

Digitization of Maps and Atlases and the Use of Analytical Bibliography¹

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From 2006 to 2008 the Royal Library of Belgium (<http://www.kbr.be/>) participated in a European Commission funded project for the development of research services in the field of old maps. This chapter presents this new Internet-accessible scientific tool (www.digmap.eu/), evaluates its possibilities and flaws, and makes suggestions for the future, specifically in reaction to (or better, in line with) Anthony Grafton's critical observations on digital libraries. The introductory section will concentrate on the nature of maps and the history of cartography in relation to digital databanks of map images. For practical reasons, in describing *Digmap* we take examples mainly from the collection of the Royal Library of Belgium.

Introduction

The creation of digital online databanks may have many particular goals, from the conservation or preservation of a collection to its substitution, but its most prominent aim certainly is to improve the collection's accessibility. This implies facilitating access to information about that collection, in other words, improving communication on the collection's content. This communication requires structured information, and structuring information is essentially what digital (as well as other) databanks are about.

¹ This contribution benefited by a short correspondence between W. Bracke and Tony Campbell in December 2007 when preparing the first *Digmap* workshop (cf. <http://www.digmap.eu/workshop>). This topic is also addressed in Bouvin and Bracke (2008).

Digitization of the written word is, if we may believe Anthony Grafton in his *The New Yorker* article on the future of reading, but “one of a number of critical moments in the long saga of our drive to accumulate, store and retrieve information efficiently” which can be traced back to the third millennium before Christ when Mesopotamian scribes began to catalogue the clay tablets in their collections (2007). In this process, books, and henceforth libraries too, became the information-storage devices that have proved the most practical and therefore the most successful. Until the arrival of the Internet, their prime position has never been questioned. With the Internet, things have clearly changed: the Web not only offers much larger storing capacity than any existing library, it also offers a relatively rapid and easy retrieval of all kinds of data, including images: anyone, from the highly specialized professional to the simple layman, can use its services without training. It allows browsing through its steadily growing collections by simple search keys or advanced searches in no time. And although books and libraries are far from being dead and forgotten, e-books and virtual libraries more and more compete with their physical counterparts.²

Improving the collection’s accessibility also means reaching a larger public than the one reached by more traditional communication tools in this field, such as card indexes, surveys of holdings, printed and manuscript inventories and catalogues, bibliographies, or other such finding aids. Access to information is indeed essential not only to the users but also to the providers of that information. Without that access, no communication is possible, and without communication no conveyance of whatever kind can be established between the information provider and its receiver. Digital databanks not only can improve access to information and reach more people, but they can also improve the communication process itself. Indeed, in matters of communication, visualization is an important and effective tool. Data visualization by means of photographs, drawings, maps, diagrams, or tables enhances the users’ understanding of the message transmitted by them. It is no surprise then that digital databanks of figurative documents and objects

² Virtual libraries can be digital or digitized. Digital libraries propose a single virtual copy of a book; digitized libraries are the result of the digitization of complete libraries without leaving out one single copy in the library. John Brown and Paul Duguid (2000) stress the impossibility of digitized libraries and note the logical shift in research towards digital libraries. They furthermore distinguish digital libraries from electronic libraries in that the former (predominant in the United States) severs many connections to the conventional library which they actually want to substitute, while the latter seeks to complement paper resources (180ff.).

tend to attract more users than those of simple texts.³ Indeed, one grasps more easily the sense of a message when put in a figurative form than when it is presented as reading simple texts. In 1801, William Playfair, pioneer in graphical representation of statistics, had already stated in his preface to *The Statistical Breviary*, when discussing the principles on which his study was based, that “making an appeal to the eye when proportion and magnitude are concerned, is the best and readiest method of conveying a distinct idea” (1801, 4). Perhaps more than any other means of data visualization or representation, maps easily combine different sorts of information (not only geographical) and complex meaning in a way that is easier to understand than statistical charts or tables as they are overall more accessible to the general public. The “appeal to the eye” also accounts for the rapid spread of thematic cartography in nineteenth-century Europe (Palsky 2008, 414ff.).⁴

In historiography too, as in other disciplines, maps have been used to aggregate information in a graphic way, to sustain an argument, or to illustrate one’s point. Most of these maps are modern maps representing geographical information of previous times. These historical maps have a long history. If not the founder than at least a very celebrated representative of the genre is no other than the Antwerp editor Abraham Ortelius (1527–98) who in 1579 published his first historical maps in the *Parergon*, a small corpus of historical maps of Belgium, Italy, Greece, Egypt, Palestine, the Roman Empire, and Saint Paul’s peregrinations, which Ortelius added to the main body of his

³ Of course, in comparison to speech, texts can be considered images themselves (cf. Goody 1977).

⁴ Recently Bertrand Daugeron (2009) has discussed the relationship between classification in natural history and cartography. For further reading see Harley’s contribution on the development of the history of cartography (1987, 1ff.). The idea that maps can be used for structuring information is foundational in the development of Geographic Information Systems (GIS). On GIS see chapter 00 in this volume. The Electronic Cultural Atlas Initiative (<http://ecai.org/>) is a fine example of how cultural data can be ordered geographically and accessed in a single interface. Ray Larson of Berkeley University presented the initiative on the first workshop organized by the *Digmap* partners in Lisbon in 2007. The templates of his conference can be visualized at <http://www.digmap.eu/workshop>. For GIS in historical research, see also Knowles and Hillier (2008).

atlas in 1584.⁵ Early and old maps on the contrary have long been neglected in historiography.⁶

Even if the use of early maps as a means of illustrating or even emphasizing a point of view has never been questioned, their reliability as a historical document has been subject to much discussion. Historian John H. Parry went as far as calling old maps slippery witnesses (1976, 33–34).⁷ Historians have indeed long neglected systematic recourse to early maps. This can partly be explained by a very limited, and essentially antiquarian and bio-bibliographical, interest in the history of early maps before the nineteenth century. Consequently, the history of cartography is a relatively young discipline which developed in the first place outside academic circles, in national learned societies and libraries or with private collectors and map dealers. Here the focus was on bio-bibliography and the publication of facsimile atlases. In academe its development was long dependent on the growing interest in and institutionalization of geography. Only from the 1930s onwards did the history of cartography gain its scholarly independence, with the foundation in 1935 of *Imago Mundi*, the first international scholarly journal in the field, by Leo Bagrow.⁸ For a long time, the multiplicity of their uses and purposes and the complexity of their language made maps very untrustworthy as historical documents, and thus they did not receive the same attention by scholars as other sources. As pointed out before, maps are indeed an effective and pow-

⁵ On Ortelius, the maker of the “first atlas,” entitled *Theatrum Orbis Terrarum* (1570), see van der Krogt (2003, 33ff.). For an overview of his map production see also van den Broecke (1996). For the history of the genre see Kretschmer (1986, s.v. *Geschichtskarte*); Skelton (1972, 62 ff.).

⁶ Although the epithets “old” and “early” (and even “historical”) are often used indistinctly to indicate premodern maps, we prefer to follow the definitions proposed in the *Multilingual Dictionary of Technical Terms in Cartography* (International Cartographic Association 1973), where a distinction is made between an old map, “which no longer serves the purpose for which it was produced and is now only of historical or artistic interest” (815.1); an early map, defined as “a map produced before the first systematic survey of the area it represents” (815.2); and a historical map, being “a map which represents features or phenomena which existed, or which are believed to have existed, in some past period of time” (823.24).

⁷ Cf. Harley (2001). In 1967 the second Conference on the History of Cartography held in London had as main theme “Early Maps as Historical Evidence.” Some of the papers were published in *Imago Mundi*; cf. Harley (1968) and Cornelis Koeman (1968).

⁸ First edited by Leo Bagrow and Hans Wertheim in Berlin, the journal is now published by *Imago Mundi Ltd*, London.

erful communication tool. They not only represent space but can simultaneously be used (and misused) for political, economical, or societal reasons. They are works of art, but can also be bearers of ideas. To be fully understood, maps have to be studied thoroughly, not just for their geographical content, but as a product of their time, and the whole production process (intellectual, manual, and technical) should be analysed. Only then can the study of old and early maps help the historian to understand the reasons (other than geographic representation) for their production. This approach, where the map itself becomes a scholar's focus of interest and study, is effective only when the history of cartography is accepted as a discipline of its own.

For many years, partly due to its inherent relationship with geography, cartography was evaluated according its degree of correctness in representing geographical reality. Little or no investigation went into these other aspects of early cartography. With Leo Bagrow, who amongst his various interests particularly cultivated the study of printed maps of the fifteenth and sixteenth centuries, historians of cartography became more involved with the study of the formal qualities of maps and their evolution (Skelton 1972, 99ff.). The early map was finally studied for what it really was, a visual cultural artefact. Since then, the social aspects of mapmaking have been a matter of interest to an ever growing group of scholars, and maps have become an historical document as valuable as the written word. In this respect, one cannot stress enough the importance of the initiative taken by Brian Harley and David Woodward in the mid-1970s, when they started to plan the publication of a multivolume encyclopedia on the history of cartography.⁹ Their work is based on the idea that the history of the map is like the history of the book and that “[m]aps—like books—can be regarded as agents of change in history” (Harley and Woodward 1987, 5). In recent decades, scholars of literature have taken this idea a step further and have approached maps as texts, applying to them the same critical treatment as is used in literature. They then consider maps to belong to traditions of graphic rhetoric, representing social processes.¹⁰ In short, the study of early maps has evolved from the

⁹ Harley and Woodward (1987). The long-awaited third volume, dedicated to cartography in the European Renaissance, came out in 2007 (Woodward 2007a). See also Knowles and Hillier (2008).

¹⁰ Particularly interesting in this respect are the chapters on literature and maps in the third volume of *The History of Cartography* (Woodward 2007a, 401–76). Recently, Denis Wood and John Fels (2008) have demonstrated the inseparability of cartographic and non-cartographic elements in maps featuring nature.

analysis of their geographical content to the historical contextualization of cartographical production.

Where does the digitization of maps fit into this discursive analysis, and how does it contribute to a better understanding of maps as an agent of time? Even more, how does the digitization of maps support the growing interest in their non-geographical aspects?

Old and early maps are all over the Web. Most sites that have a historical dimension display them, where they typically serve illustrative purposes only. Other sites are exclusively dedicated to maps: there are sites with maps of a particular city, region, or country and sites of map collections, map sellers, and other merchants. The problem with maps on the Internet is thus not so much a question of availability as a matter of dealing with the enormous amount of images of maps (i.e. of structuring mass information). Some portals have attempted to organize the information on early maps, the most important of which is without doubt the portal created and updated by Tony Campbell, honorary map librarian of the British Library. It bears the title *Map History/History of Cartography*, and as is stated by its subtitle, it is "THE Gateway to the Subject."¹¹ This portal proposes, among many other sorts of information related to the history of cartography, a selection of 2,500 annotated links to websites containing images of old and early maps. In the introduction to this list of sites containing images of maps, Campbell argues that "there is no index to the images of individual early maps on the web. It is likely that there are now (December 2007) several hundred thousand early map images."¹² Based on his experience of examining thousands of sites and being confronted with their variety and great range of quality and usefulness, Campbell offers to those who host maps some fundamental suggestions as to image selection and quality, accessibility, indexing, and metadata.¹³ Campbell's suggestions have been very stimulating to the developers of the *Digimap* services. According to Campell's analysis, the best online catalogues of map images are usually structured in a traditional bibliographic manner, offering lists of maps ordered by geographic location or other subject, and searchable by means of indexes. Only a small number of them allow users to browse their cartographic images through geographic localization tools, which make use of the maps' geographic coordinates, scale, names of places

¹¹ Tony Campbell, Map history/History of cartography, <http://www.maphistory.info/>.

¹² <http://www.maphistory.info/aboutim.html>.

¹³ <http://www.maphistory.info/aboutim.html#hosts>.

or areas, and historical events related to the toponymy.¹⁴ David Rumsey's website of 20,000 old maps is perhaps the most advanced of all cartographic websites.¹⁵ It proposes several interactive services, such as a GIS browser which shows detailed overlays of maps and geospatial data. It also uses a high-performance viewer where the map image covers the whole screen, allowing access to more visual data on the screen. Rumsey's website is now also accessible through the European Cultural Atlas Initiative website (<http://ecai.org/>). As this collection mainly concerns eighteenth- and nineteenth-century maps, the site is not of immediate use to Renaissance scholars. However, as with Campbell's website, Rumsey's work has greatly influenced the *Digimap* project.

Most digitization projects still privilege the map's image, that is, the geographical or cartographical information it contains. Metadata is mostly limited to author/editor, title, and date, and even these are often simply deduced from the map itself. Little attention is given to the map's formal aspects. Yet the importance of extensive and correct metadata is nicely illustrated by an example posted by Peter van der Krogt on the Maphist list, an email discussion group whose primary focus is old and early maps, atlases, globes, and other cartographic documents.¹⁶ Van der Krogt addresses the problematic description of a seventeenth-century map of Africa available on the website of a university library. The library offers an image of the map and of its verso, which is covered with French text. The presence of an image of the map's verso is already quite exceptional: most images of maps on the Internet are limited to their cartographical representation. The metadata accompanying the map's image also are fairly rich, with a description of the map's title, author, place and date of publication, and information on the document's size and origin. In consequence, the user's first impression is very positive: this is a useful site with high-quality images, which provides a functional viewer, and is respectful of the document's history. Yet van der Krogt detected several errors in the document's basic description (wrong title, wrong author, or wrong date). It is obvious that without good metadata a database, and certainly a digital database, cannot work effectively. The problem of errors in metadata will be addressed further on, where the discussion of *Digimap*'s

¹⁴ For a survey see Fernández-Wyttenbach et al. (2007).

¹⁵ David Rumsey Map Collection, Cartography Associates, <http://www.davidrumsey.com>.

¹⁶ Peter van der Krogt, email discussion group, January 13, 2007, <http://mailman.geo.uu.nl/pipermail/maphist/2007-January/009067.html>.

future will lead us to stress the effectiveness of the attention paid to the document's physical features.

The treatment of the enormous mass of already available images of maps on the Internet, the differences in quality of the images and their descriptions, and the variety of individual and uncoordinated initiatives in the field made it apparent that an integrated tool for the viewing and analysis of early maps and related information should be created. This led to the founding of the *Digmap* project.

The Digmap project (www.digmap.eu)

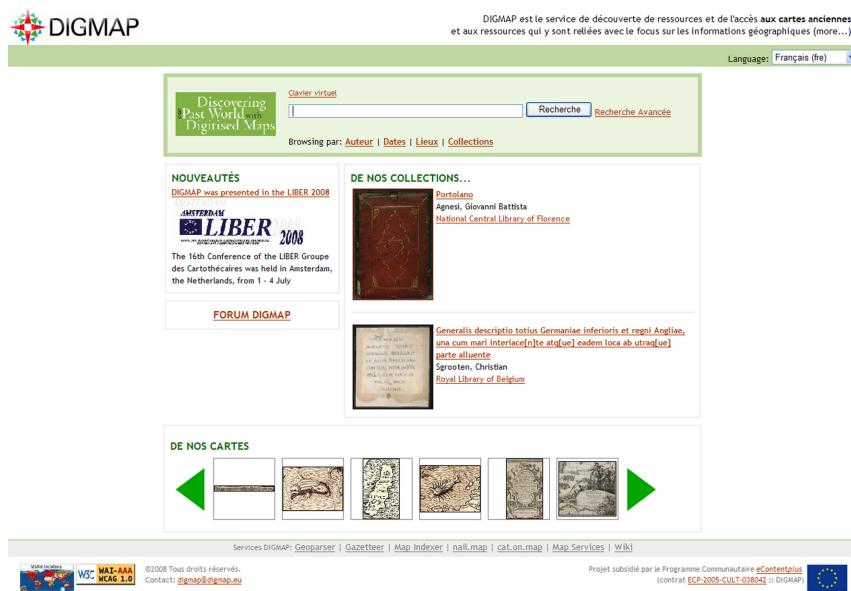


Figure 1. Webpage of the Digmap portal

Digmap stands for *Discovering our Past World with Digitized Maps* (Fig. 1). The project was run by an interdisciplinary consortium of seven European partners that can be divided into two groups. The first group comprised partners with technical skills in information systems design and development, with a particular interest in geographic information processes: The Instituto Superior Técnico of Lisbon, the project's coordinator; the Universidad Politécnica de Madrid; and the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences. The second group was composed of national librari-

ies holding relatively small but qualitative important map collections: The Biblioteca Nazionale Centrale di Firenze, the National Library of Portugal, the National Library of Estonia, and the Royal Library of Belgium.¹⁷ These were the data providers. The partners of the *Digmap* project wanted to offer the general public a tool that would combine digital information retrieval through geographic coordinates with the traditional search engines using indexing systems of library catalogues. Geo-localization of the maps is essential in the project. It is also very useful in research as it allows overlapping, linking, and manipulation of geographic information and of maps in particular.¹⁸

The project, co-funded by the European Commission program eContentPlus, a multiannual community program to make digital content in Europe more accessible, usable, and exploitable, lasted roughly for two years, from October 2006 to the end of 2008.¹⁹ At the present time almost 50,000 cartographic resources are available through the website. In addition to the metadata offered by the data providers in the project, these resources come from associated partners who graciously offered their own collections for harvesting (the national libraries of Spain, Scotland, and Iceland, and the Spanish National Geographic Institute) and through direct harvesting of cartographic resources on the Internet by OAI-PMH.²⁰ Not all resources are images of maps. In fact, the database also includes bibliographic records for which no image is yet available and records of reference works and other specific studies related to cartographical material. Every image is related to one copy of a map, but that does not mean that all images concern different maps. Indeed, different collections may have a copy of the same map. Still, every copy with its own image and bibliographical record has been recorded in the database. Cartographic resources in the *Digmap* database cover all kinds

¹⁷ A presentation of these partners can be found in the fourth newsletter of the *Digmap* project, which presents at the same time the final project's report at http://www.digmap.eu/doku.php?id=wiki:digmap_newsletter.

¹⁸ On the advantages of geo-referencing see Christopher Fleet's paper delivered at the map curator's workshop of the British Cartographic Society (2008).

¹⁹ The eContentPlus program expired on December 31, 2008, but its goals are continued to be pursued through the Information and Communications Technologies Policy Support Programme (ICT PSP).

²⁰ OAI-PMH stands for Open Archives Initiative Protocol for Metadata Harvesting, a protocol providing an application-independent interoperability framework for metadata harvesting. More information at <http://www.openarchives.org/OAI/openarchivesprotocol.html#Introduction>.

of maps and contents, ranging in time from the fifteenth to the twentieth century: manuscript and printed maps, large-scale and small-scale maps, world maps, celestial maps, maps of the continents, national, regional, and local maps, thematic maps, and more. This database can easily be extended thanks to the services offered by the *Digmap* website which will be discussed later on. In fact, there is no limit to its extension. It must be stressed though that at the time being the development of the *Digmap* website and its implementation has stopped. In the near future local repositories will be installed in the national libraries which participated in the project. Every partner will then be able to decide to close its repository to the world outside and use it as a kind of personal database, or open it to all and continue the role the coordinator has played during the project, harvesting on a regular basis the metadata and images of maps available through the Internet, graciously offered by future partners or even proposed by individuals. The latter will need an authorization to do so from the local administrator. The choice between an open or a closed system will most probably depend on the partners' investment policy and especially their willingness to invest on a long-term basis in further developing and maintaining the services offered by *Digmap*. In the long run, though, *Digmap* as a Web service should be integrated into the European Digital Library, along the lines of the European Digital Libraries Initiative.²¹

What does *Digmap* offer its users already and what will become possible in the near future? Some *Digmap* services are accessible to all users, other users need a personalized username and password which, for the time being, are only given to the participants in the project. The most important service freely accessible to all is without doubt the *Digmap* portal (<http://portal.digmap.eu>). The portal offers simultaneous and remote access to the different cartographical collections present in the database. The user interface offers simple and complex queries. An example: looking for cartographical information on Europe, users just have to type the name in the white box on the portal's welcome page and click on "search." They will then get all resources related to Europe, maps, books, etc., with a short description of the document and indication of the library or institute which provided the metadata

²¹ Cf. http://ec.europa.eu/information_society/activities/digital_libraries/index_en.htm. The European Library is a free multilingual service that offers access to both digital artefacts (books, posters, maps, sound recordings, videos, etc.) and bibliographical resources of the forty eight national libraries of Europe. The vision behind this project is to provide equal access in order to promote worldwide understanding of the richness and diversity of European learning and culture.

(Fig. 2). In cases where the resource has been digitized, a thumbnail appears on the left of the screen. On the right, statistical information can be found related to the number of documents present in the different collections of the database responding to the request. For more detailed information on one of the resources, *Digmap* connects the users to the description of the provider's catalogue. If the users click on the thumbnail or the image's URL (uniform resource locator), they will get a larger image and, if available, a quality image which can be magnified thanks to the provider's local viewer. If they look for a specific author or have a specific date, place, or collection in mind, they can also browse through the corresponding indexes.



DIGMAP

Europe | Search | Advanced Search | Bibliographic | Geographic | Time

Title	Europe	1383
Resp.	Kümmerly & Frey, ASLK	View Detailed Record
Date	1980	1883
Description	Collection 1.4 300 000	View Detailed Record
Summary	Europe Kümmerly & Frey ASLK Europa – Wegenkarten Europa – Cartes routières Europe – Road maps Collection 1.4 300 000 C.G.E.R. Bruxelles 1980 1 carte, coul., 63,5x70 cm	View Detailed Record
		View Detailed Record
		View Detailed Record
		View Detailed Record
		View Detailed Record
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		View Detailed Record
		View Detailed Record
		View Detailed Record
		View Detailed Record
		View Detailed Record

DIGMAP is a service for resource discovery and access to old maps and related resources, with a focus on their geographic information (more...)

Results: 0 - 10 of 1383 for europe

Collection

-  BNE 1383 View Detailed Record
-  BIP 39 BIP View Detailed Record
-  BNCZ 8 BNCZ View Detailed Record
-  BKB 128 BKB View Detailed Record
-  BNU 25 BNU View Detailed Record
-  BRE 29 BRE View Detailed Record
-  BUL 969 BUL View Detailed Record
-  BUL 14 BUL View Detailed Record
-  CNAE 66 CNAE View Detailed Record
-  CNAE 96 CNAE View Detailed Record

Figure 2. First page with results for the simple search (Europe)

The advanced search offers the opportunity of refining a search, be it bibliographical, geographical, or temporal.²² This can help in comparing similar maps or different copies of the same map and their descriptions. Combining “author’s name=Ortelius” and “map’s subject=Belgium,” for instance, gives a list of eight documents, all belonging to the Royal Library of Belgium. All eight maps have the same subject (the Netherlands in ancient times) and the same geographical outline (Fig. 3).²³ They all bear the same title which makes clear that their production is somehow related to Ortelius. Indeed, Ortelius made two plates of it, the first in 1584 which was replaced in 1595. Both maps appeared in various editions in different languages (Latin, German, French), which can be identified by the text on the verso (Van den Broecke 1996, 197ff.). However, some maps in the list cannot be identified with one of these published by Ortelius. They were produced later on by different cartographers who copied and edited Ortelius’s map or used his plate, as in the case of Claes Janszoon Visscher (1587–1652) who bought the plates from Pieter van den Keere (1571–after 1646) (van der Krogt 1997, 1:620–21 and 2003, 3B:770–71).[<vol. 1 not on reference list] Through the *Digmap* list, its images, and descriptions, a whole story comes thus to life, that of Ortelius’s map of the Netherlands in Roman times and its editorial success. Its history is emblematic for the map trade in the Renaissance period (and later), when copperplates moved from one editor to another and maps were often copied. Variants of different editions or printing states are sometimes hardly detectable, making correct attributions very difficult. A list of images with their full description can thus be of help in determining the maps’ identity.

²² Search keys for bibliographical searches are: title, author, contributor, date, publisher, subject, description, identifier, and contents. All are combinable. Geographic searches can be done by latitude and longitude, or north-south and east-west limit. Searches in time can be done by indicating a period, from or to a specific year. Searches can be done in the whole database or limited to certain collections.

²³ It should be mentioned that although the name Belgium is mentioned in the document’s title, the map depicts the former Netherlands of which today Belgium was a part until the end of the sixteenth century. If one would look for the Netherlands, he or she would obtain the same list.

DIGMAP

dc.creator(Ortelius) AND dc.subject(Belgium)

[Search](#) | [Advanced Search](#) | [Bibliographic](#) | [Geographic](#) | [Time](#)

	Title: Belgii veteris typus: ex consitibus geographicis Abrahami Ortelii: hac litterarum forma vestiutora pinxitius quae paulo erant recentiora his notauius ... http://maps.kbh.be/kbmagemaps1633595.htmf Resp: Ortelius, Abraham, 1527-1598 Date: 1601? 1609-12? Description: Collection (E 0°45' E 8°51'N 53°31'N 49°07') Summary: -- Kaarten -- Geschriften voor 1800 België -- Cartes -- Ouvrages avant 1800 Belgium -- Maps -- Early ... historique -- Belgique -- Cartes Historical geography -- Belgium -- Maps Collection (E 0°45' E 8°51'N 53°31'N 49°07')	View Detailed Record
	Title: Belgii veteris typus: ex consitibus geographicis Abrahami Ortelii: hac litterarum forma vestiutora pinxitius quae paulo erant recentiora his notauius ... http://maps.kbh.be/kbmagemaps1633595.htmf Resp: Ortelius, Abraham, 1527-1598 Date: 1592 Description: Collection (E 0°45' E 8°51'N 53°31'N 49°07') Summary: -- Kaarten -- Geschriften voor 1800 België -- Cartes -- Ouvrages avant 1800 Belgium -- Maps -- Early ... historique -- Belgique -- Cartes Historical geography -- Belgium -- Maps Collection (E 0°45' E 8°51'N 53°31'N 49°07')	View Detailed Record
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	Title: Belgii veteris typus: ex consitibus geographicis Abrahami Ortelii: hac litterarum forma vestiutora pinxitius quae paulo erant recentiora his notauius ... http://maps.kbh.be/kbmagemaps1503544.htmf Resp: Janssonius, Johannes, 1588-1654; Ortelius, Abraham, 1527-1598 Date: 1638 Description: Collection (E 0°45' E 8°51'N 53°31'N 49°07') Summary: -- 1800 Belgium -- Maps -- Early works to 1800 Historische geografie -- Nederland -- Kaarten -- Belgique -- Kaarten Géographie historique -- Belgique -- Cartes Historical geography -- Belgium -- en coul., 380 x 475 mm lat Ortelius, Abraham, 1527-1598	View Detailed Record
	Title: Belgii veteris typus: ex consitibus geographicis Abrahami Ortelii: hac litterarum forma vestiutora pinxitius quae paulo erant recentiora his notauius ...: 1584: cum privilegio Imperiali et Belgico ad decennium http://maps.kbh.be/kbmagemaps1503529.htmf Resp: Plantin, Christoffel fl., 1548-1589 ; Ortelius, Abraham, 1527-1598 Date: 1587 Description: Collection (E 0°45' E 8°51'N 53°31'N 49°07') Summary: -- Geschriften voor 1800 België -- Cartes -- Ouvrages avant 1800 Belgium -- Maps -- Early works to ... historique -- Belgique -- Cartes Historical geography -- Belgium -- Maps Collection (E 0°45' E 8°51'N 53°31'N 49°07')	View Detailed Record
	Title: Belgii veteris typus: ex consitibus geographicis Abrahami Ortelii: hac litterarum forma vestiutora pinxitius quae paulo erant recentiora his notauius ... http://maps.kbh.be/kbmagemaps1503563.htmf Resp: Visscher, Claes Janszoon, 1587-1652; Ortelius, Abraham, 1527-1598 Date: 1624 Description: Collection (E 0°45' E 8°51'N 53°31'N 49°07') Summary: -- avont 1800 Belgium -- Maps -- Early works to 1800 Historische geografie -- Nederland -- Kaarten -- Belgique -- Cartes Historical geography -- Belgium -- Visscher excedat (Amsterdam) 1624 1 carte, ill., 380 x 490 mm lat Ortelius, Abraham, 1527-1598 C.J.	View Detailed Record
	Title: Belgii veteris typus: ex consitibus geographicis Abrahami Ortelii: hac litterarum forma vestiutora pinxitius quae paulo erant recentiora his notauius ... Petrus Kaerius celevit & excud. Amstelod. http://maps.kbh.be/kbmagemaps1533712.htmf Resp: Keere, Pieter van der, 1571-1648 ; Ortelius, Abraham, 1527-1598 ; Keere, Pieter van der, 1571-1646 Date: 1644+--1680 Description: Collection Militaria Germanica, 15 [=78 mm] Summary: -- Cartes -- Ouvrages avant 1800 Belgium -- Maps -- Early works to 1800 Historische geografie ... geography -- Belgium -- Maps Collection Militaria Germanica, 15 [=78 mm] Joannes Janssonius Amsterdam 1644+--1680 1 carte, ill., 380 x 475 mm lat Ortelius, Abraham, 1527-1598 Keere, Pieter van der	View Detailed Record
	Title: Belgii veteris typus: ex consitibus geographicis Abrahami Ortelii: hac litterarum forma vestiutora pinxitius quae paulo erant recentiora his notauius ... Petrus Kaerius celevit & excud. Amstelod. http://maps.kbh.be/kbmagemaps1533712.htmf Resp: Keere, Pieter van der, 1571-1648 ; Ortelius, Abraham, 1527-1598 ; Keere, Pieter van der, 1571-1646 Date: 1617? 1622? Description: Collection Militaria Germanica, quorum 15 uni gradul respon, = [7,8 cm] (E 0°45' E 8°51'N 53°31'N 49°07') Summary: -- voor 1800 België -- Cartes -- Ouvrages avant 1800 Belgium -- Maps -- Early works to 1800 Historische ... -- Cartes Historical geography -- Belgium -- Maps Collection Militaria Germanica, quorum 15 uni ... ? 1622? 1 carte, en coul., ill., 375 x 49 cm lat Ortelius, Abraham, 1527-1598 Keere, Pieter van der	View Detailed Record

DIGMAP is a service for resource discovery and access to old maps and related resources, with a focus on their geographic information (more...)

Results: 0 - 10 of 8 for dc.creator:[Ortelius] AND dc.subject:[belgium]

KRBZ View detailed Record

DIGMAP Services: [Portal](#) | [Search Engine](#) | [Geoparser](#) | [Map Services](#) | [Gazetteer](#) | [Map Indexer](#) | [naii.map](#) | [cat.on.map](#) | [Wiki](#)

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DIGMAP Search Engine

Project co-funded by the Community programme eContentplus (contract ECP-2005-CULT-03804) DIGMAP

Figure 3. List of resources for the combined search by author (Ortelius) and subject (Belgium)

One does not have to be a map specialist to profit from the *Digmap* services, as illustrated by the following sample. Looking for information on the sixteenth-century cartography of America, for instance, users may fill in the word “America” and the dates 1550 and 1600 in the advanced search in time. They will then get a list of seventeen items, including images of maps of America by Ortelius, Sebastian Münster (1488–1552), Gerard Mercator (1512–94), Theodore de Bry (1528–98), and others, a reference to a portolan atlas by Giovanni Battista Agnesi of around 1550, and two identical maps of

Florida present in two different libraries and harvested thanks to the OAI protocol. The list also mentions a map by Ortelius kept at the Royal Library of Belgium for which there is no image, but the map can be most probably identified with the one offered by the National Library of Australia, of which a picture is indeed available. The latter happens to possess the 1964 facsimile edition of an earlier version of the map. In a few clicks the users will get a very nice idea of the different representations of America between 1550 and 1600 and enough information for further research. Providing access to a rich and diversified but well-structured cartographic patrimony, *Digmap* is potentially a virtual library of maps and related documents.

Besides the *Digmap* portal, other services are provided on the *Digmap* website. Those related to the database input, however, are restricted to authorized users. Still, corrections to metadata can be suggested to the website's administrator by any user by way of comments to specific documents. The administrator will then intervene in the databank, accordingly. The Record Editor (RED) gives the possibility of editing bibliographical records from any online collection which has adopted the OAI protocol, and the service called "cat.on.map" allows the registration of relevant online resources (i.e., pages with digitized maps, websites related to cartography, geography, etc.). These resources are referenced in the database as "external resources." In this system, authorized users can register and edit resources themselves by providing the respective metadata, associate geographic coordinates, and other geographic details. Geo-indexing can be done with the help of GeoIndexer, a geographic indexing service using the Google Maps API to embed Google Maps.²⁴ The final insertion of their data, however, is still decided by the administrator. The *Digmap* Gazetteer integrates information from multiple data sources and enables queries by place names, place types, footprints (the area covered by a geographic place), relations to other places, time frames and other associated metadata. It offers the possibility of converting current and historic place names into locations on the earth's surface, or vice versa. The GeoParser automatically identifies the names of places and historical periods and assigns the resources to the corresponding geo-temporal scopes. It uses the gazetteer for reference recognition. Both the gazetteer and GeoParser are automated tools for enriching the existing metadata. Additional geographical and temporal search tools are offered: GeoTimes is a service that combines spatial browsing and timeline browsing by using GeoBrowser and Timeline, respectively. GeoBrowser shows the subset of records that have geographic coordinates on the map, while Timeline provides a visual under-

²⁴ Google Maps, <http://maps.google.com>.

standing of the record dates for the subset of resources that have valid dates. The “nail.map” service supports the generation of thumbnail images. The thumbnails can either be reference maps with place markers added to them, or screenshot renderings of online resources (i.e., webpage thumbnails). Finally, the Image Feature Extractor (FTX) is a service that enables extraction of features from images that have geographic meaning, such as cartouches, map orientations, marine monsters, mermaids, etc.²⁵

The *Digmap* service is based on a metadata repository called Repox, an XML metadata repository for storing, preserving, and managing metadata sets. Repox supports a translation functionality to transform the original metadata format (MARC21, UNIMARC or any other common format) into another format. The transfer of records between Repox and the data providers is assured by OAI-PMH. Once the *Digmap* software and database is installed in the partners’ institution, *Digmap* could become in the long term a real virtual library of cartographic metadata offered by associated partners and registered users, whose number can be extended without limit, as well as harvested independently from the Internet.

Digitization and analytical bibliography

Grafton in his article on “Future Reading” (2007) expresses the idea that digital libraries will never be able to replace real ones, because every copy of a printed book is different and has a different story to tell. To study a book it is not enough to read the text it contains: it also implies the study of its different editions, even its translations. A book’s history is reflected in its dissemination, in the traces of its readers left in the book’s preserved copies. Therefore, the book historian also needs information about ownership and will want to see the marginal notes in the book’s copies. This kind of information is hard to find in digital libraries, which digitize only one copy of a book. What the book historian really needs are digitized libraries, i.e., libraries of which every single copy is digitized.²⁶ David Rothman (2007), recognizing the elusiveness of digitizing complete libraries and other collections, still dreams of seeing “every book, every other document of importance, digitized someday—not just the texts but the full images.” As long as this remains wishful thinking (and will it ever be different?), the book historian will want to consult directly all existing copies of a book. On the other hand, digital libraries can contribute to a better understanding of a book’s history.

²⁵ The different services are highlighted in the fourth and last newsletter of the project (see n. 17).

²⁶ See n. 2.

Indeed, Grafton's plea (2007) in defense of the direct study of books and other material writings does not mean he neglects or denigrates the importance of technical improvements in the field of classification. Instead, he stresses the compatibility and even more so the complementarity of both digital information retrieval and the direct study of a book's copy (or copies). In a way, a parallel may be drawn here with what happened in the field of mapping in the Renaissance when graphics became as important in geographical descriptions as the written word, and portulans became portulan charts, itineraries became route maps and cadastres became cadastral maps. Indeed, all of these were written descriptions—of sea coasts, distances between road stations, and land measurements respectively—before being represented on maps. The image did not replace the text, but a new idiom was added to the old and both became complementary (Woodward 2007b, 11ff.).

Still, the virtual universe becomes bigger every day and increases our possibilities of exploiting documents. In a paradoxical way, the creation of digital surrogates both dematerializes the physical object, yet at the same time gives us new ways of interrogating the material object. At the same time, the computer interface is adopting more and more the tactile and visual characteristics of the physical information source.²⁷ So, virtual documents increasingly resemble their physical model and offer practical advantages over the material exemplar: faster access to information; simultaneous access by different users to the same document; remote access; access to the document's content; preservation and conservation of the original document and its content; enriched media and interactivity. Yet, as things stand today, there are still important qualitative and quantitative differences between the virtual document and its exemplar, especially in the case of graphic documents. An image is not enough to supplement the original; it has to be accompanied by a detailed description of the physical object in an extensive set of metadata.

As noted above, historians of cartography have changed their focus from the geographical content of maps to the historical significance of the map as cultural artefact. Research into the material culture of maps offers new insights into their production and their role in society. This change of interest is paralleled by a revolution in analytical bibliography, where bibliographic records now include descriptions of the material characteristics of the docu-

²⁷ In 2008 LG Philips LCD developed a flexible A4 size e-paper display (cf. <http://www.lgdisplay.com/>), and in 2009 Sony Corp. launched its first wireless electronic reader with tactile screen, called the Reader Daily Edition (images at <http://www.engadget.com/2009/08/25/sony-announces-daily-edition-reader/>).

ment, characteristics which often vary significantly from copy to copy.²⁸ The analysis of the production process, the transmission and the reception of texts in all their forms necessitate the systematic inventory of the objects' material characteristics. These can be divided into three main categories: characteristics related to the map's fabrication (e.g., different states of the plate), characteristics related to the map's dissemination (e.g., casing, slipcase, binding, mounting on canvas), characteristics related to the map's use (e.g., assembly, annotations, marks of propriety). These characteristics provide information on the document's history and can explain the presence or absence of certain other features of the material object, and even the document's content. In other words, these descriptive annotations provide information about the document as such and also help to put its content in the right perspective. For instance, in the list of maps of Europe of the seventeenth century (cf. *supra*), the *Digimap* database references a folio map of Europe by William Jansz. Blaeu (1571–1638), the founder of a famous dynasty of cartographers and editors in Amsterdam (Fig. 4). The map is well known for its rich borders illustrating plans of the most important European cities of the time and its depiction of local clothing fashions in various European countries. Blaeu edited his first folio map of Europe in 1617. Different states are known of this map, and no date is given for this particular edition. Several indicators, not all of which are geographic, enable us to date this copy after 1648 and even after 1660: the name of the Republic of the Seven United Netherlands, a political entity confirmed by the Peace of Westphalia in 1648, is added on the map and the political boundaries depicted on the map are those which resulted from the treaties of 1648; on copies published after 1660 the hypothetical island Frisland east of Iceland has been removed, as is the case on this map (Bracke et al. 2007, 59ff.). To paraphrase Brown and Duguid, the periphery of the geographical information guides us to what's central, in this case, a positive identification of the map. Context shapes content (2000, 202).

²⁸ On analytical bibliography see Chartier's preface to the French translation of McKenzie (1991); Delaveau, Sordet, and Westeel (2005). For the analytical bibliography of maps in particular see Pacha (1996).



Figure 4. *Europa recens descripta à Guilielmo Blaeu* (XII – Europe gén. – XVII s. – III 10920 CP). Copyright Royal Library of Belgium

Even if essential bibliographical information is to be found on the map itself, it is not necessarily correct, as is shown by the following example.



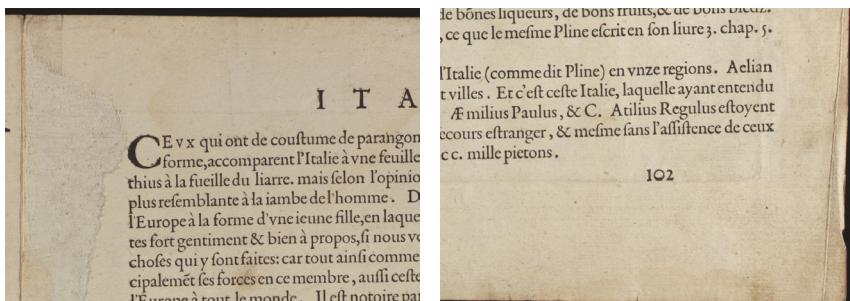


Figure 5. The southern part of Italy (XIV Italie Gén. – 1587 – Ortelius – III 11396 CP). Copyright Royal Library of Belgium

This sixteenth-century map of Italy, entitled *Italiae veteris specimen*, by Ortelius, depicts Italy in ancient times (Fig. 5). It was part of the *Parergon* (cf. supra). This map is explicitly dated 1584 in its cartouche. Thus, a description based on the cartographic image alone would date this map 1584. A cataloguer interested in analytical bibliography, however, would also look at the back of the map and come to a different conclusion. Indeed, on the basis of the typeset text printed on the back of the map, particularly the page's incipit, "Italie...", and the page number in the lower right corner, "p. 102," we can attribute the map to the fourth French edition of Ortelius's atlas, called the *Théâtre de l'Univers*, of 1587.²⁹ But we can only make this attribution if we have access to both sides of the artefact.

As maps and atlases were read and used for practical purposes, annotations and corrections were often added by the author himself or by some other user, often anonymous. These annotations give us precious information about a book's history and dissemination. For instance, this small atlas of the Netherlands in Dutch by Abraham Goos, *Nieuw Nederlandtsch Caertboeck* (Amsterdam, 1616) was still read at the end of the eighteenth century, as is illustrated by its annotations (Fig. 6).

²⁹ [7000H:31A] in van der Krogt (2003). Description of the atlas in van der Krogt (2003, 196ff.).



Figure 6. Abraham Goos, *Nieuw Nederlandtsch Caertboeck* (VH 30691 A). Copyright Royal Library of Belgium

These are signed by a certain Nicolas Petit of Luxemburg, a priest and lawyer, and dated 1787. In the online catalogue of the Royal Library of Belgium, the information concerning the annotations is given in the annotation field, a field that is generally neglected in the indexing process.³⁰

Digitization projects today tend to neglect the potential richness of bibliographic records, preferring short descriptions of documents. These are usually limited to title, creator (author, editor, or publisher), and place and year of publication. This is not the case with the *Digmap* website, which transfers the user who is looking for more detailed information on a document to the local catalogue of a determined library. Technical limitations and questions of feasibility and budget are often invoked to explain certain omissions of information in library catalogues. Indeed, export of complete records, including zones of notes and information on the level of analytical bibliography, from one library system to another—and in *Digmap* from the local providers' system to Repox—is a time and money consuming business.³¹ It seems

³⁰ More examples in Harley (1968) and Koeman (1968).

³¹ See for instance Michael Seadle's (2008) viewpoint in the first issue of *World Digital Libraries* and the interim report on digital preservation in Netherlands, published in

that choices have to be made as to the amount of information one wants to convert, choices which depend on manpower and budget. Yet, if digitization programs want to reach the scholarly community, they will have to evolve with the changes in cataloguing and making of bibliographies which libraries have been operating over the last twenty years or so.

Digmap and the future

Although the *Digmap* portal is accessible to all users of the Internet, *Digmap*'s full functionality is only available to partner institutions that install its services locally. A last example will show what the utility of *Digmap* promises to become as more institutions become involved as contributing participants. Although not as well known as his contemporary cartographers Mercator or Ortelius, Jacob van Deventer (1500–1575) is without doubt one of the major cartographers of the Renaissance.



Figure 7. Map of Brussels by Jacob van Deventer (Ms 22090). Copyright Royal Library of Belgium

July 2009 under the title *A future for our digital memory*.

Van Deventer was probably the first to use triangulation in drawing his maps. His production is composed of regional maps and city plans which cover the territory of what is now roughly the Netherlands, Belgium, Luxembourg, and Northern France (Fig. 7). His maps, the majority of which are preserved only in manuscript, excel in preciseness and detail.³² The maps, together with his city plans, were made for Charles V and his son and successor Philip II, king of Spain (and of the Low Countries), and other official bodies for military purposes, which is why most of them were never published or printed. Consequently, copies of van Deventer's work are rare and hard to come by. Over 200 cities from the Low Countries were measured and depicted by van Deventer officially from 1559 onwards. At his death in 1575, van Deventer still had not finished the volumes destined to the king. Most of his city plans survive in two versions, a minute or draft version (or what is considered as such by today's scholars) and a final version. The final version of the maps which have come to us is now in the National Library of Madrid. In the nineteenth century the minutes, which until then formed a single collection, were sold publicly and dispersed: today the city plans of the Netherlands are preserved in the different local or regional archives of the cities concerned, and the minutes of the Belgian and other cities are all preserved in one volume at the Royal Library of Belgium. Partial facsimiles have been made through the years, but to this point there is still no edition covering all city plans in their minute and final version (if both have been preserved). Through the services offered by *Digmap* the whole collection could easily become accessible with little effort. This could be accomplished in one of the following ways: all of the institutions concerned could furnish the *Digmap* database with an image and basic description or other metadata of the plan in their possession; or, because most of these institutions already have an image of their van Deventer plan on their own website, anyone interested in the subject could easily harvest the image and metadata using the Cat. on.map service described above. All images (with their metadata) grouped together in one virtual library would offer great possibilities for research on van Deventer. Indeed, besides the traditional advantages of digitization listed here, the permanent accessibility of these maps' images could contribute significantly to finding answers to some fundamental questions which still haunt van Deventer specialists and historians of cartography, such as the relation between both versions, the process of mapmaking itself and the copying of maps.³³

³² A short introduction to Deventer[<to agree with just "Deventer" used in text should be van Deventer], with bibliography, can be found in Bracke (2008).

³³ For further references, see the bibliography in Bracke (2008) where these questions

As mentioned before, the *Digimap* website is not a final product. Even after the local installation of its services, further developments will be necessary. Local administrators will have to polish the existing indexes and refine search keys. Furthermore, the insertion of new metadata by authorized users (institutions and individuals alike) will ask for a thorough follow-up, as the database's quality will depend on the quality of the metadata and the descriptions of the cartographic resources. International standards are at hand to improve the metadata's interoperability, but their application requires some bibliographical education.³⁴ National and academic libraries are in principle best placed to provide reliable metadata. The Van der Krogt example, however, shows that even here no guarantee can be given. The *Digimap* database unfortunately suffers from a lack of coherence in the harvested databanks. Indexing thus remains a major problem. If, for example, one browses the indexes by author in search of Abraham Ortelius, he will have to look under A. Ortelius, Abraham Ortelius, Ortel (Abraham), Ortelius and Ortelius (Abraham). All these forms are found in the metadata and indexed as such. It is apparent that some harmonization is necessary here. Furthermore, more attention needs to be given to representing the maps' material features. Transferring the reader to the online description supplied by one of the libraries is not enough. More images should be added: the 1587 map of Italy by Ortelius, for example, should be represented in both recto and verso. Only then would physical consultation of the material document become superfluous. Although *Digimap* gives access to high-quality images through the partner institutions' individual viewers, it does not allow the user to download these images and appropriate them. In this the program respects the copyright policy of every participating institution. The rather conservative attitude of most (but not all) libraries and other institutions is understandable, but perhaps a more generous policy would benefit both the user and the contributing institution.³⁵ Indeed, in the context of shrinking budgets, interactivity could constitute a solution. Work that nowadays cannot be done by the institutions' personnel because of lack of time or budget, from correcting images over geo-referencing to making databases of extracted features on images, could be done by the interested user.

are touched upon.

³⁴ For international standards related to bibliographic descriptions of cartographic material see the International Standard Bibliographic Description (ISBD), a set of rules produced by the International Federation of Library Associations and Institutions (IFLA) (<http://www.ifla.org/>).

³⁵ This is certainly not the place to discuss the complex matter of copyright. On this subject see Georgia Harper's plea for more free content on the Web (Harper 2008).

Conclusions

The results of the *Digmap* project are practical, proposing solutions for geo-localized digital libraries of early and old maps and related documents. The webpage offers flexible services for registering, searching, and browsing in collections of digitized early maps. Maps can be registered by their geographic boundaries and easily classified, indexed, and searched, thanks to multilingual geographic and other thesauri. All services are available on the Internet through simple “click and go” actions. All software solutions are reusable and available in open-source.

Digmap provides an answer to two main demands by users of cartographic material, both casual browsers and dedicated researchers: it constitutes a central repository of map resources offering a global index to identified early maps on the Web; and it offers access to freely available high-resolution scans facilitating the visual juxtaposition of maps. In addition to high-resolution scans, *Digmap* also offers access to a full description of the visualized document, if it exists in one of the library catalogues connected to the *Digmap* database. The automatic indexing tools are without doubt one of the main assets of *Digmap*, and through its Image Feature Extractor, *Digmap* offers something parallel to type-proof searches in scanned texts. Interactivity, although not yet fully developed, will enhance the website’s utility. Indeed, every registered user can participate actively in the creation of a real virtual library of early and old maps by adding images of maps, filling in, completing, or correcting records with metadata of newly added or already existing images, and enriching the library of reference works on the subject. Thanks to a control system of administrators, and cataloguers at the partner institutions, new data is fully checked before being definitely integrated in the repository. Finally, a forum permits users to put questions or pass expertise or other information to the scientific community or even the larger public interested in or involved with old maps.

Digmap is already an important tool for research and information retrieval and as such complementary to the direct study of the material document. It could become even more important if it can respond to the changing demands of book professionals, librarians, and cataloguers, stressing the importance of a document’s material description. For *Digmap* to become an efficient virtual library of cartographic documents it will have to respect much more the maps themselves, their formal features, and their history, and not only concentrate on their geographic content.

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