Introduction: Embracing Digital Technology—New Methods for the Critical Analysis of Sources from Central and Eastern Europe

Katja Wezel Peter Haslinger

Declaration on Possible Conflicts of Interest
The authors have declared that no conflicts of interest exist.

Funding Statement
We would like to thank the Beauftragte der Bundesregierung für Kultur und Medien (BKM), the Deutsche Forschungsgemeinschaft (DFG), the Nordost-Institut IKGN Lüneburg, and the University of Göttingen for their financial support of the conference "New Approaches in Central and East European History: The Digital and Spatial Turn," 7–9 November 2019 in Lüneburg, where earlier drafts of the articles published in this volume were presented.

Dr. Katja Wezel, Georg August University of Göttingen, katja.wezel@uni-goettingen.de, https://orcid.org/0000-0002-1599-1033

Prof. Dr. Peter Haslinger, Herder Institute for Historical Research on East Central Europe, Marburg–Justus Liebig University, Gießen, peter.haslinger@herder-institut.de, https://orcid.org/0000-0002-5871-137X

Introduction: Embracing Digital Technology–New Methods for the Critical Analysis of Sources from Central and Eastern Europe – ZfO / JECES 70/2021/3
(received 2020-08-31, accepted 2021-02-15)
DOI: 10.25627/202170311014 – eISSN 2701-0449, ISSN 0948-8294

1 Bridging the Gap: Digital Humanities as a Challenge and Opportunity for Historians

> "One cannot turn up in a university in North America or Europe without hearing that the humanities are in crisis. Many argue that by embracing the digital, humanities can avoid their decline and even perhaps benefit from revitalization, if not renaissance."[1]

This observation reflects the fundamental dilemma in which all of those active in the field of Digital Humanities find themselves these days:[2] How can we expect to transform individual disciplines within the Humanities in a common direction that prepares them for an academia of the future? How can we enhance the level of interdisciplinary interoperability by the use of digital tools and methods without burning the bridges to established techniques for the interpretation of our source material? To what extent does digital technology "challenge established epistemology"[3] and what are the consequences for how we will work, publish, and communicate in the future?

Some argue that digital technology is simply a new "tool" that can be integrated into the existing portfolio of tools available for researchers. If that was the case, one could compare digital history to the rise of oral history, which by now has been integrated into the portfolio of historians, especially in Contemporary History. However, if digital technology is more than just another tool, it requires another, different kind of source criticism and understanding. Do we therefore need to adapt our methodology and our basic epistemological assumptions when going digital? How can we, for example, make sure that the veto power of individual sources ("Vetorecht der Quelle"[4]) is still salient in times of big data? How should the new opportunities of data accessibility and knowledge portals for historical sources be framed and operated? Are we at the beginning of an overall shift from qualitative to quantitative methods?

Against this backdrop, Eva Pflanzelter has referred to Garben Zaagsma's proposal to expand "the focus of current technology-deterministic digitization

---

1 Seamus Ross: Digital Humanities Research Needs from Cultural Heritage Looking Forward to 2025?, in: Agiatis Benardou, Erik Champion et al. (eds.): Cultural Heritage Infrastructures in Digital Humanities, London—New York 2017, pp. 153–166, here p. 153.

2 We would like to thank Christian Lotz for his valuable comments on an earlier draft of this introduction.

3 Leighton Evans, Sian Rees: An Interpretation of Digital Humanities, in: David M. Berry (ed.): Understanding Digital Humanities, Basingstoke 2012, pp. 21–41, here p. 28.

4 Stefan Jordan: Vetorecht der Quellen, in: https://zeitgeschichte-digital.de/doks/frontdoor/index/index/docId/570 (2020-08-04).

practice from (certainly useful) tools and data to critical methodological and epistemological questions."[5] Pflanzelter argues:

> "Source criticism is seen as the bottleneck in the cognitive process of historians and is gaining importance in the age of digitization in many more disciplines than the historical sciences, as former reliabilities and authorities (such as archives, libraries and publishers) threaten to lose visibility and influence."[6]

According to the Association of Historians in Germany, the prevention of disruptions while transferring the pre-digital methodology of source critique into a digital format will be a constant task for all historically engaged humanities (including literary studies, art history, and cultural studies) in the forthcoming years.[7] The challenge we are facing here is not simply to guarantee the transfer of what used to be the auxiliary sciences in history (Hilfswissenschaften) into a digital future. Auxiliary sciences cannot and must not be substituted with automated tools.

For historians, employing digital methods also includes the task of rethinking the conditions for the visibility of their expertise under the circumstances of digital communication. Here we face a multiplication of potential authors and formats: Everyone can produce historical content without embracing strict quality standards. One does not have to browse the internet extensively to see that, outside of academic communication platforms with their professional approach, historical narratives are already being re-written in the digital sphere (for instance in the sphere of computer games). The increased visibility of experts in quality media on the one hand, for instance during the Covid pandemic, and the amount of questionable information available on the internet on the other, have shifted the agency of historians as well as the possible impact of science and academia. Against this backdrop, it might be wise for professional historians to emerge from previous roles as gatekeepers of an overwhelmingly pre-digital historiography in order not to run the risk of becoming bystanders vis-à-vis the massive expansion of history-related digital content.

With this special issue, we argue that Digital Humanities pose new challenges, create new opportunities, and cannot be dismissed as simply offering some "new fancy tools." Taken seriously, it challenges traditional research methods and requires a new handling of sources because a digital humanist

---

5 GERBEN ZAAGSMA: On Digital History, in: BMGN—Low Countries Historical Review 128 (2013), 4, pp. 3–29, cited by EVA PFANZELTER: Historische Quellenkritik in Lehre und Forschung, in: H-Soz-Kult, 2015-11-24, www.hsozkult.de/debate/id/diskussionen-2903 (2020-08-04).

6 PFANZELTER.

7 EVA SCHLOTHEUBER, FRANK BÖSCH: Quellenkritik im digitalen Zeitalter: Die Historischen Grundwissenschaften als zentrale Kompetenz der Geschichtswissenschaft und benachbarter Fächer, in: H-Soz-Kult, 2015-11-16, www.hsozkult.de/debate/id/diskussionen-2866 (2020-07-15).

will (have to) approach, process, and analyze sources differently. Digital Humanities require a new training for humanists. This does not mean, however, that we need a new, digital theory.[8] Computational methods complement existing theories and can enrich conventional methods in different research areas, thus building on existing theories. The question for historians today should not be "digital" or "non-digital." Rather, humanists, especially PhD students, need to understand the new digital opportunities, know how to use them, and understand their limits when drawing conclusions. Therefore, they need to have the skills to evaluate when and if digital methods suit a specific research project.

One of the first lessons taught in Digital Humanities courses is that a digital humanist doesn't deal with *data* but *capta*, a term that has been conceptualized by Johanna Drucker:

> "*Capta* is 'taken' actively while *data* is assumed to be a 'given' able to be recorded and observed. From this distinction a world of differences arises. Humanistic inquiry acknowledges the situated, partial, and constructive character of knowledge production, the recognition that knowledge is constructed, *taken*, not simply given as a national representation of pre-existing fact."[9]

First of all, every digital humanist needs to ask where the data used for a digital project is coming from, who created this data, and whether or not it can be trusted. This is the first part of any digital source critique. One also needs to be aware of which data can be transformed into *capta*, and which can't, for instance when a data set is so incomplete that any attempt to work with it would only create unreliable results. Moreover, digital humanists need to learn how to evaluate *capta* and understand the processes behind *taking* these *capta*. Digital research can be very powerful and often produces impressive visualizations. However, these visualizations and the *capta* behind them are a product of the interpretation by the researcher and thus need to be analyzed and critiqued just as much as traditional sources. In order to evaluate and critique such digital research results, one needs to understand them and preferably have some hands-on experience in using digital tools.

The articles of this special issue were first presented at the conference "New Approaches in Central and East European History: The Digital and Spatial Turn" in 2019. This special issue unites the articles dealing with the Digital Turn. All articles provide a hands-on approach by discussing the projects of researchers who have faced a challenge that they were able to overcome using digital methods. On top of that, the authors also introduce readers to the processes behind their digital technology, and thus provide insight into

---

8 STEFAN KARCHER: Does Digital History Need a Theory?, in: InFoDiTex, 2018-03-19, https://infoditex.hypotheses.org/95 (2020-07-25).

9 JOHANNA DRUCKER: Humanities Approaches to Graphical Display, in: Digital Humanities Quarterly 5 (2011), 1, http://www.digitalhumanities.org/dhq/vol/5/1/000091/000091.html (2020-07-15) (emphasis in original).

how their data became *capta*. Moreover, all five articles address the question of why and how going digital profited their project and/or why this kind of project would not have been feasible without the application of digital technology.

In addition, all articles focus on the region of Central and Eastern Europe, an area that can especially profit from the adaption of geographical digital methods, which several of the authors have used in their research. Central and Eastern Europe has long been an area where borders have been fluid and geographical names have differed depending on the ethnic composition of that specific area, state policy, or ideological regimes. Until today, names for places and regions come with ideological baggage and layers of power. The examples in this special issue show that the matrix of time, space, and spatial agency is at times quite complex and places the scholar in a challenging research environment. On the other hand, this makes the region particularly well suited for adopting digital methods, allowing for structuring *capta* in new ways, creating new and interactive visualizations, and supporting our understanding of historical change.

2 Maps and Critical Digital Humanities

Spatial concepts assume material form in maps, producing binding interpretations that, in turn, instate inter-personal meaning.[10] Maps are not copy-paste representations of the world, they are "knowledge media" that create augmented realities. As knowledge media technology, they are inherently rhetorical and share a common grammar to fulfill basic communicative functions. The first function is to provide information about locations, distances, and spatial relations (like centers and peripheries). The way maps (and therefore map makers) achieve this has multiple implications due to the fact that maps

[10] The following few paragraphs are based on PETER HASLINGER, VADIM OSWALT: Raumkonzepte, Wahrnehmungsdispositionen und die Karte als Medium von Politik und Geschichtskultur, in: IDEM (eds.): Kampf der Karten: Propaganda- und Geschichtskarten als politische Instrumente und Identitätstexte, Marburg 2012, pp. 1–12. Also see among other works: JOHN BRIAN HARLEY (ed.): The Nature of Maps: Essays in the History of Cartography, Baltimore 2001; JEREMY W. CRAMPTON: Mapping: A Critical Introduction to Cartography and GIS, Chichester 2010; IDEM, JOHN KRYGIER: An Introduction to Critical Cartography, in: ACME: An International E-Journal for Critical Geography 4 (2005), pp. 11–33; MARK MONMONIER (ed.): The History of Cartography. Vol. 6: Cartography in the Twentieth Century, Chicago 2015; JÖRG DÜNNE: Die Karte als Operations- und Imaginationsmatrix: Zur Geschichte eines Raummediums, in: JÖRG DÖRING, TRISTAN THIELMANN (eds.): Spatial Turn: Das Raumparadigma in den Kultur- und Sozialwissenschaften, Bielefeld 2008, pp. 49–69.

are based on a set of active decisions that map producers are required to make.[11]

The most important choice is what to show and what to disregard. Due to international standards of cartographic language, we see similar motifs if we look at representations of spaces. Streets, towns, buildings, state borders, and the distribution of linguistic groups are not portrayed individually, but reduced to standardized representations. Map-making therefore both requires and encourages the categorization of the world in order to reduce its complexity. Based on measurements and statistical data, maps can also differentiate the visualization of space through choice of color, contrast (warm/cold or light/dark), clustering and shading, and labeling language (such as place and region names). In this way, maps impose a lot of streamlining and even obliteration. Through the data they reference and confirm, disagree with, or contradict, they disseminate ideological elements and political claims.

The arbitrary nature of the cartographic visualization becomes clear in the case of seemingly "innocent" or "exact" depictions, for example ethnographic maps. Even physical maps, which would appear to be neutral due to the lack of political borders and their conventional cartographic language, can make political statements deriving from the choice of the areas that attention is drawn to. In some historical contexts, cartographic production is focused on regions of conflicting interpretation, disputed borders, or on the basis of competing territorial programs. The result could almost be referred to as parallel cartographic realities that are dynamically and negatively entangled. The maps and their producers communicate and interact with each other, while cartographers help disseminate political visions by authorizing competing spatial ideations based on their standing as experts.

In order to make their arguments as persuasive and salient as possible, map makers typically combine professional design and scientific language with elements drawn from political belief systems (some superb examples for this can be found in the state building cartographies at the end of World War I and during the Paris peace conferences).[12] In order to analytically highlight the

---

11 See among other studies DANIEL DORLING, DAVID FAIRBAIRN: Mapping: Ways of Representing the World, London—New York 2013; ROLF HARBECK: Digitale Landschaften und Karten für Deutschland—Amtliche Kartenmacher auf neuen Wegen, in: SABINE TZSCHASCHEL (ed.): Visualisierung des Raumes: Karten machen—die Macht der Karten, Leipzig 2007, pp. 133–142; STEFFEN SIEGEL, PETRA WEIGEL (eds.): Die Werkstatt des Kartographen: Materialien und Praktiken visueller Welterzeugung, Paderborn 2011; STEPHAN GÜNZEL, LARS NOWAK (eds.): KartenWissen: Territoriale Räume zwischen Bild und Diagramm, Wiesbaden 2012.

12 See for example STEVEN SEEGEL: Map Men: Transnational Lives and Deaths of Geographers in the Making of East Central Europe, Chicago 2018; PETER HASLINGER: National Geopolitics in Habsburg Central Europe: Imperial and Post-imperial Perspectives on Hungary and Poland, 1890–1930, in: JAN AREND (ed.): Science and Empire in

grammar of maps like these, it is of utmost importance to develop tools and ways to make the layers of visual arguments visible. Digital Humanities' methods might especially help to identify and de-code cross-references and entangled counter-arguments these maps entail. Through a thick description of different vistas of narratives and underlying identity concepts as well as geopolitical projects, they also help us to understand the mindset- and interest-based perspectives that cartographic representations are based on. Due to the power of digital visualizations, the long-discussed issue of multi-perspectivity and its discursive entanglement with historical science is highlighted even further.

In cartography, which has long been an auxiliary science for historians, digital maps increase the potential with which maps can use the power of suggestion. This becomes especially obvious in the articles of this volume that use ArcGIS or QGIS, two programs that were developed for digital cartography. By this token, Digital Humanities can help us to understand complex spatial-chronological layers, vistas, or entanglements. We need new formats not only to retrieve correct and quality-proven information, but also to make concepts, structures, and individual approaches visible as well as identify the texture of antagonistic readings of the past. The question of how to include multi-perspectivity and uncertainty in geographical metadata is one way to address this problem. Here, Critical Digital Humanities as an approach for studying and using digital technology in a way that is attentive to questions of power, domination, and exploitation offers compelling new trajectories. It includes interpretative layering and metadata management by locating and curating interpretative information in the mark-up, metadata, annotations, and in style sheets as core material needed for humanistic study. It also addresses another problem in relation to the accessibility, interoperability, and sustainability of research data:

> "The creation of digital objects […] is more than just preparation for research. This is a fundamental difference between databases as they are used in the humanities and those that are used in the natural sciences. The way in which inscriptions are photographed or in which text corpora are transcribed and encoded is crucial for the way in which these research objects will be studied in the future."[13]

The choices one needs to make when using digital methods as a humanist are obvious when setting up a database in order to collect and classify a large amount of data. On this issue, see for example Jan Vondráček's article on the war economy in Nazi-occupied Bohemia and Moravia in this volume. Study-

---

Eastern Europe: Imperial Russia and the Habsburg Monarchy in the 19th Century, Göttingen 2020, pp. 205–226.

13 WIDO VAN PEURSEN: Text Comparison and Digital Creativity: An Introduction, in: IDEM, ERNST D. THOUTENHOOFD et al. (eds.): Text Comparison and Digital Creativity, Leiden 2010, pp. 1–28.

ing different kinds of Nazi regulations and violations against them, Vondráček needed to decide how to classify, order, and merge data to include various pieces of information in his database. Working with sources in different languages (in this case German and Czech) further complicates the matter. With sources in different languages and lists of crimes and offences produced by different authors, it was necessary to merge various similar offences to make the violations comparable and allow for an easier navigation of the database. Deciding how to classify an entry in a database is a crucial choice for any digital humanist. If several languages are involved, and especially if there is a possibility of historical propaganda spilling over into digital classifications, critical reflection of the opportunities and perks of Digital Humanities and a digital source critique become most crucial.

3 Data Processing and Visualization with Historical GIS

We have all become used to data visualizations, especially since the outbreak of the Covid pandemic, when the world map of Covid cases became a standard fixture on our computers, smartphones, and TV sets.[14] Four out of five articles in this special issue are primarily working with the visualization of spatial data through historical GIS (Geographic Information Systems). GIS is a technology which unites geographical and historical approaches and is well suited for addressing historical problems that contain a spatial component. It is a computer software designed for mapping large quantitative datasets.[15] GIS originated in the 1960s as a computer system that was developed at the Federal Department of Forestry and Rural Development of Canada with the aim to study Canada's environment.[16] From a historian's point of view, GIS—or Historical GIS (HGIS)—lends itself particularly well to answering research questions in environmental, social, economic, and medical history because it enables the systematization and visualization of spatial data, such as populations, industrialization, census districts, natural resources, land use, commodities, networks, communication patterns, or the spread of diseases.[17]

---

14 Ben Shneiderman: Data Visualization's Breakthrough Moment in the COVID-19 Crisis, in: Nightingale from 2020-04-30, https://medium.com/nightingale/data-visualizations-breakthrough-moment-in-the-covid-19-crisis-ce46627c7db5 (2020-07-20).

15 Anne Kelly Knowles: GIS and History, in: eadem, Amy Hillier (eds.): Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship, Redlands 2008, pp. 1–25, here p. 2.

16 Silvia Elena Piovan: The Geohistorical Approach: Methods and Applications, Cham 2020, p. 120. See also Ian Gregory, Don DeBats, Don Lafreniere: Introduction to Part IV: Spatial and Environmental History, in: idem (eds.): The Routledge Companion to Spatial History, New York 2018, p. 351.

17 Anne Kelly Knowles: Introduction Historical GIS: The Spatial Turn in Social Science, in: Social Science History 24 (2000), 3, pp. 451–470, here p. 452.

Historical GIS requires a particular understanding of cartography, the power of maps, and spatial approaches to writing history.[18] Maps provide an array of information, often implicit, that the viewer needs to de-construct. Much like texts, maps have to be read and analyzed. One of the first "spatial analysts" who used a map—albeit one drawn by his own hands—for storing information and drawing conclusions was the British physician John Snow. His map, which linked the cholera epidemic of 1854/55 to the water from one particular pump in the Soho district of London, is a powerful example for how vital a spatial visualization can be.[19] Spatial history doesn't need large datasets or software to be effective. However, new technologies such as the commercial program ArcGIS developed by ESRI and the open-source variant QGIS allow far more raw data to be processed and more *capta* to be evaluated.

In cases where we lack qualitative sources that describe the life or death of people, historical GIS can help to fill the gaps. One of the most compelling spatial history projects that have overcome a gap in sources by using mapping as a technique is "The Holocaust by Bullets" initiated by Father Patrick Desbois.[20] The project's researchers have identified sites where Eastern European Jews were killed by mobile units of the SS (Schutzstaffel), going far beyond what has been documented by written sources. Desbois and his team interviewed local witnesses and used metal detectors to find leftovers of bullets and cartridges that were buried with the victims. With the help of GIS, the project's website provides a detailed map of killing sites in Eastern Europe, visualizing where these killings occurred and counting 1,850 execution sites to date.[21]

Computer programs like ArcGIS and QGIS can not only create powerful visualizations in the form of maps, but these programs can also be queried. As Ian Gregory and Paul Ell argue:

> "Digital technology allows us to go beyond these traditional forms of visualisation into areas such as interactive maps or diagrams that can be queried and changed, animated maps that show change over time and virtual worlds that allow exploration of a detailed representation of a recreated landscape."[22]

---

18 For a brief introduction into the field of Historical GIS, or HGIS, see JENNIFER BONNELL, MARCEL FORTIN: Introduction, in: IDEM (eds.): Historical GIS Research in Canada, Calgary—Alberta 2014, pp. ix–xix, here pp. xi–xii.

19 HUMPHREY SOUTHALL: Enhancing Life-Courses: Using GIS to Construct "New" Aggregate and Individual-Level Data on Health and Society in Twentieth-century Britain, in: GREGORY/DEBATS, The Routledge Companion, pp. 76–91, here p. 76.

20 PATRICK DESBOIS: The Holocaust by Bullets: A Priest's Journey to Uncover the Truth behind the Murder of 1.5 Million Jews, Basingstoke 2008.

21 The Map of the Holocaust by Bullets, https://yahadmap.org/#map/ (2021-07-14).

22 IAN GREGORY, PAUL S. ELL: Historical GIS: Technologies, Methodologies and Scholarship, Cambridge 2007, p. 6.

Exploring visualizations that have been created with ArcGIS or QGIS can help to overcome research problems and challenge well-established narratives. Susan Grunewald's article in this volume is an example where the outcome of spatial research and the visualization in the form of a map contradicts common beliefs and narratives. The common narrative among survivors and their ancestors is that German prisoners of war in the Soviet Union were "all imprisoned in Siberia." As Grunewald demonstrates in her article by interpreting her dataset from a new spatial and digital angle, the majority of prisoners were used as labor force on post-war construction sites in the Western, *European* parts of the Soviet Union, and not in Siberia.

GIS is a powerful technique for analyzing datasets, statistical or other kinds, as well as the underlying mechanisms of social networks, living conditions, commodity exchanges, or crimes against humanity. Having a large dataset with a spatial component is key for using GIS. While statistical datasets are often produced by national governments, GIS projects are actually very often transnational in their scope simply because landscapes naturally don't have state borders. Thus, GIS projects are aptly suited to taking a transnational approach and for cross-border collaboration. This becomes evident in this volume's article by Niels Petersen, Bart Holterman, and Angela Ling Huang. The team at the University of Göttingen studies medieval and early modern trade routes, not only using its own dataset for creating ArcGIS maps to analyze streets, waterways, and trade routes in Central and Eastern Europe, but also collaborating with other institutions in Europe, such as the Moesgaard Museum and the University of Aarhus in Denmark as well as the Radboud University in Nimwegen, Netherlands. Standard classifications, for instance agreeing to the use of a database such as Geonames,[23] are crucial for a project like this one. It is also important to agree in advance on how to use and store metadata.[24]

ArcGIS and QGIS help researchers not only to analyze and evaluate but also to sort and structure a vast array of information—as long as the data has a spatial component. Next to the location, stored in longitude and latitude, several other attributes can be added. One of these attributes that a historian will always be eager to add is time. In this volume, Jan-Hinnerk Antons uses the lists of visitors at Baltic Sea resorts, which were published by newspapers, to demonstrate the travelling radius of tourists to Baltic Sea resorts in the nineteenth century for various years. For some very popular resorts like Travemünde, this radius expanded quite drastically and, by 1860, stretched all

[23] The geographical database GeoNames, http://www.geonames.org (2020-07-17), collects the names of populated places and their alternate, historical names.

[24] In this particular project, the data in the GIS-files is linked to an SQL-database. Attributes in the GIS-file are connected to references about sources and literature, stating where the information about medieval and early modern markets or trade routes is taken from.

the way to South America. Similarly, Katja Wezel shows in her project about Riga as global port city in late imperial Russia that the number of trade connections grew substantially between 1883 and 1913, leading to both an agglomeration of trade but also a much larger trade network that eventually almost spanned the entire globe, from Riga to Australia. Riga's success as a capital of trade and one of Russia's fastest growing metropolises at the time was largely related to this exponential increase in trade. In both projects, as in historical GIS projects overall, the connection of time and space is key.

The technological opportunities arising through the use of GIS are manifold. However, it is crucial to understand that maps—created with the help of programs such as ArcGIS or QGIS—are also sources that need to be evaluated and interpreted. *One* map that a researcher creates with a program like ArcGIS is only *one* visualization and *one* possible result that can be produced by highlighting and visualizing specific information and attributes stored in the database. GIS researchers can use the interface of their database for a vast number of queries, thereby acquiring different, new *capta* every time they use this database.

4 The Added Value of Digital Humanities: When Should Digital Technology Be Used?

The digitization of archival materials makes it possible to query large data sets that could not easily be handled otherwise. Especially when big data sets are involved, digital methods are crucial for assembling, structuring, analyzing, and visualizing research findings.[25] There is, however, no magical number for the amount of raw data that can tell a researcher when digital technology should be used. Sometimes even with just about 100 data points, the structuring of data with digital technology can be very helpful, especially if one adds several different attributes.[26]

However, it is clear that digital technology becomes most effective when one deals with several of hundreds of data points. Jan Vondráček's study is based on a very large number of legal texts and police files, which were one of his main primary sources to study everyday life under German occupation. The use of digital technology allowed him to first organize and then evaluate 3,846 cases of food-, supply-, and price offences against Nazi authorities from the police register in the district of Kladno (Central Bohemia). Without the structure of a database collecting all the offences, it would have been either very difficult or simply impossible to use the police registrar as a source. The database made the data functional and searchable, creating *capta*.

---

25 PATRICK MANNING: Big Data in History, Basingstoke 2013.

26 For a visualization exemplifying what is meant by attributes, see the attribute tables in the articles by Jan Vondráček (Fig. 3) and Katja Wezel (Fig. 7).

It also allowed Vondráček to look for similarities and differences between the cases. As a result it became possible to evaluate a) how Nazi rules impacted the life of ordinary people in this district and b) to identify common behaviors, which the native population developed to circumvent Nazi regulations.

Similarly, the project of Susan Grunewald would have been either unfeasible or far more time-consuming without the use of digital methods. She initially used optical character recognition (OCR) to scan and digitalize her main source, a book that listed all German prisoner of war camps in the Soviet Union across 236 pages, to create her database of about 4,000 locations. Describing her work process, Grunewald also highlights problems such as the fact that most OCR software is designed for English and often doesn't work as well for other languages such as German, especially if the German was used to transliterate originally Cyrillic location names. Here, another aspect of DH becomes obvious: the necessity for data cleaning and quality management. As much as digital methods can help us, it still requires a researcher with specific knowledge about a region, its history, and the languages spoken there to clean the data and filter out mistakes after a computer program has rendered its results. Data cleaning is a vital part of any digital project and of turning data into *capta*.

Digitization can render results faster and on a larger scale. Its visualizations make information more easily accessible and comparable. Katja Wezel demonstrates this in her project on Riga as a global port city with the comparison of trade contacts in a diachronic overview (see images 1 and 2 in her article). Moreover, digital methods can help to organize data, and in some cases even retrieve lost data. As Wezel shows, GIS technology not only allowed her to collect and visualize the data for Riga's trade network; it also helped her to find historical street names on today's map of Riga by overlaying historical, georeferenced maps with current ones, turning the locations of businesses and companies into a database with German and Latvian street names. The database that is behind any digital project helps us to structure data while also making it possible to change attributes and research angles. Once a database has been established, the digital humanist can find answers to different research questions simply by slightly changing the query each time. Updates of data can also be achieved very quickly and are reflected immediately in research results, such as a new print-out of an updated map.[27]

Digital methods can also step in when traditional text sources are fragmented or simply not available. The added value of digital technology becomes very obvious in these cases. For Jan-Hinnerk Antons, the published lists of visitors to Baltic Sea resorts were the best way to assess the overall popularity of a resort and to evaluate the variety of tourists with regard to their origin. While traditional written sources such as travelogues also added

[27] For a comparison of traditional cartography and GIS including a list of advantages of using GIS see PIOVAN, p. 122.

crucial information, the quantitative analysis made different resorts comparable to each other. Using QGIS as a database to store the data and comparing the maps created with QGIS (see article by Antons, images 2–8), the visualizations allowed him to a) compare different sample years for one Baltic Sea resort and b) compare the use of resorts along the Baltic coast with one another and reflect their popularity among tourists, taking into account the origin of travellers. This level of comparison would not have been possible with traditional text-based research.

Similarly, in medieval and early modern history, where text sources are often extremely rare or non-existent, digital history can help to fill the crucial gap with sources that are available. The Viabundus project developed at the University of Göttingen and introduced in the article by Niels Petersen, Bart Holterman, and Angela Ling Huang allows the analysis of trade routes of medieval and early modern merchants. In contrast to older, traditional cartographic works in the field, Viabundus includes a database, where researchers—and once it is openly published also the interested public—can pose their questions and calculate the fastest and shortest routes by taking into account geographic hindrances, such as hills, as well as man-made obstacles like customs and borders.

5 Conclusion

In all these examples, the active (and crucial) mental work of the humanist who works with digital technology becomes obvious. Even if working with databases is a vital part, Digital Humanities is not just about data or *capta*. As Noah Wardrip-Fruin pointed out a while ago, humanists should not feel too impressed by the data they work with:

> "The Humanities are not simply defined by the data it has mastered. Whether in literature, philosophy, media studies or some other disciplines, humanists understand the data they study."[28]

Digital humanists need to focus on the outcome, the evaluation, and the interpretation of their *capta*, because this is what differentiates humanists from programmers and IT-specialists. Moreover, all the articles of this volume stress one important point: The use of digital technology does not outgrow the need for qualitative research and the critical analysis of historical documents and data. All the articles are a combination of both, quantitative and qualitative research approaches. Often digital technology is used to add another layer and to complement, and sometimes correct, qualitative analysis. Thus, Digital Humanities is not just about mastering data, rather the humanist inter-

[28] Noah Wardrip-Fruin: The Prison-House of Data, in: Inside Higher Ed from 2012-03-20, https://www.insidehighered.com/views/2012/03/20/essay-digital-humanities-data-problem (2020-07-18).

prets digital research results, provides an explanation of digital technology to the reader or viewer, and combines digital methods with the critical analysis of sources.

As historians, we are all potential digital humanists. All of us are already using digital technology on a daily basis. The question that we ask ourselves should not be "do we need digital methods" but "which research project(s) will profit from using digital methods" and "how can we best make use of the potentials of Digital Humanities." With this special issue we are seeking to provide some insights into projects that profited from the use of digital technology. The articles all include a reflection on the use of DH-methods and therefore contribute to answering the question: In which cases can digital technology render useful results that enchance our understanding of historical change?

Bibliography

BONNELL, JENNIFER—FORTIN, MARCEL: Introduction, in: IDEM (eds.): Historical GIS Research in Canada, Calgary—Alberta 2014, pp. ix–xix.

CRAMPTON, JEREMY W.: Mapping: A Critical Introduction to Cartography and GIS, Chichester 2010.

DESBOIS, PATRICK: The Holocaust by Bullets: A Priest's Journey to Uncover the Truth behind the Murder of 1.5 Million Jews, Basingstoke 2008.

DORLING, DANIEL—FAIRBAIRN, DAVID: Mapping: Ways of Representing the World, London—New York 2013.

DRUCKER, JOHANNA: Humanities Approaches to Graphical Display, in: Digital Humanities Quarterly 5 (2011), 1, http://www.digitalhumanities.org/dhq/vol/5/1/000091/000091.html (2020–07–15).

DÜNNE, JÖRG: Die Karte als Operations- und Imaginationsmatrix: Zur Geschichte eines Raummediums, in: JÖRG DÖRING, TRISTAN THIELMANN (eds.): Spatial Turn: Das Raumparadigma in den Kultur- und Sozialwissenschaften, Bielefeld 2008, pp. 49–69.

EVANS, LEIGHTON—REES, SIAN: An Interpretation of Digital Humanities, in: DAVID M. BERRY (ed.): Understanding Digital Humanities, Basingstoke 2012, pp. 21–41.

GREGORY, IAN—DEBATS, DON et al. (eds.): The Routledge Companion to Spatial History, New York 2018.

IDEM: Introduction to Part IV: Spatial and Environmental History, ibidem, p. 351.

GREGORY, IAN—ELL, PAUL S.: Historical GIS: Technologies, Methodologies and Scholarship, Cambridge 2007.

GÜNZEL, STEPHAN—NOWAK, LARS (eds.): KartenWissen: Territoriale Räume zwischen Bild und Diagramm, Wiesbaden 2012.

HARBECK, ROLF: Digitale Landschaften und Karten für Deutschland—Amtliche Kartenmacher auf neuen Wegen, in: SABINE TZSCHASCHEL (ed.): Visualisierung des Raumes: Karten machen—die Macht der Karten, Leipzig 2007, pp. 133–142.

HARLEY, JOHN BRIAN (ed.): The Nature of Maps: Essays in the History of Cartography, Baltimore 2001.

IDEM—KRYGIER, JOHN: An Introduction to Critical Cartography, in: ACME: An International E-Journal for Critical Geography 4 (2005), pp. 11–33.

HASLINGER, PETER: National Geopolitics in Habsburg Central Europe: Imperial and Postimperial Perspectives on Hungary and Poland, 1890–1930, in: JAN AREND (ed.):

Science and Empire in Eastern Europe: Imperial Russia and the Habsburg Monarchy in the 19th Century, Göttingen 2020, pp. 205–226.

IDEM—OSWALT, VADIM: Raumkonzepte, Wahrnehmungsdispositionen und die Karte als Medium von Politik und Geschichtskultur, in: IDEM (eds.): Kampf der Karten: Propaganda- und Geschichtskarten als politische Instrumente und Identitätstexte, Marburg 2012, pp. 1–12.

JORDAN, STEFAN: Vetorecht der Quellen, in: https://zeitgeschichte-digital.de/doks/frontdoor/index/index/docId/570 (2020-08-04).

KARCHER, STEFAN: Does Digital History Need a Theory?, in: InFoDiTex, 2018-03-19, https://infoditex.hypotheses.org/95 (2020-07-25).

KNOWLES, ANNE KELLY: Introduction Historical GIS: The Spatial Turn in Social Science, in: Social Science History 24 (2000), 3, pp. 451–470.

EADEM: GIS and History, in: EADEM, AMY HILLIER (eds.): Placing History: How Maps, Spatial Data, and GIS Are Changing Historical Scholarship, Redlands 2008, pp. 1–25.

MANNING, PATRICK: Big Data in History, Basingstoke 2013.

MONMONIER, MARK (ed.): The History of Cartography. Vol. 6: Cartography in the Twentieth Century, Chicago 2015.

PEURSEN, WIDO VAN: Text Comparison and Digital Creativity: An Introduction, in: IDEM, ERNST D. THOUTENHOOFD et al. (eds.): Text Comparison and Digital Creativity, Leiden 2010, pp. 1–28.

PFANZELTER, EVA: Historische Quellenkritik in Lehre und Forschung, in: H-Soz-Kult, 2015-11-24, www.hsozkult.de/debate/id/diskussionen-2903 (2020-08-04).

PIOVAN, SILVIA ELENA: The Geohistorical Approach: Methods and Applications, Cham 2020.

ROSS, SEAMUS: Digital Humanities Research Needs from Cultural Heritage Looking Forward to 2025?, in: AGIATIS BENARDOU, ERIK CHAMPION et al. (ed.): Cultural Heritage Infrastructures in Digital Humanities, London—New York 2017, pp. 153–166.

SCHLOTHEUBER, EVA—BÖSCH, FRANK: Quellenkritik im digitalen Zeitalter: Die Historischen Grundwissenschaften als zentrale Kompetenz der Geschichtswissenschaft und benachbarter Fächer, in: H-Soz-Kult, 2015-11-16, www.hsozkult.de/debate/id/diskussionen-2866 (2020-07-15).

SEEGEL, STEVEN: Map Men: Transnational Lives and Deaths of Geographers in the Making of East Central Europe, Chicago 2018.

SHNEIDERMAN, BEN: Data Visualization's Breakthrough Moment in the COVID-19 Crisis, in: Nightingale from 2020-04-30, https://medium.com/nightingale/data-visualizations-breakthrough-moment-in-the-covid-19-crisis-ce46627c7db5 (2020-07-20).

SIEGEL, STEFFEN—WEIGEL, PETRA (eds.): Die Werkstatt des Kartographen: Materialien und Praktiken visueller Welterzeugung, Paderborn 2011.

SOUTHALL, HUMPHREY: Enhancing Life-Courses: Using GIS to Construct "New" Aggregate and Individual-Level Data on Health and Society in Twentieth-century Britain, in: GREGORY/DEBATS, pp. 76–91.

WARDRIP-FRUIN, NOAH: The Prison-House of Data, in: Inside Higher Ed from 2012-03-20, https://www.insidehighered.com/views/2012/03/20/essay-digital-humanities-data-problem (2020-07-18).

ZAAGSMA, GERBEN: On Digital History, in: BMGN—Low Countries Historical Review 128 (2013), 4, pp. 3–29.