



**Digitizing the past, the beginning of a new future:  
the process of digitizing 12,000 historical maps and making  
them accessible via the internet**

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**Meeting:**

**121. Geography and Map Libraries, Science and Technology  
Libraries and Division of Special Libraries**

**WORLD LIBRARY AND INFORMATION CONGRESS: 75TH IFLA GENERAL CONFERENCE AND COUNCIL**  
23-27 August 2009, Milan, Italy  
<http://www.ifla.org/annual-conference/ifla75/index.htm>



City maps eighteenth century Java (example of a digitized map)

## **Abstract**

*The Royal Tropical Institute (Koninklijk Instituut voor de Tropen, KIT) has an extensive collection of maps and (nautical) charts of (sub-) tropical regions, including general maps and topographical map series, city maps, thematic maps and national atlases. The collection comprises some 27,000 maps and over 1000 atlases in total. Almost 12.000 maps are from the former Dutch colonies, Netherlands Indies (Indonesia), Surinam and the Netherlands Antilles. KIT has digitized the maps from this part of the collection, and made them available online. Thus, one of the largest collections of maps of the former Dutch colonies is now accessible via the internet. Users have access to the maps via the Library's online catalogue. The innovative part of the project is the ability to search by location and to navigate through serial maps. A link with Google Maps makes it possible to compare an old map with a new satellite image. One of the future goals is combining the KIT collections in order to make it possible to search a map and to find accompanying documents, museum objects and photographs and to add more metadata. The technical process, how to handle the workflow and solve coordinate problems in map series will be briefly explained in this paper but more extensively during the IFLA presentation, illustrated by practical examples.*

## **Background information**

### **KIT mission**

KIT is an independent centre of knowledge and expertise in the areas of international and intercultural cooperation. The Institute aims to contribute to sustainable development, poverty alleviation, and cultural preservation and exchange. Within the Netherlands, it seeks to promote interest in and support for these issues. KIT conducts research, organizes training activities, and provides consultancy and information services. Central to KIT's approach is the elaboration of practical expertise in policy development and implementation. The Institute preserves cultural heritage, organizes exhibitions and other cultural events, and provides a venue for meetings and debate.

A key objective underlying the Institute's work is to enhance and exchange knowledge of and understanding of different cultures. KIT is a not-for-profit organization that works for both the public and the private sector in collaboration with partners in the Netherlands and abroad.

### **KIT Information & Library Services**

The KIT library collection is one of the largest in Europe relating to international cooperation and development issues, and also has an international reputation in this field. This is complemented by a rich cultural-historical collection relating to the Dutch colonial past. The Information & Library Services department (KIT ILS) has a long history of disseminating information on these issues. The manner of providing services has recently shifted from those of a traditional library to include digital content, online access and electronic services. Most of the large journal collection is now available electronically and the number of monographs that can be accessed electronically is growing dramatically. Databases and websites on relevant subjects are added to the collection and additional electronic information services for library users are being planned. Initiatives to digitize the cultural heritage collection have already begun and will continue in cooperation with national and international partners. The Library contains over 350,000 monographs, 27,000 maps and 21,000 journal titles (including more than 4000 current subscriptions). The Library catalogue provides access to 340 relevant databases and websites and 55,000 fully-indexed journal articles. In addition to monographs and journals, KIT ILS has an extensive collection of maps and (nautical) charts of (sub-) tropical regions, including general maps, topographical overview maps, map series, city maps, thematic maps and national atlases. The collection includes approximately 27,000 maps and over 1000 atlases. KIT ILS also maintains the Tropenmuseum Resource Centre, a source of more general information on the developing world, where one can

find books and magazines about various countries, development assistance, travel and culture.

The Library collection is enhanced by information products developed by KIT ILS experts who not only work on the department's own products and services, but who also cooperate with partners in the South, in countries such as Surinam, Ghana and Mozambique, with the aim of contributing to capacity strengthening in information technology and information management. KIT ILS designs its information services for development professionals, governments and the business world in North and South.

In recent years, ICT-related expertise has become increasingly important in information and library services, and this is also a focal area of the expertise within KIT ILS. In addition, KIT ILS systematically cultivates a network of partners in developing countries. Approximately 250 partners, organizations and professionals in developing countries are provided with tailor-made information on a regular basis. KIT ILS exchanges experiences in the field of information management with 75 online community partners.

### ***Digitizing 12,000 historical maps***

#### **Description of the historical collection**

Most of the historical collection dates from the period 1840-1950, and originates from the former Dutch colonies. Approximately 80% of this material comes from the Netherlands-Indies, with the remaining 20% from Surinam and the Netherlands Antilles. As of December 2008, the historical collection consisted of 3,000 journal titles, 20,000 monographs and brochures and approximately 12,000 maps. The earliest map in the Library's collection is a printed and hand-coloured map of Borneo and the coast of Celebes from c. 1657. Another rarity is a manuscript version of the earliest map of the whole of Indonesia which was drawn in the period 1839-55 and was later printed in 1895. Also noteworthy is an early atlas of Indonesia from 1817, marking the reacquisition of the colony by the Dutch from the British. In May 2009, KIT ILS received a generous donation of approximately 200 maps of the Caribbean region focusing on the Netherlands Antilles which nearly triples the number of maps dating from before 1850 in the collection.

#### **Conservation cultural heritage collection**

In 1998 the cultural heritage collections were examined and evaluated by an international visitation commission. The commission recognized the cultural and historical importance of the collection. They were concerned, however, about issues such as collection management and preservation. Questions about the physical condition of the collection and accessibility had to be addressed. The preservation of the collection was deemed to be of international importance since it contains sources from the former Dutch colonies which are not only rare in the countries of origin, but are also insufficiently documented and not always stored under ideal conditions. As a result of a project to preserve the KIT cultural heritage collections sponsored by the Dutch Ministry of Foreign Affairs, the historical library collection was catalogued, selected items were conserved, and transferred to a climate-controlled room during the period 2000-2004.

In an effort to allow access while protecting the historical originals, KIT decided to digitize its entire collection of land and nautical maps, mainly from the period 1850-1950 but also from the 18<sup>th</sup> and early 19<sup>th</sup> century, and to make it available online. As a result, one of the largest collections of maps of the former Dutch colonies is accessible via the internet. The project began at the end of 2003 and, after 2 years of work, all the maps were searchable online. Since KIT was the first organization in the Netherlands to undertake such an effort, it was not possible to ask for advice or the benefit from the experience of other institutions involved in a similar digitization project. The planning and organization of the project will be outlined in the next section.

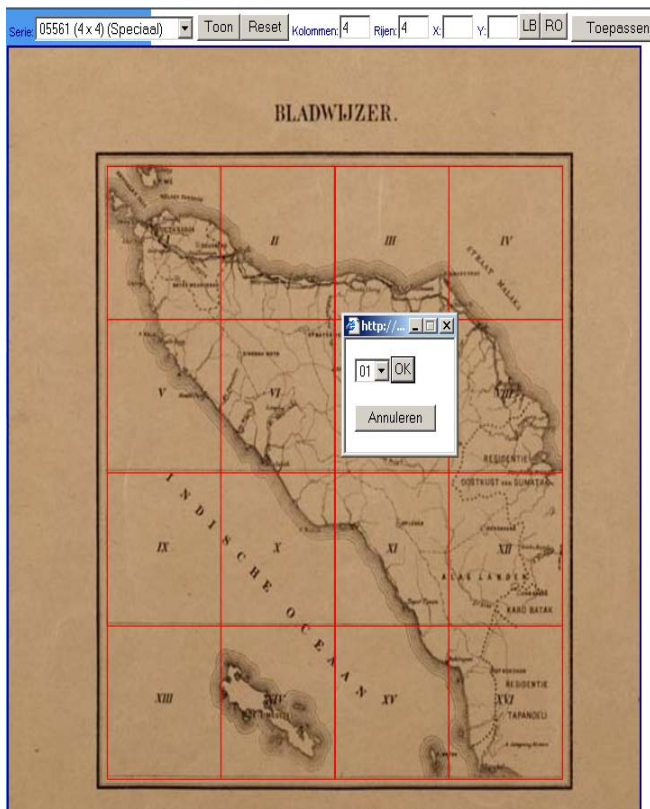
## Planning and organizing the digitization project

A digitization project is not just a scanning project. For a successful, sustainable project, it is necessary to plan each aspect: the project goals, mission, standards and procedures. The key to managing a digitization project is to have a well-defined project plan. Such a plan helps to make decisions more effectively as the project progresses. Some of the questions to consider when developing a project are:

- Who is the audience?
- What is the desired outcome?
- How will access be delivered?
- What interface is necessary?
- What materials have to be selected?
- What's the size of the collection and how are the source materials to be prepared?
- Are there copyright restrictions on particular images or documents?
- How to prepare documents for controlling the digitization process?
- How to design access, i.e. choosing and creating metadata. Does the metadata allow users to retrieve the required resource?

It's also important to be very clear about specific needs and requirements. One of KIT's requirements was the ability to search by geographical location and to present the maps directly by means of the Library catalogue. Since software did not exist in 2003 that met KIT's specific needs and requirements, it was decided to develop customized software (viewer) functionalities. This resulted in three unique functionalities:

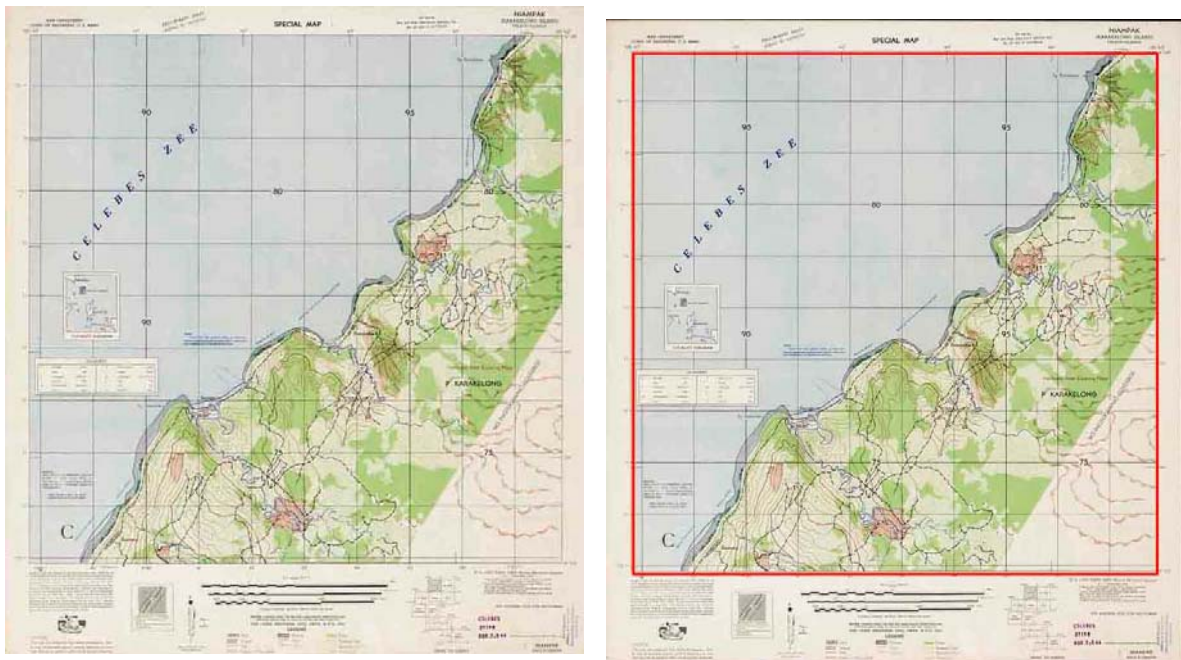
- 1) One of KIT's requirements was the possibility to switch between the online library catalogue and viewer and vice versa. Users searching in a digitized map in the viewer are able to access the bibliographical record for that particular map in the online catalogue with one click on an icon in the viewer.
- 2) Another (innovative) functionality was the ability to navigate through map series. A serial map is a map from a particular region, consisting of several map sheets, for example Java is displayed on four map sheets instead of one. The position of the individual sheets in relationship to each other is indicated on a so-called index map. All map sheets must be linked with an index map in order to be able to navigate through the series.



### Sample index map

First, the number of columns and rows in the map series must be indicated, and the upper left and lower right corners of the index map must be marked. The computer will then be able to produce a grid across the index map. This only works if every sheet in a map series has the same format and all the maps are linked together. If not, it is necessary to draw a box on every sheet manually. Finally, the correct digital data collection must be linked to the corresponding sheet by activating each box and indicating the correct digital inventory number.

- 3) The last important and innovative feature is searching via the Library's online catalogue (LOC) and by geographical location. Via the LOC one can search by title, author or keyword. However a bibliographical description only mentions the geographical location of the main cities, such as Batavia or Paramaribo. Other locations, which are not mentioned in the bibliographical records, remain inaccessible. Approximately 130.000 place names were imported into a database and provided with geographical co-ordinates. The database was then linked to the viewer. As a result, the user is able to search the map collection by location from the viewer. This functionality has it made possible to search for small cities and unknown locations. A link with Google Earth makes it possible to compare an old map with a new satellite image. Datasets of geographical names and co-ordinates can be downloaded from the internet for free. A very important aspect in this process is the conversion of prime meridians. Today, working with Greenwich co-ordinates is the standard. In the case of old maps, however, other prime meridians were used. For instance, maps of Indonesia used six different prime meridians. These had to be converted into Greenwich co-ordinates. The ability to search by location demands that current place names and their co-ordinates correspond with those on the digitized map. This is why constantly checking the geographical database and adding possible new or alternative names is necessary.



#### *Sample sheet*

*In order to search by geographical location, all map sheets have to be provided with co-ordinates. Within a map series, once the most northwesterly map and the most southeasterly map are supplied with co-ordinates, the computer can then calculate the remaining co-ordinates of the remaining sheets in the series. All exceptions must be provided with correct co-ordinates manually. In addition, it is necessary to indicate on each map sheet where the map itself ends and where the frame begins. By clicking on the upper left and lower right corners, a box appears which demarcates the actual map content.*

#### **How to handle the workflow of the project**

The presentation will focus on the practical and technical aspects of the digitization process as well as how to manage the workflow of 12,000 maps. These not only have to be prepared for digitizing but also have to be linked to the description in the library catalogue afterwards.

Before engaging a firm to digitize a collection it is essential to know the exact number of sheets and how many maps there are in various sizes. The next step is to assign a unique digital inventory number to each sheet.

There are a number of things to take into account when numbering the maps:

- 1) Maps printed on both sides.
- 2) Map series.
- 3) Sheets within a series of different editions.

Before allowing the maps to leave the building, a transport list has to be made containing the most important data, such as the digital inventory number which can be used to trace the catalogue description and the specific information for each sheet. When the scans have been supplied by the firm, it is necessary to check the following:

- Have all the original sheets been returned?
- Do the scans have the correct digital inventory number?
- Are there deviations or variations in colour?
- Position of the image, upside down or mirrored?
- Other imperfections, such as that shown below which make searching by location impossible.



*Sample scan (image crooked)*

With the help of a progress list, it is possible to determine whether all maps have been returned after digitizing. A progress list can be made by combining the individual transport lists and can be used to keep track of what has been done and what still needs to be done. The last part of the process is providing access by creating metadata and connecting the digital images to the bibliographical records.

### **Use**

Now that the maps are accessible online, interest from all over the world has increased and the maps are frequently consulted for scientific research and in the planning of development projects. There are also a number of examples of the importance of the collection for emergency relief. The historical map collection was consulted by Artsen zonder Grenzen (AzG), the Dutch branch of Médecins Sans Frontières, in order to co-ordinate their relief effort in the aftermath of the tsunami of 2004. The digitized maps contain information about every place and village, which enabled the relief workers to locate the specific regions that were affected by the tsunami and to bring help to the victims. Because the maps had been digitized, the relief workers could consult these in the field on a specially-made CD-ROM. The collection also serves as a source for international arbitration in determining land and sea borders and preparation of military peacekeeping missions.

## Future plans

- The historical collection contains a wealth of information which is still relevant to current development problems. In recognition of this fact, the Ministry of Foreign Affairs has provided additional funds to continue the first cultural preservation project. In the second phase, the emphasis will be on digitizing books and journal titles in the KIT collection so that it will be electronically accessible worldwide.
- An extra benefit of the project is that both the library and museum collections will be made searchable through one interface on the internet. In the future, a visitor will be able to find information not only about documents and historical maps, but also about museum objects and photographs. This is a huge task, but the effort is justified because, by making the KIT collections accessible as a whole, it will create an environment that will encourage research and education and will also play an important role in international and intercultural cooperation and exchange, with emphasis on strengthening the professional heritage sector in developing countries.
- Another very important goal is to disseminate the expertise gained during the project, and to support of cultural heritage projects in developing countries by means of consultancy and training.
- The addition of extra historical information and the enlargement of the database with new information, such as street names and plantations, will take place in the near future.
- In the coming years KIT will endeavour to supplement the online collection by adding missing maps in co-operation with other institutions which possess cartographical material relating to the former Dutch colonies. It's KIT's policy to digitize new accessions. For example, the generous donation of approximately 200 maps of the Caribbean region mentioned above will be digitized in 2009.
- The online availability of the historical map collection is responsible for a change in the way the maps are used. The number of visitors to the colonial collection has decreased dramatically, while the use of the digitized map collection has skyrocketed. Web 2.0 tools, user-friendly additions and the improvement of the viewer functionalities are just a few of the issues KIT needs to address in the future.

Digitizing is not the end but just the beginning of a new future!

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