

Digital business models in cultural tourism

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Abstract

Purpose – Digitalization had a relevant impact on the cultural tourism sector, both demand and supply. If, on the one hand, advances in digital technologies provided tourists with new mobile services able to amplify the cultural experience, on the other hand, they catalyzed the development of new business models by digital enterprises. This paper has a twofold purpose: to detect business models and key characteristics of mobile apps for cultural tourism and to analyze the offering of app-based services in this sector.

Design/methodology/approach – The authors defined a methodology to identify, characterize and analyze a particular category of digital products for cultural tourism: app-based services. They are studied in terms of value creation, proposition and capture with the aim to identify the distinctive features of business models. As a result, the authors identified a classification framework on three main dimensions, namely “how to exploit mobile app features to create value for cultural tourists” (value creation), “which valuable services are delivered to cultural tourists” (value proposition) and “how companies are rewarded for the value they offered” (value capture). The authors apply the framework to perform a situation analysis of app-based services in the cultural tourism market.

Findings – The analysis highlights that digital enterprises offering app-based services do not fully exploit advances in technologies about users’ value requirements. Hence, the results of our work suggest some directions that digital enterprises may follow to better exploit mobile app technology.

Originality/value – To date, little research has been devoted to investigating cultural tourism business models involving the exploitation of mobile app-based services. This research provides a useful framework to analyze fundamental aspects of business models in this sector. Such a framework represents a practical tool that provides fruitful insights for the design of a new generation of app-based services within the so-called “Internet of things” domain.

Keywords Business models, Cultural tourism, Digitalization, Digital services, Tourism lifecycle

Paper type Research paper

1. Introduction

Digitalization had a profound impact on several industries, dramatically changing socio-economic scenarios in which organizations operate to deliver and capture value (Ammirato *et al.*, 2019c). Digitalization allows people to better address stakeholders’ needs and expectations (Nambisan *et al.*, 2019). One of the main effects of digitalization results in the development of new business models that are changing organizational approaches to value creation, generating new business opportunities in many industries (Nambisan *et al.*, 2017; Williams and Boardman, 2017; Bouwman *et al.*, 2018; Teece, 2018; Vial, 2019), particularly in the cultural sector (Gehmn and Soubliere, 2017; De Bernardi *et al.*, 2019; Arrigoni *et al.*, 2020).

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This paper forms part of a special section “Entrepreneurial development and digital transformation in creative and cultural industries: trends, opportunities and challenges”, guest edited by Antonio Lerro, Giovanni Schiuma and Francesco Manfredi.



On the one hand, firms operating in cultural industries are increasingly becoming conscious of the benefits of digital technologies for the improvement of internal operations and a way to satisfy new markets demands (Carlucci *et al.*, 2018). On the other hand, digital enterprises are exploiting the “digital” to enter the cultural services market at full steam with suited and innovative business models (Carlucci and Schiuma, 2018, Ammirato *et al.*, 2019a). In this context, cultural tourism (McKercher and Du Cros, 2002; Niemczyk, 2013; Richards, 2001) shows peculiarities that make it relevant for the analysis of business model innovation (Schiuma and Lerro, 2018; Lerro *et al.*, 2016).

Digitalization is the backbone for innovating many business processes in cultural tourism, both on demand and supply.

From a tourist perspective, ICT-based solutions can help the decision-making process, along with the tourism experience lifecycle, support the performing of travel-related activities and enrich the cultural experience of the travel (Ammirato *et al.*, 2015). Digital technologies can assist the cultural tourists with plenty of functionalities to also respond to specific and contingent constraints, like the epidemic risk (i.e. Covid-19), thus becoming a strategic asset for global tourism re-launch (Gössling *et al.*, 2021). Recent advances in mobile technologies and the Internet of Things (IoT) boosted the innovation of business models by leveraging context-awareness, ubiquity and pervasiveness (Felicetti *et al.*, 2019).

From the supply side, one of the digital enterprises, the massive flow of data generated by cultural tourists and captured by sensors, devices, cameras across cultural tourism destinations, along with the phases of travel, represents a promising basis for enhancing the tourism firms’ capability to personalize their offering of products and services (Ardito *et al.*, 2019). In this sense, digitalization allows the production and simultaneous consumption (*prosumption*) of cultural services, paving the way toward new ways of offering value to tourists, providing consumers cultural tourism services that are more responsive to their expectations and needs. Such emerging opportunities make it possible to conceive a new wave of business models where stakeholders of cultural tourism can interact with digital enterprises into a virtuous cycle of value creation.

Mobile apps are rising as interesting for digital enterprises not only to provide support to cultural tourists while performing travel activities but also as core business enablers of marketplaces, i.e. “cybermediaries” (Järvelä *et al.*, 1999; Runfola *et al.*, 2013), in the cultural travel market.

Despite there being countless mobile apps dispensing a variety of services for cultural travelers, little research has been devoted to characterizing business models of mobile apps for cultural tourism, with particular regard to their value proposition. This paper thus aims to answer the following **research question**:

RQ. How can we characterize the business models of mobile apps for cultural tourism?

We aim to explore distinctive characteristics of mobile apps for cultural tourism and then identify the main business model’s objectives of value creation. To answer these questions, we

- (1) identified a set of 80 mobile apps for cultural tourism;
- (2) analyzed them against the background of business models and digital enterprises literature;
- (3) developed a multidimensional framework both to point out the distinctive features of business models of mobile apps based on cultural tourism, to characterize, classify and assess the extant offer of mobile app for cultural tourism experiences.

The paper is structured as follows: **Section 2** provides a literature review of business modeling approaches for digital services and deepens the role of digitalization for cultural

tourism. [Section 3](#) presents the methodology of the research, while [section 4](#) presents main findings of this research. Finally, section 6 concludes the paper by summarizing main issues, results and research directions for future advancements.

2. Theoretical background

2.1 Business model innovation in digital services

The availability of social media platforms, the smartphone revolution, big data analytics and the Internet-of-Things had a considerable impact on the development of new business models. A plethora of anything-as-a-service models emerged over recent years ([Rachinger et al., 2019](#)).

Many definitions of business models are available in the literature. According to [Teece \(2018, p. 40\)](#), a business model “describes an architecture for how a firm creates and delivers value to customers and the mechanisms employed to capture a share of that value.” Such a perspective that sees the business model as the “architecture of the business” is retrievable in many previous works (e.g. [Timmers, 1998](#); [Dubosson et al., 2002](#); [Osterwalder et al., 2005](#)).

Two main approaches toward business modeling are available in the literature, namely static and dynamic frameworks. Static frameworks describe the current state of a company, while dynamic frameworks also examine the evolution of a business model ([De Reuver et al., 2013](#)). [Chesbrough and Rosenbloom \(2002\)](#) described the concept of a business model according to a functional perspective, identifying the following elements: value proposition, market segments and a company’s value chain. [Hedman and Kalling \(2003\)](#) proposed a framework consisting of the following components: offering, organization, activities, competitors, customers, resources and production inputs. [Bouwman et al. \(2008\)](#) proposed a business model framework for the mobile service domain, while, in the digital start-up domain, practitioners are mainly oriented to the use of the *business model canvas* proposed by [Osterwalder et al. \(2010\)](#). [Baden-Fuller and Haefliger \(2013\)](#) introduced a framework with the following elements: customer identification and engagement, value delivery and monetization. An exhaustive analysis of the business modeling framework in the digital service domain is provided in ([Hartmann et al., 2016](#)).

In general, the business model can be considered as a conceptual tool that allows the identification of the key components of a business (i.e. revenues, costs, providers, channels, etc.) and the relations among these components into a unique and comprehensive framework ([Ammirato et al., 2021](#)). From an architectural point of view, a business model represents the reason for creating and offering a specific value proposition to existing and potential customers and the way in which the company captures value ([Osterwalder and Pigneur, 2002](#); [Mezger, 2014](#); [Hartmann et al., 2016](#); [Teece, 2018](#)). In line with this definition, [Täuscher and Laudien \(2018\)](#) characterized three distinctive characteristics of business model dimensions: value creation, value proposition and value capture.

Value creation deals with architecture, technologies and mechanisms that allow companies to offer value for their customers ([Johnson et al., 2008](#)).

A value proposition is defined as the implicit promise a company makes to its customers to deliver a particular combination of values ([Sweeney and Soutar, 2001](#)). It encompasses measurable benefits provided to customers and illustrates their return on the investment or other tangible positive outcomes of choosing a particular provider over its competitors ([Camlek, 2010](#)). [Kim and Mauborgne \(2000\)](#) modeled the value delivered to consumers according to two dimensions: the stage of the buyer experience lifecycle and utility levers. Referring to digital services, some authors (e.g. [Lindić and Da Silva, 2011](#)) agree that a business value proposition of digital services leverages three main components: content (i.e. the product or service to be purchased), context (i.e. the environment in which content is offered) and infrastructure (i.e. the way content is delivered). Other works (e.g. [Mohd-Any](#)

et al., 2015; Prebesen and Rosengren, 2016; Volpentesta *et al.*, 2019) categorized the value proposition of digital services according to the following dimension of consumer's perceived value: utilitarian value (e.g. price, cost and efficiency), emotional value (e.g. hedonic value, experience and knowledge) social value (e.g. interaction with other participants).

Value capture describes how companies turn the value proposed to customers into revenue and profits (Baden-Fuller and Mangematin, 2013; Abdelkafi and Täuscher, 2016). There are several ways to generate revenue streams, including product/service sales, usage fees, subscription fees, lending, advertising, community building, renting, licensing and brokerage (França *et al.*, 2017). Focusing on digital services, according to Osterwalder and Pigneur (2013, p. 30), digital business models involve two approaches to generate revenue streams: "transaction revenues resulting from one-time payments and recurring revenues resulting from ongoing payments to either deliver a value proposition to customers or provide post-purchase customer support." Some authors distinguished revenue streams for digital services into main categories: direct (where income is generated directly from customer transactions, e.g. selling, subscription, brokerage models) and indirect revenue streams (providing some free products and services and giving away today's revenues in return for future revenues, e.g. three-party, freemium, cross-subsidy models) (Georgieva *et al.*, 2015; Sambhanthan and Potdar, 2017).

2.2 Cultural tourism and the role of digitalization

Cultural tourism is becoming a major source of business and employment in today's economy (Richards, 2018). The World Tourism Organization estimates that cultural tourism accounts for about 40% of global tourism (UNWTO, 2018). Cultural tourism is defined as a form of tourism in which cultural attractions are the main reason to visit a destination, offering the tourist an opportunity to understand and appreciate the essence of a place (Richards, 2010; Chen and Rahman, 2018). Consumers of cultural tourism experience are attracted by a set of tangible and intangible products of a destination, encompassing history, arts, architecture, music, literature, traditions and culinary heritage (Richards, 2018).

Recent developments in cultural tourism are moving toward a more authentic approach between the tourists and residents (Chang *et al.*, 2014; Mohammadi *et al.*, 2019; Suhartanto *et al.*, 2020). This new form of tourism emerged in response to specific market needs, and it is directed toward tourists interested in an engaged and authentic experience, with active and participative learning in the arts, heritage, or special character of a place, providing a connection with those who reside in this place and create this living culture (Masadeh, 2019). This new paradigm requires the involvement of tourists in designing characteristic cultural tourism experiences. As stated by Juzefović (2015), it involves emotional, social, and participative interactions with people and territories, actively inviting tourists to become a part of the visited destination. According to this perspective, a participatory form of cultural tourism is more appropriate to contemporary social and economic structures that enable the tourist to participate actively in leisure, cultural and artistic activities, enabling a truer and more authentic experience in the destination (Remoaldo *et al.*, 2020). The attention toward a deep immersion in the experience is a response to the saturation of mass cultural tourism, revealing a new profile of tourists that become active contributors in the design of his/her tourism activities during all the tourism experience lifecycle (Remoaldo *et al.*, 2017).

Digitalization had a dramatic impact on the rise of this new form of active and participative cultural tourism experience, largely affecting the customer journey. Several studies highlighted how digital technologies positively affected the attractiveness of cultural destinations, thanks to opportunities provided by information sharing and value co-creation (Porter and Heppelmann, 2014). The emergence of social networking platforms has profoundly influenced the way tourists interact with other tourists. The "social web environment" enabled new mechanisms of interaction, cooperation and "social experience"

among tourists fostering the spread of electronic word-of-mouth communication, opinions about places, services and tourism operators (Volpentesta and Felicetti, 2012). Sharing activities and social interactions involves any activity that accompanies cultural travelers through the tourism experience, making them feel part of a community (Liu and Li, 2019). More recently, Internet-of-Things, geo-reference data and big data combined with mobile-based technologies and artificial intelligence represent fundamental elements to deliver customized and proactive cultural tourism experiences and accomplish the transition toward smart and competitive destinations (Femenia-Serra and Ivars-Baidal, 2021).

Since tourists are “digital-enabled” travelers, the success of cultural tourism and cultural touristic products depends strategically on the capacity of the digital technology to integrate complex travel information, in any place and time, to the needs of the traveler. Thus, smartphone apps rise as strategic for the success of cultural travel and, in general, for cultural tourism (Ammirato *et al.*, 2018; Niemczyk, 2013). In order to best meet these challenging requirements of the cultural travel management, tourist adopts and self-supports with information and/or digital technologies, namely web-based services (Akoumianakis *et al.*, 2011; Runfola *et al.*, 2013) and smartphone apps (Gupta *et al.*, 2018). With a growing number of users and a wide variety of applications emerging, the smartphone is fundamentally altering our current use and understanding the transport network and tourism travel (Dickinson *et al.*, 2014). Smartphones are defined by (Verkasalo *et al.*, 2010) (p. 243) as “devices that can be used both as a mobile telephone and as a handheld computer.” Thus, what separates smartphones from mobile phones are the features of a computer, such as the applications (apps) (Andersson and Frost, 2013). Smartphone apps can be defined as small programs that run on a mobile device and perform tasks ranging from banking to gaming and web browsing, making smartphones possible to use for as many purposes as possible, even including planning, managing and archiving cultural travels and related experiences. A wide variety of smartphone apps are available to the contemporary traveler able to provide a wide spectrum of services like transport planning (Uber, Skyscanner), travel planning (TripIT, Tripadvisor), accommodation planning (Booking.com, Expedia), tour guide (DETOUR, NY Travel guides) and directional services (Google maps) (Gupta *et al.*, 2018).

The evolution of cultural travels, even more articulated and diversified in cultural contents, motivations and experiences (Niemczyk, 2013), has generated a demand of travel-related services and attracted digital enterprises seeking potential customers. Many enterprises, leveraging digital multisided platforms (Brokaw, 2014; Zaheer *et al.*, 2019) provide intermediation services (“cybermediaries”) (Akoumianakis *et al.*, 2011; Runfola *et al.*, 2013) or just sell travel products (Ammirato *et al.*, 2019c). They exploit digital technologies to fulfill the cultural traveler’s demand for information, booking, choosing and paying for enjoying cultural travel.

Arguing about the value proposition of mobile apps-based services, Samy (2012) sustains that the value proposition for cultural tourists becomes crucial to position a touristic strategy and make competitive a destination or a travel product by developing smartphone travel apps around their value proposition or simply marketing a travel product, or a destination, through the most value-added and used apps. Over recent years, the rise of mobile app-based services allowed consumers the opportunity to access in-time, in-place and in-context information services (Volpentesta *et al.*, 2017). App-based services offer cultural tourists the opportunity to access complete and detailed information when and where they make their tourism-related choices, but their information provisioning has limited chances of success as it is not affected by changes in tourist’s situation unless the consumer is explicitly involved in service demand and configuration (Ribeiro *et al.*, 2018). Some characteristics of mobile app-based services have a major impact on the characterization of mobile-based information offerings since they play an important role in providing tailored, high-quality and contextualized information and, thus, in satisfying cultural tourism information needs

(Jeong and Shin, 2020). Dickinson *et al.* (2014) analyzed the app functions in the tourism travel domain. They identified five basic functions: information provision, two-way sharing capability, context awareness, IoT and tagging.

Ammirato *et al.* (2015) proposed a cultural tourism lifecycle model and identified digital technologies supporting tourists during the phases of the lifecycle, namely dreaming, booking experiencing and recollecting. Chang and Shen (2018) deepened the role of social networking features for mobile cultural tourism services. Lei *et al.* (2019) identified main functions and value components of mobile apps for hospitality services.

3. Methodology

In order to identify the distinctive features of business models of mobile-app based for cultural tourism, we defined a methodology to identify, characterize and analyze currently available app-based services in terms of value creation, proposition and capture (Teece, 2018; Täuscher and Laudien, 2018). In particular, we followed the approach adopted in (Lei *et al.*, 2019) to connect technology functions of tourism mobile apps with value. This approach is based on a qualitative research method aimed to understand companies' reasoning behind cultural tourism apps design and the resulting value perceived by travelers. Extending the concept of "fitness for use," related to information value and information quality (Borek *et al.*, 2014), we consider the value of an app-based service as the overall utility that the user receives when using the information service. In the case of app-based services for cultural tourism, the user is a tourist who requires some information necessary for his/her decision-making or learning process, as he/she is involved in cultural tourism activities in some situations. The assessment of the overall utility is strongly dependent on tourist's expectations and context of use (Chen and Rahman, 2018).

Therefore, in the proposed methodology, the utility of the app-based service is described through a set of components that can be objectively identified and evaluated by users. The user will evaluate the importance of each dimension according to his/her own concerns/attitudes and situational context.

A process chart describing the methodology is provided in Figure 1.

The phases of the methodology are described below:

Phase 1: Identifying the domain. We selected IOS App Store and Google Play as mobile apps databases to perform our search since they are the two leading mobile app stores in terms of the number of apps and downloads (Felicetti *et al.*, 2019).

We initialized a list L of search keywords with English terms related to the cultural tourism domain. In particular, we combined terms deriving from the tourism domain (e.g. "tourism," "tourist," "holiday," "vacation," "journey," "trip," "resorting," "leisure") with terms related to the cultural domain (e.g. "culture," "cultural," "heritage," "history," "tradition," "habits," "art," "museum," "monuments," "ruins" and "archaeological remains").

We performed a search on the above-mentioned databases. The list L was possibly extended with new relevant keywords retrieved in the app description. We carried out systematic research to provide an exhaustive set U of mobile apps in the cultural tourism domain. The process ended when no newer keywords or apps were found. The research was performed from one to 31 May 2020. An app of this set is included in the analysis domain if

- (1) the app description is written in English;
- (2) the app preview (or associated website, if available) claims that the app provides tourism-related information or service actively supporting the user in cultural tourism activities or learning process;
- (3) the app is not an old version or edition of another one in U.

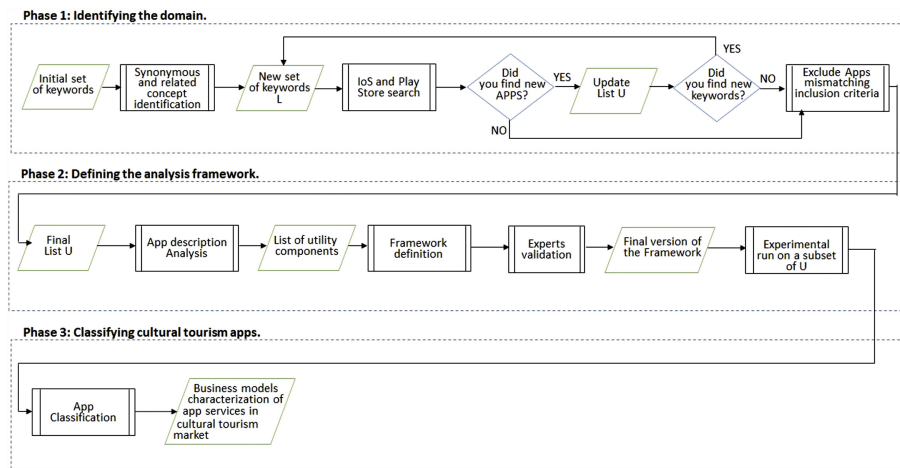


Figure 1.
A process chart
describing the research
methodology

At the end of the process, the set U was constituted by 80 mobile apps. The complete list of apps constituting the set U is provided in [Appendix](#).

Phase 2: Defining the analysis framework. Data were mainly sourced from the app description obtained from the store apps preview and associated websites (if available). Moreover, in most cases, apps were downloaded and were analyzed in more detail to verify data extracted from the app description or to generate data that were difficult or impossible to extract from the app description.

Subsequently, we analyzed the selected mobile apps in order to identify which types of information services are delivered to users.

For this purpose, we assumed that utility components can be identified considering the motivations, expectations, needs and attitudes of consumers of cultural tourism services and model a first analysis framework. The reason behind the adopted approach lies in the fact that the more the content of the service adapts to the specific motivations and expectations of the consumer, the higher the value of the service ([Mobasheri et al., 2017](#)).

We assessed the construct validity and the content validity of our framework as follows:

- (1) We asked three experienced researchers (with expertise in tourism, digital business models and mobile apps domains, respectively) to criticize the structure of the framework and the parameters adopted in our multidimensional framework. Minor modifications were made based on their feedback.
- (2) Then, we pre-tested the framework by classifying a subset of 10 randomly selected mobile apps. Each author has independently analyzed each mobile app. When two or more authors had not classified an app in the same way, the classification was discussed until an agreement was achieved. Results of the pre-test did not become part of the major study.

This allowed us to obtain the final version of our multidimensional framework described in the following paragraph:

Phase 3: Classifying cultural tourism apps. Each author separately analyzed the mobile apps belonging to U by means of the framework defined as the output of phase 2. At the end of that process, we verified that all the authors have classified the apps in the same way. We decided to consider a dichotomous scale to assess the presence (or not) of a utility dimension impacting the consumer's perceived value.

4. Results and discussion

The paper aims to characterize business models of mobile app services in the cultural tourism market and investigate the current offering of app-based services in this sector.

For this reason, we identified a modeling framework based on three main dimensions, i.e. “how to exploit mobile app features to create value for cultural tourists” (value creation), “which valuable services are delivered to cultural tourists” (value proposition) and “how companies are rewarded for the value they offered” (value capture).

Then we applied the framework to assess and characterize the state-of-art of currently available app-based services in the cultural tourism sector, to map current offerings and identify consumers’ information needs that are currently unsatisfied (or ill satisfied). For this purpose, each value dimension, i.e. value creation, value proposition and value capture, describing the mobile app services business model that has been analyzed through the lenses of utility dimensions and components.

4.1 Value creation

From a value creation perspective, the main component characterizing the mechanism to offer value to their customers is the type of information service that is provided, namely the utility component. For each sampled app, we gathered app data with respect to the information content, i.e. data on information categories used in the interaction between the tourist/user and the app-based service. Information content was categorized in a set of utility components based on semantic similarity criteria. The detection was carried out through an empirical observation of the characteristics of the APP belonging to U. [Table 1](#) shows the set of utility components we identified.

As it is evident from the analysis, 42% of apps (34 apps out of 80) work even without an Internet connection. This feature is particularly useful as it often happens that some cultural places (for example ancient buildings with thick walls or underground rooms or rural places) are characterized by a scarce connectivity ([Adeola and Evans, 2019](#)).

Social-based features are at the core of many investigated apps. 25% of apps (20 out of 80) present social networking functionalities, allowing virtual connectedness with other tourists and cultural tourism stakeholders. 10 apps offer the to give/read opinions, ratings, suggestions about tourism services, artworks, monuments, places. Some apps (10 out of 80) are specifically oriented to favor interaction between tourist and local people. Sociability is an important aspect of cultural tourism. It affects the satisfaction of tourism needs of personal connectedness and relationships among people with the same interests and local people who know the place, history and traditions, allowing a proactive and authentic tourism experience ([Blapp and Mitas, 2018](#)). Seven apps adopt a storytelling-based approach, sharing anecdotes, stories, tales and legends about some cultural tourism destinations. Place storytelling is recognized as a particularly relevant approach for cultural tourism, stimulating the desire, turning on the imagination, creating empathy-anticipating and/or prolonging the experience ([Bassano et al., 2019](#)).

Few apps seem to exploit *mobiquitous* technology features to enhance the cultural tourism experience. Six apps leverage the “near to me” function offering information tailored according to a user’s location. Five apps are able to recognize a place, a monument, an artwork, through a photo and/or a description (the so-called “shazam effect”). Only three apps exploit augmented reality functions to offer a better experience. Augmented and virtual reality technologies enhance active visitor experience in the cultural tourism context and support concentration and motivation of tourists involved in a learning experience ([Han et al., 2019](#)).

4.2 Value proposition

For what concerns the value proposition of mobile-based services in cultural tourism, the challenge of service providers is to deliver the right information, at the right time, to the right

	Utility component	Description	# Apps
u ₁	Budget monitoring	Opportunity to plan activities and control expenditure to ensure that it is in line with available funds	1
u ₂	Prices comparison	Compare offers from several sources	3
u ₃	Time-saving	The app reduces time and a user's efforts in carrying out tourism activities, e.g. book tickets directly from the smartphone, skipping the queues	18
u ₄	Economic convenience	Opportunity to save money through discount, special offering, . . .	4
u ₅	Security	Trustworthiness of information sources. It affects a user's assessment of the reliability of the information content provided by the service	2
u ₆	Reviews	Opportunities to give/read opinions, ratings, suggestions about tourism services, artworks, monuments, places, . . .	10
u ₇	Assurance	Features reducing the impact of an adverse event during the tourism experience, e.g. travel insurances, free cancellation and emergency contacts	5
u ₈	Alert messages	Push information during the travel, e.g. real-time notifications, information on weather conditions, events, . . .	3
u ₉	Certificate information sources	Trustworthiness of information sources. It affects a user's assessment of the reliability of the information content provided by the service	7
u ₁₀	Recognize the point of interest (shazam effect)	Recognize a place, a monument, an artwork, through a photo and/or a description	5
u ₁₁	Near to me	Information is customized according to a user's position/ location	6
u ₁₂	Itinerary proposals	The app proposes a cultural itinerary based on a user's preferences	4
u ₁₃	Storytelling	The app shares anecdotes, stories, tales and legends about some cultural tourism destinations	7
u ₁₄	Augmented reality	Objects (e.g. monuments, artworks, . . .) in the real world are enriched by computer-generated perceptual, visual, auditory information	3
u ₁₅	Memories collection	Opportunity to remember the cultural tourism experience through photo albums, souvenirs, posts, videos	2
u ₁₆	Entertainment	Activities that hold the attention, the interest or gives pleasure and delight to cultural tourists	2
u ₁₇	Interaction with locals	Personal connectedness with people who know the place	10
u ₁₈	Social networking	Virtual connectedness with other tourists and cultural tourism stakeholders	20
u ₁₉	Multi-language interaction	App services are available in several languages, according to a user's preferences	5
u ₂₀	Offline use	App features are available also without an Internet connection	34
u ₂₁	Users' profile customization	Information services are tailored according to a user's preferences, profile and app use	18

Table 1.
Utility components in apps for cultural tourism

place, to the right people. The objective is to provide a benefit that the consumer is able to perceive and measure. The perception of cultural tourism offerings of mobile services depends on the subjective assessment of the utility of information received in a certain situation and prior to deciding related to his/her tourism-related activity. According to [Bizer and Cyganiak \(2009\)](#), two fundamental elements impact the perceived value of an information service.

- (1) User-dependency: The value perception of an information offering depends on a user's characteristics (e.g. level of knowledge about the domain), concerns and attitudes.
- (2) Task-dependency: a user could consider information as appropriate to carry out a task but useless for other tasks.

This approach is in line with the buyer-utility map provided in (Kim and Mauborgne, 2000), where the value delivered to consumers is modeled according to two dimensions: the stage of the buyer experience lifecycle and utility levers.

We adopted a cognitive-based approach (Lei *et al.*, 2019) to bridge app functions and perceived customer value. More specifically, we grouped utility components into the following dimensions:

- (1) *Convenience*: Some apps aim to facilitate tourism experience providing services addressed to reduce efforts, time and cost in enjoying a cultural tourism experience. These apps facilitate the tourism experience by allowing tourists to find the lowest prices, take advantage of discounts and promotions, keep the budget under control.

The cultural tourist wants to save money without having to give up quality. For this purpose, some apps (like Virail and Piratinviaggio) suggest offers for flights and accommodations. Other apps (e.g. Tiquets and Google Trips) allow tourists to compare offers of different websites, while Tripify helps the user to keep under control the expenses during the trip. Applications, such as Tiquets and Virtlo, allow the user to book tickets directly from the smartphone, skipping the queues and saving precious time.

- (1) *Risk reduction*: Some features are addressed to reduce the likelihood and severity of an adverse event or to mitigate its impact. In this sense, mobile apps provide emergency contacts indicate the least dangerous routes, real-time notifications during the experience, information on weather conditions, read reviews and advice from other users, guarantee quality and reliability of contents. Before booking a restaurant or hotel, visiting an attraction or simply before choosing the destination of the next trip, most tourists rely on the reviews and suggestions of those who before them have been in the place of interest. Several applications offer the possibility of inserting and reading reviews, reassuring the traveler about his future destination. Some apps offer reviews by locals or experts, as in the case of Spotted by locals or Mesmo. Other apps (e.g. EatnMeet or HostelWorld) offer travel insurances or free booking cancellation. Some apps guide tourists through less dangerous routes (e.g. women who travel alone and move at night), offering the opportunity to easily access to emergency contacts.
- (2) *Enhancing Experience*: Some apps provide features aiming to improve and reinforce the quality of a cultural tourism experience. These features leverage hedonic aspects of travelers, increasing their desire and pleasure to be involved in a journey. For example, apps like Monogram and CicerosGet offer the opportunity to recognize monuments, piece of art and famous places from photos taken by the tourist, offering immediate information, according to a "Shazam-like" approach. Playtrip and Apptripper accompany the cultural tourists to discover works of art, monuments, etc., making the trip even more interesting. To increase the fun, some apps offer quizzes about the places the tourist is visiting. Other apps leverage augmented reality or "near to me" functions.
- (3) *Sociability*: Apps for cultural tourism offer the opportunity to enjoy tourism attractions and to satisfy tourists' needs of personal connectedness and relationships with other tourists and cultural tourism stakeholders. Some apps allow the cultural tourists to share experiences with local people: apps like Withlocals-Tour & Viaggi,

Cool cousin offer the opportunity to contact, chat, meet in person locals, as well to be guided on the journey by a local expert. Sharing is becoming an integral part of the experience; that's why applications like City Maps to go and Monugram allow integration with other platforms (e.g. social networks), while others like Modify and Geotourist create a network that connects users of the same application, allowing them to share with the community photos, travel notes, itineraries etc.

- (4) *Practicality*: Some apps offer the opportunity to better manage the tourism experience lifecycle. In this sense, features as customer profile management, search functions, instant multi-language translation, ticketing management and all-in-one functions represent a valid opportunity to reduce a user's effort while traveling. Other apps allow offline use and in advance content download. These features are useful in specific contexts where the connection is not available, or roaming charges are expensive.

The following table summarizes utility dimensions and utility components arisen from an app analysis (see Table 2).

Concerning the task dependency element of value proposition, a widespread approach in the definition of a tourist experience consists of the adaptation to the tourism sector of some generic models to describe consumer behavior in the purchase of products or services.

Therefore, the apps cover several utility dimensions and utility components.

Focusing on the value proposition of cultural tourism services, it refers to the ability to help tourists better satisfy their needs, along with the tourism experience lifecycle and

Utility dimension	Description	Utility component
<i>Convenience</i>	Find the lowest prices, reduce booking times, take advantage of discounts and promotions, keep budget under control, manage more services in a single app	Budget monitoring Prices comparison Time-saving Economic convenience
<i>Risk reduction</i>	Provide emergency contacts, indicate the least dangerous routes, real-time notifications during the experience, information on weather conditions, read reviews and advice from other users, guarantee quality and reliability of contents	Security Reviews Warranty Alert messages Certificate information sources
<i>Enhancing experience</i>	Recognition of the place through an image, use of augmented reality, games to encourage learning processes, create your own personal gallery, keep the chronology of the places with annotations and photos, audio guides	Recognize the point of interest (shazam effect) Near to me Itinerary proposal Storytelling Augmented reality Memories collection Entertainment
<i>Sociability</i>	Chat and/or receive suggestions from locals, meet locals, connect the profile to their social networks, enter the community, get awards, interact with community members, upload and share your experiences (videos or photos, travel notes, itineraries, etc.)	Interaction with locals Social networking
<i>Practicality</i>	Instant translations in multiple languages, content download for offline use, profile customization, integrate many services in a single app	Multi-language interaction Offline use Users' profile customization

Table 2.
Utility dimensions and utility components of app-based services for cultural tourism

reflects service performances impacting the consumer's judgment about the utility the tourist receives.

Ammirato *et al.* (2015) have modeled the tourism experience lifecycle through the following phases:

- (1) *Dreaming*: The process begins with the emergence of a need, a desire to travel. In this phase, tourists look for inspiration for their vacation. The dream of holiday is fed by an overabundance of photos, videos or maps on the web, allowing users to gain virtual previews of the holiday, explore places, identify the location, refer to opinions and recommendations published by travelers who already had an experience and then prospected tourists begin to "dream" their vacation.
- (2) *Planning and booking*: Once the tourist identifies the potential destination and the type of holiday he intends to do, he proceeds with the detailed planning of the trip. After establishing the details of the whole holiday, all that remains before travel is to make reservations of transportation, accommodation and any additional services (car rental, excursions, events, etc.) that will complete the tourism package.
- (3) *Experiencing*: This phase is mainly related to the in-place tourism activities: The tourist stays overnight in hotels, make excursions, enjoy meals, visit local attractions etc. . . The availability of contextualized information and additional services (maps, location-based services, context-aware mobile tourism guides, augmented reality etc.) offer tourists an opportunity to plan personalized tours, get informed on open nearby restaurants according to his time, be advised where to eat on the basis of his food preferences, get public transport information, etc.
- (4) *Recollecting*: After experiencing the holiday, the tourist comes back home and remembers the experience through photo albums, souvenirs and storytelling.

The identification of relevant utility dimensions for cultural tourists allowed us to characterize some aspects of the value proposition delivered by app-based services in that context. According to the following dimensions, namely *utility* and phases of the *tourism experience lifecycle*, as shown in Table 3, we built a framework to characterize and map the value proposition of app-based cultural tourism services.

We further classified apps according to this framework in order to identify the value proposition delivered by app-based services in the cultural tourism context. Table 4 presents a distribution of a value proposition by means of a heat map.

Most apps offer cultural tourists a set of services dealing with practical and convenient aspects, especially in the planning phase of the tourist experience. Many apps (27 out of 80) allow saving and managing quotations, reservations, calendars, plan itineraries. 20 apps offer an opportunity to find special offers, compare rates and save time finding travel solutions, book tickets. 24 apps offer social-based services supporting tourism during the dreaming phase. These services provide tourists an opportunity to be inspired by the stories and images of those who have already lived the tourist experience or by those who live in that place. In most cases (14 apps), these experiences can be directly shared by other users through features allowing memories, experiences, emotions, opinion sharing. In this way, the recollecting phase of some users supports the dreaming phase of others. It is important to underline that these are approaches to the value proposition that are typical of generalist apps for tourist services and not verticalized and oriented toward cultural tourism. In fact, there are few apps that offer value with a specific orientation to the needs of the cultural tourists. Needs such as learning, direct contact with history with places and the possibility of living a proactive and authentic experience are scarcely addressed by currently available apps.

	Dreaming	Planning	Experiencing	Recollecting
<i>Convenience</i>	Find, select, filter places according to some criteria	Find special offers; compare rates; save time in finding travel solutions; book tickets; tourist services reservation	Keep your budget under control; fast-line/skip-the-queue services; real-time monitoring of overcrowding; real-time fares; last-second deals	Costs and fares tracking
<i>Risk reduction</i>	Learn about threats, dangers, contraindications related to specific places	Know the safest routes; read reviews; having the opportunity to cancel without repercussions; buy insurance	Direct use of emergency contact, real-time notification of adverse events, real-time meteo	Users can provide suggestions and advice about some security and safety-related issues
<i>Enhancing experience</i>	Virtual reality services, inspiring video, photo and storytelling campaigns	Proposal of personalized itineraries and possibility to integrate activities with customized experiences	Receive context-based information. Take advantage of augmented reality, shazam-like and near-to-me services	Create a collection of memories with photos and personal notes
<i>Sociability</i>	Be inspired by the stories and images of those who have already lived the tourist experience or by those who live in that place	Receive suggestions and advice on which services to book; which suppliers to contact; which periods of the year, days, hours, are best for visiting the tourist attraction	Receive real-time support from other travelers who are on the spot at the time or meet locals willing to act as a tour guide	Share memories, experiences, emotions, opinions with other users
<i>Practicality</i>	Save favorite places, favorite reviews, customize the weights of other users' review criteria	Save and manage quotations, reservations, calendars; plan itineraries	Manage tickets and travel documents, receive information in real-time	Manage and archive photos, videos, souvenirs of their own holidays

Table 3.
Value propositions map of app-based services for cultural tourism

	<i>Dreaming</i>	<i>Planning</i>	<i>Experiencing</i>	<i>Recollecting</i>
<i>Convenience</i>	2 apps	20 apps	5 apps	2 apps
<i>Risk reduction</i>	10 apps	12 apps	3 apps	4 apps
<i>Enhancing Experience</i>	4 apps	3 apps	10 apps	5 apps
<i>Sociability</i>	24 apps	6 apps	4 apps	14 apps
<i>Practicality</i>	15 apps	27 apps	14 apps	5 apps

Table 4.
Heat map of value propositions delivered through app-based services for cultural tourism

4.3 Value capture

For what concern dimensions of value capture, we found that cultural tourism apps adopt well-established revenue methods for digital services. Table 5 shows methods for value capture we found in cultural tourism apps.

Most apps are based on three-party advertising: the app is provided free to tourists, while publishers are rewarded by advertisers buying in-app advertising. Few apps enable in-app transactions. We observed that in some cases, the above-mentioned value capture methods are used in combination. This mainly happens with the “advertising method” that is often coupled with freemium (the free version on the app contains advertising) or community model.

5. Conclusions

Cultural tourism represents a significant context for business model innovation research since it leverages digital technologies to present a snapshot of the image and history of a region, symbolize the identity of a community and increase the liveliness of the local economy (Chen *et al.*, 2015; Hou *et al.*, 2005), to increase the value of cultural tourism lifecycle. Nonetheless, tourism destinations have the potential to become popular attractions because travelers are increasingly interested in cultural tourism and related activities (Cucci *et al.*, 2016).

The current market paradigm that shifts toward a digital consumer society is leading new digital businesses to enter the market of tourism-related services. New technological advances on mobile-based technologies and the IoT have made possible the development of new services (Ammirato *et al.*, 2019b), providing value to cultural tourists along the tourism experience lifecycle. This is particularly true for cultural tourism since these technologies enable an active, authentic and participative tourism experience.

Massive digitalization, the IoT and virtual and augmented technologies have the potential to create new forms of cultural experiences for users and new business models with huge market potential for companies. These changes were made even more evident during the lockdown period due to the Covid-19 epidemic when due to the restrictions on tourism, various public and private companies made available in digital form various cultural tourism contents to cope with the needs of tourists. These solutions have raised new questions on how to make these solutions sustainable over time through appropriate business models.

The paper aimed to explore distinctive characteristics of business models of mobile-app based services for cultural tourism to characterize business models of mobile app services in the cultural tourism market and analyzes the current offering of app-based services in this sector. Our exploratory study attempted to provide a methodological approach and a multidimensional framework to position the offer of app-based cultural tourism services. We

Method	Description	Number of apps
Paid app download	Users are charged to download the app	5
Subscription	Users are charged a periodic (daily, monthly or annual) fee to subscribe or a fee based on actual usage rates	4
Brokerage	Charge a fee or commission for each in-app transaction it enables	9
Freemium	Give away the app with basic functions for free anticipating some customers will pay for a more advanced version	12
Community	Free services to build a community of users and collect intangibles	22
Advertising	The app is provided free to tourists. Advertisers buy in-app advertising, hoping to sell their product/services to app users	51

Table 5.
Value capture methods
of app-based services
for cultural tourism

reviewed mobile apps that provide services for cultural tourists by analyzing their functions and the information flow that occurs in the interaction between the user and the service to identify value dimensions of app-based cultural tourism services. Although several studies addressed the concept of information value, the available research lacks in defining an approach capable of analyzing the relevance of the information provided to targeted audiences by cultural tourism services. Our paper proposed a framework that, from a marketing-related perspective, could represent a valuable tool for positioning cultural tourism information offer, with the twofold objective to analyze the value proposition of app-based services according to a consumer perspective and to understand gaps of the current offering.

For what concerns the state-of-art of current available app-based services, it emerges that companies do not fully exploit advantages deriving from the introduction of ubiquitous features in providing cultural tourism-related services. We found few apps specifically oriented to cultural tourists. Only three apps leverage augmented and virtual reality technologies to enhance and favor a proactive visitor experience. As stated in [Bassano et al. \(2019\)](#), we are moving toward an experiential tourism context where “immersive experiences” have value and meaning, with algorithms and human and artificial intelligence able to direct consumer’s choices and preferences. It is crucial to know what a tourist prefers and rethink touristic strategies building unique and distinctive experiences. Mobile-based technologies are recognized as an effective and coherent tool able to exploit at best the potential attractiveness of places, engage, and retain the target of cultural tourism. However, a gap between these opportunities and what is present on the market to date is evident. Hence, practical implications revolve around informed and effective action based on current knowledge and learning about the design of IoT-based solutions. In fact, results could be used to suggest some directions to the design of a new generation of cultural tourism services and to identify potential service delivery improvements within the IoT domain.

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Appendix

#	App name	Website
1	Google trips	http://google.com/travel
2	Sidekix	http://www.getsidekix.com
3	Cool cousin	www.coolcousin.com
4	Tripadvisor	https://www.tripadvisor.it/
5	Tripcase	https://www.sabre.com/
6	Yangu	https://www.yangu.com/it
7	Monument tracker	https://monument-tracker-world-guide.it.aptoide.com/app
8	Party with a local	https://www.superlocals.in/
9	Musement	https://www.musement.com/it/
10	Foursquare	https://it.foursquare.com/city-guide
11	Ti porto io	http://www.tiportoio.tv/
12	Touchnote	https://touchnote.com/us/
13	Virail	https://www.virail.it/
14	Tiqets	https://www.tiqets.com/
15	My easy route	http://webmapp.it/
16	Playtrip	https://www.facebook.com/app.playtrip/
17	Arts and culture open heritage	https://artsandculture.google.com/project/openheritage
18	Mapstr	https://mapstr.com
19	Cities talking	https://www.producthunt.com/posts/cities-talking
20	Gps my city	https://www.gpsmycity.com/
21	All trails	https://www.alltrails.com/

Table A1.
The complete list of
analyzed mobile apps
(continued)

#	App name	Website
22	Field trip	https://www.fieldtripper.com/
23	Withlocals	https://www.withlocals.com
24	Pro natives	http://www.pronatives.com
25	Monugram	https://www.monugram.com/monugram-app
26	Jitt.travel	http://www.jiTt.travel
27	Culture trip	https://theculturetrip.com/our-app/
28	Spotted by locals	https://www.spottedbylocals.com/
29	PiratinViaggio	https://www.piratinviaggio.it/
30	Roadtrippers	https://roadtrippers.com
31	Foodspotting	https://www.opentable.it/
32	Localeur	www.localeur.com
33	Tripit	https://www.tripit.com/web
34	Tripwolf	https://www.tripwolf.com/it/
35	Museums of the world	http://museu.ms/about
36	ViaggiArt	https://viaggiart.com/it
37	Sygie travel	https://travel.sygie.com/en
38	Polarsteps-travel tracker	https://www.polarsteps.com/
39	GetCOO	https://travel.getcoo.com/
40	Golsrael	https://info.goisrael.com/it/informazioni-turistiche
41	CityMaps2Go	https://www.ulmon.com/
42	Cultural places	https://www.culturalplaces.com/en/
43	EatWith	https://it.eatwith.com/
44	Palmipedo	https://www.palmipedo.guide/
45	W-her	https://w-her.com
46	Izitravel	https://izi.travel/it
47	ZonzoFox- Guida d'Italia	https://www.zonzofox.com/it/
48	Mapify	https://mapify.travel/
49	Tourists' office	https://touristofficeapp.com/
50	Artplace museum	https://www.facebook.com/ArtplaceApp
51	TourScanner	https://toursanner.com/it
52	PackPoint	https://www.packpnt.com/
53	Tripify	https://tripifyapp.com/
54	Civitatis	https://www.civitatis.com/it/
55	Geotourist	https://geotourist.com/landing
56	Minube	https://www.minube.com/
57	Smartify	https://smartify.org/
58	MyWoWo	https://mywowo.net/it
59	Expeditions	https://edu.google.com/intl/it_it/products/vr-ar/expeditions?modal_active=none
60	Mesmo	https://www.mesmo.me/
61	Tours and Travels	https://etips.com
62	Virtlo	https://www.virtlo.com
63	Apptripper	www.apptripper.org
64	Runnin'City	https://www.runnincity.world/
65	AroundMe	http://www.aroundmeapp.com
66	Viator	https://www.viator.com/it-IT/
67	Couchsurfing travel	https://www.couchsurfing.com/
68	Ciceros	https://www.ciceros.it/
69	Eatnmeet	https://eatnmeet.app/
70	Klook	www.klook.com
71	Hostelworld	https://www.hostelworld.com/
72	GetYOurGuide	https://www.getyourguide.it

Table A1.

(continued)

#	App name	Website
73	Io prenatalo	https://ioprenotoapp.com/
74	World Around Me	https://worldaroundmeapp.com
75	ViaggiAmo Italy	http://www.trueplacesitaly.it/
76	Rome2Rio	https://www.rome2rio.com
77	Jornades	http://www.jornadesapp.cat
78	Civil war walking tour– Alexandria	https://www.alexandriava.gov/Historic
79	Visit a City	https://www.visitacity.com/
80	Eventbrite	https://www.eventbrite.com/

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