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Digitizing and Bibliographic Referencing of Cartographic Material: CULTNAT's Experience with the National Library of Egypt and the Egyptian Geographic Society

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Summary

CULTNAT, the Center for Documentation of Cultural and Natural Heritage, affiliated to Bibliotheca Alexandrina and supported by the Ministry of Communication and Information Technology, initiated a program to document cartographic material, especially historic map public and private collections in Egypt.

The Cartographic Heritage Program focuses on the digitization of cartographic collections comprised of historic maps and atlases. The digitization process is based on several precise sets of standards, which have been tried and tested, to obtain the optimal combination between the image resolution and its loading time, depending on the type of cartographic material. This digitization is complemented with the bibliographic referencing of each map and atlas, a comprehensive process that fully the cartographic material covering all its aspects, including the content, the value, the cartographic technique and method, the physical status and condition etc. It is worth mentioning that this information sheet for describing cartographic material has been developed compatible with the latest international standards and is applied for the first time in Egypt.

In this presentation, two projects of this program in digitizing and bibliographic referencing for two of the most significant map collections in Egypt available at the National Library of Egypt and the Egyptian Geographic Society will be discussed.

Introduction: Cartographic collections in Egypt

CULTNAT, the Center for Documentation of Cultural and Natural Heritage, affiliated to Bibliotheca Alexandrina and supported by the Ministry of Communication and Information Technology, initiated in July 2005 a program to document cartographic material, especially historic map public and private collections in Egypt.

Unfortunately, the notion of cartographic heritage is almost inexistent in Egypt, especially to institutions and libraries, even those officially involved in map production. Only some private collectors and very few of the informed public acknowledge the importance of many Egyptian historic cartographic collections.

The need to document cartographic collections arose when CULTNAT began to consult late nineteenth and early twentieth century city maps to produce a GIS for architectural and urban heritage. The extensive use of maps and atlases for historic research purposes was time-consuming when access to maps was limited.

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Problems facing access to cartographic collections ranged from the absence of accurate inventories, storage and retrieval problems that lead deterioration of cartographic material. These collections were not only in danger of complete loss, but also kept away and out of reach to researchers.

The Documentation of Egyptian Cartographic Heritage

To document Egyptian Cartographic Heritage, CULNAT followed a methodology to achieve the following:

1. Identification of all cartographic collections

Significant cartographic collections reside in the archives of a number of institutions, namely the National Library of Egypt whose collection amounts to more than 10.000 maps and atlases; and the Egyptian Geographic Society housing more than 20.000 maps and atlases. Other important map collections remain to be identified, documented and published. Finally, rare maps that are in private collections need to be shared.

2. Digitization of maps and atlases

The purpose of applying standards for the digitization process is to reach the optimal combination between high resolution images and file size, given the size of the map and atlases collections. In this step, the standards set by CULNAT depended on the cartographic material itself; thus, the value of the map, the medium, the ink type and the colour determined its scanning settings (Table 1)..

3. Developing a comprehensive descriptive information sheet

A descriptive information sheet was developed based on international standards for describing cartographic material. The latest is the MODS (Metadata Object Description Schema) that was developed by the Library of Congress, compatible with the previous MARC 21 format. Figure 1 shows the required descriptive fields as per MODS.

CULNAT further developed these fields to include technical information on the map projection and orientation, the cartographic technique, whether it features a legend, annotated text and statistics or not. Information on its physical condition is also included, such as the map condition, reasons of deterioration reasons and conservation measures. Also, some notes about the value of the map are included. Finally, this information sheet is bilingual (English and Arabic). Annex 1 includes the English version of the descriptive information sheet.

4. Linking digital images of maps and atlases to their descriptive data in a database

In this step, the information on each map is imported into a database, where the location of its image is inserted as a hyperlink, thus enabling the search, retrieval, editing and printing. Institutions that provide research facilities improve their service. It also provides a tool for cartographic material study and analysis. Relevant subject pertaining to Egypt can be further investigated such as the documentation of the history of Egyptian map production, or tracing the representation of Egypt in the development of cartography.

5. Publishing the entire cartographic catalogues on the internet

The last step was to publish entire catalogues online with complete bibliographic referencing, in addition to low resolution thumbnails, to disseminate information on the cartographic heritage of Egypt, sadly neglected till today. It provides the option of ordering and selling digital images or print outs via the internet thus constituting a source of income for the owners of that heritage.

Table 1: Scanning settings

Characteristics (medium, ink, colour)	Digital format	Colour type	Minimum resolution (in DPI)	Average file size for a 100*70 cm sheet (in Mb)
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Sample

Black and white – line drawing

JPEG

Grayscale

150

5



Polychromatic – line drawing

JPEG

Coloured

200-250

15



Grayscale – shades

TIFF

Grayscale

250

15



Monochromatic – shaded areas in a single tone

JPEG

Coloured

200

8



Monochromatic – shaded areas in multi tones

TIFF

Coloured

250

100



Polychromatic – shaded areas

TIFF

Coloured

250-350

250



The image shows a screenshot of a web browser window displaying a MODS (Metadata Object Description Schema) record for a cartographic material. The browser's address bar shows the URL: <http://www.loc.gov/standards/mods/v3/mods03691515.html>. The record is displayed in a structured format with various fields and their corresponding values.

Title Information	
Title	Campbell County, Wyoming.
Name:Corporate	
Name Part	Campbell County Chamber of Commerce
Type of Resource	cartographic
Genre (MARC)	map
Origin Information	
Place	
Place Term:Code (MARC Country Code)	wyo
Place	
Place Term:Text	[Gillette, Wyo.]
Publisher	Campbell County Chamber of Commerce
Date Issued	[1982?]
Date Issued (encoding="marc")	1982
Issuance	monographic
Language	
Language Term:Code (ISO 639-2B)	eng
Physical Description	
Extent	1 map : 33 x 15 cm
Note:Statement of Responsibility	this map reproduced by Campbell County Chamber of Commerce.
Note	In lower right corner: Kirtzels-Casper.
Subject (LCSH)	
Geographic	Campbell County (Wyo.)
Topic	Maps
Classification (LCC)	
	G4263 .C3 1982 .C3
Record Information	
Record Content Source	DLC
Record Creation Date (encoding="marc")	830222
Record Change Date (encoding="iso8601")	19830426000000.0
Record Identifier	5466714

Figure 1: The MODS standards for cartographic material.

Two significant map collections at the National Library of Egypt and the Egyptian Geographic Society

The cartographic archive of the National Library of Egypt amounts to more than 10.000 maps and atlases, out of which 4000 maps consist of the cadastral covergae of Egypt that was conducted by the Egyptian Survey since the 1930s and published at the scale of 1:2500. The survey of Egyptian towns conducted at the same time was published in two scales, 1:500 and 1:1000 and the National Library owns 3000 maps of this series. Egyptian town series at larger scales such as the 1:5000 are also featured in this collection. The National Library of Egypt also houses more than 100 ancient and historic maps, most of which pertain to Egypt and its immediate surrounding region, as far south as Nubia, Abbyssinia and the Eastern coast of Africa. The relationship of Egypt with its neighbouring Middle Eastern countries in Asia is also very well covered. Among these ancient and historic maps are 6 Portolan sea charts that were drawn by geographers at the time of their great travels for navigation purposes. The rest of the collection consists of different topographic coverage, ranging from 1:10.000 to 1:250.000, and a number of tourist maps for each Egyptian city. On the other hand, the collection of the Egyptian Geographic Society features more than 20.000 maps and atlases in a variety of themes,

such as topography, geology etc. for many locations of the world. As for the historic material pertaining to Egypt, it houses more than 300 atlases, namely the Atlas of Omar Toussoun, the Atlas of Youssef Kamal, the Atlas of the French Expedition and the Atlas of Egypt that was completed in 1925. It also includes coastal maps that date to 1862 and that were surveyed and published by the British Admiralty. Additionally, it features a survey of the Mediterranean coast that date back to 1893. The cooperation with institutions that are owners of cartographic collections included the training of staff on scanning techniques and standards and the capacity building in bibliographic referencing and in using databases. The target is to improve services offered by the institutions, e.g. the access to maps, consultation, description, reproduction, etc. whether online or *in situ*.

ANNEX 1: CULTNAT's comprehensive descriptive information sheet for cartographic material




INFORMATION SHEET FOR CARTOGRAPHIC MATERIAL

1. Serial number _____
2. Inventory number _____
3. Map title as printed _____
4. Translated title (English) _____
5. Translated title (Arabic) _____
6. Cartographic media
 - map sheet
 - globe
 - atlas
 - relief model
7. Cartographic type
 - traditional map
 - photogrammetric image
 - remote-sensing image
8. original reproduction
9. Map theme

<ul style="list-style-type: none"> <input type="checkbox"/> physical <input type="checkbox"/> Topographic <input type="checkbox"/> Hypsographic <input type="checkbox"/> Geological <input type="checkbox"/> Geomorphological <input type="checkbox"/> Hydrological <input type="checkbox"/> Fluvial (rivers) <input type="checkbox"/> Climatological <input type="checkbox"/> Psychological (and) <input type="checkbox"/> Maritime <input type="checkbox"/> Vegetation 	<ul style="list-style-type: none"> <input type="checkbox"/> human <input type="checkbox"/> Demographic (population trends, population mobility, demographic structure, gender, occupational, ethnic, educational, medical status, ... population density) <input type="checkbox"/> Economic (economic production regions, consumption regions, industrial distribution, marketing, transportation, commerce, livestock, crops, land use, mineral resources, communication, ...) <input type="checkbox"/> Social (urban and rural populations) <input type="checkbox"/> Political (national political boundaries, administrative boundaries, local councils, election zones) <input type="checkbox"/> Historic
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INFORMATION SHEET FOR CARTOGRAPHIC MATERIAL

10. Geographic coverage
 - World
 - Partial globe
 - Continent (eastern, western, northern, southern hemisphere)
 - Africa
 - Europe
 - Asia
 - Australia and Oceania
 - North America
 - South America
 - Antarctica
 - Region
 - National entity
 - Sub-region
 - Administrative region
 - Small administrative unit
11. Map scale
 - not drawn to scale
 - scale indeterminate
 - textual scale
 - 1:500
 - 1:1000
 - 1:2500
 - 1:5000
 - 1:100,000
 - 1:250,000
 - 1:500,000
12. Linear scale
 - yes no
13. Comparative scale
 - yes no
14. Map projection
 - Mercator (UTM)
 - Equal area
 - Equal distance
 - Mollweide
 - Sanson Flamsteed
 - No projection


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INFORMATION SHEET FOR CARTOGRAPHIC MATERIAL

15. Map technology (geodesy)
 - yes no
16. Series
 - yes no
17. Series title _____
18. Map number in series _____
19. Language
 - one more
 - Latin
 - Italian
 - French
 - Arabic
 - English
 - Turkish
 - German
20. Author _____
21. Publisher _____
22. City _____
23. Country _____
24. Edition _____
25. Map printing dating _____
26. Colour
 - monochromatic
 - coloured
 - black and white
27. Material
 - paper
 - paper on fabric
 - other _____
28. Inset
 - yes no
29. recto verso
30. Verso content _____
31. Legend
 - yes no
32. Annotated data
 - yes no

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INFORMATION SHEET FOR CARTOGRAPHIC MATERIAL

33. Statistical data
 - yes no
34. Map orientation
 - traditional to the north
 - to other cardinal points
35. Cartographic technique
 - chromochromatic
 - chromolith
 - isopleth
36. Number of maps per sheet (excluding inset)
 - one
 - more than one _____
37. Number of sheets
 - one
 - more than one _____
38. Map dimensions (in cm) _____ x _____
39. Sheet dimensions (in cm) _____ x _____
40. Map condition
 - very good
 - good
 - average
 - poor
 - very poor
41. Deterioration reasons
 - insects and parasites
 - humidity
 - poor storage
42. Conservation measures
 - _____
 - _____
 - _____
43. Evaluation notes
 - _____
 - _____
 - _____

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