

NFTS: WHAT OPPORTUNITIES AND CHALLENGES IN TOURISM?

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Abstract

Purpose – In previous works we discussed the contribution of digital tourism not only to the improvement of the reputation of a Country (i.e. Sentiment Analysis) but also of the possibility to create opportunities for a new kind of online tourism. In recent times, with the development of the so-called Metaverse, also influenced by the pandemic emergency, Countries' digital efforts in creating tourism opportunities gave new perspectives related to the possibility to capitalize on digital content, transforming them – jointly with physical tourism experiences – into possible further incomes and means to increase a Countries' reputation. Specifically, in this context, we considered the enabling technology represented by Non-Fungible Tokens (NFTs), an innovative application of blockchains creating a unique opportunity in several sectors, including tourism. This work aims to explore possible applications of NFTs in tourism, analyzing the experiences currently in place.

Methodology – Due to the innovative topic and the very few experiences in NFTs applications in tourism, this paper represents a preliminary review of current projects implementing the use of NFTs, so that the applied methodology consists mainly in qualitative analysis and discussion about the possible development of this technology in tourism. To this purpose, we introduced some applications currently in place, such as those of travel agencies like Travala, of some airlines (Air Europa, Emirates), Cruises companies (Norwegian Cruise Line), of the Economic Development Ministry of Slovenia (project "I Feel Nft", presented at Expo Dubai 2020, representing the first of this kind in the world). The paper explores possible implications and further development of these initiatives, designing possible metrics to measure their success, paving the way for future quantitative analysis once data about the introduced case-studies is available.

Findings – Through the discussion of the cases found, it appears that the main benefits of digitisation through NFTs consist in promoting and presenting major tourist destinations, exhibitions, works of art and companies' products in the form of tokens, digital content and souvenirs for visitors. However, some of the analysed cases also suggest possible applications for actual commerce in the tourism sector, including ticketing services and hotel bookings. Other possible applications can be hypothesised with regard to the certified training of staff working in the hospitality sector.

Originality of the research – The paper is highly innovative and currently unique in that the adoption of NFTs in tourism is recent and still open to proposals for implementation. The contribution is therefore very important, both in terms of operational proposals (applications, guidelines and good practices) and in terms of defining metrics for measuring the effectiveness of NFTs in the tourism economy.

Keywords NFT, Non-Fungible Token, Blockchain, Econometrics, Digital Platforms

INTRODUCTION

In previous works (Musanovic, Folgieri, Gregoric, 2021; Folgieri, Baldigara, Gricar, 2020; Folgieri, Bait, Carrion, 2016) we discussed the contribution of digital platforms as a means to improve the reputation of a country (i.e. Sentiment Analysis), analysing the possible opportunities given by virtual tourism (Folgieri and Bait, 2014). In a few years, the latter has become a fundamental asset for tourism and especially with the development of Virtual Reality into the so-called Metaverse, the digital world has become an aspect impossible to neglect in a country's tourism offering. We cannot emphasise enough how the pandemic emergency has pushed countries to intensify digital efforts to create tourism opportunities.

However, the cost of creating digital content is not completely absorbed, in terms of return on investment, by the decrease in real tourism that has occurred over the past two years. In general, the returns on these investments occur indirectly, as mentioned above, through the improvement of a nation's reputation and thus resulting in a greater flow of tourists. The fact remains that it would be highly desirable if the investment made in digital could also constitute a source of revenue itself. From this perspective, the technological development in recent years gives new perspectives related, on one hand, to the possibility of further increasing a country's reputation, and on the other hand, to the possibility to capitalise digital content, transforming them - jointly with physical tourism experiences - into possible further revenue streams. Specifically, in this context, we considered the enabling technology represented by Non-Fungible Tokens (NFTs). In fact, NFTs represent an innovative application of blockchains creating a unique opportunity in several sectors, including tourism. This work aims to explore possible applications of NFTs in tourism, analysing the experiences currently in place.

Due to the innovative topic and the very few experiences in NFTs currently applied to the tourism sector, this paper represents a preliminary review of current projects implying the use of NFTs, so that the applied methodology consists mainly in qualitative analysis and discussion about the possible development of this technology in tourism. Indeed, the first paragraph is focused on some case studies about some initiatives currently in place.

In the following paragraph two, we introduce NFTs, whilst in paragraph 2 we present a review of current applications and good practices in applying NFTs in Tourism. In paragraph 3 we suggest guidelines to make NFTs effective. Furthermore, we also suggest some metrics in order to obtain Key Performance Indicators (KPIs) to evaluate the return coming from the implementation of an NFT strategy in tourism. In the discussion paragraph we suggest further possible applications and we report some criticisms related to NFTs.

Finally, in the conclusion, we highlight the impact of this study and summarise the possible benefit and the opportunities for further applications in tourism and investigation.

1. NFTS: BACKGROUND

NFTs are also known as “digital contracts” or, according to the Ethereum naming convention, as “smart contracts”. Practically, they are blockchain-based digital signatures used to authenticate digital assets.

In the NFT term, the word fungible makes this digital object particularly interesting. Fungible means “replaceable by another identical item; mutually interchangeable”. Many things around us are fungible, such as money, a pen, and a book, but when something is a unique asset it becomes non-fungible. To remain in the tourist field, a room with a breathtaking view at a specific time of year is non-fungible because for a tourist, it is not interchangeable with another time, another room, or another view. The NFT is thus a title to a unique digital asset (whose uniqueness and ownership are certified by the blockchain), which can represent a digital asset or be linked to an asset in the real world. Just like a real-world asset, an NFT can be transferred, sold or borrowed.

From a technical point of view, a digital file is converted into a digital asset that will be stored on the blockchain. The described process is named as “minting”. The commodity created through the minting process can be subsequently placed on the market, sold, bought, or resold. In this context, the blockchain allows the verification of the state of an NFT and tracking all trading activity among the users.

To enter the NFTs market, users need a digital wallet, such as Coinbase (<https://www.coinbase.com/>) or Metamask (<https://metamask.io/>), for the cryptocurrencies used in the NFTs marketplaces. The most known marketplace is Opensea, but there are specific marketplaces related to different sectors (music, for example). The Ethereum blockchain is also the most commonly used, but there are other options such as Binance (BNB currency), Solana (Sol currency), and even non-crypto alternatives such as Coinbase.

In order to place an NFT on a marketplace, usually, an initial fee is required. The requested amount depends on the fluctuation of the cryptocurrency market, this is known as ‘GAS’. There are also GAS-free alternatives, such as the Polygon Network (MATIC currency). Opensea, the main NFTs marketplace (Matney, accessed 16/01/2022), allows its users to sell their assets in several currencies. Once on the marketplace, the NFT can be sold adopting a fixed price or as an auction. To increase the value of an NFT for users, they are usually in limited editions. Therefore, they are particularly appreciated by collectors and suitable for auctions.

NFTs have undergone incredible development in recent years, especially in the field of Digital Art and are often associated with virtual art objects or the ‘virtualisation’ of real-world art artefacts, precisely because of this field of application. In this sense, NFTs are also receiving much attention in the field of cultural tourism, as a motivation to preserve (as a collector) a memory of a visit to a museum or place of cultural interest. Museums and institutions dedicated to cultural heritage have already adopted NFTs to explore the possibility of receiving funds by trading these digital assets. Indeed, cultural heritage institutions, who are always looking for funding and were particularly affected by the covid period, are seeing NFTs as a possible additional source of income. One of the advantages of NFT lies in the fact that blockchain provides certainty about authorship, the

authenticity of a work, royalties and associated duration (Chevet, 2018; Regner, Nils and Schweizer, 2019; Zeilinger, 2018). As far as artistic productions are concerned, NFTs also provide an opportunity to increase revenue for both artists (NBC, accessed 16/01/2022) and the owners of work whether they are individuals or institutions. Museums, galleries, and events could for example produce NFTs based on digital reproductions in limited collections even of a performance, which usually cannot be monetized. Some interesting cases concern the Uffizi Gallery and the Hermitage Museum. Both have used NFTs in order to raise funds: the Uffizi minted Michelangelo's Tondo Doni in May 2021; in July 2022, the Hermitage minted works by Leonardo, Monet and Van Gogh. The Whitworth Art Gallery in Manchester also minted its NFT of William Blake. Anyway, the most well-known NFT auction was made by The house Christie's which realised USD 69 million with the digital work 'Everyday's: The First 5000 Days' by Mike Winkelmann, known as Beeple.

Another sector in which NFTs are currently widely used is the music sector. In fact, musicians and composers have always had the problem of seeing the royalties of their work decreasing more and more over time due with too many intermediaries involved in the distribution of their work, as well as difficulties in achieving professional success and a recognised reputation in a highly competitive business sector. In this context, NFTs present an opportunity to reach potential audiences directly, creating a fanbase that not only benefits from supporting their favourite artists, but also from monetising collections of artists that may become famous over time. An interesting case in music is a duo of session-men who play in disguise to conceal their identity. They minted their latest 4 songs as an NFT collection on Opensea (<https://opensea.io/collection/clowncoin>) and sold them for a total of ETH 2.1922 (6179.98 euros at today's exchange rate), despite their fanbase being very limited (only 180000 subscriptions on youtube). Music NFTs are so developed that there are specific marketplaces for single-edition music NFTs such as Catalog, Foundation, Arpeggi and FormFunction. There are also platforms for different music genres, such as Grovetime for dance music, or Beat Foundry for generative music, and some Decentralised Autonomous Organisations (DAO, that is crypto-based investment co-ops) like Noise DAO or MusicFund, the latter collecting membership via NFTs, where holders vote each month to donate ETHEREUM to three musicians through the community fund.

The numbers revolving around financial transactions related to NFTs are impressive. The Opensea marketplace alone rose from 1.3 million in July 2021 (source TechCrunch) to more than 13 billion in January 2022 (source NBC); the total market cap of NFTs is about \$31.4 billion, making up 1.53% of the current \$2.05 trillion total market cap for cryptocurrency (source Blockworks). From a financial point of view, therefore, NFTs represent an asset of interest to investors in every field.

Although Digital Art was an early adopter of NFTs, the concept of 'smart contracts' is not limited to applications of this type. On the contrary, the applications being thought of are only more related to the purchase of tickets for events, cultural events, travel, hotels. For this reason, NFTs represent a great opportunity for tourism.

2. A REVIEW OF CURRENT APPLICATIONS AND GOOD PRACTICES IN TOURISM

In order to determine the potential application of NFTs to the world of tourism, we conducted a review of current initiatives to identify some good practices among them as examples for future initiatives.

One of the early adopters of the concept of NFTs as digital assets applicable to the tourism sector is IoTeX (<https://iotex.io/>), an open source platform at the intersection of IoT and blockchain, which has introduced a service that allows NFTs to be mined as ‘travel evidence’. Such NFTs allow data such as the location of the place visited, the weather and other (collectible) evidence of a location’s visit to be signed with cryptography. IoTeX has also collaborated with a blockchain-based travel agency to register tourist trips through blockchain, associating them with ‘proof of travel’ NFTs. There is no official data on the volume of users involved in this operation, but the initiative paves the way for other similar applications. For example, those who are passionate about monuments could collect NFT badges by completing a specific itinerary within an area, which could turn the idea of a holiday into a cultural adventure.

The advantage of using NFTs is that they are based on blockchain and, although there is still a lack of in-depth knowledge on the subject, most people know that the most appealing feature of blockchain is that it is secure.

However, probably the most interesting case is that of Slovenia, which was the first country in the world to issue NFTs through the ‘I feel NFT’ project to promote tourism. Aljoša Ota, director of the Slovenian Tourist Board, focused on sustainable innovation to confirm Slovenia as a smart destination, ‘ready to look to the future and new technologies’. The presentation press conference was held at Expo Dubai 2020, where the NFT deli issue was presented as a means of promoting the country’s tourism. It is a collection of 15,000 unique digital 3D icons, exclusive panoramas and 360 high-resolution photographs, the digitisation of which is secured by blockchain. The NFT cards, distributed by the Slovenian Tourist Board, also provide the right of access to a number of exclusive services in the country, such as events, museums, and attractions. In addition, Slovenia also plans to establish NFT certificates for tour operator training courses, who may become certified ‘Slovenia Experts’ in the future.

Other initiatives indirectly related to tourism concern the travel industry. Air Europa, for example, launched NFT tickets, a combination of digital information with experiences and services, which can be stored inside a wallet. At check-in, the NFT is switched into a travel document for boarding the flight. Emirates has also announced a similar project, which will combine the concept of collectable and Metaverse NFTs. In addition, Norwegian Cruise Line launched the first NFT collection to celebrate the launch of First Class, offering six artistic creations for sale and auction. Those mentioned are examples of initiatives already in place, but the main questions we should ask ourselves are: what are the applications we can imagine for tourism? Are there guidelines to identify an action that can be turned into NFT?

Why book a flight or a trip, a stay, a ticket for an event or a hotel room via NFT? For instance, should the customer or the merchant need to cancel the booking, neither the customer nor the merchant would lose any money as the NFT could be surrendered directly by the customer, simplifying cancellation and refund policies, as if it were a title in its own right.

One auction that caused quite a stir was the one organised on Opensea by Trips Community.com in collaboration with Gruppo Alpitour. Up for grabs was an exclusive night in a hotel of the luxury chain VRetreats. Whoever won the auction could either enjoy the stay directly or resell it, perhaps even earning a decent profit.

Mantas and colleagues (Mantas, 2021) propose a model for NFTs as digital gift. Starting from considerations about visitors' attitude in collecting photos and memories, they propose a personalized e-souvenir consisting in a collage of selfies and photos as a digital touristic postcard. In this case, the creation of an NFTs would provide the digital ownership of the postcard.

Ngo (Ngo, 2022) shows how the Vietnamese Ministry of Culture-Sports and Tourism is facilitating NFTs integration into tourism activities. The author collected data about initiatives related to tourism to the Phu Quoc Island, using the Dephi technique to evaluate the outcome. The findings indicate a strong interest in introducing NFTs both on the government side and in tourism organisations. Particularly, hotels are oriented to use NFTs for booking and luggage checking, whilst travel agencies would integrate the technology in automatic commissions for all the travel intermediaries involved in the tourism procedure.

Another application of NFTs in tourism is described by Mofokeng and Fatima (Mofokeng and Fatima, 2018) about future tourism trend in utilizing non-fungible tokens to aid wildlife conservation in South Africa. In fact, assuming Hobbs (Hobbs, 2018) observations about people's tendency to place money in collectibles on the basis of scarcity or rarity, and given that NFTs value is based on scarcity and uniqueness, Mofokeng and Fatima state that these tokens could be used to create digital wildlife collectible assets to finance wildlife conservation as a supplementary source of revenue and generating a new opportunity in tourism, through collectibles and online/remote experiences. In this context, the paper presents some projects already in place using NFTs to the described aim:

- "Honu", created by Axiom Zen (CryptoKitties) in 2018, representing a turtle-inspired CryptoKitty and auctioned to raise money for sea turtle conservation in the Caribbean. The project is in partnership with the non-governmental organisations Ocean Elders and ACTAI Global. The NFT was sold for \$ 25 000.00 (Tahir, 2018) to support the Sea Shepherd Conservation Society.

- Panda Earth (Panda Earth, 2018), aiming at conservation of panda through the use of NFTs, a project set up by the China Conservation and Research Centre for the Giant Panda, source of tourism. In late 2018 the Chinese developers crippled the project and about 15% of the Panda NFTs became "extinct" because the metadata was stored on servers that are no longer online. However, a global community has taken over the project by wrapping NFTs Panda with intact 2018 metadata. Currently, these NFTs help save wildlife through the community-run PanDAO (<https://opensea.io/collection/>)

pandaearthofficial). When terminated, the first Panda Earth project had recorded 1177 transactions, with a volume processed worth 66.97 Ether (font: Mofokeng and Fatima, 2018)

Ertürk and colleagues (2021) point out that cultural heritage sites contribute to the economic and social development of a local area by attracting visitors who are aware of the need to preserve cultural heritage as a link between the past and the future. However, they remark that not all cultural assets are protected and the lack of funds for preservation can lead to the loss of cultural assets. The authors propose a study to create a decentralised system to be used to raise funds and attract visitors to cultural heritage sites. The proposed system is based on decentralised technologies, in particular blockchain and NFTs, creating a model in which revenues are transferred to foundations in a transparently to preserve and maintain cultural heritage.

3. PROPOSAL FOR EVALUATION METRICS

From the review of success stories and based on the feedback collected on the Internet about NFTs and blockchain, some guidelines emerged that we think it useful to share to suggest how to implement a strategy linked to these digital assets.

First of all, it should be remembered that NFTs must be linked to unique objects, digital or otherwise. Therefore, it is good to define a characteristic that makes each NFT non-replicable.

The characteristics that one should keep in mind when one wants to create an NFT are therefore:

- uniqueness and non-replicability
- collectability
- the possibility of transferring ownership
- the simplicity of acquisition/access/use

This last point seems particularly important to us, as at present the general visitor often lacks the digital skills necessary to easily enjoy an NFT. Making the acquisition mechanism simple, with a bit of design effort, would contribute to increasing the positive visitor experience, encouraging the use of NFTs in the future and, collaterally, also fostering the development of digital skills.

As for the metrics that could be adopted to measure the success of a tourism initiative based on NFT, an immediate consequence of the previous consideration is that Key Performance Indicators that could be adopted definitely derive from User Experience surveys. Although, in fact, these are qualitative methods and do not give direct quantitative information on Return Of Investment (ROI), they can nevertheless contribute to the evaluation of the success of an initiative.

The evaluation method underlying customer satisfaction metrics consists of short questionnaires that allow qualitative and quantitative assessments, also supporting

subsequent evaluations of the economic impact of any critical issues (in a negative sense) and proposals for improvement (in a positive sense). The most useful and easy-to-implement metrics and related KPIs are the Net Promoter Score (NPS), Sentiment Analysis (Musanovic, Folgieri, Gregoric, 2021; Folgieri, Baldigara, Gricar, 2020; Folgieri, Bait, Carrion, 2016), and Rating and Ranking variations.

The Net Promoter Score is an indicator to measure the amount of 'promoters' of a product, brand or service, compared to 'detractors'. The index ranges from -100 (all are detractors) to +100 (all are promoters).

It is based on a single question: How likely would you be to recommend this product/brand/service to a friend or colleague? The answers are ranked as follows:

0-6 = Detractors: dissatisfied users who could cause damaging feedback through negative word-of-mouth.

7-8 = Passives: satisfied but indifferent users who might be influenced by knowledge of other systems, thus not gaining loyalty to the product/service presented.

9-10 = Promoters: loyal users who will use the product/service and recommend it to others.

To calculate the Net Promoter Score, it is necessary to subtract the percentage of detractors obtained from the percentage of promoters. The result is not expressed in percentage points, but as an absolute number between -100 and + 100.

The formula is: $NPS = \% \text{ Promoters} - \% \text{ Detractors}$

Sentiment Analysis makes it possible to measure the positive and negative sentiments aroused by a product/service.

Finally, keeping track of ratings (and those of competitors) as well as ranking (i.e. comparing the ratings received with those of one's competitors) complete the framework of evaluation criteria that should be adopted especially in innovative campaigns such as the NFT-based one.

Obviously, a comprehensive evaluation must also be made from a quantitative point of view. It is important to track the actual increase in the number of visitors and consequently the increase in turnover.

4. DISCUSSION

In the tourism sector, NFTs could indeed prove to be a useful tool for enhancing visitor engagement in many ways. To name a few, NFTs could provide tourists with a collectable and tangible souvenir of their holiday, although this may raise eyebrows, as NFTs are intangible in themselves; they could also pique the interest of others by showing and demonstrating their experience to others. A traveller could, in fact, after physically visiting a place, receive or buy a digital souvenir represented by a collectible and, above all, unique NFT. This possibility helps to bridge the gap between physical and digital visitors, giving hospitality entrepreneurs and artists the opportunity to offer an

incentive that contributes to the awareness of the tourism offering. The possibilities are also manifold from the point of view of the exhibitors. In fact, the tracking of NFTs also enables the tracking of trips, e.g. for statistical and econometric purposes.

Another possible application could be linked to the completion of a sort of 'loyalty card' which, once completed (remember that NFTs are traceable and therefore unique), would give the opportunity to obtain discounts on flights or stays in tourist facilities. Moreover, such 'rewards' could be sold to other users, thus generating a fully traceable and reliable secondary market, relieving companies of the difficulty of checking whether the reward is actually due.

Several applications of NFTs have been considered in this review. The following table 1 summarises the considered case study and their success.

Tables 1: **Considered case study**

Case Study	Typology	Description	Evaluation?
IoTeX	<ul style="list-style-type: none"> - open source platform - 'proof of travel' NFTs 	Allows NFTs to be mined as 'travel evidence' (location of the place visited, the weather and other collectible)	No official data on the volume of users involved
Slovenia, 'I feel NFT' project Slovenian Tourist Board	Collection of 15,000 unique digital 3D icons and 360 photographs, secured by blockchain	The NFT cards also provide the right of access to exclusive services in the country, such as events, museums, and attractions.	No official data available
Air Europa	NFT tickets	<p>A combination of digital information with experiences and services, which can be stored inside a wallet.</p> <p>At check-in, the NFT is switched into a travel document for boarding the flight.</p>	No official data available
Emirates	NFT to be stored inside a wallet	Combine the concept of collectable and Metaverse NFTs.	No official data available
Norwegian Cruise Line	NFT collection	To celebrate the launch of First Class, six artistic creations for sale and auction.	No official data available

Trips Community.com in collaboration with Gruppo Alpitour	NFT for an exclusive night in a hotel of the luxury chain VRetreats	Whoever won the auction could either enjoy the stay directly or resell it.	No official data available
Digital gifts (proposal) Literature: Mantas, 2021	NFT as personalized e-souvenir	Collage of selfies and photos as a digital touristic postcard. The creation of an NFTs would provide the digital ownership of the postcard.	Model proposal
NFTs integration into tourism activities Vietnamese Ministry of Culture-Sports and Tourism Literature: Ngo, 2022	NFTs related to tourism to the Phu Quoc Island	- Hotels oriented to use NFTs for booking and luggage checking; - travel agencies in integrating the technology in automatic commissions for all the travel intermediaries	Dephi technique used to evaluate the outcome
NFTs in wildlife conservation in Africa. Literature: Mofokeng and Fatima, 2018	NFTs as digital wildlife collectible assets	to finance wildlife conservation as a supplementary source of revenue and generating a new opportunity in tourism Highlighted projects: - “Honu”, Axiom Zen (CryptoKitties), 2018 - Panda Earth, 2018, China Conservation and Research Centre for the Giant Panda	- Honu sold for \$25000.00 - Panda Earth: 1177 transactions, with a volume processed worth 66.97 Ether
Proposal for NFTs-based system transferring revenues to foundations Literature: Ertürk and colleagues, 2021	Decentralised NFTs-based system	NFTs to raise money from visitors to save cultural heritage sites	Model proposal

We also performed an evaluation of the case studies presented, based on the applicability - or usefulness of such application - of the metrics proposed in our study. Considering that they are all NFT-based, all the considered reviewed project present the uniqueness and non-replicability characteristic. In the following Table 2, we show the result of the evaluation of the characteristics of collectability, ownership transferring, simplicity of acquisition/access/use.

Tables 2: NFTs characteristics of the analysed projects

Project	collectability	possibility of transferring ownership	simplicity of acquisition/access/use
IoTeX	YES	Maybe	HIGH
Slovenia, 'I feel NFT' project	YES	YES	HIGH
Air Europa	YES	YES	MEDIUM
Emirates	YES	YES	HIGH
Norwegian Cruise Line	YES	Maybe	MEDIUM
Trips Community.com	YES	YES	MEDIUM
Digital gifts - Mantas, 2021	YES	Maybe	MEDIUM
Phu Quoc Island, Vietnam - Ngo, 2022	DIFFICULT	YES	MEDIUM
NFTs in wildlife conservation in Africa - Mofokeng and Fatima, 2018	YES	YES	HIGHT
NFTs-based system - Ertürk and colleagues, 2021	YES	YES	HIGHT

Apart from some of the case studies examined (namely NFTs in wildlife conservation in Africa) reporting the trading volume generated by the initiative, it was not possible to assess the ROI. However, the cases reporting on the economic return of the initiative show how NFTs can not only generate an increased interest in a tourism initiative, but also generate direct, often considerable, revenues. As pointed out in the chapter about an evaluation proposal, it would be also important to collect quantitative data, tracking the increase in the number of visitors and in turnover, as well as performing a Sentiment Analysis and evaluating KPIs such as the NPS and the Rating and Ranking variations described in the evaluation criteria we propose. In this regard, it was not possible to carry out this evaluation in the reported case studies, as the data resulting from the described initiatives were not disclosed.

The spread of NFTs will of course also depend on whether or not cryptocurrency and credit card circuits are integrated. If these circuits will support digital currencies, NFTs will certainly become a unique resource for tourism operators. Moreover, as pointed out above, purchasing and all NFT-related transactions should be made easy, so that even those who do not yet have the necessary digital skills can access this technology.

Of course, there is no shortage of criticism of NFTs. One of the most frequent concerns is their impact on the environment - due to the energy consumption associated with the so-called minting process and to the blockchain-based trading operations (Raeesah, and Paschen, 2021).

Another criticism is related to auctions. It would be preferable, in fact, unless one is thinking of luxury tourism, that the issuing and selling of NFTs be carried out at a fixed price and also accessible to those who do not necessarily have large sums of money.

CONCLUSION

In this work, we explored the potential given by the introduction of NFTs in Tourism. To this purpose, we introduced some applications currently in place, such as those of some travel agencies, airlines (Air Europa, Emirates), Cruises companies (Norwegian Cruise Line), and the Economic Development Ministry of Slovenia (project "I Feel Nft). We also explored some possible implications and further development of these initiatives, designing possible guidelines and metrics to measure the success of initiatives based on NFTs.

The paper lacks a quantitative analysis of the presented case studies because data related to the initiatives have not been released, so that a further investigation could be done once these data are publicly known. Despite criticisms, NFTs appear an attractive opportunity for the Hospitality Industry and Tourism. To date, however, they are not used extensively due in part to a lack of technological awareness. In fact, although the process of minting and selling NFTs is seemingly simple, it hides pitfalls that need the attention of professionals. Moreover, there are criticisms regarding the environmental impact of NFTs' minting process.

FTs are certainly not yet mainstream, but certainly they deserve further investigation. This work opens the door to a new hot topic in tourism research, considering also that the use of NFTs is destined to grow especially because of their character of uniqueness and the trust guaranteed by the blockchain.

The contribution of this paper is therefore important, both in terms of operational proposals (applications, guidelines and good practices) and in terms of defining metrics for measuring the effectiveness of NFTs in the tourism economy.

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