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## **Smart destination management driven by emotions and small data**

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### **I - Introduction**

Mobile applications for visitors are digital interfaces that contribute to changing how a destination is valued. They contribute to the quality of the visitor experience. The purpose of this paper is to lay the theoretical and functional (but not operational) foundations for the use of an emotion-based application by a destination. Emotion is at the heart of the tourism experience (Aho 2001, Bastiaansen & al. 2019, Knobloch & al. 2017, Tussyadiah 2014) and should be an element of destination enhancement.

Traditionally, applications support access to information, digital products, and services. They can also support creative activities and local talent. It is rare for apps to associate emotions, life moments and values carried by residents with places through geolocation.

This article explores the boundary between experience and emotion and how to fix and communicate emotion (Bakhtiyari and Husain 2013, Gauducheau 2008, Hosany et al. 2020). From a functional point of view, it questions the elements to be considered to express and measure emotion (Halté 2016, Klonsky et al. 2019) and to exploit the small data resulting from the application to enhance the territory.

The originality lies in the fact that residents co-create and co-value the destination through a digital dialogue with visitors. By encouraging the sharing of emotions between residents and visitors, tourism becomes more inclusive.

## II - Emotion at the heart of the tourist experience

Since the work of Pine and Gilmore (1999), the academic literature considers the tourism experience as a subject. It is not our intention to revisit this literature, which notably questions the design of experience (Tussyadiah 2014), the status of experience as a concept (Vergopoulos 2016), a process (Aho 2001), or as a fixing element of experiential marketing (Knobloch et al. 2017). Experience is composite. Bastiaansen & al. (2019) identified various constituent elements: attention, involvement, engagement, immersion, cognitive absorption, and emotion. Skavronskaya & al. (2017) associate awareness and mindfulness, attention, memory, feelings, emotions, and a cognitive pattern with experience. We consider that emotion gives the experience its memorable character and, as such, is at the heart of the new tourism experience. After explaining the notion of emotion (1), we will see that for a tourist destination, being able to fix the emotion of visitors and to communicate around emotion can contribute to making it attractive (2) to the point of considering emotion as the new frontier of destination valorization (3).

### 1. What is emotion?

From an etymological perspective, emotion derives from the Latin *motio* 'to move' and 'to emote.' It has long been associated with a 'moral disorder,' making it an object of study in cognitive science and neuropsychology (Moyle et al., 2019). In a figurative sense, emotion is felt individually or collectively to the point of generating a movement, a transport. An emotion is experienced, felt, generates sensations and feelings. Depending on the degree of sensitivity and receptivity of individuals and the circumstances, emotion can be strong, acute, intense, painful, happy, poignant, sentimental, etc. For a long time, repressed and judged sentimentalist, emotion is a total modification of the "the being-in-the-world" (*l'être-dans-le-monde*, Sartre, 1939: 66). Emotion can be of aesthetic, artistic, literary, musical, spiritual, or cultural origin. It is this informational and sentimental richness that interests tourism as well as its experiential content. For Gauducheau (2008: 390), "*emotion is a complex reaction of the individual to a state of the environment or an event.*"

Emotion has been associated in the literature with various tourist practices such as festivals, shopping, leisure parks, heritage visits, adventure (Hosany & al., 2020). Emotions permeate visitors' experiences and guide their responses to external stimuli, affecting their attitude, behavior, and memory. Emotions are "*fleeting phenomena rather than stable attributes of an individual that come and go with the ebb and flow of daily life*" (Kuppens, 2015: 297).

Emotions shape the tourism experiences (Kim & Fesenmeier, 2015; Volo, 2016), and they contribute to creating a lasting memory, thus influencing future behavior and travel choices. Used by individuals to assess their interest in repeating specific experiences, emotions are also shared with others through storytelling, becoming powerful motivators of future behavior for self and others. Fleeting but powerful emotions are associated with

individuals' past experiences. Thus, the direction and strength of emotional responses to stimuli can differ considerably from one tourist to another, resulting in various responses.

From a tourism perspective, emotion is often studied at the various stages of the decision cycle 'before - during - after' the trip (Li & al. 2014, Hosany & al. 2020). Before the trip, i.e., when choosing a destination, the image can generate a positive emotion, but this is passive and projected, often due to destination marketing. On the other hand, once there, the emotion becomes an "active" response to the visitor's experience. At this stage, emotion is plural. From the destination perspective, emotions generated during the trip, and fed after the trip, color the experience. They make it a memorable moment (or not) which will give rise to a revisit (or not) or a recommendation (or not) to friends and relationships. A visitor who associates positive emotions with a destination and displays satisfaction will have a positive experience. They are likely to be loyal to that destination.

Moreover, linking emotion and experience invites us not to reduce the experience to a product purchased from tourism providers and thus make the visitor more proactive (Knobloch et al., 2017). It also allows the experience to be associated with a sentimental, affective dimension and meaning, sharing, and knowledge.

## **2. Capturing and communicating emotion**

From a methodological point of view, how to capture and communicate the visitor's emotion? The measurement method is generally problematic because it borrows heavily from psychology (Hosany & al., 2020).

Indeed, many studies, particularly in psychology and neuromarketing, explore the neurotransmitters at the source of emotion via visual stimuli activated during tests, electroencephalograms, and questionnaires (Bastianen & al. 2016, Moyle & al. 2019, Klonsky & al. 2019). Those analyses fall into two categories, those that seek to understand the relationship between stimulus and behavior (behaviorist approaches) and those that explore the mental process at work between stimulus and behavior (cognitive approaches). These approaches measure emotion and consider the link between emotion and destination based on images or rating scales, regardless of whether the individuals tested know the destination. The link between emotion and experience is independent of the on-site presence or the localized socio-cultural interactions. It depends on pre- or post-visit emotions, which poses a problem of memory distortion and emotion reconstruction in the latter case.

Moreover, this raises the question of the link between emotion and knowledge. It seems that emotion cannot be considered an independent variable with no link to the place visited. Capturing emotion is not simply a matter of measuring it on a scale of values.

For example, Hosany & Gilbert (2010) developed the Destination Emotion Scale (DES) through two empirical studies. The DES measures the diversity and intensity of tourists' emotional experiences of destinations. The authors followed a rigorous process to develop the Destination Emotion Scale, following conventional guidelines. Data for the first study were collected face-to-face from 200 British people. Respondents must rate

the intensity of their emotional experience of the destination they had visited (e.g., 'I felt a sense of pleasure'). An exploratory factor analysis with Varimax rotation initially identified a 3-dimensional measure of 23 items, and after establishing one-dimensionality, the scale remains at 15 items. The three dimensions of the DES are: Joy (cheerfulness, pleasure, joy, enthusiasm, and delight); Love (tenderness, love, attention, affection, and warmth), and positive surprise (astonishment, surprise, fascination, inspiration, and surprise). The alpha coefficients and composite reliabilities exceed the recommended standards.

In the second study, Hosany & Gilbert (2010) examined the dimensionality and validity of the DES. They were using the guidelines recommended by Dillman (2007) to collect the data via a postal survey in a town in the southeast of England (UK). The sample size for the second study was 520 respondents. Correspondence factor analysis (CFA) establishes the construct validity of the destination emotion scale. In addition, multiple regression analyses performed on the data with the emotion dimensions as independent variables, satisfaction, and intention to recommend as dependent variables confirm the scale's predictive validity. Although the CFA shows that the 15-item measure has solid psychometric properties, further evidence of the scale's validity is needed. Validity is the degree to which a construct achieves empirical and theoretical significance. The literature identifies six criteria for achieving construct validity: content validity, one-dimensionality, reliability, convergent validity, discriminant validity, and nomological validity (Garver & Mentzer 1999; O'Leary-Kelly & Vokurka 1998; Ping 2004).

Furthermore, in Hosany & Gilbert's (2010) study, the sample was limited to one culture (British nationals). To advance knowledge, Steenkamp & Burgess (2002) emphasize the need for researchers to test new scales in different countries and environments, thereby establishing external validity. The scale's discriminant validity is assessed by using place attachment, a theoretically related but distinct construct (Scannell & Gifford 2010). The "place attachment" conceptualization is the emotional connection between an individual and a particular spatial setting (Williams & al. 1992). People's relationships with place can represent a range of positive emotions from love to contentment (Manzo 2005).

If we abandon measurement for observation, the Internet and social networks seem to be vectors capable of fixing emotions and facilitating communication and, therefore, social interactions around emotions. Emotion manifests the mental state of the visitor, which, when expressed on social networks, calls for reactions in return and contributes to strengthening social links. One way of capturing this emotion is to search in the tone of posts, photos, and messages, the nature of the emotions of what is perceived and experienced by the visitor by analyzing verbal and non-verbal corpus.

Another way to do this is to focus on emoticons to express emotions, a state of mind, or a feeling in the digital age. An emoticon is a conventional representation of emotion through a typeface or image that substitutes for verbal expression. As Halté (2016: 442) points out, *"The subjective elements that emoticons can indicate can be, for example, an*

*emotion, an attitude, or even a practical instruction.*" Initially confined to ASCII<sup>1</sup> expressing smileys, they are now drawn and available in abundance and no longer necessarily concern facial expressions but also objects, monuments, animals, etc., to the point of being consigned to a universal library<sup>2</sup>. The primary emotions expressed are joy, humor, sarcasm, sadness, anger, laughter, amazement, sadness, etc. These emoticons can be positive, negative, relational.

Hosany & al. (2020), aware of the difficulty of measuring emotion and above all the need to adjust the measurement to the specificity of tourism, propose the "emotion apps model," which offers a reading of emotion combining, in a continuum, different criteria (joy, etc.), different configurations mixing positive and negative elements, consciousness and unconsciousness concerning the place visited, opening the way to a better consideration of emotion in research in tourism.

The communication of emotions is complex. Indeed, what distinction can we establish between emotion felt *in situ* and emotion expressed *ex-post* by the visitor? How can a destination understand why people feel emotions and tap into these emotions to enhance the territory?

### **3. Emotion as a destination enhancer: a new frontier**

According to sociologists and psychologists, places are sources of identification and affiliation that give meaning and purpose to life (Gustafson 2001; Williams & Vaske 2003). Research in environmental psychology<sup>3</sup> establishes that people develop relationships with places (Hidalgo & Hernandez, 2001). Previous studies explore the nature and nuances of people's relationship with places, also known as place attachment (Kaltenborn 1998). Place attachment is the connection between individuals and places. Theorized as a multidimensional concept, place attachment "*involves an interplay of affect and emotions, knowledge and beliefs, and behaviors and actions in reference to a place*" (Altman & Low 1992: 5).

Two main conceptualizations of place attachment dominate the literature in environmental psychology (Hidalgo & Hernandez, 2001; Manzo, 2003; Williams & Vaske, 2003) and tourism (Gross & Brown 2008; Lee & al. 2012; Yuksel & al. 2010): place identity (emotional attachment) and place dependence (functional attachment). Place identity refers to the symbolic importance of a place as a repository of emotions that give meaning and purpose to life. Place dependence reflects functional or goal-oriented connections with an environment. It indicates the extent to which physical

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<sup>1</sup> ASCII: American Standardized Code for Information Interchange. For example :) refers to the smiley 😊.

<sup>2</sup> This library is managed by a consortium of major Internet players (Amazon, Apple, Facebook, Google, Huawei, Microsoft, Netflix, Oracle, SAP, etc.) who decide after a long study process if the proposed emoticon can be included in the catalog (<https://home.unicode.org>)

<sup>3</sup> According to Moser and Weiss (2003), environmental psychology studies the interrelations between the individual and his or her physical and social environment, from a spatio-temporal perspective.

environments provide conditions and characteristics that support a person's specific goals or desired activities (Williams & al. 1992).

Beyond the iconic images used by territorial marketing to invite travel, how can a destination be enhanced through emotion? It comes down to asking how a destination can explore visitors' emotions during and after their journey and how to make their visits enriching experiences.

If emotion is a matter for visitors, we must not forget that this emotion must also concern the permanent residents of a territory, an emerging subject in tourism research. Indeed, residents also experience emotions concerning tourism development in their territory and its direct, indirect, and induced effects generated and sometimes suffered. The literature mainly explores reactions to the hosting of major sporting events (Fabry & Zeghni 2020, Ouyang & al. 2017), but more and more authors are interested in the stress of residents linked to tourism or the hosting of major sporting and cultural events (Jordan & al. 2019, Zheng & al. 2019).

For a visitor to favorably associate emotions and experience, the place visited must provide most positive emotions. The visitor must also feel welcome and be able to interact with the permanent residents if they wish. It is, therefore, in a destination's interest to encourage these exchanges. In the digital age, a mobile application promoting the destination can also serve as an interface between the various population categories. Traditionally, applications promote access to information, digital products, and services. They can also support creative activities and local talent. Rarely do they allow emotions to be associated with places. Residents and visitors can share moments of life and values through geolocation. The originality lies in the fact that residents co-create and co-value the destination through a digital dialogue with visitors. By encouraging residents to share with visitors, tourism becomes more inclusive. We formulate the following proposals:

*P1: Emotion is the basis of a renewed tourism valorization essentially carried by residents and visitors.*

From the perspective of enhancing the value of a destination through digital technology, the destination can recover the application's data and try to explore and exploit it. This data would provide information not only on emotions but also on visitor journeys, visiting times, mobility, etc. This information would make it possible to improve and individualize the tourist offer. This data opens the way to an enhancement of the territory based on small data.

*P2: The data generated by the application should, through its systematic analysis and exploitation, promote understanding visitors' needs and behavior to improve and individualize the tourism offer.*

Emotions and the resulting data constitute an issue to explore in the management of tourist destinations and the ongoing work on the attractiveness of tourism on a more inclusive and even sustainable basis (Barry & Neault 2021).







### III. The use of an emotion-based application by a destination: some functional elements

Destination applications, initiated by the institutions in charge of tourism promotion, aim to make the territory in which visitors are temporarily staying intelligible (Gavalas & al. 2014). At a minimum, they include characteristic tourist points, practical information (openings, prices, etc.), mobility (means of transport, timetables, prices, etc.), shops, restaurants and bars, places of entertainment, weather, the purchase of services, and any other element of interest to a person who does not intend to stay for the long term. In addition to these informative and transactional features, we propose to add an experiential dimension driven by emotion. The objective is not to measure emotion but to capture the sense of emotion expressed by visitors when they stay at the destination (1) to enable the destination to work on its attractiveness on a new basis (2).

#### 1. Capturing the emotion of visitors via emoticons

As we saw in the first part, emotion is complex and composite. It reflects several categories of mental dispositions, including the six fundamental facial emotions identified by Eckmann. These are joy, anger, fear, sadness, surprise, and disgust. These emotions serve as the basis for the development of other derived emotions. They have a universal character (Eckmann 2002). For a territory that receives visitors from all over the world, this is an important characteristic. At the risk of oversimplification, the application can propose selecting emoticons deemed characteristic of a particular emotion that will be understood by all, regardless of the cultural base.

Table 1 - Emoticon palette to capture visitors' emotions

<i>Emotions</i>	<i>Emoticons</i>	<i>Natures</i>	<i>Manifestations</i>	<i>Expresses</i>
<i>Joy</i>		Satisfaction, Success, Passion	Happiness, Good mood, Contentment, Interest	A positive emotion
<i>Anger</i>		Frustration, Annoyance	Closure, Nervousness	A negative emotion
<i>Fear</i>		Worry, Concern	Apprehension, Mistrust, Fear	A negative emotion
<i>Sadness</i>		Loss, Disappointment	Unsatisfaction, Affliction	A negative emotion
<i>Surprise</i>		Unexpected, Revelation, Astonishment	Enthusiasm, Wonder, Inspiration	A positive emotion
<i>Disgust</i>		Aversion, Reject	Contempt, Irritation	A negative emotion

Source : according to <https://www.unicode.org/charts/PDF/U1F600.pdf>



By proposing to visitors to express their emotion(s) by selecting from a panel of emoticons, it then becomes possible to capture moments of satisfaction, contentment that is assimilated to a positive emotion, and moments of disappointment, sadness, frustration that refers to more negative emotions (Derks et al. 2007). The use of location data will make it possible to associate a place/point of interest with the emotions expressed.

## **2. Enhancing the value of the destination based on the emotions of its residents**

A destination that attracts visitors is mainly concerned with enhancing its amenities and proposing places to visit and experience. Social networks and specifically dedicated platforms, for their part, allow individuals to communicate their experiences and rate certain services (Tripadvisor, Withlocals, etc.).

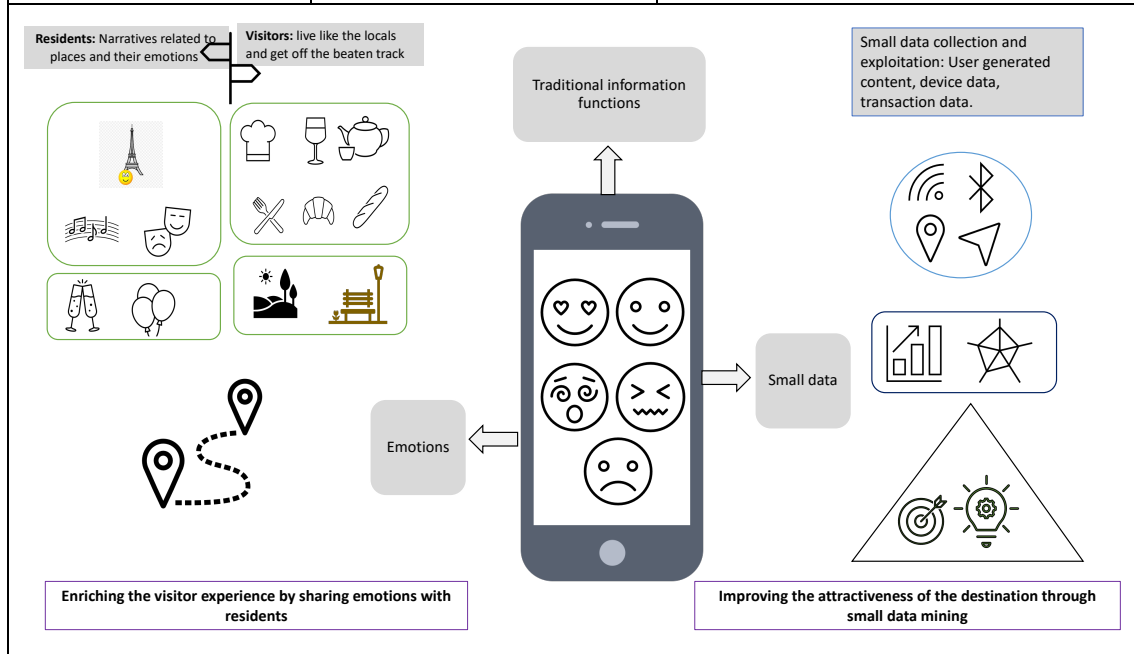
We can note that tourism involves a range of interactions between tourists and residents, which means that industrial development strategies need to consider both stakeholders. In addition to tourists' perception, the local community's image of their place of residence and the destination is essential, as this audience acts passively and actively to shape the image of destinations in the minds of visitors. One of the biggest challenges for DMOs is to understand that they serve tourists and stakeholders directly around them and the local community.

Turning residents into tourism actors and even prescribers and promoters of the destination are growing (Mona 2021, Transat 2021 Chair). The idea we are proposing is to allow, through the destination application, the sharing of emotions between residents and visitors. It means allowing residents to attach fragments of their personal history to specific places in their city and communicate them to visitors. These stories could help to shape unusual tours or even new tourist services. These stories could help to shape unusual tours or even new tourist services. The addition of a dimension (text or photos) to the places visited helps arouse visitors' curiosity and attention off the beaten track.

Beyond the narrative dimension, this functionality of the application allows the destination not only to enhance its value by considering the emotions shared and crossed between residents and visitors but also to exploit small data (GPS, tracking via Wi-Fi terminals, connections to operators, RFID, etc.) and thus improve the image of the destination.

Figure 1 - The place of emotions in the tourism experience managed by destinations

Nature of the information	Category	Example of content (not exhaustive)
Information for visitors produced by the territory's stakeholders and distributed by the tourist offices	Points of interest	Museums, archaeological sites, monuments, churches, Parks and gardens
	Ticketing and activities	Theaters, Exhibitions Guiding, visits, concierge service, Leisure Shopping, ....
	Local information	Local time Weather, Temperature Tourist office, ...
	Mobility to destination	Schedules and Lines Mobility solutions (walking, cycling, bus, streetcar, metro, etc.) Route calculation, ...
	Food and Lodging	Hotels Restaurants Bars Caterers, ...
Information for visitors produced by residents	<i>Storytelling</i> by residents about their attachment to the place in relation to their experiences, uses and practices.	Customization of tours and itineraries based on time at destination, budget, and selected individual stories.



#### IV. Conclusion

Our proposal, helps to ensure that the destination and its permanent resident populations regain the ability to manage tourism rather than being impacted by it. This is what Haywood (2020) proposes, when he suggests that residents make their destination 'special' and re-imagine future tourism on a smarter basis. As he points out, “*Tourism becomes smarter by design when the revival and revitalization of all communities-as-destinations takes center stage and is taken seriously.*” (Haywood 2020, p.607).

The health context (Covid-19) also makes it possible to envisage the possibility of integrating other functionalities into the destination application, such as the number of visitors to a place. Visitors to a site could themselves indicate their feelings about the state of frequentation of a place. These are all means given to destinations to distinguish themselves and differentiate themselves.

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