pachucki's statements on media coverage and social media handling regarding customer satisfaction (Pachucki et al., 2022b; Ritchie, 2004).

However, apart from these examples, all interviewees made it clear that Greece is not implementing the wide range of New Technologies available, one participant in particular saying that besides the sporadic implementation of VR in luxury hotels "The rest are in a prototype [in paper] business plan" with no specific integration strategy. This is due to the fact that Greece "is sufficiently internationalized and receives influences, but not to the extent it should in order to develop further [technologically]" said another interviewee, as problems of staff education and inadequate infrastructure slow down any New Technology implementation plan. These findings are in line with those of the INSETE, DESI and UNWTO reports, where Greece has been presented as being on an adequate technological level, but downgraded in many aspects of technology implementation, while also the lack of trained professionals was shown in the T&T report (European Commission, 2022; INSETE, 2021b, 2021a; World Economic Forum, 2022). Additionally, our questions regarding New Technologies integration in business practices (especially in the case of AI) created moral issues that often lead to technophobia surrounding the sector, as most of the answers elaborated on the negative side of things, while positive answers were mainly generalised and referred to the need for steady evolution in the field. As it seems, there is a strong belief that New Technologies will replace human presence in the sector; as one of the Academic Professors put it: "There should be a systematic understanding of the benefits this kind of applications bring [...] once the experts/entrepreneurs see that this transition makes their businesses more competitive and profitable, they will proceed to adopt these changes". Furthermore, governmental backing also ought to be more present in the sector as the evident slow digital transformation may cause an irreplaceable gap that will further hamper SMEs future endeavours.

The problems and difficulties encountered in the undertaking of this study must also be stated. First, bibliographical literature on new technology applications in Greek tourism was not easy to locate, an issue that led us to lean heavily on reports by INSETE or international organizations like UNWTO on the matter. Second, the researcher faced issues with the Thesis timetable of completion, as interviewee interest emerged as late as mid-September, thus rushing the process

of data analysis, limiting on our part the possibility of inclusion of more participants in order to expand the survey with additional interviews. Related to that was the fact that we were unable to track down any government official or GNTO member, although an effort was made in that regard by approaching a former minister of tourism: a considerable drawback, as their potential input would have been helpful in every aspect of this research. Finally, the generalised answers that were often provided to important survey questions by some participants, showed a lack on their part of the technical edge that our survey was looking for, even though they helped us shape our final thoughts regarding Greece's technological level.

As for recommendations for further future study on this subject matter, it would be fruitful to investigate such research questions again in repeated time intervals of two years or more, in order to see if the declared and/or announced measures and plans in the tourism sector are indeed carried out on the side of the government and, if so, how they will affect the sector, as, for example, 2025 is the deadline year for *Greece's Digital Transformation Bible 2020-2025* (Ministry of Digital Governance of Greece, 2021) for example. But also, this research could take place with much more in-depth and extensive questionnaires and interviews, a much bigger and more diversified sample, also on a comparative basis with other similar cases, i.e., other southern European countries or other tourism destinations, competitive to Greece. Additionally, it would be beneficial to explore best practices in specific aspects of the tourism sector (examples of usage of big data or IoT in hotels, or destination management with smart tools etc.) with a detailed view of each practice respectively. This would have been an important piece of information, as our exploratory research only attempted to cover comprehensively current and emerging trends in the relationship between multiple categories of tourism actors and New Technologies, in a holistic but inevitably limited overview of the sector.

References

- Adamopoulou, E., Kapopoulos, P., & Marinopoulou, E. (2022). *Greek Tourism Industry Reloaded: Post-pandemic Rebound and Travel Megatrends*.
- Akhtar, N., Khan, N., Mahroof Khan, M., Ashraf, S., Hashmi, M. S., Khan, M. M., & Hishan, S. S. (2021). Post-covid 19 tourism: Will digital tourism replace mass tourism? *Sustainability (Switzerland)*, *13*(10), 1–18.
<https://doi.org/10.3390/su13105352>
- Athens Voice Newsroom. (2020). *Coronavirus - Removal of measures: What reopens on Monday 18 May 2020*. Athens Voice.
https://www.athensvoice.gr/greece/647755_koronoios-arsi-metron-ti-epanaleitoyrgei-ti-deytera-18-maioy-2020
- Avkopashvili, P. T., Polukhin, A. A., Shkodinsky, S. V., & Poltarykhin, A. L. (2019). The fundamental provisions of the concept of knowledge economy. In *Studies in Systems, Decision and Control* (Vol. 169, pp. 57–64). Springer International Publishing. https://doi.org/10.1007/978-3-319-94310-7_5
- Bec, A., Moyle, B., Schaffer, V., & Timms, K. (2021). Virtual reality and mixed reality for second chance tourism. *Tourism Management*, *83*, 104256.
<https://doi.org/10.1016/J.TOURMAN.2020.104256>
- Benyon, D., Quigley, A., O’Keefe, B., & Riva, G. (2014). Presence and digital tourism. *AI and Society*, *29*(4), 521–529. <https://doi.org/10.1007/S00146-013-0493-8/TABLES/1>
- Bigg, M. M. (2022). Key Moments in the Russia-Ukraine War: A Timeline. *The New York Times*. <https://www.nytimes.com/article/ukraine-russia-war-timeline.html>
- Booking.com. (2017). *Booking.com Expands Global Access to the Booking Assistant*.
<https://news.booking.com/en-us/bookingcom-expands-global-access-to-the-booking-assistant/>
- Bryman, A. (2012). *Social Research Methods* (4th ed.). Oxford University Press.
- Buhalis, D. (2001). Tourism in Greece: Strategic analysis and challenges. *Current Issues in*

Tourism, 4(5), 440–480. <https://doi.org/10.1080/13683500108667898>

Center for Climate Change and Health. (2016). Climate Change 101 : climate science basics. *Public Health Institute/Center for Climate Change and Health*, 1–10.

<http://climatehealthconnect.org/wp-content/uploads/2016/09/Climate101.pdf>

Climate change in the Mediterranean | UNEP MAP. (n.d.). Retrieved December 1, 2022, from <https://www.unep.org/unepmap/resources/factsheets/climate-change>

Constantini, A. J. (2022). Understanding Europe’s shift to the right – POLITICO. *Politico*. <https://www.politico.eu/article/understanding-europes-shift-to-the-right/>

Davies, R. (2015). *Industry 4.0 Digitalisation for productivity and growth*.

DW. (2021). *Pope Francis says migrants’ plight ‘tragic’ on Lesbos*.

<https://www.dw.com/en/pope-francis-says-migrants-plight-tragic-on-lesbos/av-60027713>

Ethnos Newsroom. (2021). Coronavirus - Lesbos: Mini lockdown under investigation - Case explosion in schools. *Ethnos*.

<https://www.ethnos.gr/greece/article/188210/koronoioslesbosexetazetaiminilockdownekrhxhkroysmatonsesxoleia>

Ethnos Newsroom. (2022). *Removal of measures: End to vaccination and disease certificates from May 1 - The masks remain*. *Ethnos*.

<https://www.ethnos.gr/greece/article/205625/arshmetrontelostapistopoihtikaemboliasmoykainoshshsapo1hmaioyoimaskesparamenoy>

Eurobank. (n.d.). *What is digital transformation*. Retrieved April 21, 2023, from <https://www.eurobank.gr/el/business/digital-academy-business/ti-einai-o-psifiakos-metaximatismos>

European Commission. (n.d.). *Tourism Business Portal*. Retrieved October 27, 2023, from https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/business-portal_en

European Commission. (2015). *Big data | Shaping Europe’s digital future*. <https://digital->

strategy.ec.europa.eu/en/policies/big-data

European Commission. (2019). *Digital Economy and Society Index – DESI*.

European Commission. (2022a). *Digital Economy and Society Index – DESI*.

<https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2021>

European Commission. (2022b). *Leading Examples of Smart Tourism Practices*.

European Council. (2022a). *EU response to Russia’s invasion of Ukraine*.

<https://www.consilium.europa.eu/en/policies/eu-response-ukraine-invasion/>

European Council. (2022b). *How the Russian invasion of Ukraine has further aggravated the global food crisis*. <https://www.consilium.europa.eu/en/infographics/how-the-russian-invasion-of-ukraine-has-further-aggravated-the-global-food-crisis/>

Farkhondehzadeh, A., Robat Karim, M., Roshanfekar, M., Azizi, J., & Legha Hatami, F.

(2013). E-Tourism: The role of ICT In tourism industry. *Journal of Applied Economics and Business*, 1(4), 67–79.

Faroe Islands. (n.d.). *About the project*. Retrieved March 4, 2022, from

<https://www.remote-tourism.com/about-the-project>

Fredericks, L. (2021). *Virtual Tourism: The Complete 2021 Guide*. CVENT.

<https://www.cvent.com/en/blog/hospitality/virtual-tourism>

Furht, B. (Ed.). (2006). Augmented Reality. In *Encyclopedia of Multimedia* (1st ed., pp.

29–31). Springer, Boston, MA. https://doi.org/10.1007/0-387-30038-4_10

Gabriela Pereira Carvalho, N., & Walmir Cazarini, E. (2020). Industry 4.0 - What Is It? In *Industry 4.0 - Current Status and Future Trends* (pp. 1–9).

<https://doi.org/10.5772/intechopen.90068>

Galanos, G. (2013). The Greek Tourism Industry and the Challenge of the Economic

Crisis. In P. Sklias & N. Tzifakis (Eds.), *Greece’s Horizons: Reflecting on the Country’s Assets and Capabilities* (pp. 131–145). Springer, Berlin, Heidelberg.

https://doi.org/10.1007/978-3-642-34534-0_11

- Guduraš, D. (2014). Economic Crisis and Tourism: Case of the Greek Tourism Sector. *Ekonomiska Misao i Praksa / Economic Thought and Practice*, 23(2), 613–632.
- Happ, É., & Ivancsó-Horváth, Z. (2018). DIGITAL TOURISM IS THE CHALLENGE OF FUTURE-A NEW APPROACH TO TOURISM. *Knowledge Horizons-Economics*, 10(2), 9–16. www.orizonturi.ucdc.ro
- Hernandez, J. (2016). Refugee Flows to Lesvos: Evolution of a Humanitarian Response. *Migration Information Source*. <https://www.migrationpolicy.org/article/refugee-flows-lesvos-evolution-humanitarian-response>
- Hornyak, T. (2020). Meet the robots that may be coming to an airport near you. *CNBC*. <https://www.cnbc.com/2020/01/10/meet-the-robots-that-may-be-coming-to-an-airport-near-you.html>
- Hrehova, S. (2018). *Brief overview of the concept of big data*. <https://doi.org/10.4108/eai.6-11-2018.2279366>
- Hronček, P., Gregorová, B., Tometzová, D., Molokác, M., & Hvizdák, L. (2020). Modeling of Vanished Historic Mining Landscape Features as a Part of Digital Cultural Heritage and Possibilities of Its Use in Mining Tourism (Case Study: Gelnica Town, Slovakia). *Resources 2020, Vol. 9, Page 43, 9(4)*, 43. <https://doi.org/10.3390/RESOURCES9040043>
- IBM. (n.d.-a). *What Is Cloud Computing?* https://doi.org/10.1007/978-1-4842-8032-4_1
- IBM. (n.d.-b). *What is the Internet of Things, and how does it work?* Retrieved January 15, 2023, from <https://www.ibm.com/blogs/internet-of-things/what-is-the-iot/>
- IEA. (2022). *Global Energy Crisis*. https://www.iea.org/topics/global-energy-crisis?utm_source=google&utm_medium=search&utm_campaign=energy+crisis+hub#energy-saving-tips
- INSETE. (2018). *Evaluation of the Brand “Greece” And Comparison With The Competition In N. Europe Based on the Tourist Experience*.
- INSETE. (2021a). *Annual Report on Competitiveness and Structural Adjustment in the*

Tourism Sector for the Year 2020 - Attica Region.

INSETE. (2021b). *Greek Tourism 2030: National Action Plan.*

INSETE. (2021c). *The Contribution Of Tourism To The Greek Economy In 2020.*

INSETE. (2022). *Greek Economy: The war in Ukraine and the prospects for development.*

INSETE. (2023). *Statistics Sheet No 80.*

Kathimerini Newsroom. (2022). Greek tourism: How it is affected by the war in Ukraine.

Kathimerini.Gr. <https://www.kathimerini.gr/economy/561854485/ellinikos-toyrismos-pos-epirezetai-apo-ton-polemo-stin-oykrania/>

Kirby, P. (2023). Greek elections: Mitsotakis hails conservative win as mandate for reform. *BBC News.* <https://www.bbc.com/news/world-europe-65997486>

Lang, K. R., Shang, R. D., & Vragov, R. (2009). Designing markets for co-production of digital culture goods. *Decision Support Systems*, 48(1), 33–45.

<https://doi.org/10.1016/j.dss.2009.05.010>

Linke, S. (2020). Landscape in Internet Pictures. In D. Edler et al (Ed.), *Modern Approaches to the Visualization of Landscapes* (pp. 139–156). Springer VS,

Wiesbaden. https://doi.org/10.1007/978-3-658-30956-5_8

Lu, J., Xiao, X., Xu, Z., Wang, C., Zhang, M., & Zhou, Y. (2022). The potential of virtual tourism in the recovery of tourism industry during the COVID-19 pandemic. *Current Issues in Tourism*, 25(3), 441–457.

https://doi.org/10.1080/13683500.2021.1959526/SUPPL_FILE/RCIT_A_1959526_S M1841.DOCX

Marr, B. (2021, April 12). The Amazing Ways VR And AR Are Transforming The Travel Industry. *Forbes.* <https://www.forbes.com/sites/bernardmarr/2021/04/12/the-amazing-ways-vr-and-ar-are-transforming-the-travel-industry/>

Martinelli, A., Mina, A., & Moggi, M. (2021). The enabling technologies of industry 4.0: Examining the seeds of the fourth industrial revolution. *Industrial and Corporate Change*, 30(1), 161–188. <https://doi.org/10.1093/icc/dtaa060>

- Ministry of Digital Governance of Greece. (2021). *Digital Transformation Bible 2020 - 2025*. <https://digitalstrategy.gov.gr/>
- Niestadt, M. (2018). *Digital tourism in the European Union*.
- NIREIS SA. (2015). *Big Data Analysis in the Tourism Sector*.
<https://www.niriis.gr/συμβουλες/big-data-analysis-στον-τουριστικό-τομέα/>
- Oh, H., Fiore, A. M., & Jeoung, M. (2007). Measuring experience economy concepts: Tourism applications. *Journal of Travel Research*, 46(2), 119–132.
<https://doi.org/10.1177/0047287507304039>
- Oikonomaki, E. (2018, October 17). Technology is “key” for the development of tourism. *Real.Gr*.
https://www.real.gr/oikonomia/arthro/h_texnologia_kleidi_gia_tin_anaptyksi_tou_tourismou-502165/
- One Planet Sustainable Tourism Programme. (n.d.). *CLIMATE CHANGE & TOURISM*. Retrieved December 1, 2022, from <https://www.oneplanetnetwork.org/programmes/sustainable-tourism/glasgow-declaration/climatechange-tourism>
- One Planet Sustainable Tourism Programme. (2021). *Glasgow Declaration: a Commitment to a Decade of Climate Action*.
- Pachucki, C., Grohs, R., & Scholl-Grissemann, U. (2022a). Is nothing like before? COVID-19–evoked changes to tourism destination social media communication. *Journal of Destination Marketing and Management*, 23.
<https://doi.org/10.1016/j.jdmm.2022.100692>
- Pachucki, C., Grohs, R., & Scholl-Grissemann, U. (2022b). Is nothing like before? COVID-19–evoked changes to tourism destination social media communication. *Journal of Destination Marketing and Management*, 23, 1–10.
<https://doi.org/10.1016/j.jdmm.2022.100692>
- Pallister-Wilkins, A., & Anastasiadou, E. P. (2020). *Advancing Alternative Migration*

Governance Concepts in Protection in Lesvos during Covid — 19 : A crucial failure (Issue 822625).

Papatheodorou, A., & Arvanitis, P. (2014). TOURISM AND THE ECONOMIC CRISIS IN GREECE-REGIONAL PERSPECTIVES. *Région et Développement*, 39, 184–203.

Pecený, U. S., Urbančič, J., Mokorel, S., Kuralt, V., & Ilijaš, T. (2019). Tourism 4.0: Challenges in Marketing a Paradigm Shift. *Consumer Behavior and Marketing*, 1–19. <https://doi.org/10.5772/INTECHOPEN.84762>

Pillai, A. (2021). *How Virtual tourism can rebuild travel for a post-pandemic world*. World Economic Forum. <https://www.weforum.org/agenda/2021/05/covid-19-travel-tourism-virtual-reality/>

Pine, B. J., & Gilmore, J. H. (1998). Welcome to the experience economy. *Harvard Business Review*, 76(4), 97–105.

Psaropoulos, J. (2023). Greek conservatives clear an ‘open road’ to political supremacy | Elections News | Al Jazeera. *AlJazeera*. <https://www.aljazeera.com/news/2023/5/22/greek-conservativesclear-an-open-road-to-political-supremacy>

Ritchie, B. W. (2004). Chaos, crises and disasters: a strategic approach to crisis management in the tourism industry. *Tourism Management*, 25(6), 669–683. <https://doi.org/10.1016/J.TOURMAN.2003.09.004>

Samson, R., Mehta, M., & Chandani, A. (2014). Impact of Online Digital Communication on Customer Buying Decision. *Procedia Economics and Finance*, 11(14), 872–880. [https://doi.org/10.1016/s2212-5671\(14\)00251-2](https://doi.org/10.1016/s2212-5671(14)00251-2)

SAP. (n.d.). *What Is Augmented Reality?* <https://doi.org/10.1016/b978-1-59-749733-6.00001-2>

Șchiopu, A. F., Pădurean, A. M., Țală, M. L., & Nica, A. M. (2016). The influence of new technologies on tourism consumption behavior of the millennials. *Amfiteatru Economic*, 18(Specialissue10), 829–846.

<http://hdl.handle.net/10419/169039><http://creativecommons.org/licenses/by/4.0/>
www.econstor.eu

SETE. (n.d.). *Greek Tourism - Basic Figures 2019*. Retrieved October 12, 2022, from <https://sete.gr/el/stratigiki-gia-ton-tourismo/vasika-megethi-tou-ellinikoy-tourismoy/>

Sigala, M. (2018). New technologies in tourism: From multi-disciplinary to anti-disciplinary advances and trajectories. *Tourism Management Perspectives*, 25, 151–155. <https://doi.org/10.1016/J.TMP.2017.12.003>

Sigala, M. (2020). Tourism and COVID-19: Impacts and implications for advancing and resetting industry and research. *Journal of Business Research*, 117, 312–321. <https://doi.org/10.1016/j.jbusres.2020.06.015>

Skyscanner. (2016). *Chat your way to your next trip: Skyscanner launches Facebook Messenger bot for travel search*. <https://www.skyscanner.net/company-news/chat-your-way-to-your-next-trip-skyscanner-launches-facebook-messenger-bot-for-travel-search>

Smith, H. (2019). “In my nightmares I’m always in the sea”: a year on from the Greek fires. *The Guardian*. <https://www.theguardian.com/world/2019/jul/20/greek-fires-one-year-on-103-dead-survivors-and-rescuers-look-back>

Stergiou, E. (2022). *Greek Stats Authority sees inflation close to 12%; will announce GDP performance*. Ot.Gr. <https://www.ot.gr/2022/06/06/english-edition/greek-stats-authority-sees-inflation-close-to-12-will-announce-gdp-performance/>

Sternberg, E. (1997). The iconography of the tourism experience. *Annals of Tourism Research*, 24(4), 951–969. [https://doi.org/10.1016/s0160-7383\(97\)00053-4](https://doi.org/10.1016/s0160-7383(97)00053-4)

Stavis-Gridneff, M. (2023). E.U. Asks Greece to Investigate Video of Migrants Left at Sea. *The New York Times*. <https://www.nytimes.com/2023/05/22/world/europe/greece-migrants-video-eu-investigation.html>

Sukhodolov, Y. A. (2019). The notion, essence, and peculiarities of industry 4.0 as a

- sphere of industry. In *Studies in Systems, Decision and Control* (Vol. 169, pp. 3–10). Springer International Publishing. https://doi.org/10.1007/978-3-319-94310-7_1
- Terkenli, T. S. (2006). Landscapes of a New Cultural Economy of Space: An Introduction. In *Landscapes of a New Cultural Economy of Space* (pp. 1–18). Springer.
- Touhtidou, S. (2021). Digital nomads: Who are they and why should we care. *Euronews*. <https://gr.euronews.com/2021/02/04/digital-nomads-poioi-einai-kai-giati-mas-endiaferoun>
- Tourism Impact Model – Tourism 4.0*. (n.d.). Retrieved March 2, 2023, from <https://tourism4-0.org/tim/>
- Tsartas, P., Kyriakaki, A., Stavrinoudis, T., Despotaki, G., Doumi, M., Sarantakou, E., & Tsilimpokos, K. (2019). Refugees and tourism: a case study from the islands of Chios and Lesbos, Greece. *https://doi.org/10.1080/13683500.2019.1632275*, 23(11), 1311–1327. <https://doi.org/10.1080/13683500.2019.1632275>
- United Nations. (2015). *Paris Agreement*. https://climate.ec.europa.eu/eu-action/international-action-climate-change/climate-negotiations/paris-agreement_en
- United Nations Statistical Division & World Tourism Organization. (2010). International Recommendations for Tourism Statistics 2008. In *United Nations Publication*. <https://doi.org/10.18111/9789211615210>
- UNWTO. (2020). Gamification in Tourism: Pokémon Go and Beyond. *Medium*. <https://medium.com/@unwto/gamification-in-tourism-pokémon-go-and-beyond-2045acea2c1e>
- Varoufakis, Y., Patokos, T., Tserkezis, L., & Koutsopetros, C. (2011). The Economic Crisis In Greece And Europe In 2011. In *Observatory of Economic and Social Developments*. GSEE Labor Institute.
- Vetter, M. (2020). Technical Potentials for the Visualization in Virtual Reality. In *Modern Approaches to the Visualization of Landscapes* (pp. 307–317). Springer VS,

- Wiesbaden. https://doi.org/10.1007/978-3-658-30956-5_17
- Voronkova, L. P. (2018). Virtual Tourism: On the Way to the Digital Economy. *IOP Conference Series: Materials Science and Engineering*, 463(4), 1–4.
<https://doi.org/10.1088/1757-899X/463/4/042096>
- Wolf, Z. B. (2022). How the far right is surging in Europe. *CNN*.
<https://edition.cnn.com/2022/09/26/politics/europe-far-right-what-matters/index.html>
- World Bank. (2022). Emerging risks to the recovery. In *The World Development Report 2022: Finance for an Equitable Recovery* (pp. 49–73). https://doi.org/10.1596/978-1-4648-1730-4_ch1
- World Economic Forum. (2011). *The Travel & Tourism Competitiveness Report 2011*.
- World Economic Forum. (2013). *The Travel & Tourism Competitiveness Report 2013*.
<http://www.fitzroy.cl/wp-content/uploads/2013/05/Travel-and-Tourism-Competitiveness-2013-Fuente-WEF.pdf>
- World Economic Forum. (2015). *The Travel & Tourism Competitiveness Report 2015*.
<https://doi.org/10.1016/j.annals.2003.12.019>
- World Economic Forum. (2017). *The Travel & Tourism Competitiveness Report 2017*.
- World Economic Forum. (2019). *The Travel and Tourism Competitiveness Report 2019*.
http://www3.weforum.org/docs/WEF_TTCR_2019.pdf
- World Economic Forum. (2022). *Travel & tourism development index 2021: Rebuilding for a sustainable and resilient future*.
https://www3.weforum.org/docs/WEF_Travel_Tourism_Development_2021.pdf
- World Health Organization. (n.d.). *Coronavirus Disease (COVID-19) Pandemic*. Retrieved November 8, 2022, from
<https://www.who.int/europe/emergencies/situations/covid-19>
- World Tourism Organization. (2021a). Covid-19 and Tourism - 2020: a year in review. In *United Nations World Tourism Organization*. <https://www.unwto.org/covid-19-and->

tourism-2020

- World Tourism Organization. (2021b). International Tourism Highlights 2020 Edition. In *UNWTO*. <https://doi.org/https://doi.org/10.18111/9789284422456>
- World Tourism Organization. (2022a). *Impact of the Russian offensive in Ukraine on international tourism*. <https://www.unwto.org/impact-russian-offensive-in-ukraine-on-tourism>
- World Tourism Organization. (2022b, November 29). *Impact Assesment of the Covid-19 Outbreak on International Tourism*. World Tourism Organization (UNWTO). <https://doi.org/10.18111/9789284423200>
- Wu, W. (2020). Analysis of Digital Tourism, Virtual Tourism and Wisdom Tourism. *Advances in Intelligent Systems and Computing, 1147 AISC*, 18–25. https://doi.org/10.1007/978-3-030-43309-3_3
- Youd, F. (2021). The robots taking over the world’s airports -. *Airport Technology*. <https://www.airport-technology.com/features/the-robots-taking-over-the-worlds-airports/>
- Ziyad, M. (2019). Artificial Intelligence Definition, Ethics and Standards. *Artificial Intelligence Definition, Ethics and Standards*, 1–11.

Figures References

Fig.1: Tourism 4.0 (no date), The Tourism Impact Chart: <https://tourism4-0.org/tim/>

Fig.2: Geoforum.pl (2017), The City Guide Tours Interface:

https://geoforum.pl/?page=news&id=24612&link=pttk-nagrada-prace-o-aplikacji-turystycznej&menu=46814%2C46836&fbclid=IwAR000aQjHLgMm_vPhfyief9O5k75P_NQMxaQa2i-JK8kRwFMcNWX32IZXQ0

Fig.3: Chris Hall (2023), The UI of Google maps: <https://www.pocket-lint.com/what-is-google-maps-ar-navigation-live-view/>

Fig.3: Tim Hardwick (2021). The UI of Apple maps: <https://www.macrumors.com/how-to/ios-ar-walking-directions-maps/>

Fig.4: UNWTO. (2020), The Interface of Pokémon Go:

<https://medium.com/@unwto/gamification-in-tourism-pokémon-go-and-beyond-2045acea2c1e>

Fig.5: Faroe Islands (no date), The Faroe Islands interactive virtual Tour: <https://www.remote-tourism.com/about-the-project>