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## Unique elements of Polish city brands in online reviews

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## UNIQUE ELEMENTS OF POLISH CITY BRANDS IN ONLINE REVIEWS

**Abstract:** The aim of the paper is to identify unique elements of the brands of Polish cities and to identify similarities and differences between them. The work attempts to answer the following research questions: Which elements significantly differentiate the brands of studied cities in online reviews? and Which of the studied cities are the most similar in terms of brand elements and which differ in this regard. The data for analysis was obtained from *TripAdvisor*. Reviews about areas of tourist concentration – old markets or old towns – from five Polish cities: Poznań, Wrocław, Kraków, Gdańsk and Warsaw were analysed (N = 5125). The research shows that Gdańsk and Warsaw as well as Poznań and Wrocław have the most similar brand elements. The Kraków brand is the more unique in relation to other cities.

**Keywords:** brand equity, destinations, cities, *TripAdvisor*, *Text Mining*.

### 1. INTRODUCTION

Brand according to Kotler, Bowen, Makens & Baloglu (2017) is a name, sign, symbol, design, or a combination of these elements that is intended to identify goods or services and differentiate them from competitors. The possibilities of using the brand concept in relation to tourist destinations have been confirmed by many authors (Buhalis, 2000; Konecnik, Gartner, 2007; Woodside, Cruickshank, Dehuang, 2007). Branding is a process of endowing products and services with the power of the brand and its main purpose is to create differences between products (Kotler *et al.*, 2017). Branding is currently considered an extremely important aspect of the destination management practice, as the growing opportunities for tourist trips and the number of available destinations result in increased substitution and lack of differentiation between destinations (Pike, 2005). According to Aaker (2009), brand equity is a set of assets and liabilities to a brand, its name and symbol, that add to or subtract from the value provided by a product or service to a firm and/or to that firm's customers. Hence, in the context of destination management, an important research task is to study the perception of brands, their equity and impact on consumer behavior in tourism.

Brand equity can be identified in two ways. First, as an indicator of the financial result that the organization owes to the brand, and secondly, brand equity can be assessed from the consumers' perspective (Boo, Busser, Baloglu, 2009). This is the so-called customer-based brand equity (CBBE). Keller (1993, p. 8) defines it as "the differential effect of brand knowledge on consumer response to the marketing of the brand". This means that it is based on the associations and attitudes of the brand users. Aaker (2009, pp. 15-16) lists the following dimensions of brand equity: brand loyalty, brand awareness, perceived quality, brand associations and other assets such as patents, trademarks, channel relationships, etc. The first four of these dimensions are related to customer-based brand equity. Florek (2014) lists two dimensions of brand equity sources: perceived (measured by brand awareness, associations, image, perceived quality) and behavioural (measured by brand loyalty, willingness to pay or recommendation).

The concept of brand equity in reference to place was first formulated by Papadopoulos (2004, p. 43): these are "the real and/or perceived assets and liabilities that are associated with a place (country) and distinguish it from others".

Konecnik & Gartner (2007), in one of the first empirical works about destination brand equity, proposed a customer-based brand equity model using the perception of tourists. As a result of surveys conducted among Croatian and German tourists, they found the existence of four dimensions to Slovenia's brand equity: awareness, image, quality and loyalty. They identified a number of relationships between these dimensions and stated that the image is a central concept in destination branding. It turned out, however, that when the destination brand becomes known to consumers, the image is transferred to the other dimensions of the brand and is obscured by it. Konecnik & Gartner (2007) noticed also that the other dimensions of brand equity affect the dimensions of the image (Fig. 1). For example, brand awareness has an impact on the cognitive dimension of the image, without which there is no brand equity. The dimensions of the image and quality of the brand have the strongest impact on the affective dimension of the image. In turn, loyalty to the brand influences the conative dimension of the image. Thus, both the interrelationships between the dimensions of the image, and the cumulative equity of the brand components, create the brand equity of the destination, in total.

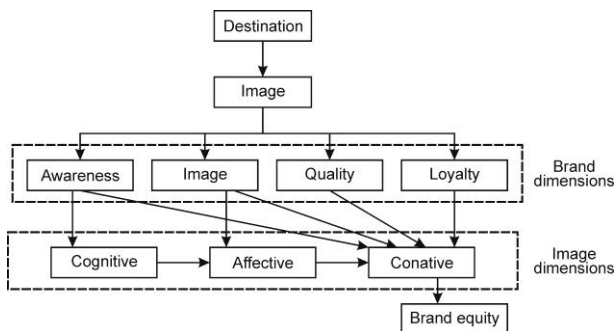


Fig. 1. Destination brand equity development

Source: Konecnik & Gartner (2007, p. 403); author's elaboration

Another very interesting study was conducted by Boo *et al.* (2009) among American tourists. They have done online research among Las Vegas and Atlantic City guests. Researchers constructed and tested specific scales to measure four dimensions of the gambling destination brand. They stated that it is possible to study the destination brand equity using the CBBE model, but these brands should be evaluated by comparison with other competing destinations in the same category. Brands tested in this way should be popular and well known to the participants. Researchers found that when a destination brand is researched, a specific scale has to be constructed that takes into account the nature of the areas being compared.

In another article, Lucarelli (2012) reviewed 217 English-language articles published between 1990 and 2009. He proposed a three-dimensional, interdisciplinary

model of analysis and assessment of a city's brand equity including elements of the city brand, measurement of the impact of city brands and the impact of branding on cities.

Interesting research on consumer-based city brand equity was made by Florek (2014). As a result of surveys conducted among the residents of Poznań and Wrocław, the author has distinguished four dimensions of city brand equity: attachment, perception, recommendation and satisfaction.

Based on a literature review, Leicht (2016) formulated criteria to select areas for brand comparison to guarantee external validity. These are:

- comparable area, e.g. city vs city, region vs region,
- spatial and cultural context that offers at least certain degree of differentiation, e.g. location in different places and/ or cultural spheres,
- comparable types of place, product or service offered.

## 2. REVIEWS AVAILABLE ONLINE, BIG DATA AND TEXT MINING

The information passed from 'mouth to mouth' (word of mouth - WOM) is an important factor in the process of shaping a destination image (Brown, Getz, 2005; Jalilvand, Shekarchizadeh, Samiei, 2011). However, with the emergence of social media, Internet 2.0<sup>1</sup> and user generated content (UGC), this phenomenon began to take on a whole new character. Numerous online travel forums and opinion aggregators, such as *Trip-Advisor*, *Lonely Planet* or *Ciao*, provide countless pieces of information that significantly affect the consumer decisions of their users. This form of information transfer is referred as electronic word of mouth (eWOM) and is considered to be the most influential source of information nowadays (Jalilvand, 2016).

Cantalops & Salvi (2014) as well as Casalo, Flavian, Guinaliu & Ekinci (2015) stated that eWOM has the greatest impact among all sources of information on consumers of tourist services and this is mainly due to their intangible nature. Millions of reviews available online<sup>2</sup> consistently create a huge and diverse set of data known as *Big Data*, whose processing, using computer algorithms (*Data Mining* and *Text Mining*), enables new, previously unavailable knowledge to be found (Kuhzady, Ghasemi, 2019; Liu, Huangb, Bao, Chenc, 2019; Nowacki, 2019).

*Text Mining* refers to the process of acquiring high-quality information from text data and covers a wide range of topics and algorithms for text analysis, covering various communities and including information retrieval, natural language processing, data mining and machine learning (Allahyari *et al.*, 2017). With the

advent of e-commerce and online shopping, a huge number of product reviews and user reviews have been emerging, and are still growing. By analysing such data, one can get important information and opinions on topics that are essential in online advertising and marketing (Allahyari *et al.*, 2017).

### 3. AIM OF THE WORK AND RESEARCH QUESTIONS

Searching for characteristic elements of destination brands can be carried out by analysing online reviews in two ways: qualitatively and quantitatively. Qualitative research has been conducted, among others by Niezgodna (2017) and she identified three dimensions of the images of the palaces at Versailles and Caserta in the reviews available on *TripAdvisor*. The Greek researchers Kladou & Mavragani (2015) identified the dimensions of Istanbul's image, while Nowacki (2017) identified the features of global city images. Quantitative research was also carried out, such as the identification of cultural experiences among people visiting the cultural attractions of Naples (Simeon, Buonincontri, Cinquegrani, Martone, 2017), unique words associated with the Balkans (Smith *et al.* 2018) or the characteristic words of the Barcelona brand (Tamajón, Valiente, 2015). Interesting research was also performed by Nakaima, Marchiori & Cantoni (2019) who identified tourists' experiences from visiting ten islands which were popular holiday destinations. Data analysed were opinions obtained from *TripAdvisor*.

In the light of the above findings, it can be concluded that there is a gap in identification of characteristic brand elements of destinations (see Lucarelli, 2012, p. 236), especially using the comparative method, *Big Data*, *Text Mining* and advanced statistical methods.

Therefore, the aim of this research is to identify the characteristic elements of Polish city brands and to indicate the similarities and differences between them. The following research questions were formulated:

RQ 1: What brand elements significantly differentiate the examined cities in online reviews?

RQ 2: Which cities are the most similar to each other in terms of identified brand elements and which are different?

### 4. METHOD

Reviews available on the English-language portal *TripAdvisor* were used as research material (*TripAdvisor*, 2019). The categories of review were selected from available tourist attractions in the examined cities ('Things

to do in ...'): in the centre, in the old town or old market, i.e. in the main tourist concentration zones in the city (see also Kladou, Mavragani, 2015). There are many different tourist attractions in these districts, such as churches, town halls, monuments, fountains, museums, restaurants, hotels, souvenir shops, tourist information points and more.

The five most popular tourist cities in Poland were selected for research, i.e. Poznań, Wrocław, Warsaw, Gdańsk and Kraków. For Poznań and Wrocław, reviews of the Old Market Square were analysed, while in the other cities – Old Town districts (there is no Old Town category in *TripAdvisor* for Poznań, and there are only 425 reviews for Wrocław in this category) [16.02.2019]. As the lowest number of reviews in the compared categories (Old Market Square / Old Town) was in Poznań (1026), to maintain proportion, exactly 1025 reviews were collected for each city (Table 1). The reviews were downloaded on 15<sup>th</sup> February 2019 using the *Web Scraper* application (*Web Scraper*, 2019) and 5125 reviews for all cities were obtained in total (Table 1).

Table 1. Collected data according to city and category of tourist concentration site (N = 5125)

City	Category	N	%
Poznań	Old Market Square	1025	20
Wrocław	Old Market Square	1025	20
Warsaw	Old Town	1025	20
Gdańsk	Old Town	1025	20
Kraków	Old Town	1025	20
Total	x	5125	100

Source: author.

The data obtained were analysed using the *Text Mining* procedure available in the statistical package *Statistica 11.0*. As a first step, the frequency of words in all reviews were counted and next, the one-way analysis of variance ANOVA was carried out. As result the list of words which substantially differentiate the examined cities was found. In the last step a correspondence analysis was carried out by means of which the relationships between variables (cities) and cases (words) were examined. This allowed to illustrate obtained dependencies on a two-dimensional graph of 'city-words'.

### 5. RESULTS

At the beginning, the most common words in all reviews were counted. The set of words contained in the *EnglishStopList.txt* file in the package *Statistica*, i.e. words such as 'a', 'the', etc., were excluded from counting. Next, the lemmatization procedure (the stemming) was carried out, to reduce inflections to the dictionary

form. Thus, the different grammatical forms of the same words were combined into one category, e.g. 'traveling', 'traveled', 'travel' etc. As a result of this procedure, a list of 105 unique words was obtained (Table 2). Next, an analysis of variance ANOVA was carried out whose aim was to find differences between the average numbers of occurrences of a given word in the reviews concerning individual cities. It turned out that 74 out of 105 words differentiate between the surveyed reviews in a significant way (Table 2).

The F test carried out in ANOVA indicates the significance of differences between any of the five sets of reviews for each city. To determine whether two sets of reviews for two specific cities are significantly dif-

ferent from each other, for each case (word) selected in the ANOVA analysis, an additional *post hoc* Scheffe test was carried out (Kenneth, Bordens, Abbott, 2008, p. 432). This analysis yielded 75 unique words for the studied cities (Table 3): the most for Kraków (35), following Poznań (25), Wrocław and Warsaw (14 each) and Gdańsk (8).<sup>3</sup> As a result of analysis, only those words were selected which significantly distinguished one or two cities (this was done in just a few cases, e.g. the figures for 'restaur' for Poznań and Wrocław were 486 and 433 respectively, and these were significantly larger than for Warsaw (273), Gdańsk (352) and Kraków (348).

As can be seen in Table 3, many of the identified words were not very characteristic and did not say

Table 2. Analysis of variance (ANOVA) of the occurrence of words in the sets of reviews concerning individual cities (N = 105)

Word	F	p	Slowo	F	p	Word	F	p
Also	7.088	<b>0.000</b>	Full	5.126	<b>0.000</b>	Pretty	2.480	<b>0.042</b>
Amaze	4.485	<b>0.001</b>	Get	6.770	<b>0.000</b>	Price	0.275	0.894
Architecture	11.286	<b>0.000</b>	Go	1.342	0.252	Pub	16.524	<b>0.000</b>
Area	15.086	<b>0.000</b>	Good	5.577	<b>0.000</b>	Really	2.545	<b>0.038</b>
Around	3.364	<b>0.009</b>	Great	6.105	<b>0.000</b>	Rebuilt	58.471	<b>0.000</b>
Atmosphere	4.610	<b>0.001</b>	Hall	68.695	<b>0.000</b>	Recommend	3.487	<b>0.008</b>
Aack	3.732	<b>0.005</b>	Historic	22.986	<b>0.000</b>	Restaur	29.616	<b>0.000</b>
Bar	24.999	<b>0.000</b>	History	31.318	<b>0.000</b>	See	7.343	<b>0.000</b>
Beauty	6.976	<b>0.000</b>	Hour	5.924	<b>0.000</b>	Shop	29.811	<b>0.000</b>
Best	3.597	<b>0.006</b>	Hous	22.064	<b>0.000</b>	Sit	5.905	<b>0.000</b>
Build	2.648	<b>0.032</b>	Interest	1.431	0.221	Small	8.097	<b>0.000</b>
Busy	1.127	0.342	Just	4.325	<b>0.002</b>	Spend	1.921	0.104
Cafe	2.140	0.073	Like	0.931	0.444	Squar	342.014	<b>0.000</b>
Can	2.058	0.084	Little	1.230	0.445	Stay	2.792	<b>0.025</b>
Charm	1.961	0.098	Local	0.876	0.296	Still	5.774	<b>0.000</b>
Christmas	24.863	<b>0.000</b>	Look	2.438	0.477	Street	43.598	<b>0.000</b>
Church	28.323	<b>0.000</b>	Lot	4.847	<b>0.045</b>	Stroll	2.548	<b>0.037</b>
City	5.533	<b>0.000</b>	Love	2.938	<b>0.001</b>	Surround	9.438	<b>0.000</b>
Clean	7.796	<b>0.000</b>	Main	14.745	<b>0.019</b>	Take	6.572	<b>0.000</b>
Coffee	0.441	0.779	Make	0.360	<b>0.000</b>	Time	1.070	0.370
Color	18.147	<b>0.000</b>	Many	3.772	0.837	Tour	20.345	<b>0.000</b>
Colour	21.513	<b>0.000</b>	Market	118.381	<b>0.005</b>	Tourist	0.538	0.708
Come	3.480	<b>0.008</b>	Much	6.826	<b>0.000</b>	Town	121.924	<b>0.000</b>
Day	2.794	<b>0.025</b>	Museum	10.610	<b>0.000</b>	Visit	4.310	<b>0.002</b>
Definite	0.296	0.881	Must	3.959	<b>0.000</b>	Walk	34.767	<b>0.000</b>
Differ	1.147	0.332	Nice	10.382	<b>0.003</b>	War	58.569	<b>0.000</b>
Drink	5.785	<b>0.000</b>	Night	6.928	<b>0.000</b>	Watch	14.786	<b>0.000</b>
Eat	1.823	0.122	Old	115.270	<b>0.000</b>	Well	0.487	0.746
Enjoy	2.054	0.084	One	8.581	<b>0.000</b>	Will	2.526	<b>0.039</b>
Even	1.885	0.110	Part	15.873	<b>0.000</b>	Wonder	1.599	0.172
Every	2.990	<b>0.018</b>	People	1.461	<b>0.000</b>	World	7.502	<b>0.000</b>
Feel	4.145	<b>0.002</b>	Place	6.490	0.211	Worth	0.998	0.407
Find	2.767	<b>0.026</b>	Plenty	2.365	<b>0.000</b>	Would	2.149	<b>0.072</b>
Food	1.533	0.190	Poland	6.141	0.051			
Friend	2.208	0.066	Polish	4.229	<b>0.000</b>			

Note: words that significantly differentiate the examined cities are marked in bold.

Key: 'F' - value of the f-Fisher test, 'p' - significance of the f-Fisher test.

Source: author.

Table 3. Unique words characteristic for each city (N = 74)

Poznań		Wrocław		Warsaw		Gdańsk		Kraków	
word	number	word	number	word	number	word	number	word	number
Also	99	Atmosphere	105	Area	152	Amaze	98	Amaze	90
Bar	244	Beauty	376	Back	45	Architecture	165	Area	146
Build	273	Best	59	Feel	53	Build	272	Around	272
Color	76	Christmas	133	Hour	55	Museum	63	Back	47
Colour	74	Drink	98	Nice	231	Small	74	Best	53
Come	48	Find	60	Old	597	Stay	52	Church	152
Day	128	Full	89	Part	79	Street	257	City	298
Drink	93	Great	282	Polish	63	Visit	305	Clean	70
Good	169	Market	299	Rebuilt	117			Come	40
Hall	142	Night	75	Small	73			Day	126
Hous	106	One	147	Still	57			Every	78
Market	327	People	131	Town	647			Full	93
Museum	67	Pretty	44	War	129			Get	91
Must	93	Restaur	433	World	72			Historic	155
Nice	281							History	170
Night	89							Interest	87
People	130							Just	150
Polish	66							Lot	326
Pretty	43							Love	249
Pub	63							Main	132
Restaur	486							Stay	52
Sit	54							Much	105
Squar	741							Plenty	107
Surround	56							Recommend	71
Watch	89							See	222
								Shop	338
								Stay	56
								Street	212
								Stroll	51
								Take	117
								Tour	138
								Visit	257
								Walk	356
								Will	75
								Would	60

Source: author.

much about the brand elements of the city (such words as 'also', 'feel' or 'find'). In order to not obscure the image of the cities examined during further analysis, it was decided to remove them. After this procedure, 42 words remained.

Afterwards, a correspondence analysis was made for such a data set (Hill, 1974). This is a descriptive and exploratory technique, providing information about the structure of connections between columns (variables) and rows (cases) on a hierarchical table (Stanisz, 2007, p. 307). It provides similar results to factor analysis but for qualitative data.

Before the correspondence analysis was started, a Pearson's  $\chi^2$  test (for 95% confidence level) for the data table was performed (42 cases - number of words x 5 variables - number of words on individual cities).

The result is shown below:

$$\chi^2 = 4528.71, \text{ df} = 164, \text{ p} < 0.0001$$

The test showed that there is a statistical relationship between the studied cases and variables at the significance level of  $p < 0.0001$ . In the next step a correspondence analysis was carried out, as a result of which four dimensions were obtained, of which the first two were statistically significant. The first dimension explained as much as 78.3% of the variance of variables and together with the second dimension, explained almost 90% of the variances of the studied variables, which was considered a very good result (Table 4) (see Stanisz, 2007).

The obtained results were presented in the form of a two-dimensional graph (Fig. 2), where squares represent individual cities, and circles represent individual

Table 4. The results of correspondence analysis

Dimension	Singular values	Eigen-values	% of inertia	Cumulative %	$\chi^2$ values
1	0.337	0.114	78.28	78.28	3545.063 <sup>a</sup>
2	0.120	0.014	9.95	88.24	450.915 <sup>a</sup>
3	0.101	0.010	6.96	95.20	315.429
4	0.084	0.007	4.79	100.00	217.308

Note: <sup>a</sup> – statistically significant values at  $p < 0.05$ .  
 Source: author.

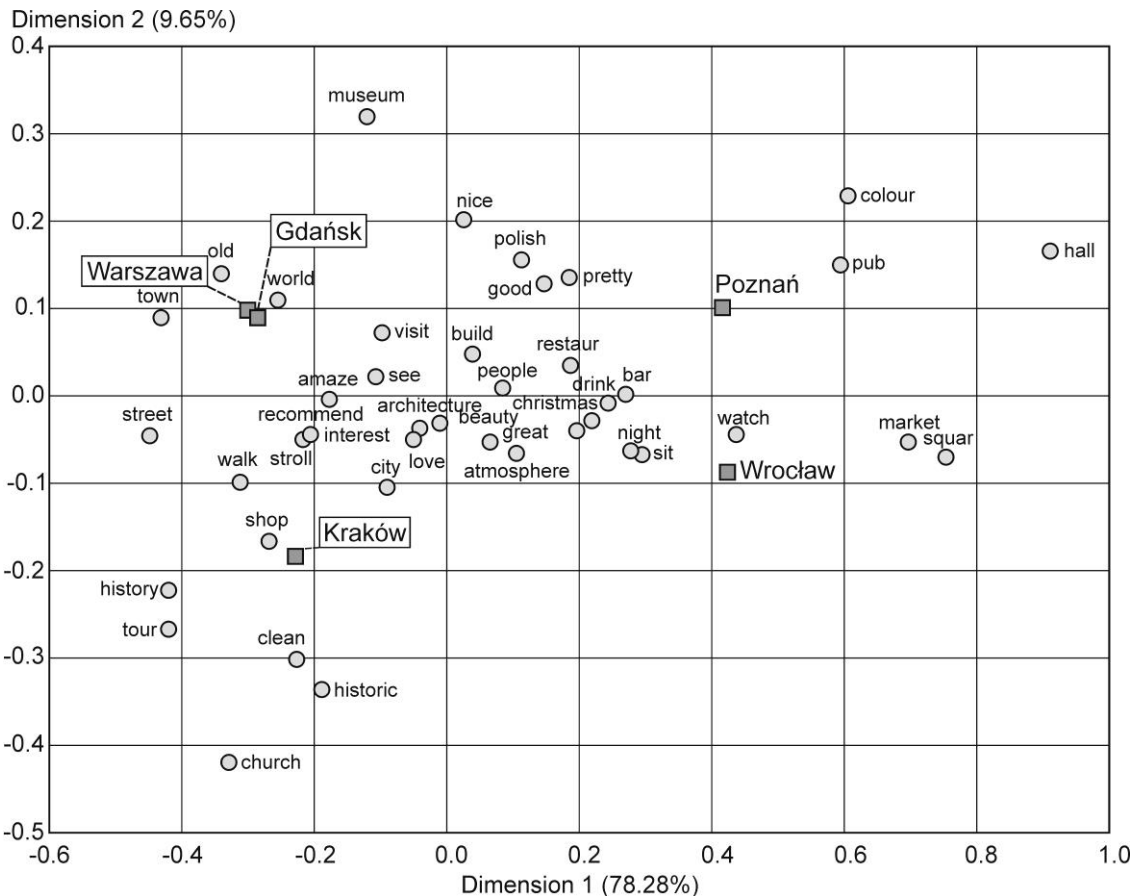


Fig. 2. Two-dimensional graph of row and column dimensions for 43 words and five cities  
 Source: author

words. The graph shows that Kraków is located at a considerable distance from other cities. The words that most distinguish Kraków from the others are shop, walk, clean, history tour, and church. The next two cities, which are almost at the same point on the graph, are Warsaw and Gdańsk and are characterized by words such as old town, world or museum in the comments. The final two cities, also relatively close to each other, are Poznań and Wrocław and their words include drink bar, Christmas atmosphere, market square, market hall, restaurant, pretty, good, Polish, night, sit.

## 6. DISCUSSION AND CONCLUSIONS

The purpose of the above research was to identify the characteristic elements of the Polish city brands and to indicate the similarities and differences between them. This goal was accomplished by performing *Text Mining*, ANOVA and correspondence analysis, on a large quantity of data – 5125 reviews available on *TripAdvisor*.

The performed research allowed to identify specific words – elements of the brand, which differ the examined cities (specifically the areas of old markets/ old

towns). These elements can be used in creating marketing messages, website content, creating tourist products and even in attempts to build or modify existing territorial brands and images of tourist destinations.

The most specific words – brand elements – have been identified for Kraków and Poznań. In the light of the analyses, Kraków can be associated with historical tours, walks through the streets of a clean city, but also as a city with interesting shopping opportunities. Associations with Poznań are a colourful city full of pubs, a beautiful town hall, great bars, pubs and restaurants as well as an interesting nightlife. It was found that there are similar elements for Gdańsk and Warsaw, as well as for Poznań and Wrocław. The Kraków brand is characterized by the greatest uniqueness in relation to the others.

The above studies show that Poznań and Wrocław, as well as Warsaw and Gdańsk, may become the target of further comparative researches using CBBE, as they meet the conditions indicated by Leicht (2016) previously mentioned. In these studies, the unique elements of the city brands identified above could be used.

A limitation of the above research is the use of a single category (old market or old town) in the analysis. In further research it would be worth expanding the analysis to other attractions located in the city (in TripAdvisor's category 'Things to do...'), as well as restaurants and hotels, thanks to which the analysed elements of the city brand, and thus the city brand equity model, would become fuller. It is also worth identifying the forms of activities and tourists experiences which are characteristic of the studied cities, which together with the above-mentioned characteristic elements could be used in shaping tourism products, marketing strategies and in creating equity of city brands.

## ENDNOTES

<sup>1</sup> Internet (Web 2.0) – definition of internet websites in which the content generated by the users of a given website plays a fundamental role.

<sup>2</sup> For example, TripAdvisor – the world's largest travel site – contains 702 million reviews of 8 million hotel beds, airlines, tourist attractions and restaurants in 49 countries. Every month, 490 million unique users use the information contained therein (TripAdvisor. Media Centre).

<sup>3</sup> The sum of words is greater than 74 because a few words were considered characteristic for several cities.

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