

Digital postcard collection analysis model: application in geography

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Since the 1970s, academic researchers in various fields have shown significant interest in postcards, both as a subject of research and as its source. Numerous studies published to date mostly describe and interpret representative examples of postcards or analyse all postcards in a collection with respect to several selected characteristics, but without discussing the applied model of analysis. Therefore, the objectives of this study are: 1) to establish a model of the analysis of digital postcard collections; 2) to apply the model to the quantitative analysis of the geographical content of the postcards. The objectives follow from the study's purpose, which is to highlight the applicability of postcard collections in geographical and other types of research. The research on which the study is based included several methods: a) content analysis for the purpose of the quantitative analysis of qualitative data and for the purpose of the classification and categorisation of attributes; b) descriptive statistics for the purpose of calculating the frequency of the appearance of certain attributes and for the purpose of their graphic representation; c) exemplary method, for the purpose of a detailed analysis of geographical data, as an example of the application of the model. Content analysis

relied primarily on classification and categorisation. The analysis also revealed numerous limitations in relation to the grouping of the postcards, which explains, to a degree, the authors' reluctance to divide many postcards into distinct groups. The research results reveal that a postcard collection, if understood as a complete set of different data, may present an abundant source of research, once the data is defined, classified and categorised, considering that a collection organised in this manner would reveal data and relations which would not have been obvious had the postcards been studied separately, individually, or in small groups. In geographical research, the motifs of images can be used as the basis of in-depth qualitative research, especially if it is aimed at identifying morphological, functional, demographic, or wider social and symbolic changes in space.

Keywords: model of analysis; digitised postcards; postcard collection; National and University Library; geography

INTRODUCTION

Theoretical Framework

Literature contains various definitions of the concept of 'postcard', which depend on the perspective of the author and the dominant field of expertise and interest of the postcard researcher. The online edition of the Croatian Encyclopaedia (2013-2026) defines the postcard as a 'postal card with a picture, photograph, drawing, advertisement, or similar on the back.' The International Standard Bibliographic Description for Non-Book Materials (ISBD; as cited in Sabolović-Krajina, 2024, p. 90) defines a postcard as 'a picture produced on card and designed for transmission through the mail without the use of an envelope.' Bogavčić (2015, p. 1) defines it as a 'serially produced open, illustrated flat medium designed for sending personal text messages by post,' and Krpan Smiljanec (2020, p. 150) as 'a dedicated photograph whose primary purpose is correspondence.' Postcards have also been described as images of a particular space in a particular moment, frozen in time, as well as a 'comprehensive, diverse, and visually narrative product created as a piece of visual information, primarily for tourists' (Albers & James, 1988; as cited in Banda et al., 2024, p. 159), 'mini diaries' (Vanderwood & Samponaro, 1988: vii), 'symbolic depictions of sceneries and views, i.e. images of the ways in which tourists convince themselves that they are looking at landscapes. Postcards are tourist dreams frozen in time' (Winiwarter, 2001, p. 451), or even 'a kitsch souvenir, a prized reminder of an absent loved one, a bygone curio' (Price, 2015, p. 159). Other authors define the postcard as a medium of communication, i.e. the 'carrier of the most important attributes of a place in a specific period' (Puljar, 1997, p. 155), and 'one of the earliest forms of visual mass media' (Zupanc, 2010, p. 55).

A digitised postcard is a printed postcard which underwent the process of digitisation. This complex, multi-stage, and long-lasting procedure of digitally processing printed postcards, usually carried out by institutions competent for heritage, implies ‘adherence to several standards: the expert processing of standard material with search-enabling metadata, the technical process of scanning, online availability, and management of access and long-term protection-related rights’ (Sabolović-Krajina, 2024, p. 92). Digitisation is carried out to increase the availability of postcards, protect printed postcards, and create digitised versions with which to expand an institution’s holdings. It is often part of a larger project (e.g., Croatian Cultural Heritage, Greetings from Croatia: Digitisation of Old Postcards from the Print Collection of the National and University Library (NSK), Digitised Heritage of Zagreb) (Havliček, 2022).

Apart from individual digitised postcards, digitisation efforts produce postcards collections, which facilitate the searchability, as therefore the use, of large numbers of postcards according to various criteria, anywhere and at any time. Namely, in addition to scanned printed postcards available online, the metadata (NSK) contains information on the title, imprint, physical description, publisher, place of publication, type, collection, project, format, subject, language, call number, period covered, note, rights, identifier. Many libraries and archives in Croatia have digital postcard collections (e.g., NSK, the city libraries of Zagreb, Split, Rijeka, Osijek, Pula, Koprivnica, Varaždin, and the State Archives in Rijeka).

Contribution of the study

The authors believe that an important contribution made by this study is that it used the example of a postcard collection, i.e. the Digital Postcard Collection of NSK, which is also the largest digital postcard collection in Croatia, to present a comprehensive model for potential further research, particularly quantitative studies, based on postcard collections as data sources. Despite the extensive body of scholarly work on postcards in the reviewed Croatian and international literature, no such model was found, and this body of work will be discussed in considerable detail specifically to highlight the absence of a similar model for the quantitative analysis of large numbers (collections) of postcards. Therefore, the anticipated contribution of this study contribution lies in its methodological advancement of postcard research via the introduction of a new analytical model. Considering that the model comprises select characteristics/attributes, i.e. the data on the postcards that the authors considered most significant, like any categorisation, it is necessarily subjective and non-comprehensive. Therefore, other re-

searchers might expand the model with additional attributes which they regard as more significant from the viewpoint of their own fields of expertise. Nevertheless, the model is more detailed and comprehensive than the library metadata usually available for individual digitised postcards because, apart from encompassing an entire postcard collection, it also incorporates a wider range of postcard-related data, which are then further classified, categorised, quantified, structured into an analytical framework, and made publicly available, making it somewhat novel in regard to the reviewed works. In this sense, the authors believe that the model may serve as either a ready-made model for the study of postcard collections or as an inspiration for the further study of specific postcards or postcard groups within geographical research as well as research concerned with, or making use of, visual archives, digital collections, and methods for analysing historical visual sources. Namely, considering that other collections (and individual postcards) are likely to have the same attributes, other researchers may have been faced with similar difficulties regarding their processing.

The model's applicability is substantiated through a detailed description of the postcards' characteristics/attributes, in order to provide geographers with relevant data, and through the statistical processing of aggregated data, rather than through a qualitative analysis of the gathered data appearing in the entire postcard collection and in the individual postcards (qualitative analysis would include interpretation, i.e. the interpretation of the content of individual postcards or postcard groups within a broader context, which is not the purpose of this study). Namely, the authors believe that, based on the analysis of the postcards' content, the postcard collection can serve as the basis or supplement to qualitative geographical research of space and landscapes, and that it can motivate detailed geographical interpretations of space and its transformations over time. The study is deemed useful in that it fills a gap caused by a limited number of geographical studies with postcards as the subject-matter or main source of research.

Purpose and objective of the study

The purpose of the study is to emphasise the potential applicability of postcard collections in geographical and other types of research. Two main objectives can be derived from the purpose: 1) to define a model of the analysis of a digital postcard collection, and 2) to apply the model to the quantitative analysis of geographical content 'inscribed' in the postcards. These can be further broken down into the following sub-objectives: a) to identify and describe the basic clusters and attributes of the postcards; b) to classify the postcards according to the iden-

tified attributes; c) to identify the problems with regard to classification; d) to describe the geographical cluster and the pertaining attributes in more detail, and e) to analyse, quantitatively and qualitatively, the geographically relevant aggregated data. The research was carried out from August to November 2023.

Subject-matter of research

The subject-matter of the research underpinning this study is the set (collection) of digitised postcards kept by the National and University Library (NSK) in Zagreb, and available on its website. The listed and processed postcards are dispersed through several postcard collections and projects centred on the digitisation, i.e. scanning and library processing, of old postcards. These collections include: the Postcard Collection (PC; containing 1621 postcards), NSK Print Collection (GZNSK; 1519), the Cultural and Historical Collection of the Brdovec Museum (KPZMB; 37), the Danube Digital Collection (DZD; 13), the Zrinski Digital Collection (DZZ; 5), the Collection of Foreign Drawings and Prints (ZSCG; 1), the Greetings from Croatia Project (PIH; 889), Krka Then and Now (PSK; 25), the Dendrotheque (Den; 19), e-Culture: the Digitisation of Cultural Heritage (e-K; 7), the Zriniana Project: Digitisation of Materials on the Zrinski Family (PZ; 1), etc. Although a small number of digitised postcards can be found in other collections as well, these were not analysed due to the frequent absence of the scans of one of their sides, usually of the back, which made it difficult to establish with certainty whether they were postcards or simply photographs, especially considering that the relevant metadata did not contain information to that effect. This the case with the Drniš City Museum's Collection of Old Photographs and Postcards / the project Krka Then and Now (12) and the Photoarchives of the Eparchy of Dalmatia (1). Most individual postcards were present in more than one collection, primarily the Postcard Collection and the Print Collection.

A total of 1668 postcards were analysed, 24 of which were scanned twice, which brings the total number of analysed postcards to 1644. It should be noted that the analysed set may contain some identical postcards entered under different titles and therefore listed under different initial letters in the alphabetical order, which means they were potentially located far from one another, and thus difficult to detect. If indeed there were such cases, their number is negligible, which is why they have no bearing on the objectives and conclusions of the research.

RESEARCH OVERVIEW

As collectables, postcards have been collected and classified since being first transmitted by post in 1886, when the Universal Postal Union approved the international circulation of postcards (Puljar, 1997). However, it was not until the 1970s, after initially having considered them to be ephemeral and banal depictions of popular culture, that a significant number of scholars and experts in various fields became interested in postcards as a subject-matter and source of research (Ferguson, 2005). From the perspective of their specialty, they all studied certain parts of postcards, usually the motifs of their images (a rare few have studied the featured printed and handwritten texts, e.g., Andriotis & Mavrič, 2013). Today, postcards are primarily the subject-matter of research by anthropologists, ethnologists, sociologists, culturologists, geographers, economists (in the field of tourism), urbanists, historians, art historians, and visual artists, who mostly treat them as rich data sources that require interpretation. Krpan Smiljanec (2020) claims that postcards are an indispensable part of a town's identity in the past and can serve as a source of data for various historical, sociological, and cultural analyses.

Among the first academic researchers of postcards were the anthropologists, who have been studying them since the 1980s. In the same period, geographers began recognising postcards as rich sources of geographical data and continued to do so with increasing frequency in the 1990s. Since the early 2000s, geographers have thus dubbed them 'technologies of representation' (Crang, 1999, p. 252; as cited in Price, 2015, p. 157), 'travelling landscape-objects' (della Dora 2009, p. 335; as cited in Price, 2015, p. 157), and 'objects for research and critical analysis as markers of the society that produced them' (Nordström 1999, p. 93; as cited in Price, 2015, p. 157). Zupanc (2010) saw postcards as sources of geographical research. He emphasised the main functions of postcards: communicational, semantic, and promotional.

As archival and library material to be collected, described, categorised, sorted into collections and sub-collections, adequately stored, digitised, grouped (e.g. into digital galleries), and presented to the public in a physical or digital format, postcards are primarily the purview of archivists, librarians, and museum employees (e.g. Goldberga, 2022; Havliček, 2022; Ladd, 2015; Ladišić & Šerbu, 2024; Sablić & Barbarić, 2021; Sabolović-Krajina, 2024; Serdar, 2021; Stevens, 1995; Vojnović-Traživuk, 2018). Meanwhile, enthusiastic collectors (e.g. Bogavčić, 2015; Bogavčić & Salopek Bogavčić, 2020; Bogavčić & Salopek Bogavčić, 2023; Goleš, 2015; Goleš, 2025; Leko, 2015) independently collect and sort postcards according to various criteria, over lengthy timespans.

The extended duration of the process of the ‘discovery’ of postcards as valuable subject-matter and source of research is partly due to a few limitations outlined as early as 1985 by anthropologist Nicholas Peterson (as cited in Ferguson, 2005). These limitations were: a) huge quantities of images; b) the impossibility of accurately dating most postcards; c) the lack of data on how widely circulated and seen they were, and d) the frequent absence of data on the photographer, the content, or the context of the images. Ferguson (2005) further elaborates on additional limitations: a) inauthenticity, i.e. the warping of visual depictions, which raises doubts about the reliability of other data obtained from a postcard; b) the impossibility of obtaining all of the postcards produced and sent (also emphasised by Huss, 1988; as cited in Winiwarter, 2008); c) changes in a postcard’s authorship over time, and d) the discrepancy between the methodology applied in historiography and social sciences and that applied in the research of images. As shown further on in this study, similar limitations encumber the analysis of digital postcard collections. As for the methods used, as van Eeden (2011) states, most postcard studies combine quantitative and qualitative analysis. Quantitative analysis is useful in determining the frequency of certain motifs, while semiotic analysis can be used in detecting ideological meanings.

In the 1990s, postcards became more frequently discussed in academic journals (Ferguson, 2005), and their popularity has been on the increase since then. Nowadays, on digital platforms, one can find references to dozens of books and articles (in English alone) dedicated, entirely or in part, to postcards. These works are then further cited and autocited. Their comprehensive overview would require a separate study and is not covered by the objectives of this one. It should be noted, however, that many works used in this research refer only to a small number of the numerous existing publications in their literature review sections, where these are then categorised according to academic disciplines and research topics. For example, in a study published in 2005, Rogan cites approximately ten authors and studies addressing various aspects of postcards. In his 2010 doctoral thesis, Zupanc differentiates between scholars who take greater interest in images of people, citing five of their works, and those who focus on places (mostly geographers), citing ten works and fifteen authors. A 2015 paper by Foltête and Litot on postcards as objects for spatial analysis of tourist regions mentions eleven works that explore various sociological issues.

Further perusal of publications on postcards reveals that they tackle a wide range of topics using an array of approaches: from photo-monographic presentation and cataloguing of postcards from a certain place or collection (e.g. Goleš, 2015; Goleš, 2025; Phillips, 2000;

Vanderwood & Samponaro, 1988), through the historical development of postcards across periods (this development being either the subject of a publication or part of the introduction to a related topic, e.g. Bogavčić, 2015; Bogavčić & Salopek Bogavčić, 2020; Gugganig & Schor, 2020; Price, 2015; Puljar, 1997; Rogan, 2005; Scheffer, 1999; Šarić, 2023; Winiwarter, 2008/), and postcard classification (e.g. Bogavčić, 2015; Bogavčić & Salopek Bogavčić, 2020; Senjković-Svrčić, 1987, as cited in Puljar, 1997, p. 154; Sabolović-Krajina, 2024; Zupanc, 2010), up to the monodisciplinary and interdisciplinary interpretation of postcards.

The interpretation of postcard images can be simple if its goal is, for example, to detect visible changes in space by comparing more recent images with older picture postcards (e.g., Arreola & Burkhart, 2010; Debussche, Lepart & Dervieux, 1999; Larsen & Swanbrow, 2006; Sawyer & Butler, 2006; Viñao & Martínez Ruiz-Funes, 2016). However, it becomes a lot more complex if the content of the postcards is believed to carry hidden messages, invisible at first sight. The analysis and interpretation of postcards are mostly used to explore the representations of phenomena such as heritage, landscapes, image, (self)perception, identity, stereotypes, myths, ideologies, communication, (self)promotion and commodification, as well as to decipher the meanings, messages, and symbols they contain, or to detect the contexts and entities which create and consume them, all in order to ultimately decode various social relations and norms. They can also serve to interpret other ‘texts’ inscribed in the visual and textual parts of postcards.

In the 21st century, the work of numerous scholars consists of detecting and interpreting the multiple layers of meaning carried by postcards (Crang, 1996). Presented below are but a few examples of such work. Dular (1996) studied postcards as an ethnological document, pointing out the potential messages communicated by the motifs of the images. Edwards (1996) wrote about ethnicities and the socially constructed myths communicated through picture postcards. Puljar (1997) used postcards from Konavle to differentiate, from a cultural and anthropological perspective, between the multiple meanings of the postcard. Scheffer (1999) studied the role of postcards representing the architecture of a place in the creation of the concept of place, its meanings and contradictions. Pritchard and Morgan (2003) determined how they contribute to the cultural production, performance and consumption of landscapes, places, and identities. Mayes (2010) studied the lay production of postcards in Western Australia. Youngs (2012) wrote on the interplay of vision and the production of knowledge in the context of cultural constructions of nature and environmental perceptions using the example of postcards of the Grand Canyon National Park. Symes (2019) brought to the fore the relations implicit even

in the short texts of postcards. By analysing the messages written by the senders of postcards from (unattractive) industrial cities, Kisiel (2022) concludes that postcards primarily have a utilitarian function, i.e. that of communicating a message. Casteliani Marinho Falcao, Maki and Tanaka (2024) hold that postcards are primarily a means of communication, given that they can even depict natural disasters.

Albers and James (1983) demonstrated how picture postcards contributed to the strengthening and promotion of a stereotypical image of a people, while Cohen (1995) wrote about how they can carry clear political messages of the domination of one culture over another. By analysing colonial-era postcards from Arabia, Burns (2004) asserted their significance in the construction of a visual discourse on power and the interrelationship between history and politics. Similarly, Patterson (2006) explored postcards in the context of affirming the stereotypes and ideologies evident in the depictions of Britons and Indians on British postcards. By analysing Romanian industrial sites and landscapes in picture postcards during the socialist period, Ilovan and Maroși (2018) shed light on the strong ties between state ideology, the discourse on economic development, and the representation of social development. Using the example of picture postcards from the Republic of South Africa circulated from the 1940s to the 1970s, van Eeden (2011) demonstrated how such depictions reveal the society's dominant ideological position. Mayhew (2019) explored the role of postcards in the maintenance of relationships between combatants and civilians during the First World War.

Considering that its advent coincided with the early days of tourism (Winiwarter, 2001), the postcard has been the subject of many scholarly works in the field of tourism, which is understandable, given that the main purpose and function of the postcard is to be a testament to the tourist's voyage. A few researchers approached the postcard as a tourist product serving a promotional purpose, as well as a symbolic one, in the context of representing a certain destination. For instance, Corkery and Bailey (1994) used the example of postcards from Boston to illustrate how the shift in their depicted images points to place commodification. In her analysis of Maltese postcards, Markwick (2001) points to the diversification of the motivations of contemporary tourism, revealing that, while the stereotypical image of Malta as a 'sun and sea' destination is sustained, tourists are increasingly attempting to penetrate 'backstage realities.' Hillman (2007) demonstrated that postcards were used to justify one's journey and authenticate travel experience. Yüksel and Akgül (2007) explored whether images depicted by postcards evoke positive emotions and whether these emotions affect the recipients' choice of their holiday destination. Milman (2011) considered the construction and representation of the image of

Alanya in Turkey for the purposes of tourism. By analysing postcards from Berlin, the same author assessed the role of postcards in the presentation of the image of that tourism destination (Milman, 2012). Hahm, Li and Milman (2011) studied the role of postcards in the presentation of an image and the promotion of a destination. Pongajarn, van der Duim and Peters (2014) examined the role of contemporary Thai postcards in the enactment of tourism destinations. Zupanc (2019) wrote about a shelter on the Poklon overpass in Istria, its role in the development of tourism and its representations on postcards. Slunjski (2019) analysed the presentation of cultural heritage on Međimurje postcards for the purposes of tourism. Mârza (2022) used the example of Austro-Hungarian cities to study the beginnings of the transformation of cities into tourism brands. To demonstrate the significance of postcards for the early development of tourism in Sarajevo and their contribution to the promotion of Sarajevo as a tourism destination, Banda et al. (2024) analysed and classified the motifs on picture postcards from the Austro-Hungarian period.

Research conducted by Viñao and Martínez Ruiz-Funes (2016) focused on postcards used for the promotion of educational institutions in Spain. Some authors took note of the exceptional educational potential of postcards and studied it. A project implemented by Failing (2016) pointed out the usefulness of digitised postcards in historical research and interactive, inquiry-based teaching. Allen and Molina (1992) emphasised the importance of representing a place and creating its image in geographical education. Using the *Postcrossing* project as an example, Vojteková, Kaľavská and Vojtek (2025) demonstrated that postcards distributed via the web can serve as an innovative, experimental method in teaching geography. Gugganig and Schor (2020) emphasised the usefulness of postcards in teaching anthropology, primarily for the purpose of interpreting the messages they contain, whether manifest or hidden. Waitt and Head (2002) also examined representational silences in postcards. Bonarou's (2021) study of Greece's self-representation through picture postcards provides a more detailed classification of authors and works according to their predominant themes and analytical approaches.

The publications consulted either describe and interpret individual representative postcards or analyse all postcards in a collection with respect to several selected characteristics. If the latter is the case, the publications usually do not discuss the analysis model used but simply present the aggregate data. Variations in the number of analysed postcards are quite significant, ranging from 12 (Pritchard & Morgan, 2003), 33 (Slunjski, 2019), 134 (Andriotis & Mavrič,

2013), 150 (Puljar, 1997), 150 (Milman, 2012), 357 (Larsen & Swanbrow, 2006), 500 (Markwick, 2001), 748 (Zupanc, 2010), 2000 (Phillips, 2000) and 4200 (Bonarou, 2021) to 5000 (Winiwarter, 2008).

Zupanc (2010) is one of the first Croatian researchers, and undoubtedly the first Croatian geographer, to categorise and quantitatively analyse a large set of postcards. He carried out a tabular analysis of the cultural and natural heritage motifs and toponymy represented on postcards from Istria. Bogavčić (2015) classified postcards from Dalmatia according to various criteria. Slunjski (2019) grouped postcards from Međimurje according to the localities and cultural heritage they represented. Bogavčić and Salopek Bogavčić (2020) grouped postcards from Croatia according to various categories. Systematic and comprehensive quantitative analyses of entire postcard collections, particularly digital ones, which cover several attributes, are rare. An author worth mentioning in this context is Sabolović-Krajina (2024), who classified the digitised postcard collection of the Koprivnica museum according to publisher, year of publication or travel, and motifs. As previously mentioned, the above research did not present a comprehensive model of data analysis. The selected numerical data were usually presented in the interpretational part of the works, and only rarely in tabular, aggregated form. Nevertheless, due to the extremely useful insights they provide regarding the analysis of certain types of data, the mentioned works of Croatian authors were an excellent foundation and inspiration for this study. Therefore, this study can be understood as supplementing the earlier ones mentioned above.

RESEARCH METHODOLOGY

The types of content featured on a postcard can be divided into images (e.g., photographs, illustrations), printed text (e.g., name of the publisher and depicted location), handwritten text (e.g., a note from the sender, the address of the recipient), a postage stamp and a postmark (place of dispatch). In order to collect as much varied data as possible, the research focused on inspecting and describing all the mentioned types of content. A database in the form of an extensive worksheet was prepared, containing 18 columns, 15 of them dedicated to the selected characteristics/attributes of the postcards, and 1645 rows (for 1644 postcards and the title). The following attributes were analysed: 1) *Postcard type*; 2) *Publisher (photographer)*; 3) *Place of publication*; 4) *Year of publication*; 5) *Printing technique*; 6) *Number of pictures*; 7) *Colour of images*; 8) *Postcard format*; 9) *Depicted location*; 10) *Dominant motif*; 11) *Postcard contains*

handwritten text; 12) *Language or script of the handwritten text*; 13) *Postcard sent*; 14) *Year of travel*; 15) *Recipient's location* (Table 1). The coding of individual attributes is described in section 4.

Table 1 Part of a worksheet

Title	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Abbazia : Im Hafen	2	A. Fr. Reincke	Dresden	0	2	1	1	1	Opatija	port	1	German	1	0	Zagreb
Adria Quarnero : Buccari	1	Feitzinger's Kunstverlag	0	1908 or before	2	1	1	1	Bakar	coastal landscape	1	Croatian	1	1908.	Laduč
Agram : Dom = La cathédrale	2	Stengel & Co.	Dresden or Berlin	1901.	1	1	2	1	Zagreb	church	1	Croatian	1	1901.	Kotor
Place de l'Académie : Zagreb (Croatie)	2	Naklada Jul. Hühna	Zagreb	1905 or before	1	1	1	1	Zagreb	square	1	Croatian	1	1905.	Ogulin
Académie	2	0	0	1904 or before	1	1	1	1	Zagreb	scientific institution	1	Croatian	1	1904.	Osijek
Antunovac (1)	1	A. Gomerčić	Zagreb	1925 or before	2	2	1	1	Antunovac (Lipik)	school (1), catering facility (2)	1	Croatian	1	1925.	0
Antunovac (2)	1	A. Gomerčić	Zagreb	1925 or before	2	2	1	1	Antunovac (Lipik)	church (1, 2)	1	Croatian	1	1925.	Virovitica
The Arcades (Cloisters) Depicting the Miracles of Our Lady of Bistrica	1	Davorin Zajc	Marija Bistrica	1914.	2	1	2	1	Marija Bistrica	church	1	Croatian	1	1914.- 1918.	Laduč
Arth-Rigi-Bahn	2	Brunner & Cie	Winterthur	1886 or before	1	1	2	1	0	railway	1	German	1	1886.	Vienna
Assicurazioni Generali : Zagreb, Jelačićev trg 3	1	0	0	0	1	1	1	1	Zagreb	financial institution	1	Croatian	0	0	0

Source: structured by the authors according to National and University Library in Zagreb, 2023

The research employed content analysis (quantitative analysis of qualitative data, used to classify and categorise attributes), descriptive statistics (used to calculate the share of individual attributes and their graphic representation), and the exemplar method (used to analyse geographical data in greater detail, in order to exemplify the application of the model). Content analysis primarily relies on classification and categorisation. Classification refers to the grouping of attributes according to predefined, precise, and mutually exclusive criteria (e.g., postcard type, colour of images, whether the postcard contains handwritten text, whether it was sent). Categorisation is a method based on the common features and similarities between attributes, which are subsequently grouped into categories according to their similarities (e.g., dominant motif, year of publication). As such, it is necessarily subjective, considering it depends on the author and the purpose of research. Although categorisation allows for greater flexibility and arbitrariness in choosing the number and range of grouping categories, these characteristics are also its biggest disadvantage, given that they enable the assignment of an attribute to several categories and the selection of different categories by different researchers, all of which renders impossible the comparison of the results.

The number of analysed postcards differs from one category to another because it depends on the amount of data that could be collected on a specific attribute. Thus, the number can be lower or higher than the total number of postcards. A lower number is the result of deducting, from the total number of postcards, all the postcards which do not contain data on the relevant attribute (obtained either from the postcard itself or the metadata; e.g., cases where there is no data on the publisher or place of publication) or which contain unknown or illegible data on the relevant attribute (e.g., cases where the depicted location is unknown or the year of travel indicated on the postmark is illegible). A higher number is the result of the appearance of multiple data of the same type on a single postcard (e.g., cases where the publisher is registered in several cities or the text is written in several languages).

The development of the model faced numerous limitations, which calls for a detailed description to ensure the clarity and applicability of the model. The limitations concerning the entire postcard collection and certain general difficulties with identifying the data from the postcards are discussed below, while the section on research results describes the challenges related to specific attributes:

- Classification of the digitised postcards from the Digital Collection of NSK into subcollections. This resulted in a varying total number of postcards and the repetition of certain postcards across several subcollections. The total number of postcards analysed in this study was obtained based on researching each collection that contained postcards.
- Missing scans of postcard backs. Namely, certain postcards were missing scans of the back. However, the metadata for some of them contained information taken from the back (e.g., year and place of publication, publisher, year of travel), which was taken into consideration as part of the analysis.
- In cases where the metadata did not correspond to the information on the postcard, the latter was considered relevant.
- Missing standard information on the postcard. In such cases, the information was obtained indirectly (e.g., the year of publication or travel of a postcard could be approximated based on the year of construction of a depicted building or the period of activity of the printing house).
- Illegible information. The illegible parts were usually the text written by the sender (address, note) or the postmark containing information on the year and place of dispatch and/or receipt. The printed text was mostly legible.
- The digital collection is not representative. Namely, like all postcard collections, this one is but a part of the total fund of postcards published and circulated in an area within a certain period. Collections usually contain postcards that can be valued as collectables, e.g., those which represent rare or oldest examples (Winiwarter, 2008), obtained by libraries and archives from various collectors. In addition, NSK digitises postcards as part of various projects (e.g., Greetings from Croatia), which means that the digitised postcard fund is a result of separate initiatives. There are also other factors at play. Considering that NSK is located in Zagreb, the postcards from Zagreb were digitised first (the Greetings from Zagreb project). Therefore, when interpreting the results of the analysis of the postcard collection and its contents, one should preclude the adoption of general conclusions on causal relations, that is, conclusions on all Croatian postcards, all postcards in NSK, or all postcards from a certain location, and strive to deduce only on the basis of the digitised postcard collection discussed herein.

Examples of the analysis of individual postcards

Two postcards shown in Figure 1 were selected as examples of individual postcard analysis. The title of the first postcard (Figs. 1a and 1b) is *Zagreb: The Building of the Department of Religion and Education* (<https://digitalna.nsk.hr/graficka-zbirka-nsk/?pr=i&id=14900>). As the postcard bears a long address, it was assigned to Category 2. Information about the Zagreb-based publisher (*Papirnica F. X. Hribara*) is printed on the front, making Zagreb the place of publication. The date on which the postcard was written appears on the front, while the postmark on the reverse indicates the year of travel, namely 1899; it can therefore be concluded that the postcard was published in or before 1899. The metadata state that the printing technique used was print, and the postcard was therefore classified in Category 1. The postcard contains a single image (1) and is black-and-white (Category 1). Its format is standard (9.1 × 14.2 cm; Category 1). The place depicted is Zagreb, while the dominant motif is a building, that is, an individual built structure, which belongs to Category 2. The postcard contains handwritten text (Category 1). The sender's text, in English ('Best wishes'), is written on the front side. The postcard bears two postmarks: the first from the place of dispatch (Zagreb), and the second from the recipient's settlement (Jarkovac, in the municipality of Sečanj, Vojvodina). This indicates that the postcard was sent (Category 1) and travelled to the settlement in 1899, as is also stated by the sender in the recipient's address. The year in which the postcard was written, which coincides with its year of travel, was recorded by the sender on the front.

The title of the second postcard (Figs. 1c and 1d) is *Jalkovec near Varaždin* (<https://digitalna.nsk.hr/graficka-zbirka-nsk/?pr=i&id=629036>). As it bears a short address, it was assigned to Category 1. Neither the publisher nor the place of publication is indicated, and both variables were therefore assigned Category 0. On the reverse, the sender recorded the date on which the postcard was written (20 December 1954). The postmark bears the same year (1954), leading to the conclusion that the postcard was published in or before 1954. According to the metadata, the printing technique used was phototype, and the postcard was therefore assigned to Category 2. The postcard contains a single image (1) and is black-and-white (Category 1). Its format is standard (9.1 × 13.8 cm; Category 1). The place depicted is Jalkovec near Varaždin, while the dominant motif is a manor house, that is, an individual built structure, which belongs to Category 2. The postcard contains handwritten text (Category 1). The sender's message, written in German and Croatian, appears on the reverse. The postcard bears a postmark indicating the

place of dispatch (Varaždin), demonstrating that it was sent (Category 1) and travelled to Zagreb in 1954, as indicated by the recipient's address. The year in which the postcard was written, which coincides with its year of travel, was recorded by the sender on the reverse.

RESEARCH RESULTS

After the determination of the main characteristics/attributes of the postcards, and before the classification of each postcard according to them, the attributes were divided into four clusters, according to the type of data obtainable from each postcard and inherent to a specific area: geographical, historiographical, linguistic, and technical.

Although the technical cluster is described at the end of the study, one of the attributes it contains, i.e. *postcard type*, is presented below. Given that the attribute reflects a postcard's general appearance (which is, in turn, connected to the postcard's purpose and time of publication), it was deemed to be a logical starting point for further classification. A postcard's appearance is defined by its layout, in terms of the arrangement of the image, the sender's text and the recipient's address, observed by comparing the front and the back. Therefore, four postcard categories were established based on postcard type:

- postcard with a long address (2)
- postcard with a short address (1)
- greeting card (3)
- unknown (the type cannot be determined because the scan of the back is missing) (0).

Postcards with a long address feature an image and the sender's text on the front, and only the recipient's address on the back. These are older variants of postcards (Cro. *dopisnica*) (Fig. 1a. and Fig. 1b.). Postcards with a short address feature an image on the front and the sender's text and recipient's address on the back, which is split into two parts. These are more recent postcards, like the ones found today (Fig. 1c. and Fig. 1d.). A greeting card is a thematic postcard used to convey good wishes in connection with a significant day or pleasant event.



Figure 1 Example of the front of a postcard with a long address (a); Example of the back of a postcard with a long address (b); Example of the front of a postcard with a short address (c); Example of the back of a postcard with a short address (d)

Source: National and University Library in Zagreb, 2023

Out of a total of 1644 postcards in the analysed set, almost two thirds (64.1%) belong to the category of postcards with a short address, while those with a long address (*dopisnice*) comprise 28.3% of the set (Fig. 2).

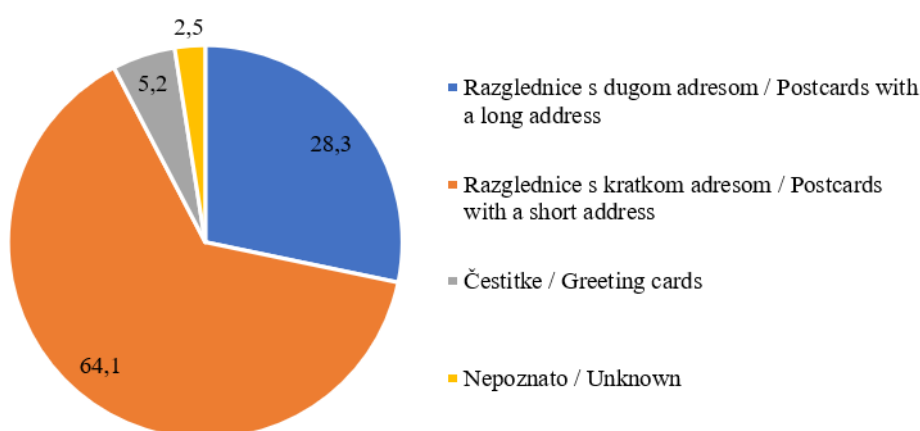


Figure 2 Postcard type

Source: calculated by the authors according to National and University Library in Zagreb, 2023

In accordance with the objective of the study, the attributes in the geographical cluster are described in detail below. A simple quantitative analysis of the geographical attributes was carried out to exemplify the use of data obtained by data classification.

Geographical cluster

This cluster includes geographically relevant data classified according to four attributes: depicted location, dominant motif, place of publication, recipient's location.

Depicted location

This attribute is found on the front of the postcard. The term 'location' means any place/locality, i.e. geographical feature, shown on the postcard (e.g. an island, a valley, a mountain). It does not refer only to inhabited places, although they are the ones that are most frequently depicted. The attribute *depicted location* is divided into two categories:

- exact location (if it was possible to determine the exact location, which was usually written on the postcard);
- unknown (if it was impossible to determine the exact location shown or if the postcard did not feature an image of a location) (0).

The main difficulty lay in identifying the depicted location in cases where its name appeared in several variants. In such cases, the contemporary names of inhabited places were always entered in the worksheet, regardless of the variant in which they appeared on the postcard (e.g., *Rijeka* instead of *Fiume*, *Opatija* instead of *Abbazia*, *Budapest* instead of *Budim/Buda*). Deciphering the toponyms of small, inhabited places or localities written in a foreign language presented yet another difficulty, which was resolved through additional research (e.g., the Czech town of Lanškroun was written in German as *Landskron*).

Quantitative analysis of the attribute revealed that half (50.2%) of the postcards from the collection depicted Zagreb (Tab. 2). Other inhabited places were represented to a much lower degree in the collection than Zagreb; they appeared on about a dozen postcards each, or even on just a few. Osijek, Vukovar, Medvednica, and Topusko appeared on approximately 1% of the postcards. The extreme overrepresentation of postcards from Zagreb is a direct consequence of the plan to digitise the postcard collection of NSK, according to which postcards from Zagreb were digitised first.

Table 2 *Locations depicted on postcards (10 or more occurrences)*

Depicted location	Number of postcards	Share of postcards
Zagreb	825	50.2
Osijek	20	1.2
Vukovar	20	1.2
Medvednica	16	1.0
Topusko	15	0.9
Glina	12	0.7
Metković	12	0.7
Petrinja	12	0.7
Krapinske Toplice	11	0.7
Opuzen	10	0.6
Unknown	95	5.8

Source: calculated by the authors according to National and University Library in Zagreb, 2023

Dominant motif

This attribute also appears on the front of the postcard. The attribute was classified into the geographical cluster because the great majority of the motifs, as this study will reveal, depict the visible social and natural elements of space, i.e. elements of the landscape, which contain data on the space and changes within it.

In this study, motifs are discussed primarily regarding those that are dominant. Considering that the primary aim of the study is to propose a model of the analysis of a postcard collection and demonstrate its applicability in geography, as a source of geographically relevant data, rather than to interpret in detail the geographical motifs in the analysed set of postcards, the classification of the motifs was highly simplified. This means that a single dominant motif was identified on each image and then assigned to a single category (e.g., if the image showed a street with a church visible on it, it was assigned to only one category, A, rather than to two categories, A and B), regardless of the potential number of motifs the image contained. Therefore, the images and motifs stand in a ratio of 1:1. Occasionally, the postcard's title indicated the dominant motif. Qualitative research of the depicted geographical motifs would certainly require a more precise categorisation, i.e. the assignment of individual motifs to several categories. For instance, Bogavčić (2015) divided postcards, according to their motifs, into topo-

graphic (depicting inhabited places and geographical areas) and thematic in a strict sense (featuring images that are not primarily related to an inhabited place or geographical area, but rather, represent people, animals, natural phenomena, and formations or human creations as well as express greetings or feature advertisements or artwork reproductions).

The *Dominant motifs* attribute is divided into six categories. The first three are markedly geographical, while the other three include motifs that are non-geographical in terms of theme:

- Panoramic and close-up motifs: urban landscape (parts of big cities, smaller inhabited places that had an urban morphology at the time of the postcard's production), rural landscape (sparsely populated areas with rural characteristics, inhabited places that had a typical rural morphology at the time of the postcard's production), coastal landscape (sparsely populated coastal areas with rural characteristics, inhabited places that had a more rural than urban morphology at the time of the postcard's production, coastal towns), street, square, park, port/harbour, waterfront, promenade, etc. (1)
- Individual built structures: castle, fortress, sacral building (church, chapel, cathedral, monastery, parish house), residential building (summer house, villa, house), administrative building, military building, financial establishment, school, scientific institution, healthcare institution (health resort, hospital, sanatorium), cultural establishment (theatre), sports establishment (stadium), factory, industrial facility, rail terminal, railway station, railway line, overlook, hospitality establishment (bathhouse, hotel, restaurant), farmland, shop, customs house, mountain chalet, headquarters of an association, fountain, developed spring, exhibition pavilion, city gates, stud farm, monument, tower, bridge, ruins, archaeological site, tomb, etc. (2)
- Natural features: islet, waterfall, river, lake, cave, forest, coast, bay, beach, canyon, field, hill, channel, etc. (3)
- A person or a group of people: children, musicians, firefighters, processions etc. (4)
- Other: specific plants or animals, means of transport (train, funicular, ship), machinery, coat of arms, event, decoration, symbol, object, etc. (5)
- Special postcards: greeting card (thematic motifs), printed card (a promotional postcard representing a built structure, intended as a souvenir). (6)

At this stage of the analysis, the biggest difficulty arose from a main feature of the categorisation, which was the possibility of assigning a single motif to several categories. There-

fore, only six categories were selected. A higher number of categories would yield more combinations of the categories in the table and significantly more motifs than the total number of postcards, which would complicate the categorisation. For the same reason, both the panoramic and the close-up motifs were included in the first category. Further subcategorisation would have been less accurate, because the extent of the space captured by an image is sometimes not easily discernible (e.g., it can be hard to tell whether a postcard depicts a street or a square, if both of these places are visible on it; or whether the dominant motif is a street or a part of the town if the image is panoramic). Another type of problem appeared in cases where the printed text of a postcard's title did not match the image on it (e.g., the title referenced a square, while the image depicted a street, or vice versa; the title referenced a church, seen only in the distant background of the image, while the dominant motif was a park or square in front of the church). In such cases, the motif was determined based on the categorisation presented above, regardless of the title.

Based on quantitative analysis, it was established that the collection contained 1644 postcards, which featured 2012 images. The most prevalent motifs on all the images were the panoramic and close-up motifs (45.2%), followed by motifs of individual built structures (42.6%) (Fig. 3). All other motifs—mostly from postcards with thematic motifs (greeting cards) and those depicting natural landscapes—comprised only 12.2% of the total number. The reasons for such a distribution mostly had to do with the postcards' purpose, which was to depict recognisable, unique and valuable (in terms of identity and promotion) spaces, which were predominantly cultural goods, as opposed to the less recognisable and sometimes even unknown or generic-looking natural landscapes. Such postcards were also easier to make because the featured object did not have to be captured in a wide shot by a professional photographer to be attractive.

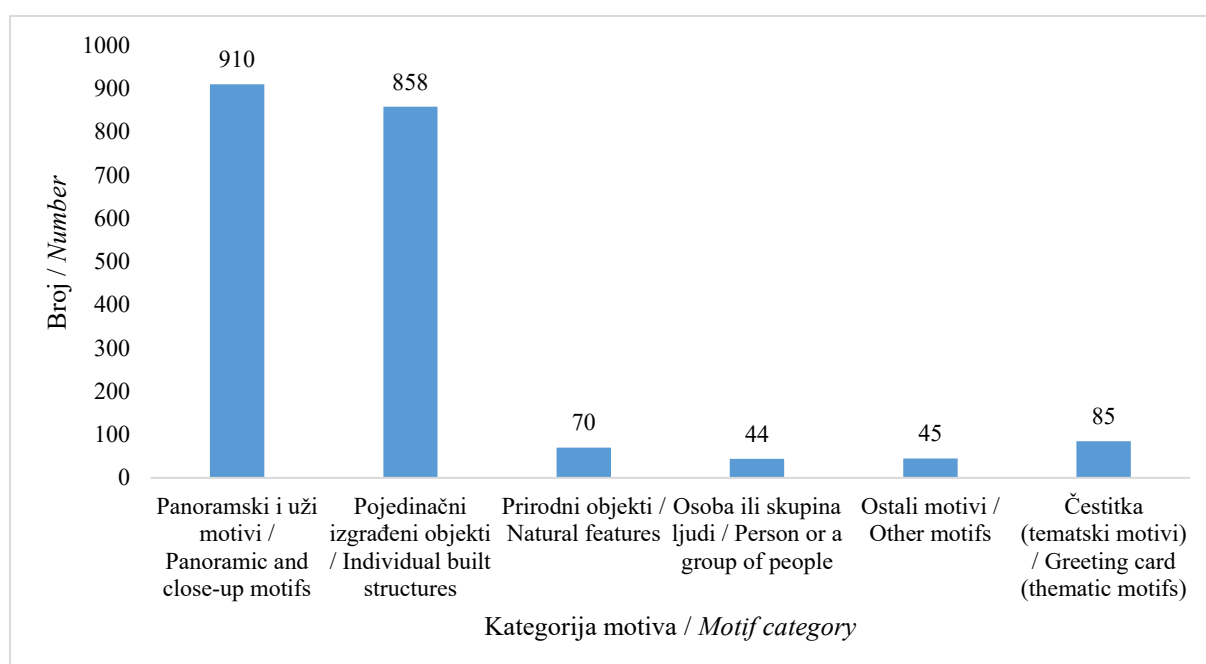


Figure 3 *Motifs in visual representations*

Source: calculated by the authors according to National and University Library in Zagreb, 2023

Place of publication

Information on the place of publication is provided in the printed text on a postcard's front or back. The *place of publication* attribute was divided into two categories:

- place name (or two place names, if the publisher was registered in both places and it was unclear in which of them the postcard was printed)
- unknown (the place name is omitted or illegible or the scan of the postcard's back is not available) (0).

When determining a postcard's place of publication, in some instances we encountered the same issue as when identifying the depicted location, i.e. the appearance of a place name in several variants. In such cases, in line with the previously established practice, the contemporary place names were consistently entered into the worksheet, regardless of the variant in which they appeared on a specific postcard (see 4.1.1.). We encountered no difficulties related to foreign names of small, inhabited places because the postcards had generally been printed in major cities.

According to the analysis, 30.6% of the postcards contained no information on the place of publication or, if they did contain such information, it was either illegible or indeterminable

due to the unavailability of a scan of the postcard's back (Table 3). Over a third (39.4%) of the postcards whose place of publication could be identified were printed in Zagreb. Approximately 3% of postcards were printed in Vienna or Dresden; several dozen, or in some cases only a few of them, were published in other cities. The overrepresentation of postcards published in Zagreb is also a consequence of the digitisation plan of NSK. Namely, it stands to reason that most of the postcards which were sent from Zagreb (as indicated by the data on the prevalence of postcards representing Zagreb) would have been published in Zagreb. The reasons for the representation of other towns and cities should be further studied.

Table 3 *Postcards' places of publication (10 or more occurrences)*

Place of publication	Number of postcards	Share of postcards
Zagreb	648	39.4
Vienna	53	3.2
Dresden	49	3.0
Berlin	30	1.8
Budapest	22	1.3
Prague	21	1.3
Trieste	19	1.2
Osijek	15	0.9
Vukovar	15	0.9
München	14	0.9
Dubrovnik	14	0.9
Leipzig	11	0.7
Sisak	11	0.7
Koprivnica	11	0.7
Petrinja	10	0.6
Glina	10	0.6
Rijeka	10	0.6
Unknown	503	30.6

Source: calculated by the authors according to National and University Library in Zagreb, 2023

Recipient's location

This attribute can be identified from the information on the back of the postcard, i.e. from the text written by the sender, if the postcard contains handwriting, or from the postmark, if the postcard travelled by post. The *recipient's location* attribute was divided into two categories:

- place name (if legible and identifiable)

- unknown (does not contain handwritten text, the place name or postmark are illegible, or the back of the postcard was not scanned) (0).

The main difficulty lay in deciphering the sender's handwriting, which could be illegible due to messiness or the postcard being frayed or damaged. If the handwriting was illegible, and the postcard contained a postmark, it was sometimes possible to identify the recipient's location from the latter. Another difficulty lay in identifying the name of the depicted location based on several variants in which it appeared. In that case, regardless of the variant in which a place name appeared on a postcard, its contemporary variant was entered into the worksheet (see 4.1.1. and 4.1.3.). Determining the toponyms of small, inhabited places or localities written in foreign languages also presented a challenge and was ultimately resolved by referring to additional sources (see 4.1.1.).

According to the analysis, data on recipients' locations could not be determined for most postcards from the collection (27.7%) (Tab. 4.). The destinations of most of the postcards were Zagreb (13.1%) and Osijek (9.1%). The share of all other destinations was less than 3%. Although it can be assumed that Zagreb was the most frequent destination of the postcards because it was most populated, this assumption should be confirmed by qualitative research.

Table 4 *Recipient's location (15 or more occurrences)*

Recipient's location	Number of postcards	Share of postcards
Zagreb	216	13.1
Osijek	149	9.1
Beč	35	2.1
Jarkovac (Serbia)	26	1.6
Bjelovar	26	1.6
Rijeka	25	1.5
Bol	25	1.5
Laduž	24	1.5
Petrinja	20	1.2
Kotor	17	1.0
Cavtat	17	1.0
Đakovo	16	1.0
Karlovac	16	1.0
Sarajevo	16	1.0
Vukovar	15	0.9
Unknown	456	27.7

Source: calculated by the authors according to National and University Library in Zagreb, 2023

Historiographical cluster

This cluster contains historical data, usually related to postcard dating, divided into four attributes: *publisher (Photographer)*, *year of publication*, *postcard sent*, *year of travel*.

Publisher (Photographer)

Information on the publisher or, less frequently, the photographer was provided in the printed text on the front or back of the postcard. The attribute was divided into two categories:

- name of publisher (photographer)
- unknown (name was not printed, is illegible, or the back of the postcard was not scanned) (0).

The main difficulty lay in the fact that it was sometimes unclear whether the person referred to by their proper name was the publisher (often a natural person at the time) or the photographer, and whether they were one and the same. For example, the following names appear in connection with this attribute: Griesbach and Knaus, Pacher and Kisić, Federico Cretich, Milan Dirnbach, Rudolf Seissel. In such cases, the relevant data was entered into a single category. Certain publishers could be identified based on their logo, which required additional research.

Year of publication

Information about the year of publication was provided in the printed text on the back of the postcard. The attribute was divided into three categories:

- exact year (as printed)
- approximate year (established based on the year of posting written by the sender, the postmark or the stamp, or based on an image of a structure whose year of construction could be determined)
- unknown (no printed information, no text written by the sender, no postmark or stamp because the postcard was not posted, the relevant information cannot be determined based on an image or is illegible, or the scan of the postcard's back is not available) (0).

Considering that information on the year of publication was rarely provided in the printed part of a postcard, it was usually determined approximately, based on the year of posting (e.g., '1903 or earlier' means that the postcard was sent in 1903; 'in the 1920s' means that the year of publication was determined based on the stamp). This enabled the classification of postcards

according to specific periods of their development. In a broad sense, according to the periodisation proposed by Bogavčić (2015), old postcards (printed up to 1941), produced in the so-called golden age of postcards (1897 – 1914), comprise the biggest share of the postcards digitised by NSK (and analysed herein). A significant number of postcards are also from the subsequent period, known as the period of stagnation and decline (1918 – 1945).

Postcard sent

The digitised collection of the National and University Library in Zagreb (NSK) includes both circulated and uncirculated postcards, that is, postcards that were sent through the postal system and those that were not. Circulation status was determined primarily by the presence or absence of a postmark on the reverse side of each postcard. This attribute was classified into two categories:

- Sent—a postmark is present (1).
- Unknown—the postcard was not sent and has no postmark, its reverse side was not digitised, or the available metadata provide no evidence that it circulated (0).

Several situations complicated the determination of circulation status. Some postcards contained handwritten messages but had never been sent. Others bore a postmark but no postage stamp; these were nevertheless classified as circulated. When the reverse side of a postcard had not been digitised, information on its circulation status was obtained from the associated metadata. The analysis showed that almost three-quarters of the postcards (73.4%) had been sent, while 24.1% had not.

Year of travel

The *year of travel* attribute is part of the postmark on a postcard's back or of the handwritten text on a postcard's front or back. The attribute was divided into three categories:

- exact year (as written down by the sender or indicated on the postmark)
- approximate year (established according to the postage stamp)
- unknown (not indicated in the handwritten text, the text or the postmark are illegible, the postcard does not contain handwritten text, or the postcard was not sent, or a scan of the postcard's back is unavailable) (0).

The oldest postcard in the analysed collection (depicting a railway track in Switzerland) travelled by post in 1886, while the most recent one (depicting the bridge near Maslenica) made its journey in 1967 (Fig. 4a and Fig. 4b).

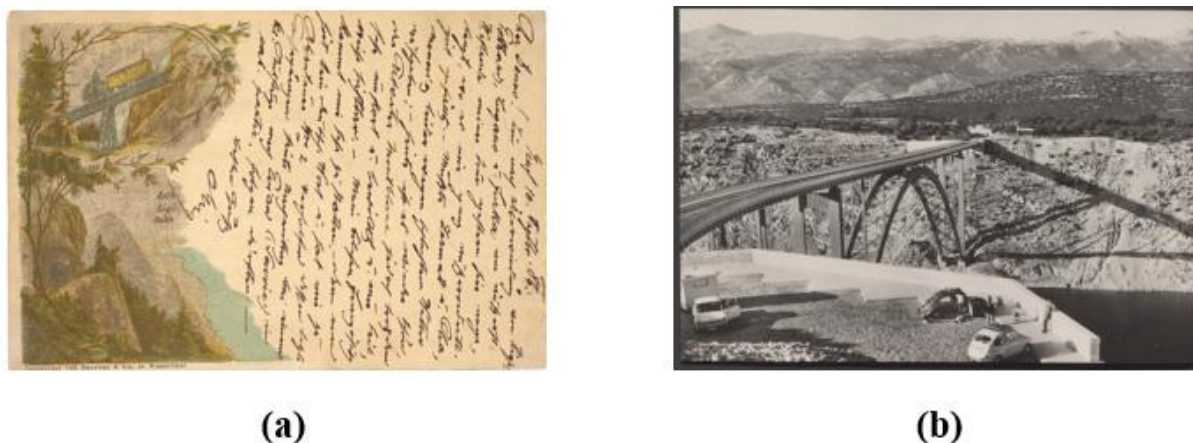


Figure 4 (a) *The oldest analysed postcard (1886); (b) The most recent analysed postcard (1967)*

Source: National and University Library in Zagreb, 2023.

Linguistic cluster

This cluster contains linguistic data. The data were grouped into two attributes: *postcard with handwritten text* and *language or script of the handwritten text*.

Postcard with handwritten text

This attribute is part of the handwritten text on the postcard's front or back. It was divided into two categories:

- postcard with handwritten text (contains text written by the sender) (1)
- unknown (does not contain written text, or does not contain text written by the sender, or a scan of the postcard's back is unavailable) (0).

In cases where a scan of a postcard's back was not available to us, we relied on the metadata to establish whether the postcard travelled by post (postcards which contain at least the handwritten address of the recipient). Almost three quarters (74.9%) of the postcards from the analysed collection contain handwritten text, while 22.3% do not.

Language or script of the handwritten text

The language or script was determined based on the handwritten text on the postcard's front or back. Most of the postcards differed in terms of the language (or languages) they were written in, while only some of them differed with regard to the script (or scripts) as well. The attribute was divided into two categories:

- language (or languages) and script (or scripts)
- unknown (the postcard does not contain handwritten text, the handwriting is illegible, or a scan of the postcard's back is unavailable) (0).

Different situations arose in connection with this attribute. On some postcards, the address and the text were written in different languages (we entered both into the worksheet), although almost always in the Latin script, if the postcard was sent from Croatia. The script was only identified as either Latin or Cyrillic (considering that the texts and addresses were too short to enable the identification of the exact Cyrillic alphabet). A fourth (25.4%) of the postcards contained script classified as 'unknown.' Approximately half of the postcards were written in Croatian (55.6%), 11.2% were written in German and 2.1% were written in the Cyrillic script. All other languages are represented by less than 2%.

Technical cluster

This cluster contains technical data grouped into five attributes: *postcard type* (described at the beginning of the section on research results), *printing technique*, *number of images*, *colour of images*, and *postcard format*.

Printing technique

The *printing technique* attribute refers to the different offset printing techniques used for postcards. The attribute was divided into three categories:

- print (1)
- phototype (2)
- unknown (not indicated or another technique indicated by the metadata, e.g., photography, lithography, chromolithography, photographic printing) (0).

Considering that the subject of analysis were digitised postcards, information about printing technique was gathered from the metadata. Namely, we could not identify differences in

printing technique ourselves because we could not observe or touch the original postcards. According to available data, approximately half of the postcards were produced using the print technique (54.7%), and almost all the rest using the phototype technique (43.7%).

Number of images

Regarding this attribute, postcards were divided according to the number of images they contained (1–14). The total number of images on the analysed postcards was 2012, and 89.2% of the postcards contained only one image. The remaining postcards were collage-type, containing several images. 4.9% of them contained two images, while 2.6% contained three images. The biggest number of images, i.e. 14, was featured on a folded postcard.

Image colour

The colours of the images on the postcards (subsequently used to group the postcards according to colour) currently featured in the digital collection could be identified only on a basic level. The main difficulty lay in the inability to precisely determine the colours of the images on the digitised postcards. For instance, in some cases it was not possible to distinguish between a black-and-white photograph and a black-and-white drawing or tell whether the black-and-white photograph (or drawing) was subsequently colourised or originally produced in colour. Therefore, the images/postcards were divided into three categories:

- black-and-white (1)
- colour (2)
- combined (1, 2).

According to analysis, approximately two thirds of the postcards (68.6%) were black-and-white and approximately one third (31.3%) were in colour.

Postcard format

The *postcard format* attribute refers to the shape of the postcard. With respect to this attribute, the postcard can be square, rectangular, round, elliptical, or irregularly shaped. All of the analysed postcards were rectangular, mostly with horizontally oriented elements, and 13.8 × 8.9 cm in size (1). The data was obtained from the metadata.

DISCUSSION

The results of the research carried out on the Digital Postcard Collection of the National and University Library in Zagreb show that a postcard collection, if viewed as a complete set of different data, can be an abundant source of research after the data are defined, classified, and categorised, i.e. systematised. It is only after these preliminary activities that the collection reveals data and relations which would not have been obvious had the postcards been considered as separate, individual examples or as small-group examples. A comprehensive model of analysis of NSK's digital postcard collection can help decipher such hidden relations. Not all (or even most) of the attributes were presented and described in the studies published so far on the quantitative and qualitative analysis of postcards (e.g., Bogavčić, 2015; Bogavčić & Salopek Bogavčić, 2020; Sabolović-Krajina, 2024; Slunjski, 2019; Zupanc, 2010). Therefore, the herein presented model is a supplement to such previous studies. Considering that the model might provide a basis for further disciplinary and interdisciplinary research, future lines of research are also proposed below.

All the attributes of the geographical cluster related to location or inhabited place (*depicted location* and *place of publication, recipient's location*) can be useful to geographers (as the study has shown) and economists for spatial and economic analyses of the extent and strength of the visibility of local communities in tourism. For example, an analysis of postcards from a collection of a local museum may serve to determine, based on the relation between the depicted location and the recipient's location, the network of connections and the dominant travel routes of the postcards. This, in turn, gives insight into the visibility of the local community in its immediate or wider surroundings. According to the existing studies of postcards, including this one, data on the dominant motifs of images have proven to be the most widely applicable. It is, therefore, expected that the motifs of images will continue to inspire most researchers from various fields and areas of interest.

In geographical research, particularly in the fields of cultural, tourism, urban, historical, and physical geography, quantitatively analysed motifs can serve as the basis of in-depth qualitative research of the depicted geographical motifs, studied individually or in groups. Such research could be used to identify the dominant heritage motifs depicted on postcards from a certain collection and the reasons for the selection of those motifs; to determine the reasons for the overrepresentation of cultural heritage motifs in comparison to natural heritage motifs; to

establish why so many postcards feature the same motifs and identify the reasons for the choice of those motifs; to discover what a multitude of different postcards from the same place can tell us about promotion in tourism; to identify the transformations of the present-day landscape within a space with respect to the landscape depicted on a postcard and the drivers of those transformations; to discover how a community represented on the postcards in a certain manner is perceived; to examine the effect of postcards on the creation of the image of a place; to learn about the creators of the images of the spaces depicted on the postcards and about their intentions, etc.

Data on the publisher (photographer) could be of use to historians in determining the social and cultural relations between individuals (publishers, photographers) and the local community in the past or, for instance, in exploring the development of cultural activities (printing houses) in certain towns or cities. The year a postcard was published and sent, as well as its postmark and postage stamp, enable the dating of a postcard, the delineation of the logical periods of postcard development according to common characteristics (undertaken by numerous authors - see section 2), and the classification of postcards according to these periods.

Data on the language and script of the printed and handwritten parts of postcards can be useful to linguists in analyses of toponym variants and the frequency and periods of the use of exonyms, old words and expressions in Croatian and in foreign languages, in sociolinguistic analyses of different contexts of postcard writing, the culture of writing, the literacy and speech standards of a specific period, standard phrases, etc. Technical data, such as data on printing technique and image colour, can be of use to collectors and researchers of graphic technology or, for instance, of the development of printing techniques in the past.

CONCLUSION

In line with the two main research objectives, the study defined a model of the analysis of a digital postcard collection using the example of the digital postcard collection of the National and University Library in Zagreb. The model was then applied to the quantitative processing of geographical content ‘inscribed’ into the postcards. The study also emphasised considerable limitations to its research, such as those related to the non-representativeness of the studied collection. Moreover, subjective and objective obstacles arose when assigning postcards to categories, which, to some extent, explains postcard researchers’ reluctance to classify a larger number of postcards. These factors precluded the drawing of general conclusions from the interpretation of the results. However, certain observed phenomena require further research. For example, the location shown on the postcard and the recipient’s location were sometimes in rather proximity (e.g., Nijemci - Vinkovci; Trsteno - Cavtat), which may indicate stronger connections between the inhabitants of geographically closer areas, as opposed to those that are more distant. The dominant motifs of postcard images were landscapes, sacral buildings, streets, squares, and parks, which indicates that these were perceived as valuable parts of a space, which created the image of the depicted location.

Despite the limitations, research has confirmed the claim that structured and classified (for instance, using this model) data collected from postcard collections and individual postcards can be used as the basis of further qualitative research, particularly the one aimed at reconstructing the morphological, functional, demographic and broader social and symbolic changes in space. This justifies the use of postcards as a valuable source in geographical analyses. The principal contribution of this paper in relation to existing research lies in its methodological advancement, shown through the development and practical application of a model for the quantitative analysis of large numbers of postcards, i.e. entire postcard collections, particularly as part of geographical research.

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