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The role of drones in communication and promotion of tourism experiences – A case of Poland

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Abstract: Tourists travel to collect images in either their memories or some tangible form. The contemporary trend of mass tourists' behaviour is to replace cameras with digital devices. The next step, but only taken by selected and more technology-oriented segments of tourists, is the use of drones (Unmanned Aerial Vehicles – UAV). The aim of the paper is the evaluation of UAV's role in tourism in Poland. In-depth interviews were conducted with Polish experts (N=13) in the field of drones. The survey questionnaire (N=1175) was conducted with Polish tourists. It was found that drones enhance user value and technology-induced experience. UAVs can also enhance tourists' experience. It is becoming an increasing trend, Polish tourists being no exception, to use them to commemorate some extraordinary moments or sites, but most of all tourists themselves. In Polish tourism market, the entities promoting most frequently with UAVs are venues: congress and trade centres, attractions and hotels. Drones are also used to widen the experiences of meetings and events' participants.

Keywords: drones (UAVs), photos, videos, experience, digital immediacy
JEL classification: L83

Uloga dronova u komunikaciji i promociji turističkih iskustava – Slučaj Poljske

Sažetak: Turisti putuju da bi prikupili slike u svojim sećanjima ili u nekom opipljivom obliku. Savremeni trend ponašanja masovnih turista je da se kamere zamene digitalnim uređajima. Sledeći korak, ali samo za odabrane i tehnološki više orijentisane turiste, jeste upotreba dronova (*Unmanned Aerial Vehicles – UAV*). Cilj rada je evaluacija uloge *UAV*-a u turizmu na primeru Poljske. Sprovedeni su dubinski intervjui sa poljskim stručnjacima (N=13) iz oblasti dronova, dok je poljskim turistima distribuiran anketni upitnik (N=1175). Utvrđeno je da dronovi omogućavaju stvaranje visoke vrednosti za kupce i potpuno tehnološko iskustvo. *UAV* takođe mogu poboljšati iskustvo turista. Postaje sve izraženiji trend, koji je karakterističan i za poljske turiste da ih koriste za beleženje nekih izuzetnih trenutaka ili mesta, a pre svega sebe. Na poljskom turističkom tržištu subjekti koji najčešće promovišu dronove su prostori: kongresni i trgovinski centri, atrakcije i hoteli. Dronovi se takođe koriste za proširenje iskustava učesnika sastanaka i događaja.

Ključne reči: dronovi (UAVs), fotografije, video snimci, iskustvo, digitalna neposrednost
JEL klasifikacija: L83

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1. Introduction

The aim of the paper is the assessment of the role of drones (Unmanned Aerial Vehicles – UAVs) in tourism. Drones are able to provide aerial filming and aerial photography, customized for tourists or institutions. The majority of people are visualizers so influence on their sense of sight seems to be the most effective way of communication. Drones are used either by suppliers of tourist services and/or tourists, and both aspects are taken under consideration in the paper.

There are a few publications on the role of photography and videography in tourism (Bandyopadhyay & Ganguly, 2015; Belk & Yeh, 2011; Dinhopl & Gretzel, 2015; Dinhopl & Gretzel, 2016; Fairfax et al., 2012; Galí & Donaire, 2015; Gillespie, 2006; Jensen, 2015; Li et al., 2019; Robinson, 2011) and none of them focuses on drones use. Moreover, the issue of co-creation of tourists experience due to new technologies needs a thorough investigation and analysis because it is a relatively new phenomenon. Drones are the examples of modern technology which, in combination with other ICT tools, creates the spillover effect of digital immediacy (Bell & Lyall, 2005).

The analysis was conducted on the basis of Polish tourism market and it was the first research concerning this issue in Poland. The paper is structured as follows. The first part presents a review of the key literature related to the role of technology for tourism, visual means of communication, changes in tourists behaviour in the aspect of experience: creation, capturing and (re)presentation is performed. Next, drones are described, their advantages and disadvantages are pointed out, as well as the legal barriers of their usage. In the second part of the paper, the research methodology is briefly presented. Empirical part is based on the following results of (1) in-depth interviews conducted with the representatives of Polish tourist services providers, (2) survey questionnaire conducted amongst tourists in Poland and additionally (3) on secondary sources of information. The analysis of the interviews and survey questionnaire results is performed, the results are triangulated and presented, which is followed by a discussion. At the end of the manuscript, conclusions, managerial implications limitations and further research were discussed.

2. Literature review

2.1. Importance of photo and video content for tourists experience

Visual aspects are crucial in tourism. One of the main tourists' motivations to travel is collecting images, either in their memories or on some devices. Initially, it was suggested that through photography tourists tried to "understand destinations and attractions as tourist sights" (MacCannell, 1976, p. 17). Taking photos of unique tourism experiences was perceived as "a demarcation to the ordinary character of everyday life" (Urry, 1990). Pictures help to understand destinations and attractions as tourist sights (Chalfen, 1979; MacCannell, 1976). Recently, tourist photography focus was redirected towards a unique 'triangle' of social relations – between tourists and hosts, tourists at the destination and tourists and those who stayed home (Urry & Larsen, 2011). In the literature one can even find a modern definition of tourist photography which reads (Larsen & Sandbye, 2014): "a social practice, a networked technology, a material object and an image" (p. 13).

When discussing photography in tourism, the attention should be paid to the Urry's concept of 'tourist gaze', which has evolved in time (Urry, 1990; Urry, 2002; Urry & Larsen, 2011). Tourist gaze was determined by the subjectivity of experiences and ways of seeing and understanding things. As such, the tourist gaze is in accordance with Berger's ideas of never

looking at things only, but "always looking at the relation between things and ourselves" (Berger, 1972, p. 9). "The tourist gaze is therefore an 'active and dynamic process in which tourists employ 'aesthetic reflexivity' to make sense of the visual" (Lash & Urry, 1994, p. 36). What is the most important from the general point of view in tourism, gazing or just looking, constitutes touristic consumption which is stressed by Crouch (1999) and MacCannell (1976). Tourists travel to collect images – they look at sights and 'consume' them with their eyes (Dinhopl & Gretzel, 2016). Dinhopl and Gretzel (2016) stress also that visual representation practices nowadays objectify places by "selecting, framing, and representing places in the visual media they produce of their trips" (Löfgren, 1999).

The change of the personal photography function – from commemorating places to increasing the importance of communication (Sontag, 2004), self-expression and identity formation (Shanks & Svabo, 2014; van Dijck, 2008) is also noteworthy. Certainly, it is strictly connected to and enabled by ICT development, in particular by social media.

There is another change connected with the abovementioned - the main object of a contemporary tourist photography is not an attraction or a sight but a tourist him/herself. As a result a *signum tempori* is a special type of photos – the self-picture, so called 'selfie' (Hess, 2015). The approach of Dinhpol and Gretzel (2016) seems convincing, they stress that the self-picture is characterized by "the desire to frame the self in a picture taken to be shared with an online audience".

Photography and tourism are "inextricably linked" (Sontag, 1977). Feighey (2003) explored the place of visual evidence in tourism research. Over the years photography prevailed in the comprehension of tourist experiences. The technology development "has created the possibility to make also videos" (Chalfen 1987, p. 61). It can be stated that the evolution has taken place, from photography to videography. However, nowadays both techniques coexist, having in mind the boost of social media for final consumers of tourism experience (tourists) communication, content creation of destination and user generated lifestyle impact.

The contemporary trend of mass tourists' behaviour is replacing cameras with digital devices, like smartphones or iPhones (Dickinson et al., 2014). In the adventure/sport tourism a camera has been substituted by a GoPro camera due to two main reasons. In adventure tourism, a fixed GoPro camera (to a helmet or a special harness) allows tourist to use hands in practicing an adventure activity. The second is a specific need of adventure travellers to capture and showcase and communicate the adrenaline experience of a certain tourism destination in an accepted form, such as social medial channels, e.g. Instagram, YouTube and others. The next step, but taken only by selected and more technology oriented segments of tourists, is drones usage.

The representation of tourist photos and videos was found to be markedly different. Tussyadiah and Fesenmaier (2009) stressed the capability of tourist videos to generate travel narratives. Similarly, Marlow and Dabbish (2014) highlight that photos and video provide a different form of tourist engagement (Daft & Lengel, 1986), in which video secured higher levels of immersion (being there feeling) for specific tourist destination.

Tourists' photos and videos are presented to others, shared, and there are many motivations to do it, of both push and pull character. The presentation of social practices rises in complexity as a result of the larger and more dispersed audience (Lo et al., 2011). If a tourist's experience was not perpetuated by photography or video, it is as if it has never happened.

While discussing the issue of photos and videos presentation it should be highlighted that there are special websites for sharing. There is a social network like Instagram (www.instagram.com) for photo-sharing and the website TravelByDrone allows users to

acknowledge the "world from the perspective of drones".

Generally, social media evolve into the form of networked travel, providing a insight into tourists' experience with other tourists that have stayed home (Germann Molz, 2012) and are a foundation for the concept of networked travel (Germann Molz & Paris, 2015; Larsen et al., 2007). Tourists' photos and videos allow people to share their experiences with others, owing to the technology, nearly in the real time. In the literature it is called digital immediacy (Bell & Lyall, 2005). Bell and Lyall (2005) stress that "people share images with other people immediately to convey the emotions associated with it: 'not just, 'I was here'; but 'I am here, right now', having this experience in real time, and here is the evidence that this is the case" (p. 136). Immediacy argues the notion of visual co-presence (Ito, 2005) and the opportunity to 'interact' with those that have not been present (Germann Molz, 2012; Germann Molz & Paris, 2015). Esteeming immediacy was found to be vital for videos capturing sports events or concerts.

In the literature, it is claimed that in presentations photos privilege tourist settings over tourist activities or practices (Crouch & Lübbren, 2003) while it holds the other way round for videos (Dinhopl & Gratzel, 2015). Yet, it should be stressed that taking photos or videos from drones changes this situation. With widening the angle, it is possible to show both a person and a sight in a good quality. Thus, drones eliminate some barriers and remove the necessity of choosing, diminishing the difference between tourists photos and videos.

In relation to supply side of the tourism market, it should be noted that videos and photos have become a powerful tool for firms striving for effective communication with their clients. Schroeder (2004) uses the expression "emphasizing role of the visual in business" and calls it "image economy". Visual content is an inseparable part of any marketing strategy (Manic, 2015). Images and videos and innovative techniques for the production of graphical content are essential pillars of visual content-driven marketing strategies.

Images help to secure wider reach and recognition and strengthen the efficiency of marketing activities. Marketers have acknowledged the importance of visual storytelling in recent years and they have provided more and more engaging visual content for their customers. Drones are very important tool in obtaining this goal.

2.2. Revolution of tourists' experience through the photo and video self-content creation

Tourists' experiences are one of the crucial categories in contemporary tourism. It is a "core of tourism product" (Berbeka, 2016, p. 42). An experience refers to the 'experience economy' (Pine & Gilmore, 1998) and is discussed in many aspects of tourism (Berbeka, 2018).

It is worth paying attention to the Florida's concept of Creative Class (Florida, 2002), its participation in tourism and an approach of its representatives to experiences (Gretzel & Jamal, 2009). As Florida (2002) describes, Creative Class experiences are rich, "participatory and storied, narrated and shared through multiple media", often nature-based. The life of the Creative Class is a "mobile social life" (Larsen et al., 2007) in which "travel is an everyday experience and tourist experiences are part of everyday life". Creative tourists as "peak experience consumers" (Wang, 2002) continuously await transformative experiences, so over time, they are persuaded to push the boundaries to achieve peak and occasionally adventeures and extreme experiences (Florida, 2002). They want to capture this experience and share with others and here the technology is indispensable, both the tools to capture – like drones - and devices to share them like social media.

Moreover, experience co-creation by participants as a concept is also worth mentioning

(Payne et al., 2008). Korkman (2006, p. 27) also stress a "new logic for value creation where value is embedded in personalized experiences", "value is created by experiences" (Prahalad, 2004, p. 172). The experiential consumption approach (Holbrook & Hirschman, 1982) and consumer culture theory (Arnould & Thompson, 2005) emphasize affective, contextual and non-utilitarian consumption domains in which value resides in the consumption experience (Payne et al., 2008). It is a core idea of The Service Dominant Logic, stressing a value creation by a consumer at the moment of consumption (Lusch & Vargo, 2006) and transformed to the Customer Dominant Logic (Rihova et al., 2018)

Experience in tourism is determined by numerous factors (Jennings & Weiler, 2006). One of the most important is technology (Buhalis & Law, 2008; Gretzel et al., 2006). The increasing role of technology was stressed by the recognition of the phenomenon known as "Technology-Enabled Enhanced Tourist Experiences" (Neuhofer & Buhalis, 2012).

According to Tussyadiah and Fesenmaier (2007) as a consequence of ICTs impact on the tourist experience, the current tourist experience was distinctively altered. Thus, Gretzel and Jamal (2009) argue that novel experiences arise as a result of novel types of technologies capable to support these experiences.

Research results have also pointed out that technology stirred tourist experiences through the use of travel videos (Tussyadiah & Fesenmaier, 2009), smartphones (Wang et al., 2012; Wang et al., 2014) and technologies such as Google Glass (Tussyadiah, 2014). Aerial films and pictures may be added to these examples.

Nowadays, tourism theory stresses the significant role of visual media in allowing tourists produce and present tourist experiences (Cary, 2004). Visual media in tourism facilitates tourism experiences by exploiting novel technologies (Haldrup & Larsen, 2010; Urry & Larsen, 2011).

In fact, the attention is drawn to three phases: capturing experiences, mediating and presenting them. Drones have particular role in the first two phases. Blogs and social media encourage sharing of experiences, especially captured by visual media, influencing thus the third phase.

2.3. Drones as a new tool in tourism development

Drones, more formally acknowledged as Unmanned Aerial Vehicles (UAVs), are light flying robots which fly autonomously or through remote control following software driven GPS coordinates. Drones are able to provide both aerial photography and aerial filming. It is a lot of motion in the image they provide, that influences visual and kinetic aspect of people perception process. The majority of people are visualizers so an impact on their sense of sight seems to be the most effective way of communication.

Drones have become more and more popular in tourism, being used by tourists and by tourist services suppliers (Jiang & Lyu, 2022). Not only are they useful in capturing outdoor activities, but also they are used indoor, if there is enough space in a venue. The latter aspect is used in MICE sector (Kovačević et al., 2020).

Drones allow showing people the natural environment or the interior of any building from a different perspective. Professionals who steer-up drones make videos and pictures that are considerably cheaper and environmentally friendly in contrast to helicopters.

In regard to drones, three aspects should be taken into consideration: safety and regulations; commercial opportunity; and privacy (Jessop, 2016). There are different regulations and approaches to tourists' drone usage in various countries, from no regulation to a complete

ban on drones. Furthermore, concerning safety, there are different regulations in various countries. Generally, it is forbidden to use drones in proximity of strategic areas like airports, military zones and other similar areas. The problem of privacy, also in tourism, is really serious and should be taken under consideration. Some hoteliers take precautions because they are concerned about clients' privacy.

Drones used for commercial services found their place as marketing instruments for hotels, events and destinations, even for real estate promotion. Drones are cost-effective marketing instruments that can fly over objects taking videos and photos of high resolution that could be supported with a proper soundtrack with an aim to encourage the attractiveness of the tourist product. As a consequence, many companies are emerging to offer services of UAV photography and other applications to governmental bodies, DMOs, hotels and travel agencies.

Tourists can use drones during their travel, but they can be as much helpful in the planning phase of a journey. Pictures and films from regarded destinations, venues or attractions taken from drones are important decision factors. It seems that taking a drone on a vacation has become an 'epic way to catalogue ones summer exploits'. Drones are considered essential equipment for travellers who can afford them.

In addition, selfies could be taken by drones. They have been designed with younger users in mind, such as representatives of the X and Z generations. They record eight to ten seconds of video that starts with a zoom in and moves back to show the entire location. There are some dedicated platforms, e.g. Dronelife.com, where digital networks are created.

The prices of drones differ significantly, from $50 to $10,000, but the price of a camera drone for private use is from approximately $400 (Mavic Mini), through $1,400 for a very popular DJI Mavic2 Pro, to $3,000 for DIJ Inspire 2 (MyFirstDrone, n.d.).

In Poland, in 2013, quite liberal law regulations concerning drones were implemented. Namely, UAVs can be used by private owners without any certifications, whereas a licence of the drone pilot is necessary if a company commercially offers services. A professional drone pilot must be certified; there are two categories – VLOS (Visual Line of Sight) and BVLOS (Beyond Visual Line of Sight). Currently, there are transitional provisions adjusting the regulations to the EU Commission 2019/947. From January 2023, new regulations will be introduced, in accordance with EU regulations.

3. Methodology

The aim of the paper is an assessment of the drone's significance for tourism, taking into account the case of Polish market. Both sides of the market, demand and supply, are investigated. In reference to tourist service providers, the following main research questions were formulated:

- Which entities in tourism market use drones?
- What are the aims of UAVs usage?
- Has the scale of drone's usage increased lately?
- What are the main advantages and disadvantages of UAVs usage?

The identification of the UAVs role for tourist services suppliers was made on the basis of secondary sources of information gathered by the netnographic analysis and due to interviews with Polish experts in drones and their services market conducted in May-August 2018. Finally, the triangulation of results was applied.

Non-probability sampling was used in interviews with the UAV providers and industry experts within a rather small sample (N=13). Purposive sampling of participants was used due to a criterion or purposive attributes (Mason, 2002). In this way, the central themes and questions of the sample were explored (Bryman, 2012). Interviewees were purposefully chosen for the study based on their engagement within the industry, focusing on supply perspective, including providers, developers and industry experts, venue and tourist attractions managers. Each of them was asked the above 4 questions as an introduction to an in-depth statement. Responses were recorded and transcribed. The interviews lasted from 20 to 35 minutes.

The second research task was an exploration analysis of the demand side of the market. The main questions were:

- What is the scale of using drones by tourists?
- Why do they use drones?
- How is it organized?

The questionnaire survey was conducted in the summer 2018 in the direct form amongst Polish tourists in Krakow. The selection of a sample was of purposive-quota character. The gender and age of respondents were included as control variables. The size of the sample was N=1175, N=622 of which correctly filled in questionnaires. There were 23 questions. The questions concerning drones were as follow: Have you used a drone during your trips? (4 possible answers); Why have you used drones? (open question), Who has organized filming? (4 possible answers).

The sociodemographic characteristics of the sample are presented in Table 1.

Table 1: Sample description

	Number	%
Gender		
Female	336	54%
Male	286	46%
Age		
Younger than 18 years	22	4%
18-26 years of age	213	34%
27-35 years of age	144	23%
36-45 years of age	101	16%
46-55 years of age	65	10%
56-65 years of age	43	7%
66-75 years of age	22	4%
Older than 76 years	12	2%
Place of residence		
Countryside	115	18%
A small city (less than 20,000 inhabitants.)	117	19%
A medium-sized city (20,000 – 200,000 inhabitants)	201	32%
A big city (more than 200,000 inhabitants)	189	30%

Education		
Tertiary	331	53%
Secondary	255	41%
Vocational	22	4%
Elementary	14	2%
Occupation		
Pupil	36	6%
Student	158	25%
White collar worker	165	27%
Manual worker	76	12%
Self-employee	77	12%
Retired	41	7%
Housewife	48	8%
Unemployed	15	2%
Material situation		
Very good	76	12%
Good	282	45%
Average	233	37%
Bad	26	4%
Very bad	5	1%
Activity in media		
Facebook	499	80%
You Tube	370	59%
Instagram	234	38%
Snapchat	209	34%
Twitter	137	22%

Source: Author's research

4. Results and discussion

The interviews' results indicate that in tourism, referring to its typology, there are two main areas of drone's application: 1. MICE (meetings, incentives, conferences and events) tourism and 2. adventure and outdoor tourism. Taking types of tourist entities into consideration, the interviewees highlighted that drones were used by venues like congress, conference and trade centres, tourist attractions, hotels as well as by tour operators and some destinations.

To check these statements the netnographic analysis of all Krakow hotels' webpages (153) was conducted in July 2018. It reveals that only nine out of 153 hotels, which means 6%, use films or pictures taken by drones in their promotion. Four out of 153 have promotional films on YouTube. It should be noticed that two of these venues which make use of the films are five-star hotels and two other are four-star hotels. Five remaining hotels have pictures taken from UAV; one of them is five-star hotel and four are three-star hotels.

According to Polish interviewed experts, the main aim of using drones is the promotion of tourist products. The effect of aerial photography or films presentation is the rise of visual material quality and a possibility of 'deeper immersion' of clients experiences (Marlow & Dabbish, 2014). The aerial presentations allow getting the 'wow' effect and gain competitive

advantage. However, experts stress that these are usually additional promotion activities.

Some venues allow meeting organisers to use drones to prepare their promotional materials, before and during a meeting. A very interesting solution is adopted by The ICE Kraków Congress Centre. The Congress Centre has full authors' rights to its promotional materials performed with drone's usage. And The ICE Kraków Congress Centre sub-licenses the use of these materials (or some part of them) to a meeting organiser while preparing the promotion of its own meetings. It is a solution which reduces organisers' costs and time.

Results of interviews prove that for two years there has been an increasing trend of drone's involvement in promotion of events in the meeting industry in Poland. The interesting remark is that the scope of using drones is often proportional to the size of meetings. The aerial filming seems to have particular effects in showing big events and meetings (for example, bigger than 1,000 participants).

Besides a promotional meaning, drones have improved the opportunities for adventure travellers to visit places that are not easily accessible. By capturing photos of inaccessible sites with the use of drones, adventure travellers have a better insight into how inaccessible sis could be explored.

Interviewees stress that an advantage of drones is that they give a virtual travelling experience. Hence, videos and images captured by drones provide a cost-effective opportunity for people that are physically or economically limited to take a peak at thease places without visiting them. The results of interviews also lead to the conclusion that drones advantages are unmatched manoeuvrability, environmental safety and real time of registration.

The active outdoor tourism was pointed as benefiting from UAVs potential. Thus, the second investigated issue was the usage of drones for promotion of Polish ski centres. All webpages of ski resorts associated in the Association of Polish Ski and Tourist Resorts were analysed. Out of 66 webpages of resorts members of the Association, 42 contain visual promotional materials prepared with the use of drones. It means that 64% of resorts use drones to promote their facilities. A detailed analysis reveals that there are differences between resorts located in various voivodships. In Lesser Poland and Silesia, where there is a high concentration of ski resorts, the percentage of UAV's materials is high, 68% and 80%, respectively. In Lower Silesia, in spite of also relatively high number of ski centres, only 40% of them post on the webpages materials made from drones.

The second research task was an assessment of tourists approach to drones being used during travels. The results of questionnaire survey showed that, in 2018, 88% of tourists in Krakow were equipped with smartphones, and 79% of the owners took photos and made films with them during their trip. When aerial photography is taken into consideration, 92% of respondents had never used the drones, 4% had used them once before, and over 3% had used them several times. A mere 1% of respondents take drones systematically with them on tourist trips.

The analysis of relations between the socio-demographic features of the respondents and the use of drones showed statistical significance only in the case of financial situation (test probability ratio p=,00622). Amongst those who use the aerial photography, the organization of filming was tested. One third of the respondents carried out filming on their own, whereas in 41% of the cases filming was done by the travel companions. For 19% of respondents the aerial filming from the drone was provided by the tour operator, 7% admitted that there were other cases, too. Cognitively interesting was the identification of the motivation to use the drones. Various reasons were indicated. They may be divided into a few groups.

Firstly, the motive of another perspective was mentioned, i.e. the opportunity to take an innovative look from above. This was expressed in the following statements: *for different perspective; I enjoy getting a bird's-eye view on the world; I wanted to see inaccessible places.* Secondly, the innovativeness of this solution was important*: for unique pictures and films; because it is an interesting technology; for films used on websites; for tests*. One of the motives was also curiosity connected with the novelty of this solution: *out of curiosity; because there was a chance*. It can be said that it was an experience for the tourists, who said: *because I wanted to have a souvenir; for entertainment; it was a super-experience; to record an important event*. There were also other explanations: *for the scenery*, i.e. experience in particular surroundings, in relation to the Mossberg's category of photo experience.

The need to record particular forms of sports activity was also signalled, e.g. filming sports activity. There was also the motive of convenience mentioned. As usual, a role is played by the reference group; their impact was also mentioned: *I was talked into it by friends.* Another motive was the appreciation of new technological solutions: *I like drones*.

The study touches the question of sharing photos from trips by tourists. The results prove that 78% of respondents share their photos in the Internet. Tourists mainly used the social media, as many as 56% admitted using this form of sharing. Over a quarter of the visitors sent them by email. 14% of respondents posted the photos on their website and the same percentage sent the photos to the Cloud, another 7% posted them on their blogs. This acknowledges the concepts of pursuing travel with a digital community, networked travel (Germann Molz & Paris, 2015; Larsen et al., 2007), and connected tourists experiences (Neuhofer, 2016).

5. Conclusions

Taking photos during a trip with the use of mobile devices, mostly smartphones, is behaviour typical of the tourists in Krakow (70% of respondents). Even more common, it is to share the photos and films in the Internet (nearly 80%), which confirms the networked travel and digital immediacy (Bell & Lyall, 2005). The fact of common sharing of the pictures from the trip shows that it should be treated as a potential viral marketing tool of a destination or tourist attraction.

The aerial photography is not yet popular with tourists visiting Krakow, only 8% of the respondents use them. Their motives are a desire to see the world from the air following Dedalus dream, innovativeness of the solution and striving for new experiences. Tourists using drones admitted that they allow gaining new experiences.

The results of interviews reveal that the advantages of drones are the following: unmatched manoeuvrability, environmental safety, real time of registration and lower costs than using helicopters.

The increasing role of drones and their significance in tourism is a result of continued interdependencies and convergences of tourism, digital culture, and communication technologies. Using them to commemorate some extraordinary moments or places is an increasing trend, Poland being no exception.

UAVs can also enhance tourists' experience; referring to the experience hierarchy drones allow reaching the fourth level - Technology-Empowered Experience (Neuhofer et al., 2013). These results are a theoretical contribution to knowledge about consumer behaviour and its determinants.

Drones are one of the tools necessary for the concept of networked travel (Larsen et al.,

2007), but, as observed, Poland is still in the preliminary phase of this process. Some entities on Polish tourism market use drones to increase the efficiency of their promotional materials. Films are the means of storytelling in a visual way, so they may take the communication to a new level. In July 2018, only 6% of hotels in Krakow had aerial films or pictures in their promotional materials, all being high-standard hotels. On the other hand, 64% of Polish ski resorts members of the Association of Polish Ski and Tourist Resorts use drones for promotion.

It seems that in adventure tourism, in its 'hard' form, a replacement of helicopters by drones contributes towards limitation of risk taking. In the case when registration of a situation, event or any undertaking is easier (cheaper, repeatable), there is a smaller pressure on doing it in all conditions and circumstances. Thus, drones can indirectly increase safety of participants.

5.1. Managerial implications

Study findings provide several valuable managerial implications mostly in the context of tourism management and policy. The use of technology was found to be critical in the process of experience (co)creation. Drones could be used by tourism providers as an 'experience resource environment' grounded on the technological requirements of tourists in pre/during/post travel phase. Tourists commonly use their drones, however, additional technological support through the use of services, applications and infrastructure should be secured as well. The main managerial effort must be made to ease effective connection, engagement and sharing of tourists' experiences. Organisation of filming from drones can be a competitive advantage to a tourist services supplier. In adventure tourism, it could also increase the possibilities of exploring new areas. In addition, there are also ideas to use drones as an access point to the Internet for tourists (Rusdi et al., 2019).

5.2. Limitations and future research

The qualitative research (interviews) was conducted on a small sample, on the representatives of particular tourism facilities. The research requires broadening and deepening to determine the needs of supply side for film material and aerial photography and evaluate its effectiveness.

The drones are a tool used for recording of experiences relating particularly to active tourism. It is advisable to conduct research in this segment of tourists, identify the scope of the use of drones, and evaluate the scale on which they motivate taking more risk and moving boundaries.

Conflict of interest

The authors declare no conflict of interest.

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