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Use of AI in tourism and sustainability context in Barcelona

FINAL MASTER PROJECT

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Abstract

The use of AI has become a subject of heated research in many destinations, especially in SMART cities that want to take advantage of the full extent of this new development in the technology department. New challenges have emerged thanks to the new applications available for use and the appearance of tools that are designed to make destination management easier and more intuitive for the stakeholders in charge of managing destinations. Barcelona, the capital of Catalonia, has been one of the destinations that has been severely affected by the arrival of AI within many sectors, including tourism. Through the use of secondary sources, different application cases can be seen in different businesses that are now making use of the AI as an integral part of their work structure. According to Fontanari & Traskevich (2023), tourism organizations are beginning to use this technology in order to buffer improvements to their current operational procedures and optimize certain actions that previously required human input.

Complimenting these secondary resources, primary resources are also used in order to have field knowledge of the effects of AI in the growing world of tourism. By performing interviews with the stakeholders on the city of Barcelona, this paper aims to showcase the different effects of AI that are currently ongoing in this city in terms of tourism in order to discover the most efficient ways to make use of AI for tourists and DMO's, as well as the current side effects and possible challenges that may arise in the future due to the use of AI in the future for tourism.

The results suggest that despite the growing applications of AI in tourism, the catalan capital is still using it at a surface level, without experimenting rapid growth with its stakeholders or employees and clients. The technical limitations they face, as well as the lack of proper training of staff members about its use has left stakeholders with a system at its infancy, but with good prospects of improvement towards the future. The CETT-UB Barcelona institution, which specializes in tourism, hospitality and gastronomy research, has proven the existence of certain ethical issues in regards to the use of this technology not just in the tourism landscape, but throughout other sectors as well. Risking the critical thinking of its users, data leakage and possible discrimination through paid versions of AI applications.

Keywords: AI, Digitalization, Smart cities, Tourism resources, Adaptation

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1. Introduction to AI

1.1. Origins and evolution of the Artificial Intelligence

Artificial Intelligence, also known as AI, is, according to IBM (2022) a multidisciplinary field that involves the creation of machines and computers that can simulate human learning and input such as reasoning, problem-solving and language understanding. The very first concepts of AI date back to much earlier eras, where philosophers, mathematicians and logical processes were being first explored. Examples of this can be seen with salvaged items such as the antikythera mechanism, from the Greek era in the 100 BCE (Carman, 2011), an analog computer that was used in order to predict astronomical positions and lunar phases. Whilst it does not qualify as true artificial intelligence due to its lack of adaptive qualities, its complexity and applications has caught the attention of some researchers, who took it into account as one of the first basis of what AI could turn out to be in the future (Rivas & Torres, n.d.).



Figure 1. Antikythera mechanism. Source: BBC

Early foundations of AI can also be found within the intellectual foundations of intelligence itself, when famous philosophers such as René Descartes and Gottfried Wilhelm speculated that reasoning could be simplified to a format of rules and mathematical symbols, which later became an idea that was central to computational logic (Russell & Norvig, 1995). This later turned into what would become the field for human cognition replicated by machines and computers.

In 1950, Alan Turing proposed a research in which he asked the question “Can machines think?”, which gave birth to the famous Turing test, the ability to distinguish patterns between human and machine (Turing, 2007). This became a starting point in the understanding of human behavior and how it could be replicated within a machine, thus presenting AI as a formal scientific discipline.

Moving forward five years, in 1955, the term AI was formally adopted during the Dartmouth Summer Research Project on Artificial Intelligence, organized by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon. To quote their proposal: “every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it” (McCarthy, et al., 2006). Further AI research focused on symbolic approaches where intelligence was represented through explicit rules and logical reasoning, albeit with limited technological capabilities at the time (Newell & Simon, 2007). Therefore, in the present day, AI applications within tourism contexts introduce a new layer of complexity, especially in urban contexts

where many stakeholders coexist and use AI on a daily basis.

1.2. Research objectives

In order to contribute to the understanding of AI and apply it to the world of tourism in an efficient and coherent way, a main research question is proposed in order to set a clear path in the understanding of AI and how it is affecting the city of Barcelona, as well as understanding how it will change in the future with the aid or despite the use of AI tools:

- To analyze how artificial intelligence is being applied within the context of tourism in Barcelona and what effects it is having on stakeholders.

By answering this question, it is possible to assess the current situation of AI within the city and trace a forecast for the future that may provide stakeholders, policy-makers and decision-makers data that can help create a better tourist environment that does not compromise the lifestyles of residents and tourists and takes full advantage of AI technology while leaving room for possible new inventions in the future that may complement AI.

Alongside this main research question, subquestions or secondary questions are proposed that do not directly answer the main topic, but they can help gain insight within the context of AI in tourism and facilitate data that may prove crucial in understanding and answering the main question.

The secondary questions are the following:

- To understand the motivations in regards to the use and adoption of AI in tourism
- To analyze the perception of stakeholders in regards to AI in tourism
- To assess the challenges that have risen due to the appearance of AI for stakeholders, clients and third parties.

1.3. Hypothesis

The hypothesis that this project will follow is the idea that AI in tourism will become one of the most essential tools in the next steps for the improvement of not just tourism, but lifestyle in general. Providing rich, dynamic information that tourists, employees and locals can see interpreted in a clear way, helping them make decisions with more precision and consciousness of the context in which they travel, preventing possible problems such as overtourism, gentrification and a redistribution of wealth towards other areas that may not have high visitor numbers. Using AI, it is believed that what little a district or neighborhood may have, it can be displayed in a way that becomes attractive for tourists.

2. Literature review

2.1. The advent and use of AI throughout the world.

Nowadays, the advent of AI within the tourism sector has managed to become a breakthrough point for the everyday lives of tourists, employees and local residents of a specific destination. Many important modern cities within the world have adapted to new technological advancements as part of the process of becoming a SMART city (Kim et al., 2021). Throughout the world, many companies have been open to the idea of new technologies to enhance their daily lives, and companies have been putting a lot of effort in providing experiences that take full advantage of this new invention. Even outside of the tourism sector it has become a fundamental part of everyday life, extending its use from decision-making to the creation of programs and elements.

Currently, the biggest companies within the technological industry have begun to invest the vast majority of their resources into developing and acquiring the highest level of AI technology possible (Brusseau, 2023). And with their growing investments, so do cities. As they adapt more to newer technologies, plenty of tasks that required human intervention can now be automated while conserving to a degree the level of satisfaction from the customer previous to the establishment of AI. Statistically, it has been noted through research that those that have benefitted the most from AI technologies in the tourism sector are Destination management organizations (DMO's), tourism businesses and public administrations that want to use AI as a buffer for innovation procedures (Fontanari & Traskevich, 2023).

AI has a wide range of different applications within many different fieldworks, not just tourism. While its main purpose remains as a simulation and interpretation of the human brain, its uses can vary depending on the context. One of the most used functions within the tourism industry can be found in the use of the recommender system. This system, born before the advent of AI, uses the data gathered on user preferences, experiences and trends in order to personalize and enhance certain experiences, such as places to visit or which queues are less crowded in a theme park (Xiang & Fesenmaier, 2016). One of its main appearances remembered by many people was with Disney's MyMagic+ subscription program, which was explicitly aimed at tourists and programmed to make guests' stays more welcoming by providing restaurant recommendations, itineraries, acted as hotel keys and gave certain recommendations to explore the surroundings of the parks (Huddleston et al., 2016). However, the results provided back in the 2010's were not to everybody's satisfaction, which resulted in a project that could not make the company money with its initial budget. However, the appearance of AI has led to a much more comfortable tourism experience, providing more customized itineraries, smoother crowd management and generative AI is being used as a marketing tool for in-park decoration and other forms of promotion (Kim, 2022).

This demonstrates that AI has managed to appear in a good number of industries in order to provide support to the staff and automate certain processes. However, it is important to remember that no matter how powerful this tool may be, it lacks the necessary emotions and consciousness that a human being has. To provide an example, the healthcare industry has adopted AI as part of the tools to aid staff research and perform operations and even accompany patients. However, it cannot replace humans in situations where empathy is necessary and cannot be overcome with the current applications of AI. Thus, creating obstacles and risks that need to be monitored as well (Montemayor et al., 2022).

Deep language learning models such as ChatGPT have made certain impacts throughout the entire world by being able to overcome certain obstacles such as language barriers, communication

problems and ethical improvements. These findings suggest that language learning models are the primary tool for businesses and consumers alike to use when using AI (Shen et al., 2024). During its early days, even language learning models were subject to rule-based systems that severely limited their capacity until they could be autonomous enough to provide proper answers and learn to be prepared against real life situations. This is why recent advances in deep learning are more ambitious and suppose a much bigger economic cost for companies that want to develop their own models. Amongst these competitors we find Google, Amazon, Meta, NVIDIA, Apple, Microsoft, Tesla and more. All of them are investing their funds in order to have a superior AI model that can be more accurate than its competitors, even if it is by a very slim percentage (Iansiti & Lakhani, 2020).

Top 10 Investors in AI Overall

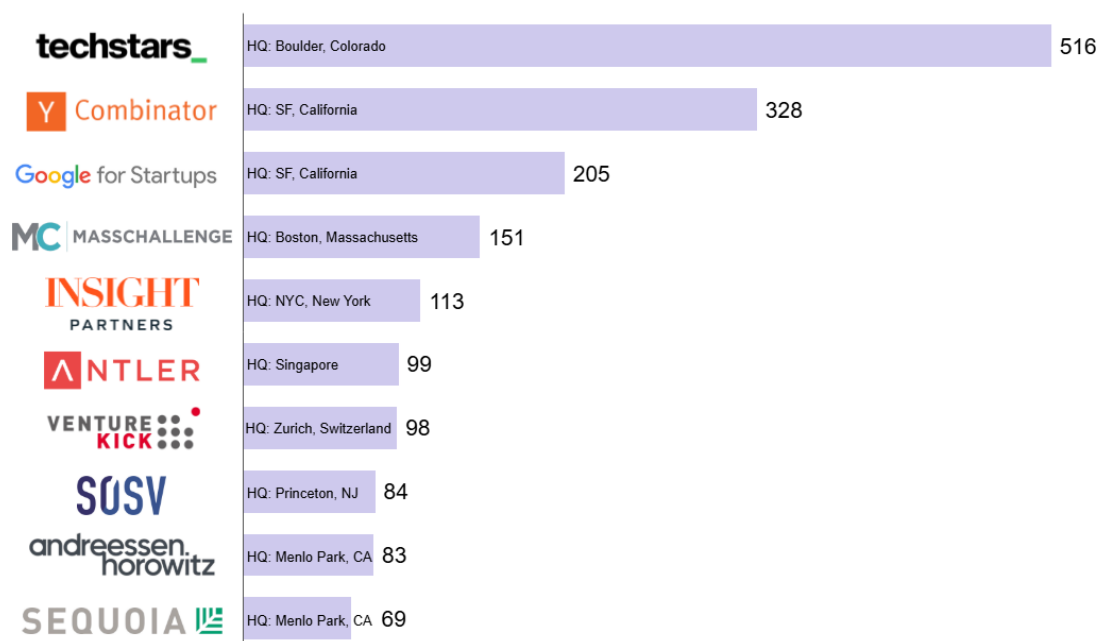


Figure 2. Top 10 Investors in Artificial Intelligence of 2025 in millions of dollars. Source: Aventis Advisors.

The above investors are mostly businesses that help other startups or even established businesses with their own services and sell products to them in order to accelerate them, including AI services. Kerty Levy, managing director of Techstars mentions that the first thing that his company asks every founder of a startup is what their AI strategy is and places emphasis on how important this new tool is for the future of investment (Alphamark & Ansari, 2025).

2.2. Applications of AI throughout the tourism industry

AI, just like the other industries, has extended its reach to the tourism industry, where its applications have shown notoriously positive results. It has appeared throughout the entire customer journey: from pre-trip planning to the post-trip evaluation, making customers feel that they are accompanied every step of the way. Public and private sectors have made use of it as part of their personalization and recommendation systems which further prove the potential of this tool for the future of the industry.

One of its most widespread uses that also extends beyond the tourism industry is the personalization of experiences and recommendations based on collected data such as the search history of

customers and previous purchases. A clear example of this can be found on [Booking.com](https://www.booking.com)'s website which not only provides constant customer support with AI but also actively seeks and attracts them by using notifications that are related to their interests and recent searches. This encourages further engagement and satisfaction. On top of this, AI systems can also offer discounts for the purchase of a certain product related to it. For instance, when booking a trip to Sydney, the system may offer a discount for the Sydney Tower Eye to enhance their experience (Mitra & Jain, 2024)

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Ver disponibilidad >

Figure 3. Discounts in hotels provided with AI recommendation after a Hong Kong trip purchase.
Source: Booking.

Another popular use of AI being applied in the tourism industry is the use of chatbots and virtual assistants for tourism itineraries and purposes. Despite there being instances of virtual voice assistants in the past to guide tourists and individuals, they did not reach the level of adaptation of current day technology and could only answer predetermined requests that have been previously programmed. The new eTourism challenges, however, require fast-paced solutions that rise up to the new dimensional challenges (Calvaresi et al., 2021). This is why, nowadays customers can even create their full custom itineraries through apps such as GuideGeek, which elevates the standard experience to industrialized levels.

The most recent developments in artificial intelligence, particularly in natural language processing and generative AI, have improved the capacities of chatbots in tourism environments, with systems now being able to provide real-time assistance, personalized recommendations and even multi-lingual automated support without the strict need to program it beforehand (Ramalho et al.,

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2023). Not only that, AI is also able to provide assistance in the reservation process of attractions and tours by providing detailed information about a specific product or answering frequently asked questions (Voigt, 2024). According to Tussyadiah (2020), these tools go beyond simply aiding customers acquire their experiences, they actually enhance the overall experience by reducing wait times and optimizing processes, which increases overall customer satisfaction. Thus, it led to many organizations and businesses to start adopting these systems to maintain continuous engagement with customers before, during and after the service has been provided. Sometimes without the need of actual human presence. By using other related platforms such as Whatsapp, all information regarding the trip of a passenger can also be confirmed and provided without issue and in an instant.

These developments have led to their integration within the tourist experience and after its completion. This helps in the enhancement of operational efficiency and guest experience. Just like how tour operators and policy-makers are implementing AI in their systems, from voice assistants to automated check-in systems. For instance, the Henn-na hotel in Japan has been recognized as one of the first hotels to be staffed mostly by robots. By using AI and natural language processing, it is possible to provide an experience similar to an actual human staff member. (Thiruthanigesan et al., 2025). In a similar manner, AI can provide support for guests in their rooms via the previously mentioned chatbots to modify the room temperature, ambience, etc to their own preferences. Furthermore, before leaving the building, it can also recommend guests about certain travel patterns and route optimization between the hotel and the airport, for example (Bingöl & Yang, 2025).

Once the tourist has reached the airport, airline companies utilize AI as part of their own customer service automation. A documented case lies within KLM Royal Dutch airlines which have introduced AI chatbot which can provide updates in real time to respond to customer inquiries, reducing waiting times and improving efficiency of customer interactions (Pavlenko, 2025). This demonstrates its efficacy which could be implemented in cases such as the one happening in the airport of Dubai and the middle east due to the ongoing war between Iran and the U.S. which has stopped a large number of flights and impeded communications with customers due to the uncertainty of the situation. However, it has been reported that not only is AI useful during the flight but also for the maintenance of the airport and guidance of tourists. Another exemplification is found in the robot called “Spencer” which has been deployed to a plethora of European airport environments, adapting routes in real time and avoiding obstacles it encounters. It also serves to enhance mobility operating vehicles and answering specific customer inquiries, making a union between the field of robotics and AI within tourism infrastructures (Skubis et al., 2024).



Figure 4. Robot “Spencer” for airport enhancement. Source: volavi

2.3. Limitations, failures and ethical challenges of AI in tourism

AI, however, is not a flawless system, as it has risen as of recent years and it is still in a somewhat early development. Therefore, as studies have shown such as Banerjee & Chanda (2020), AI presents important limitations and challenges that have to be kept in mind at the time of putting it into use. These range from technological limitations to privacy or moral concerns of its use not only on the tourism industry but on a day-to-day basis.

Perhaps the most notorious issue in regards to algorithm bias and failures that are generated based on user profiles, behaviors, search histories and more. Automation in AI may lead to job displacement in certain tourism areas, which can cause low-skilled tourist work beginners to end up in areas that demand a high skill such as management or operation control (Farahani & Ghasemi, 2024). In the same manner, recommendation systems and visibility algorithms used by platforms such as online travel agencies have prioritized destinations, hotels and attractions that receive high levels of engagement and put them above others that may have similar services but smaller reputation. Thus, contributing to a reduction of space and overcrowding, which may cause overtourism in certain areas (Xiang & Fesenmaier, 2016). As a result, this creates a loop in which dominant destinations and services dominate and those that do not remain underdeveloped. It could be argued that this is a type of oligarchy in which the power is given to a minority. Especially given how AI will dominate the industry moving forward. Moreover, it can also harm cultural representation, as places not shown on the searches may make mainstream attractions the most visited ones and lead to homogenization of experiences, losing authenticity in the process.

Following this principle, there are companies which use AI in order to determine a certain price range. This is called algorithmic or dynamic pricing, a strategy to adjust prices in real-time based on market demand and using AI technology. Thus, increasing revenue by inflating the prices at higher demands and lowering them at low demand. The problem lies in the fact that this very principle can be detrimental for customers living in certain areas. Studies have shown that these practices can reduce trust between customers and companies, as they may feel scammed upon buying a similar item or service at a different price than someone else and believe that they are not given fairness or transparency.

As it can be seen, the effectiveness of AI is largely determined by its access to vast amounts of user data. This is necessary in order to ensure that all operational AI procedures work as intended and offer the maximum amount of customization possible. However, it is this same data gathering that has caused a major concern among its users, which is the possible breach of privacy, consent and constant surveillance of AI systems in regards to user data (Oseni et al., 2021). A major issue in regards to this matter is in its opacity, as some applications or services collect data constantly, without the user's knowledge and in the background. Whilst many of these applications inform about how the user data is used under their terms and services clauses, many times it is still unclear for users due to the length of these documents. Thus, raising many questions from users and distrust in regards to the transparency of the companies that use these services (Zuboff, 2023).

Real-world applications of this technology seen in places such as airports implement biometric technology. For instance, in order to scan and recognize customers which have a valid ticket. However, customers have reported to be sceptical of these practices, as they believe that the risks for potential misuse or possible information leaks can cause a severe risk of losing large amounts of personal data. Thus, causing worry amongst users. Airports such as Hong Kong's or Shanghai's make large use of this technology, as they belong to one of the world's leading countries in research and development of this technology, but it has caused ethical concerns regarding mass surveillance,

control and data security risks.



Figure 5. Facial recognition systems powered by AI in the airport of Shanghai. Source: Daily Mail.

In Smart tourism destinations, the internet of things, which are the physical items that communicate between themselves with sensors and specialized software, contributes to the emergence of highly monitored environments, without leaving the feel of being monitored in anything that society does. However, it could be argued that this is what governments and stakeholders desire, as companies such as Microsoft and Google are investing more resources into developing systems that monitor their users with more frequency. An example of this can be seen with the U.S: which is considering the need to report certain personal data in order to acquire the ESTA (Electronic System for Travel Authorization) just to enter the country, severely affecting the tourism sector there.

Tech limitations

Ivanov & Webster (2019) performed research in order to understand the new technologies of the new century and evaluate their applications in real-life scenarios, including the often cited Henn-na hotel in Japan. However, despite the futuristic appeal and low labor costs of the infrastructure, researchers found that at the time, the hotel experienced several system failures that led to an unsatisfactory guest experience. Upon interviewing customers, they reported frequent misunderstandings with voice-activated assistants, especially when the accents or languages did not match. Therefore, frequent human intervention was necessary in order to resolve issues, which oftentimes were not readily available to resolve the issue in time. It also demonstrated the inefficiency of maintaining and updating physical robotic systems, as their economic costs are too steep for small to medium companies to assume. This can also be seen on the previously mentioned airports, in which the chatbot systems used by airlines are not flawless in their performance. As a result, customer frustration is not uncommon amongst infrastructures that make use of these systems. This suggests that AI is not perceived as a tool to replace human input, but rather complement it. Especially in areas in which emotional intelligence and adaptability is necessary.

Sustainability objectives

The tourism UN (previously known as UNWTO) has established and encourages objectives to follow the sustainability goals that are in accordance with the Agenda 2030. To ensure that they succeed, they use all the available tools that can help reach them. Of course, the advent of AI has put it as one possible solution to the goals of the UN. However, studies show that the introduction of AI as a possible agent for sustainability in tourism has trade-offs that may seem contradictory to what has been shown so far in regards to sustainability protocols.

In particular, related to the previously mentioned hotels and airport infrastructures, the environmental costs of AI are much too steep to maintain on a daily basis. Energy-intensive data centers have been built in order to train and keep automated models updated, such as the aeternal mentis center in Álava. However, the carbon footprints they produce is significant, reaching an average 52 million tonnes of CO₂ in 2025, according to Climate Impact Partners (2025). This, alongside the massive demand for new and improved AI systems puts more pressure into the environment and production costs, which has raised ethical questions about how AI promotes sustainability, yet it also impacts it in a negative way on a grand scale (Vinuesa et al., 2020).

This issue also extends beyond energy consumption by businesses, as the increase of overall tourism demand due to tourism and route planning by AI makes tourism more accessible, but also more prone to contaminating the environment. Efficiency gains do not contribute much to the overall total if the total consumption rises.



Figure 6. aeternal mentis AI training center in Álava. Source: El País.

2.4. Applications of AI in tourism in Barcelona

Some cases of companies that have begun to adopt these systems into their daily services include customer support. To provide an example, the BSC (2025), the Barcelona Super Computing Center, established a pact with Renfe in order to provide AI customer support in place of its current manual system. This way, the company aims to improve the efficiency and customization of the service and BSC targets to be one of the prime AI factories in all of Europe.

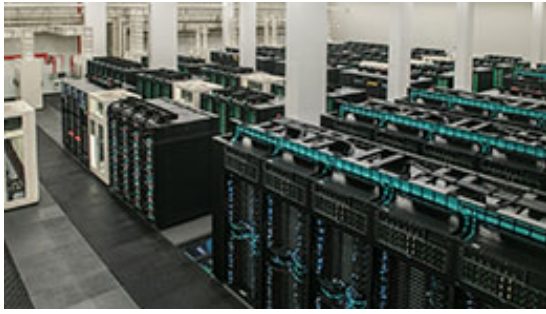


Figure 7. The Barcelona Super Computing Center. Source: BSC's official website.

In regards to when a customer is enjoying their experience, AI can still prove to be a valuable tool that accompanies and helps them.

AI systems not only benefit customers, but company systems and structures as well. SMART city infrastructures demand the constant monitoring of tourist flows, demand patterns, resource management and other tasks that require heavy attention (Camero & Alba, 2019). This is why digital solutions have been implemented in order to maintain the constant monitorization required, including sensors, social media platforms, mobile applications, etc (Gretzel et al, 2015). However, the implementation of AI for the automation of these tasks has proven to be a severe improvement and optimization that also helps save costs and allocate resources to other areas in which they are needed, providing economic growth (Erdil & Besiroglu, 2023).

Another reason as to why companies are willing to formally adopt AI into their structure is due to the sustainability opportunities it presents (Pisoni & Molnár, 2024). Within the context of tourism, this means an increased monitoring in environments and the previously mentioned resource allocation. Therefore, being more efficient in how energy is consumed in certain services such as transport by personalizing and recommending certain options to customers (Buhalis & Amaranggana, 2014). In cases such as Barcelona, AI tools are used by policy-makers in order to identify peak tourism seasons and develop new strategies to promote de-seasonalization. Thus, reducing the pressure within the destination. Related to this, the CETT-UB institution, which specializes in higher education and research in tourism, gastronomy and hospitality, has promoted the discussion and exploration of AI in the context of tourism by using initiatives such as the CETT Smart Tourism Congress, which is aimed at professionals, businesses and institutions of the sector to debate and gather new ideas while cultivating the promotion of this new technology in tourism.

In this same context, AI has established relevant applications to the world of transportation, one that has been pointed out as one of the most contaminating in terms of sustainability, according to the International Air Transport Association (IATA). In 2019, aviation was responsible for 2.5% of global CO₂ emissions. Therefore, with Artificial Intelligence tools, routes are optimized for tourists and recommendations are given to prioritize public transport or other methods of transport such as bicycles or walking, thereby reducing carbon emissions produced by tourism activities (Li et al., 2018).

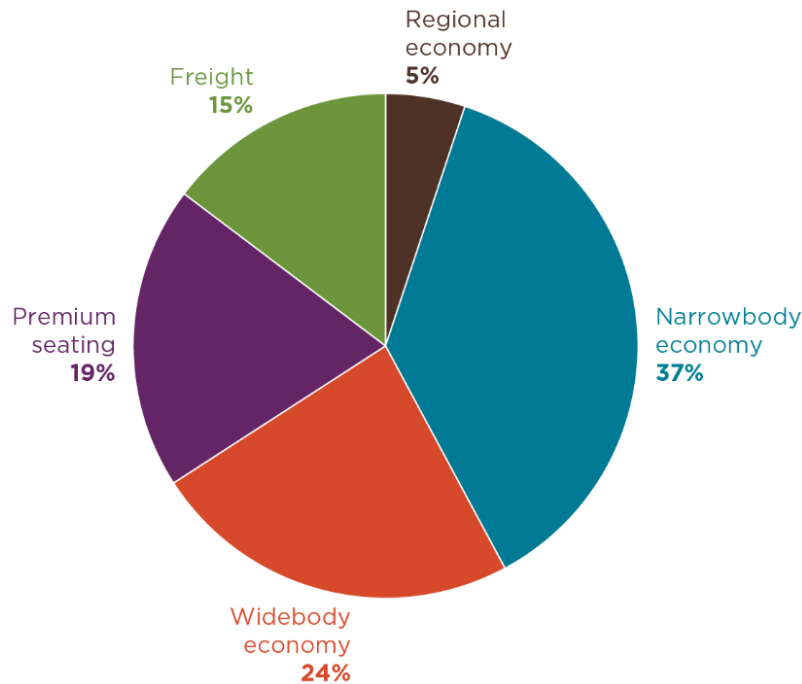


Figure 8. CO2 emissions by operations and aircraft seating class in 2019. Source: ICCT.

Thus, the application of such technologies within the context of the city of Barcelona has led to it being essential to its current structure. Certain sectors such as the previously mentioned CETT-UB or the 22@ Poblenou district have invested a large amount of resources into the R&D of new AI applications for visitor and crowd control, smart mobility systems, recommendation systems and customer service automation (Ajuntament de Barcelona, 2024). Examples of such platforms include Identify Travel, HistARy or Cicerone, which are services designed to aid destination managers and policy-makers generate attraction with the use of this new technology.

One of the reasons behind the need to control crowds better with this new technology is because the city of Barcelona currently suffers from a widespread overtourism issue. Overtourism, according to the European Parliament, refers to the tourism impact which exceeds physical, ecological, social, economic and/or political capacity thresholds (Peeters, 2019). In the Catalan capital's case, this means that the central areas, such as the Sagrada Família, the Catalonia Plaza, Passeig de Gràcia, etc, are suffering from a rather large congestion of tourists during peak seasons, in particular, the summer season. This has led to the necessity of approaching tourism in different ways, as the city, usually described as a metropolis, is far too small to handle such a large number of tourists. However, traditional methods, including static planning or manual monitoring, are no longer feasible within this context. Unpredictable factors, such as social media trends, influence the reasons for tourist travel (Gretzel et al., 2015). However, these same factors have proven AI to be feasible and necessary for the development of further tourism monitoring systems. Cities like Barcelona already collect big data as part of their process. The challenge, therefore, lies in the need to translate this data into actions that can make positive impacts and mitigate the negative ones. Thus, helping tourism advance as a sustainable industry.

However, despite the promotion of a strong innovative environment, stakeholders within Barcelona such as hotels, DMO's, transport operators, etc, have not yet fully implemented AI into their services. Most have been using it in a fragmented way to help with operational procedures and not in a direct Business-to-customer way. Therefore, these systems are not directly interconnected with the

destination environment and serve as tools for businesses to use as a helping hand with day-to-day problems, but without a direct impact on the city due to AI. Thus, Barcelona could be considered a destination with strong institutional interest in AI-driven smart tourism, but with uneven practical adoption among tourism stakeholders.

2.5. Research gaps and the need for further studies

Despite the increasing integration of artificial intelligence within the tourism sector in Barcelona, there are still several limitations in the current body of research. Most existing studies focus on the technological capabilities and potential benefits of AI, particularly in relation to smart city development, efficiency, and sustainability (Gretzel et al., 2015; Buhalis & Amaranggana, 2014). However, there is a lack of empirical research that examines how these technologies are perceived and experienced by key stakeholders within the destination. In particular, the perspectives of local stakeholders as well as residents have been given limited attention by several different reasons. One of the main problems researchers find when attempting to speak to the most important actors or government bodies is rejection upon an interview or question request. A definitive answer as to why this occurs has not been found yet, although most of the bodies that are often interviewed belong to political bodies which often evade day-to-day questions, let alone those from a single interviewer (Bull & Mayer, 1993). This has led to insufficient qualitative and quantitative evidence towards the effectiveness of AI in tourism systems.

Despite Barcelona being a leading tourism destination, there is not enough evidence and literature that correctly correlates the application of AI in tourism with sustainability. There remain certain issues such as social pressure, spatial distribution of tourists and the well-being of residents. Upon asking these questions, many stakeholders respond vaguely or do not have a proper answer to the problem, contributing to the lack of evidence available. Therefore, despite there being heavy publicity about the positive effects of AI within these fields, not enough evidence has been provided to ascertain the adequacy of this system within the tourism industry outside of the automatization of certain positions.

The current research analytical viewpoints put emphasis within the advances of AI technology. However, there is not a proper approach as to how stakeholders are adapting to, changing or resisting the rise of this new tool available for all. The direct impact of AI within local residents and businesses is largely sidelined in favor of the theoretical capabilities of AI to satisfy possible demands. But without the points of view and impacts of the local stakeholders, no qualitative evidence can be proven to know the actual impact of these tools and their effectiveness.

Additionally, the prospect of AI being able to provide solutions to tourism challenges is a matter that has been described in theory. However, there is a very limited amount of actual field applications and media and general consensus cannot truly evaluate its efficacy. Furthermore, while the possible applications have been promoted, there is a critically limited analysis of its unintended consequences. As stated earlier, it seems contradicting that AI and sustainability can cooperate together, as concerns regarding data privacy, increased tourism demands for algorithmic results and environmental costs are often not acknowledged. In specific cases such as Barcelona, understanding these trade-offs is critical as it can make the destination grow in the wrong way if handled incorrectly, changing from a stagnation stage to one of decline.

The integration of AI within governance and policy frameworks has broad gaps to be considered; decision-making processes, regulatory frameworks and long-term planning. If AI is used for all of these processes, the role of government institutions will be questioned by the general public, raising concerns about their actual inputs regarding certain decisions and their impact on the environment.

In light of these gaps, this paper aims to contribute to the currently existing literature by incorporating primary data through stakeholder perspectives beyond theoretical and technological discussions of the implementation of AI and offer a more comprehensive understanding on how AI is being implemented through their point of view and evaluated in practice throughout the city of Barcelona. By providing this data, it will be possible to give a more precise assessment as to how AI can effectively contribute to the issues of overtourism and sustainability challenges or if its role can only be limited by structural and contextual constraints.

3. Methodology

A documentary research was performed in order to discover the effects of the use of the new AI technology throughout the city of Barcelona and how its appearance and applications are impacting the city, its residents, visitors and environment from a medium to long-term period. This research involved phases that included the gathering of documentation and interviews and meetings with several of the involved stakeholders. The documents and sources utilized for this research were of varying origin, ranging from official websites to academic resources with previous information and updated data in the topics discussed within this paper, including the challenges that are arising due to the extended use of AI in the daily lives of residents and decision-makers. By using these resources, it is possible to attain a broader extent and understanding of how Barcelona can adapt to this new tool available to them.

To carry out this research, qualitative methodologies were followed in order to understand the points of view of the different entities and stakeholders involved within the city of Barcelona, including political and technological institutions which carry out their own research procedures in regards to AI. To carry out this research, interviews and surveys have been delivered both in person and through online methods such as Google forms. The responses were analyzed together in order to identify recurring themes and shared perceptions among the selected stakeholders, providing an exploratory indication of how AI is currently perceived and used by actors in Barcelona's tourism sector. However, due to the limited range of the available stakeholders, these results cannot prove that this consensus reaches to all stakeholders in the city, but paints a sketch of how it is perceived by some of the most important institutions within the city.

The research was conducted over a nine-month period through sequential phases of documentary analysis, stakeholder contact, interview collection, and qualitative categorization. Taking this into account, it is safe to assume that whilst the context of AI may have advanced, it has not done so in a significant manner unlike the changes made over the course of one or two years of difference. This guarantees a critical approach with a lessened impact concerning the advancement of this technology. Likewise, the sources of information taken into account during the making of this research were chosen considering their impact on both the tourism industry and Barcelona. As stated earlier within the paper, the available data in regards to the points of view of stakeholders and the adequacy of AI systems on real environments is limited. It is expected that this research can help assemble a strong base in which to base future ones and give light to the parties that are not currently being focused on.

The scale at which the data has been gathered follows a structure based on the scale of its importance and impact. Beginning with the impact of AI in the world and a general overview of its effects on the world, following to a more detailed explanation of its applications throughout the tourism industry and ending on its possible impacts throughout Barcelona's tourism industry. The goal with this structure was to facilitate the understanding of the concepts related to AI as well as introducing the general situation happening within the AI tourism industry in an organized manner.

After performing the required interviews throughout the next phase of the methodology, the proper citations were made taking into account each actors' perspective in regards to the situation of AI in tourism.

This documentary research also includes information gathered through other sources related to AI in tourism. Including the webpages of the implicated parties in this research such as the 22@ district in Barcelona and the CETT-UB university of Mundet, including visits to both locations to ask faculty members about the possible advancements of AI in the industry.

Question	Purpose of the question
What is your role and how is your organization involved in tourism in Barcelona?	To acknowledge the impact of tourism of the interviewed within the boundaries of Barcelona.
Is your organization currently using artificial intelligence? If so, in what ways?	To discover the different applications of AI that each stakeholder has acquired.
What motivated the adoption (or non-adoption) of AI in your organization?	To know the background and possible objectives of the adoption of new technologies for each stakeholder.
What benefits has AI brought to your organization or operations?	To know the positive impacts of AI within the organization or actions that the stakeholder performs, in accordance to the expected benefits seen in the literature review.
In your opinion, has AI improved the tourist experience? How?	To discover specific potential benefits of AI within the tourism industry of Barcelona and know possible alternative applications.
What challenges or limitations have you encountered when using AI?	To know the limits of AI and how it impacts negatively within the tourism industry.
Are there any concerns regarding ethics, privacy, or job displacement?	To know possible political or job disagreements regarding the ethics of using AI in a work or tourism environment.
Do you think AI can help address issues like overtourism or sustainability in Barcelona? Why or why not?	To assess the viability of AI as a tool in the fight against overtourism within the city of Barcelona.
How do employees and customers generally react to the use of AI?	To discover the impact that AI has in the perception of customers and in their products.
How do you see the role of AI evolving in Barcelona's tourism sector in the next few	To assess the possibilities that AI can offer in the future of the tourism sector in Barcelona and determine its effectiveness.

years?	
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Table 1: Questions and purposes for stakeholders. Source: Own elaboration.

The stakeholders selected for this research process range from many different actors pertaining to the hospitality industry of the city of Barcelona. The range of these stakeholders include hotels, travel agencies and other actors of the tourism sector of different areas of Barcelona that may have a different input depending on the severity of tourism of the area they are in. This also aids in identifying possible methodologies that have been applied in other areas.

The interviewed stakeholders are the following:

Stakeholders	Description
MTS Globe	DMC agency specialized in the delivering of tourism related services for touroperators, including passenger guidance within airports.
CETT-UB	Higher education and research institution specialized in tourism, hospitality, and gastronomy in Barcelona
Turisme de Barcelona	Offices pertaining to the official tourism board of the city of Barcelona.
Hotel Condes Barcelona	4-star hotel located in Passeig de Gràcia with multiple achievements provided by Tripadvisor.
Hotel Marriott Four Points	4-star hotel located in Poblenou with various positive reviews from the public.

Table 2: Stakeholders taken for this research. Source: Own elaboration

4. Results

4.1. Categorization analysis

In order to analyze the data gathered throughout the interviews, a categorization analysis related to the research objectives was performed. This includes the transcription from the stakeholders' answers and the variables and categories of each research objective. The method to analyze this data involves the creation of variables through the ones found within each of the projects' research objectives and the creation of categories out of these variables to determine which are the main issues that the stakeholders face with the use of AI throughout the city. Finally, the categories are classified by the frequency in which they appear in each of the research objectives in order to provide a descriptive summary identified among the interviewed stakeholders.

It has to be taken into account that the majority of these interviews were done under anonymous testimonies, as the interviewed people did not want to disclose their personal information for the purposes of this research. Whilst each individual question will be analyzed for a qualitative analysis after the categorization analysis, a full disclosure of each interview is available at the annex of the project for preservation purposes.

- To analyze how artificial intelligence is being applied within the context of tourism in Barcelona and what effects it is having on stakeholders.

Participant	Variable	Category	Extract
MTS GLOBE	Effects	Automatization	We are not sure how AI can improve the tourism industry as a whole. It helps in the automation of processes, but we don't know how it may help the situation as a whole. This is a reason as to why we don't use it.
CETT-UB	Effects	Digitalization	We offer master's programs focused on tourism, digitalization, and AI, so we are already specialized in this field.
Turisme de Barcelona	Effects	Optimization	Our technological department implemented the use of AI. According to them, it helps keep track of the sales and automate their processes, but our procedures at the front desk are unaffected. We mostly use it to help us automatize processes.
Hotel Condes Barcelona	Effects	Optimization	The higher-ups use it as part of the marketing department to optimize the processes of sales and publicity, using it for the webpage design, among other things.

Hotel Marriott Four Points	Effects	Automatization	Our staff mostly uses it on applications such as ChatGPT, Gemini and other things, but we do not use it directly with the customers.
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Category	Frequency	Percentage
Digitalization	1	20%
Automatization	2	40%
Optimization	2	40%
Total	5	100%

Table 3: Categories, frequencies and extracts of the applications of AI technologies within the context of tourism in Barcelona. Source: Own elaboration.

Stakeholders state that the most used for AI applications is with the use of AI services for automatization of tasks and to help employees obtain information more easily. However, as it can be seen within this table, AI has not provided a clear use in modern-world tourism applications and problems and companies are reluctant to use them outside of their own departments. Condes Barcelona, however, stated that the marketing department makes use of it as part of their SEO and revenue management department. This matches with the Turisme de Barcelona's statement about the marketing department using it to optimize and keep track of sales.

CETT-UB, however, is pointing at a more general approach, including the digitalization of services with the use of AI in the long term, including new programs specialized in this field.

- To understand the motivations in regards to the use and adoption of AI in tourism

Participant	Variable	Category	Extract
MTS GLOBE	Motivation	Service enhancement	We do not use AI, but we think other companies use it because it helps their employees automate their processes.
CETT-UB	Motivation	Modern Adaptation	AI has become part of the way we work, so like many other sectors, we have had to adapt and adopt it as a new tool.
Turisme de Barcelona	Motivation	Service enhancement	The technological department says that it is designed to help our operational procedures while keeping track of sales, but it's in the background so we do not know the technical procedures.
Hotel Condes Barcelona	Motivation	Modern adaptation	As the other companies were using AI to adapt to the changes in the future, we wanted to use AI as well as part of our routine. The staff mostly uses it to find information or solve problems.
Hotel Marriott Four Points	Motivation	Competitive pressure	Our competitors have begun to use it a lot and we could not just stay idle without it, so we adopted it as part of our standard procedures.

Category	Frequency	Percentage
Modern adaptation	2	40%
Competitive pressure	1	20%
Service enhancement	2	40%
Total	5	100%

Table 4: Categories, frequencies and extracts of the motivations of stakeholders in regards to the use of AI in tourism. Source: Own elaboration.

The interviewed stakeholders suggest that it is a fact that the modern adaptation of the technologies has made them adapt AI as part of their operational procedures. MTS Globe, despite saying that they do not utilize AI as part of their procedures, mentions that they have seen competitors using them as part of their processes to ensure an enhancement of their services, such as easier management of the customers. Marriott Four Points mentions that it was due to competitive pressure that they have begun to adopt AI, but they haven't implanted it fully just yet. This may explain why many hospitality services have not fully expanded their AI procedures yet; they are starting to adopt it without knowing of the full extent of its potential.

- To analyze the perception of stakeholders about AI in tourism

Participant	Variable	Category	Extract
MTS GLOBE	Perception	Uncertain	We are not sure how AI can improve the tourism industry as a whole. It helps in the automation of processes, but we don't know how it may help the situation as a whole.
CETT-UB	Perception	Positive	There is a clear intention for AI to improve the tourist experience, but from my perspective its real impact is still in a very early stage.
Turisme de Barcelona	Perception	Uncertain	I am not certain how it may improve further situations within the city, as the uses we have for it are currently operational.
Hotel Condes Barcelona	Perception	Positive	We do think that AI will grow in the future to help tourism. The marketing department uses it and we think that it can expand to other functions later on.
Hotel Marriott Four Points	Perception	Uncertain	We are unsure how it may help in the future. We ourselves have just begun using it, but we don't know if it can help tourism in any big way other than using it as a tool on

			behalf of the staff or by tech teams.
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Category	Frequency	Percentage
Positive	2	40%
Uncertain	3	60%
Total	5	100%

Table 5: Categories, frequencies and extracts of stakeholders' perceptions of AI in tourism. Source: Own elaboration.

The general point of view of the stakeholders is that the use of AI for tourism applications is still in its infancy and thus, cannot properly point out any factual evidence that proves that it will help tourism in any meaningful way. Whilst the hotel Condes presents a positive stand that AI will grow to become a useful tool for tourism in the future, it is clear that its functions have yet to demonstrate a strong efficacy that can impact the state of tourism as it currently stands. This opinion is shared by the CETT-UB institution who is putting effort into training their staff members in this new technology in hopes of it becoming a key player in the future of tourism in Barcelona. Nonetheless, they also admit that it is still at a far too early stage to produce any meaningful results.

- To assess the challenges that have risen due to the appearance of AI for stakeholders, clients and third parties.

Participant	Variable	Category	Extract
MTS GLOBE	Challenges	Technical difficulties	We heard that AI usually causes problems to companies with their operational functions and use. Usually they have trouble configuring it correctly.
CETT-UB	Challenges	Critical thinking	In my opinion, AI is a powerful tool, but it only works effectively when there is a human, critical mind capable of using it to unlock its full potential. In the end, I believe that human thinking and critical capacity cannot be replaced by machines.
Turisme de Barcelona	Challenges	Technical difficulties	We usually have trouble understanding some of the AI functions, as our main program works in the background and only the higher-ups know what it is for.
Hotel Condes Barcelona	Challenges	Technical difficulties	Sometimes we struggle with some of the AI functions. The staff usually says that they do not know how to use the learning AI and just use the basic ChatGPT. We do know that customers sometimes prefer the use of AI for their itineraries, but the

			interpretation is best left to an actual professional.
Hotel Marriott Four Points	Challenges	Environmental impacts	We know that AI is making a lot of impacts within the environment. We see on TV some ads regarding the AI centers built that destroy nature. As for us, our challenge is to know what uses we can give it in the future.

Category	Frequency	Percentage
Technical difficulties	3	60%
Critical thinking	1	20%
Environmental impacts	1	20%
Total	5	100%

Table 6: Categories, frequencies and extracts of the challenges related to the use of AI in tourism. Source: Own elaboration.

The major issue that stakeholders currently present with AI is its use in practical applications. This correlates with the previous table's results in the fact that the system is still in its infancy and many workers have not yet adapted to its functions. However, an important approach was made by CETT-UB in which they state that the full potential of AI can only be unlocked by the critical thinking of those that create it and use it, preventing misuses. Likewise the hotel Condes states that customers sometimes prefer the professional approach of their itineraries, as the AI appears limited in interpreting the itineraries they make for a trip or hotel as well as a human does. The hotel Marriott Four Points mentions the environmental impacts that the centers of AI data gathering are making on the terrain, which corroborates the evidence presented in the literature review and the impacts these centers have on society and nature.

To make the results easier to understand, a thematic map was added after the categorization tables. The map shows the main topics identified in the interviews and which stakeholders mentioned each one. Since only five stakeholders were interviewed, it should be read as a visual summary of the main patterns found in the interviews.

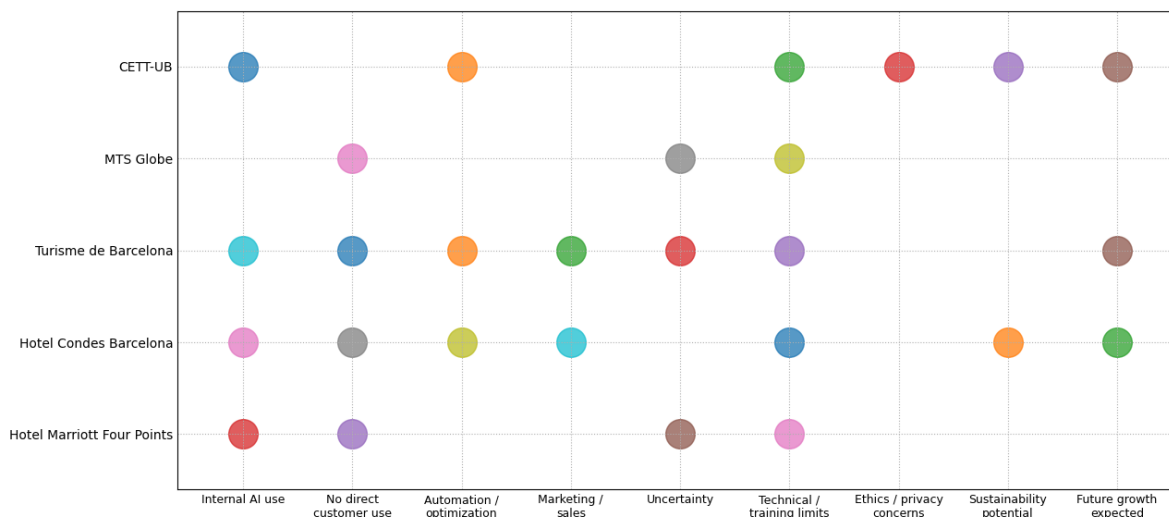


Figure 9. Thematic map of stakeholder responses on AI in Barcelona's tourism. Source: Own elaboration.

The map shows that technical and training-related difficulties are the most common issue, as they appear across all interviewed organizations. It also shows that AI is mostly used internally, especially for automation, optimization, marketing, sales, and general support tasks. In contrast, direct use with tourists or customers remains limited. Overall, the figure supports one of the main findings of this research: AI adoption in Barcelona's tourism sector is still at an early and uneven stage, and most organizations use it mainly as an operational tool rather than as a fully integrated part of the tourist experience.

4.2 Interview analysis

Each of the stakeholders have expressed their opinions, methods, desires and concerns regarding the sustainability, management and applications of the new AI technologies within the city of Barcelona. Their points of view sometimes differ but have been found to be, in general, similar in several aspects, from their behavior, points of view, applications of the technology and even the tools used. It is clear, in accordance with the categorization results, that the stakeholders interviewed use tools that are openly available to the general public, such as Chat GPT, Gemini, amongst others. However, the interviewed stakeholders seem to not have provided a general, clear or distinctive use or program to their employees that fully utilizes the use of AI, nor have they made any use for it that directly benefits their customers. This aligns to other surveys that indicate that the sales and marketing department are the ones that are primarily targeted by AI programs, but only around 35% of the companies that use AI actually implement them for direct customer service (Nessler, 2025). Travel agencies seem to steer mostly towards the use of it through background and sales analysis, but it is mostly imperceptible by their front desk and other employees.

As mentioned earlier, the full answers to the interviews can be found on the annex at the end of this paper for the perusal of those who want to read through it. Through this section, the general answers of the stakeholders will be provided to give an overview that answers the posed questions at the beginning of this paper alongside the categorization analysis with codified variables.

The general answers to the questions are the following:

- **What is your role and how is your organization involved in tourism in Barcelona?**

This question was used as a way for readers to comprehend the backgrounds of the stakeholders interviewed. Accounting for the 5 stakeholders, there are included the CETT-UB institution, MTS Globe as a DMC, the Barcelona official tourism board Turisme de Barcelona and two hotels that have a strong presence in the city.

These stakeholders were selected based on their tourism presence in the city and their level of awareness of AI systems, having important roles to nurture the tourism of the city.

However, as it will be seen forward, not all the stakeholders interviewed had the same level of knowledge regarding this new tool. Most prominently, the MTS globe branch in Barcelona does not use this type of tool. Regardless, it stands that all of the interviews have some impact on the tourism landscape of the city.

- **Is your organization currently using AI? If so, in what ways?**

MTS Globe was the only participant in this question to mention not using AI in any form, at least on the Barcelona division of the company. Their reasoning was that due to the constant presence that needs to be present with the customers. This is aligned to the other participants' responses, which mention that their uses are on the operational side instead of the customer side. However, it is important to notice that none of the customers mentioned any explicit use of it to interact face-to-face with the customers. With no mentions towards any of the literature review's examples such as the airport robots, which are lacking on the Josep Tarradellas Airport.

The other stakeholders have pointed out that the most use given to the AI was sent to the technological and sales department of each organization, mentioning marketing applications that work on the background of other staff's operational procedures.

- **What motivated the adoption (or non-adoption) of AI in your organization?**

The stakeholders in this process mentioned the use of AI as part of the modern adaptation of new technologies for their services, as AI is growing at an accelerated rate and the need to adapt to future changes. Whilst stakeholders agree that modern adaptation is their reason behind the new changes, Marriott Four Points mentions that it was more of a pressured decision coming from its competitors using AI as part of their new services and, as such, had no proper time to adapt, unlike the bigger branches of Marriott. The other stakeholders also mention the use of this new tool as a way to accelerate and optimize their processes, but usually as part of marketing and sales tracking, as mentioned before. Despite MTS Globe having no use of AI services and tools, it mentioned before that it helps in the automatization of processes, which is related to the advancements seen in the literature review regarding the applications of AI.

A noted point is that none of the interviewed mentioned the substitution of staff or employees due to the adoption of AI services in their procedures. The reason behind this may be because the uses for the AI in these cases has not yet extended far enough to do so, as there is evidence which proves that AI, alongside Augmented Reality and other technologies is slowly but surely replacing workforces entirely (Yilmazdogan. 2024).

- **What benefits has AI brought to your organization or operations?**

The interviewed stakeholders generally agreed that the main benefits brought by AI are related to operational efficiency, optimization of processes and support in decision-making. However, the extent of these benefits varied depending on the stakeholder and their level of AI implementation within the organization, as some of them have described its uses for sales and marketing departments whilst others have been using it for simple operational procedures.

CETT-UB emphasized the use of AI as a way to accelerate processes and improve efficiency in educational and organizational tasks. This aligns with the literature review, where AI is often portrayed as a tool capable of simplifying administrative and operational procedures while improving productivity. Similarly, Turisme de Barcelona stated that AI assists in solving complex problems and generating ideas for projects and planning, although its use remains mostly operational and background-oriented.

Hotel Condes Barcelona highlighted the benefits of AI within the marketing and publicity departments, particularly in webpage design and sales optimization. This demonstrates how AI is currently more present in analytical and promotional environments instead of direct tourism interaction. Marriott Four Points, on the other hand, mentioned that their implementation of AI is still recent and therefore there are no clear measurable results attributed to it yet. This indicates that some tourism organizations are still in an early adaptation phase where AI is perceived more as an experimental or supportive tool rather than a transformative technology. This is once again in accordance with the literature review, which showcases the lack of game-changing applications of AI in Barcelona's tourism landscape.

MTS Globe did not identify any direct benefits due to the absence of formal AI implementation within its Barcelona branch. Nevertheless, even this stakeholder recognized AI's role in automation, indirectly acknowledging its potential advantages within tourism operations.

- **In your opinion, has AI improved the tourist experience? How?**

The stakeholders interviewed generally displayed uncertainty regarding the direct impact of AI on the tourist experience. While most participants acknowledged the potential of AI to improve tourism services in the future, few were able to identify concrete examples in which AI currently enhances the experience of tourists within Barcelona.

CETT-UB considered that AI still remains in an early stage regarding its real impact on tourists, despite recognizing its strong future potential. This cautious perspective was also shared by Marriott Four Points and MTS Globe, both of which expressed uncertainty regarding AI's ability to significantly transform tourism experiences beyond automation and operational support.

Turisme de Barcelona and Hotel Condes Barcelona linked AI improvements primarily to marketing, webpage design and trip preparation processes. According to these stakeholders, AI may help tourists indirectly by facilitating access to information, improving travel planning and supporting digital services. However, these applications remain largely external to the physical tourism experience itself.

An important observation derived from the interviews is that none of the stakeholders identified

examples of highly advanced AI applications directly interacting with tourists within the city, such as AI robots, smart assistants or autonomous tourism systems frequently discussed in the literature review. However, it does not contradict it as it has been seen throughout the interviews that Barcelona has yet to implement AI towards more impactful tourism purposes.

- What challenges or limitations have you encountered when using AI?

The interviewed stakeholders identified several challenges and limitations regarding the implementation and use of AI technologies. These concerns varied depending on the organization's level of familiarity with AI systems, although several common patterns emerged throughout the interviews.

CETT-UB provided the most extensive and critical perspective regarding AI limitations. The institution highlighted concerns related to ineffective prompt usage, overreliance on AI tools, unequal access to paid AI services and the possible deterioration of critical thinking skills due to excessive dependence on automated responses. Furthermore, CETT-UB also emphasized the environmental impact of AI systems, particularly regarding energy and water consumption required to sustain large technological infrastructures. These concerns strongly align with the ethical and sustainability debates presented within the literature review.

Other stakeholders mainly focused on practical and technical limitations. Turisme de Barcelona and Hotel Condes Barcelona both mentioned difficulties understanding advanced AI functions and limitations regarding employee training. In these cases, the majority of staff members rely primarily on accessible public tools such as ChatGPT instead of more specialized AI systems. This demonstrates that, despite AI adoption, technical knowledge among tourism employees remains relatively limited.

MTS Globe expressed concerns regarding the complexity of configuring AI systems correctly and the operational difficulties that may emerge during implementation. Meanwhile, Marriott Four Points emphasized uncertainty regarding the future uses of AI as well as environmental concerns associated with large AI infrastructures.

- Are there any concerns regarding ethics, privacy, or job displacement?

The majority of stakeholders interviewed did not perceive AI as an immediate threat regarding ethics, privacy or job displacement within their organizations. However, CETT-UB expressed the most critical and academically developed perspective regarding these issues. The institution highlighted concerns surrounding the collection and use of personal data by AI systems, emphasizing the importance of transparency and regulation under frameworks such as the European Union Artificial Intelligence Act. Additionally, CETT-UB acknowledged the ongoing debate regarding job displacement, although it argued that AI is more likely to support human work rather than fully replace it in the near future. Something which the other stakeholders confirmed with their testimonies, as none of them mentioned any concerns regarding any of the proposed problems.

The remaining stakeholders generally stated that they had not experienced direct ethical or labor-related issues due to AI implementation. Turisme de Barcelona and the hotel stakeholders indicated that AI had not caused staff replacement or workforce reductions within their organizations. Instead, AI was mainly perceived as a complementary support tool for operational and marketing purposes.

Hotel Condes Barcelona raised concerns regarding possible data leaks and customer information security, although they clarified that AI systems are not directly responsible for storing customer information within their organization. Meanwhile, Marriott Four Points suggested that larger hotel

chains pertaining to Marriott may possess more advanced AI procedures and therefore potentially face more complex ethical challenges than smaller branches currently do. Unfortunately, it was not possible to interview the larger chains of Marriott during this project.

- Do you think AI can help address issues like overtourism or sustainability in Barcelona? Why or why not?

The stakeholders interviewed presented mixed perspectives regarding AI's capacity to address issues such as overtourism and sustainability within Barcelona. While some participants believed AI could become a useful tool in the future, others remained uncertain regarding its practical applications in these areas.

CETT-UB expressed the strongest confidence in AI's potential contribution to sustainable tourism management. According to the institution, AI may help manage tourist flows, improve circular economy strategies and facilitate better integration between tourism stakeholders and the local population. Furthermore, CETT-UB highlighted the role of AI in improving environmental protection through the use of data analysis and more informed decision-making processes.

In contrast, MTS Globe, Turisme de Barcelona and Marriott Four Points showed uncertainty regarding how AI could directly contribute to solving overtourism or sustainability problems. Their responses suggest that, at present, AI applications within their organizations remain focused primarily on operational support, marketing and process automation rather than urban management or sustainability strategies.

Hotel Condes Barcelona adopted a more optimistic position, suggesting that AI may gradually expand into functions capable of assisting tourism sustainability in the future. However, the stakeholder did not provide specific examples of current AI systems actively contributing to sustainability objectives.

An important finding from the interviews is that the majority of stakeholders still associate AI with internal operational functions rather than broader destination management strategies. This demonstrates that, despite the theoretical potential presented in academic literature, AI applications related to sustainability and overtourism management remain relatively underdeveloped or insufficiently visible within Barcelona's tourism industry. Which was also explored in previous questions.

- How do employees and customers generally react to the use of AI?

The interviewed stakeholders generally described employee reactions toward AI as positive or neutral, particularly when AI tools are perceived as supportive technologies capable of simplifying tasks and improving efficiency. Customer reactions, however, appear more limited due to the relatively low visibility of AI systems in direct tourism interactions.

CETT-UB noted that customers are initially reluctant toward AI due to unfamiliarity with the technology and uncertainty regarding its applications. Nevertheless, the institution explained that users tend to recognize the usefulness and value of AI once they become more accustomed to it. This reflects the broader societal adaptation process currently taking place regarding emerging technologies.

Turisme de Barcelona and Hotel Condes Barcelona both reported positive employee reception toward AI implementation, especially because the technology assists with operational tasks, planning and marketing procedures. In these organizations, AI is viewed primarily as a tool that facilitates routine activities rather than replacing human labor.

The interviewed hotels also mentioned that customers rarely comment on AI systems directly, mainly because most AI applications remain invisible to them or are limited to webpage functionalities and background processes. Similarly, Marriott Four Points indicated that AI is mostly used internally by staff members and therefore customers generally do not react to it during their stays.

MTS Globe stated that, since they do not formally use AI within their Barcelona branch, they cannot evaluate employee reactions accurately. However, the stakeholder acknowledged that tourists themselves increasingly use AI tools independently to obtain information and understand complex travel-related issues. This relates to how they utilize this technology to plan their itineraries beforehand without the need to consult a travel agency or a professional, but as stated earlier, AI may not replace them as it currently does not have the power to interpret its choices better than an actual human.

- **How do you see the role of AI evolving in Barcelona's tourism sector in the next few years?**

The interviewed stakeholders generally agreed that AI is likely to play a more significant role within Barcelona's tourism sector in the future, although opinions differed regarding the speed and scale of this transformation.

CETT-UB presented the most developed vision regarding the future evolution of AI in tourism. According to the institution, AI will become increasingly integrated within Barcelona's strategy as a smart, sustainable and data-driven tourism destination. The stakeholder emphasized that AI should function as a strategic management tool capable of coordinating tourism stakeholders and supporting long-term sustainability objectives.

The remaining stakeholders also anticipated further AI growth, although most maintained cautious expectations regarding its immediate impact. They sustained that AI may gradually evolve into a more visible and efficient support system capable of assisting tourists throughout their travel experience. The organizations highlighted the possibility of future expansions in areas such as applications, marketing systems and operational management.

Marriott Four Points and MTS Globe expressed more reserved perspectives, indicating uncertainty regarding the extent to which AI may truly transform tourism operations in the near future. Both stakeholders emphasized that current AI applications remain limited and mostly operational, suggesting that substantial transformation may still require further technological development and organizational adaptation. However, it is possible that this may be partially due to their low usage of the tool to develop a sharper point of view about its applications. A more repeated usage of it may lead to the discovery of the options pointed out by the other stakeholders interviewed.

5. Conclusions

Artificial intelligence has become an increasingly relevant topic within the tourism industry due to its growing applications in operational management, customer service, digitalization and sustainability strategies. Throughout this research, it has been possible to analyze both the theoretical perspectives presented in academic literature and the practical perceptions of stakeholders involved within Barcelona's tourism sector. Throughout the literature review, it can be seen that AI possesses significant potential to transform tourism through automation, personalization, data analysis and smart tourism management systems. Furthermore, previous studies highlight the possible contribution of AI towards sustainability objectives, optimization of tourist flows and the improvement of operational efficiency.

However, it is this same literature review that also points out the flaws given in the sector due to the use of this new technology. Namely the concerns with privacy, data leakage, sustainability issues and tech limitations at the present time. Thereby, proving that the technology is still in an early stage in its life, yet it shows incredible potential for stakeholders and businesses to take advantage of, in and out of the tourism sector.

In order to answer the objectives proposed at the beginning of this project, alongside the literature review, a qualitative research was performed using purposive sampling in order to select stakeholders based on their level of relevance in the tourism scene of Barcelona, ranging from institutions, hotels and DMC's with any level of awareness of this new technology. Afterwards, semi-structured interviews were performed in order to analyze their answers through a categorization analysis and a qualitative exploratory research, which yielded the answers to the previously established objectives. To complement this qualitative research, a categorization analysis was also performed with descriptive counts and codified categories.

The qualitative research performed with stakeholders in Barcelona revealed that the practical implementation of AI within the city remains considerably more limited than what is often suggested in theoretical discussions. Most interviewed stakeholders primarily use AI as an operational support tool focused on marketing, sales analysis, process optimization and administrative tasks. Direct customer-facing AI applications remain relatively uncommon among the interviewed organizations. However, the CETT-UB institution revealed that in the context of tourism in Barcelona, there is a high possibility that AI will become a strong player in the future, as its applications have been shown in other countries and in different tourism services such as airports and direct interactions in hotels. Something which is corroborated by the literature review of the topic. However, at the present time, other stakeholders in the city of Barcelona have not yet tapped into the full potential of this technology, as the lack of hard evidence in this matter as well as the testimonies of the interviewed stakeholders prove that the technology is still being applied only at surface level for operational procedures and administrative roles.

The results also demonstrate that stakeholders generally perceive AI as a technology with future potential rather than as a transformative tool that is already changing tourism in a significant manner. Many participants expressed uncertainty regarding AI's capacity to directly improve the

tourist experience or solve complex issues such as overtourism and sustainability. Nevertheless, stakeholders acknowledged that AI may gradually become more relevant as tourism organizations continue adapting to digital transformation processes. In turn, they accepted the adoption of the system in their procedures and operations. As many stakeholders pointed out, it helps them in their current routines and has established itself as one of the tools available to the staff members, even if the customers do not perceive it actively just yet. An exemption of this can be seen with MTS Globe, as its stand to not adopt AI is due to their operational procedures needing to interact directly face-to-face with the customers in real time, something which they state that AI cannot replicate nor help, revealing that there are roles which this technology simply cannot adapt to yet.

One of the most relevant findings of this research is the contrast between the optimistic discourse commonly found within academic literature and the cautious, limited and fragmented implementation currently observed among tourism stakeholders in Barcelona. While institutions such as CETT-UB and technological sectors actively promote AI development and digitalization, many tourism organizations still remain in early adaptation stages and primarily use accessible tools such as ChatGPT for operational support rather than advanced integrated systems. Additionally, the research confirms that human interaction continues to be considered essential within tourism services. Several stakeholders emphasized that AI should function as a complementary tool rather than a replacement for human workers, particularly in areas requiring interpretation, emotional intelligence and personalized assistance. Thus, it cannot be said that the perception of stakeholders in regards to the use of AI is completely positive, as they remain skeptical about their proper uses and applications, even with some of them presenting a positive outlook to the future of AI.

Stakeholders have also pointed out a number of challenges that have risen due to the use of AI in the tourism industry. Namely, CETT-UB has raised the most amount of academically related concerns in regards to its use. such as the loss of critical thinking, unequal paid access versions and damage to the environment as a result of the overuse of the tool. The literature review serves as proof of this testimony, revealing areas that consume much energy and access due to the overuse of this technology. Similarly, other stakeholders pointed issues in regards to the setup of the system, claiming that they lack the required knowledge of prompts or technical requirements to configure the system. Something interesting to note is that Turisme de Barcelona's staff mentioned that they do not use it directly, yet it is working in the background of their operations, which may also raise another challenge; the lack of proper training of staff members in this area. Despite CETT-UB already doing so, other companies do not believe AI needs extensive training in order to use it, which may indirectly delay the advantages and applications which the tool could yield in the future of tourism.

One of the most relevant findings of this research is the contrast between the optimistic and transformative discourse often presented in academic literature and the cautious reality observed among tourism stakeholders in Barcelona. While AI is recognized as a technology with future potential, most stakeholders still perceive its applications as being in an early stage of development. The interviewed organizations generally expressed uncertainty regarding AI's ability to significantly improve tourism experiences or solve complex issues such as overtourism and sustainability in the short term.

The results also indicate that human interaction continues to play a fundamental role within tourism services. Several stakeholders emphasized that AI should function as a complementary support tool rather than a replacement for employees, particularly in environments where interpretation, emotional understanding and personalized service remain essential elements of the tourism experience. As seen in the interviews provided by the stakeholders, the use of AI has been proven to be at the surface level in Barcelona, but there are no signs of growth towards a level of replacement of human functions unlike some examples provided on the literature review, such as the use of AI powered robotics for cleaning functions on airports. Additionally, this research identified several

challenges associated with AI adoption. These include technical difficulties, lack of employee training, uncertainty regarding practical applications, concerns about environmental impacts and the possible overreliance on automated systems. These findings reinforce the idea that the tourism industry in Barcelona has not completely adopted AI in the same ways as other countries have.

5.1. Limitations of the research

During the period in which the study was carried out, many stakeholders were experiencing a new peak in visitor numbers, as well as facing preparations for the upcoming summer season. As such, the number of available stakeholders to interview was limited and was not possible to acquire a larger number. Another factor to take into account is that many companies and businesses are afraid of revealing their inner procedures, as it could cause a leak in information and reveal trade secrets, which made them even more reluctant to share their answers. AI as a tool in the market is one of the most sought-out and invested technological advancements in recent years, and companies are struggling to differentiate each of their own AI's against their competitor's. Thus, they prefer to stay quiet about their procedures.

Furthermore, the constant shifts in AI technology and advancements makes it essential for stakeholders and businesses to keep updating their own systems. Thus, the accuracy of each report may not reflect the current state of the technology. Turisme de Barcelona stated, before their interview, this same reasoning, as their current workforce only operates with surface level AI systems.

5.2. Implications of the research

This research was done as a project in order to study the situation of Barcelona in regards to the new AI technologies after their major adoption worldwide as a system to aid in operations in the vast majority of sectors. Throughout this period, AI operated systems have gone beyond simple artificial intelligence to follow a pre-set line of instructions to a much more complex system that can provide answers in real time, interpret situations and optimize and even automate certain routines that were previously performed by human input. It was because of this phenomenon that this research was made in order to assess the situation that was happening in the tourism landscape of Barcelona with the arrival of AI.

Thus, this research was made with the purpose of to help the tourism sector and researchers to acquire new knowledge and awareness of the potential and possible flaws of AI operated systems in tourism. As well as acknowledge the situation which stakeholders are currently in with this new tool, as they are often overlooked in reports talking about the benefits of AI for tourism, focusing only on the prospects that this tool may bring in the future, but not how it is affecting them at the present time.

Additionally, the results of this research show that the current state of AI is not limited to the tourism and social sectors, but to the general area of Barcelona. Despite having an image of an advanced, touristic city, it is contradictory that it would not apply one of the biggest innovations in technology into one of their biggest sectors, more so when other countries do. Hence, this research also helps in providing light into this detail and exposes the previously mentioned benefits and flaws so that AI may be implemented in the future in more sectors of the city.

5.3. Future lines of research

The nature of this project is not to provide or create a new AI powered solution for the tourism

landscape for the city of Barcelona. Rather, it allows for a deeper insight on the behavior of stakeholders about the use of AI in the tourism sector of Barcelona, pointing out its applications, flaws and potential benefits that it is currently not observing. The research performed with the interviews with the stakeholders includes bibliographic and qualitative methodologies applied with the stakeholders to properly showcase their points of view. However, future research could expand on the qualitative approach by using larger samples of stakeholders and developing a quantitative methodology through structured surveys and statistical analysis.

Therefore, it is proposed that for future research a more scientific and technical approach is performed with qualitative findings showcasing tools such as charts and tables that may reflect on the use of AI in the sector and how many stakeholders are actually using it directly with their customers, not just as a part of their operational procedures.

Lastly, it is also proposed that this type of research may be expanded to other cities with similar tourism landscapes in order to make a comparison with the city of Barcelona and determine possible additional applications of this technology for the catalan capital. This would also allow for better cooperation between cities and exchange of technology knowledge for the advancement of AI and the tourism industry as a whole. As seen on the literature review, a proper use of AI can benefit the area on a grand scale, providing good results and optimizing more processes which currently require human input.

6. Results and answers to the initial questions

The first research objective aimed to analyze how artificial intelligence is being applied within the context of tourism in Barcelona and what effects it is having on stakeholders. The results demonstrate that AI is currently being utilized mainly for operational and administrative functions rather than direct customer interaction. Stakeholders such as Turisme de Barcelona, Hotel Condes Barcelona and Marriott Four Points highlighted the use of AI in marketing, sales optimization, webpage design and process automation. Meanwhile, CETT-UB emphasized the role of AI within educational digitalization and future tourism development, pointing out ethical issues which plague the use of this system throughout the world. These findings indicate that AI implementation within Barcelona remains largely focused on internal organizational efficiency rather than highly visible tourism applications. However, it is possible that this finding may change in the future, as Barcelona is a destination which is highly nurtured by its tourism income and innovation measures. Thus, the prospect of AI in tourism may be promoted once more applications are discovered in the future.

The second research objective focused on understanding the motivations behind the adoption or

non-adoption of AI technologies within tourism organizations. The interviews revealed that stakeholders are primarily motivated by the need to adapt to modern technological changes and remain competitive within the tourism industry. Operational optimization and service enhancement were also identified as key motivations behind AI adoption. However, organizations such as MTS Globe demonstrated caution regarding AI implementation due to uncertainty about its practical applications and effectiveness within tourism services. Therefore, it can be concluded that the current uses and adoptions of AI by stakeholders has not been exploratory. Whilst they adopt the technology, they do not utilize its full potential, merely using it as a background agent or tool to aid in the current operations of each company.

The third objective sought to analyze stakeholder perceptions regarding AI and its influence on tourism experiences. The results suggest that stakeholders generally maintain a cautious but optimistic perception regarding the future of AI within tourism. While several participants acknowledged AI's future potential, most agreed that its current impact on tourism experiences remains limited. The interviewed organizations did not identify significant direct AI interaction with tourists, reinforcing the idea that AI applications within Barcelona are still in an early stage of development. However, the literature review showcased examples being applied in other countries which use AI systems for tourism in more applications than those shown in the city of Barcelona, yet, neither the government nor the stakeholders have shown interest in exploring these applications at any point, which may seem at odds with the idea of Barcelona being an innovation center for technology and tourism.

The last objective of this research was to identify the challenges and limitations associated with AI implementation. The results revealed that technical difficulties, lack of employee training and uncertainty regarding AI functions remain among the most common concerns for stakeholders. Furthermore, concerns related to environmental impacts, overdependence on technology and the preservation of human critical thinking were also identified, particularly by CETT-UB and Marriott Four Points. These findings align with the concerns presented in the literature review regarding the ethical and environmental implications of AI systems. The research also aimed to assess whether AI could contribute to solving issues such as overtourism and sustainability within Barcelona. Although the literature review frequently presents AI as a useful tool for smart tourism management and sustainability strategies, the interviewed stakeholders generally expressed uncertainty regarding its practical effectiveness in these areas. While CETT-UB presented a more optimistic perspective concerning AI's ability to support sustainable tourism management and tourist flow control, the majority of stakeholders stated that current AI applications remain focused on operational support rather than destination-wide sustainability management.

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8. Annex

What is your role and how is your organization involved in tourism in Barcelona?	Answer
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CETT-UB	My organization is involved in tourism in Barcelona as a recognized higher education institution in tourism, contributing through teaching, research, and applied projects in the field.
MTS Globe	We are a DMC specialized in providing tourism services around Europe and here in Barcelona we give specialized attention for groups of tourists heading to their destinations.
Turisme de Barcelona	We are responsible for promoting Barcelona as the leading tourism destination in Spain. We promote the tourism offers and activities within the city.
Hotel Condes Barcelona	Ours is a hotel in Passeig de Gràcia designed to provide comfortable stays for customers that want to be at the heart of the city. We have a great locations besides the Pedrera of Gaudí.
Hotel Marriott Four Points	We are a hotel in the district 22@ in Poblenou. We usually have visitors coming for business purposes, as the 22@ is the innovation district of the city.

Is your organization currently using AI? If so, in what ways?	Answer
CETT-UB	Yes, my organization is currently using artificial intelligence in several ways. We offer master's programs focused on tourism, digitalization, and AI, so we are already specialized in this field. In addition, our staff, including myself, has received expert training on how to use and apply AI effectively in teaching and in the classroom.
MTS Globe	We do not use AI, but we think other companies use it because it helps their employees automate their processes.
Turisme de Barcelona	Our technological department implemented the use of AI. According to them, it helps keep track of the sales and automate their processes, but our procedures at the front desk are unaffected. We mostly use it to help us automatize processes.
Hotel Condes Barcelona	The higher-ups use it as part of the marketing department to optimize the processes of sales and publicity, but we do not have access to the exact full details.

Hotel Marriott Four Points	Our staff mostly uses it on applications such as ChatGPT, Gemini and other things, but we do not use it directly with the customers.
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What motivated the adoption (or non-adoption) of AI in your organization?	Answer
CETT-UB	AI has become part of the way we work, so like many other sectors, we have had to adapt and adopt it as a new tool. It helps us manage processes in a faster and more efficient way.
MTS Globe	We do not see the benefits that the AI may give us here, as we are guiding customers to their destinations from Barcelona and the work we do requires physical inputs.
Turisme de Barcelona	The technological department says that it is designed to help our operational procedures while keeping track of sales, but it's in the background so we do not know the technical procedures. At the front desk, we use it in case we have a more complex problem or want to get ideas for a project.
Hotel Condes Barcelona	As the other companies were using AI to adapt to the changes in the future, we wanted to use AI as well as part of our routine. The staff mostly uses it to find information or solve problems.
Hotel Marriott Four Points	Our competitors have begun to use it a lot and we could not just stay idle without it, so we adopted it as part of our standard procedures.

What benefits has AI brought to your organization or operations?	Answer
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CETT-UB	It helps us manage processes in a faster and more efficient way.
MTS Globe	None. We have not adopted its formal use. At least, not here in Barcelona.
Turisme de Barcelona	It helps us solve some problems that require a more in-depth search. It also gives us ideas as to how to plan a project or design something.
Hotel Condes Barcelona	The higher-ups use it as part of the marketing department to optimize the processes of sales and publicity, using it for the webpage design, among other things.
Hotel Marriott Four Points	As we have used it very recently, we do not have any clear statistics that may be attributed to AI. Perhaps in the future when it grows, we may use it more.

In your opinion, has AI improved the tourist experience? How?	Answer
CETT-UB	In my opinion, it is still too early to clearly demonstrate this in full, although it is already showing strong potential. There is a clear intention for AI to improve the tourist experience, but from my perspective its real impact is still in a very early stage.
MTS Globe	We are not sure how AI can improve the tourism industry as a whole. It helps in the automation of processes, but we don't know how it may help the situation as a whole. This is a reason as to why we don't use it.
Turisme de Barcelona	We can say that it has improved the operations of tourists for preparations of trips and companies with the design of webpages or tracking of sales, as is the case in our company.
Hotel Condes Barcelona	With the development of marketing projects and portfolios of sales for the businesses to use.
Hotel Marriott Four Points	We are unsure how it may help in the future. We ourselves have just begun using it, but we don't know if it can help tourism in any big way.

What challenges or limitations have you encountered when using AI?	Answer
CETT-UB	The main challenges and limitations I have encountered when using AI: Challenges: • Difficulty in using prompts effectively to obtain clear and accurate responses. • Overuse of the tool due to the existence of multiple platforms with different features. • Risk of unequal access to paid versions, which may increase social segregation. • Possible loss of critical, analytical, and reflective thinking skills due to constant interaction and the speed of responses. • Environmental impact linked to the high consumption of energy and water required to operate these technologies. Limitations: In my opinion, AI is a powerful tool, but it only works effectively when there is a human, critical mind capable of using it to unlock its full potential. In the end, I believe that human thinking and critical capacity cannot be replaced by machines. However, machines such as AI can significantly help to simplify and support even complex processes, improving their clarity, precision, and level of detail.
MTS Globe	We heard that AI usually causes problems to companies with their operational functions and use. Usually they have trouble configuring it correctly.
Turisme de Barcelona	We usually have trouble understanding some of the AI functions, as our main program works in the background and only the

	higher-ups know what it is for. That is why we mostly use ChatGPT for our operations while the sales AI is working separately.
Hotel Condes Barcelona	Sometimes we struggle with some of the AI functions. The staff usually says that they do not know how to use the learning AI and just use the basic ChatGPT. If anything, the limitations we encounter are in any further uses besides ChatGPT and other similar programs.
Hotel Marriott Four Points	We know that AI is making a lot of impacts within the environment. We see on TV some ads regarding the AI centers built that destroy nature. As for us, our challenge is to know what uses we can give it in the future. But we still use normal operations without AI.

Are there any concerns regarding ethics, privacy, or job displacement?	Answer
CETT-UB	Yes, in my opinion there are concerns regarding ethics, privacy, and job displacement that are under consideration and current discussion. • Ethical and Privacy: concerns about how personal data is collected, stored, and used by different AI systems. Transparency and responsible use guaranteed by AI systems according to the EU Artificial Intelligence Act. • Job displacement: ongoing debate about the extent to which AI may replace certain tasks or roles, although it may also create new opportunities and support human work rather than fully replace it.
MTS Globe	None in our case. Our recruitment procedures are usually temporary and we do not have any privacy issues.
Turisme de Barcelona	We usually do not have issues regarding job displacement. The sales department uses it to keep track of sales but we haven't heard of anyone being fired because of it. As for ethics, we don't have any problems here. The town hall has everything regulated in its use.

Hotel Condes Barcelona	None so far. We have heard of data leakage and how sometimes companies lose their customer data, but we do not store it using AI. Nor are there any issues of job displacement within the company. We do know that customers sometimes prefer the use of AI for their itineraries, but the interpretation is best left to an actual professional.
Hotel Marriott Four Points	We do not have any issues of ethics or job displacement due to AI. The other Marriott hotels seem to use it more than us though, so maybe they have a more controlled point of view.

Do you think AI can help address issues like overtourism or sustainability in Barcelona? Why or why not?	Answer
CETT-UB	Yes, it can help manage tourist flows, improve the circular economy, and support better integration between tourism and local stakeholders. It can also contribute to stronger environmental protection through the use of data and more informed decision-making.
MTS Globe	We are not sure about how it can do it, as its uses seem to be more focused on operational procedures and not something that helps those kinds of problems.
Turisme de Barcelona	I am not certain how it may improve further situations within the city, as the uses we have for it are currently operational. It is primarily focused on the marketing area, as we mentioned, but nothing that may help sustainability.
Hotel Condes Barcelona	We do think that AI will grow in the future to help tourism. The marketing department uses it and we think that it can expand to other functions later on. It already helps with the website, so it is possible that tourists may come to use it further on.
Hotel Marriott Four Points	We are unsure how it may help in the future. We ourselves have just begun using it, but we don't know if it can help tourism in any big way other than using it as a tool on behalf of the staff or by tech teams.

How do employees and customers generally react to the use of AI?	Answer
CETT-UB	In my opinion, customers are initially reluctant because they are not fully familiar with what AI is and how it can help them. However, once they become more familiar with it, they tend to recognize its potential and value.
MTS Globe	We do not use it so we do not know on behalf of us as a company in Barcelona at least. We see that tourists tend to use it to understand complex issues, however.
Turisme de Barcelona	For us it came as no surprise that we end up using it as we have to keep updated with the new technologies as part of the Town hall for tourism promotion. As for our customers, they usually accept their use for quick answers, but we do not use it directly with them.
Hotel Condes Barcelona	Employees had a general positive reception as the AI proves to be useful in their operations and helps them smooth some routines. Customers would only really see it on the webpage, but none of them had mentioned anything about it when they came to visit. We know it helps with their trip planning.
Hotel Marriott Four Points	Our staff sometimes uses it and mentions that it helps them in some of their tasks. Customers have no reaction about AI in our hotel as we do not actively use it as part of their stay.

How do you see the role of AI evolving in Barcelona's tourism sector in the next few years?	Answer
CETT-UB	In the next few years, I see AI playing an increasingly important and integrated role in Barcelona's tourism sector, especially as part of the city's broader strategy to become a smart, sustainable, and data-driven destination. AI should serve as a strategic tool for managing the tourism ecosystem, involving all stakeholders and

	aligning with the destination's overall strategy.
MTS Globe	Barcelona may grow to accept AI as part of their tools to promote tourism, but until it becomes useful and can perform more complex tasks, it won't make much of a difference.
Turisme de Barcelona	In Barcelona's case, AI may grow to become a strong player in tourism. While it currently doesn't have a clear scenario in which it shines on its own, they may refine its efficacy to help tourists in every step of the way.
Hotel Condes Barcelona	As we said, it will improve in the future to offer solutions to the problems of overtourism and sustainability that you mentioned. Maybe the marketing and sales department finds a way for the front desk to use it more often and for tourists to apply it with an app.
Hotel Marriott Four Points	We are not sure about how it will play out in the future. We have continued using our regular procedures and implementing the AI bit by bit, but nothing major so far.