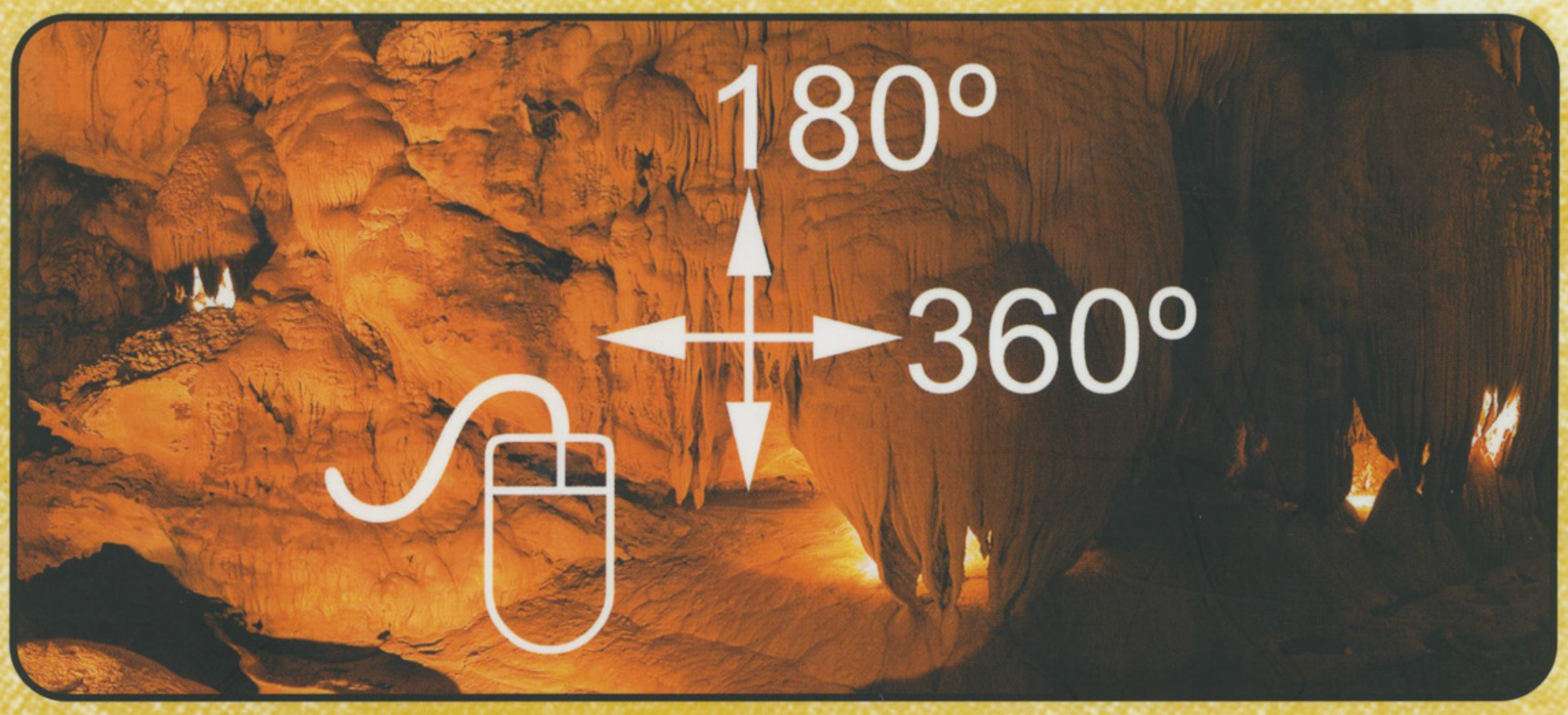
WORLD HERITAGE IN THE DIGITAL AGE

30th Anniversary of the World Heritage Convention
Alexandria, Beijing, Dakar, Mexico City, Paris, Strasbourg

www.virtualworldheritage.org

HERITAGE MANAGEMENT MAPPING:
GIS and Multimedia

Alexandria - Egypt, October 21-23, 2002



Organized by

Center for Documentation of Cultural and Natural Heritage

CULTNAT

www.cultnat.org

The Ministry of Communication and Information Technology

BIBLIOTHECA ALEXANDRINA
مكتبة الإسكندرية

CULTNAT

UNESCO

Preface

The "Heritage Management Mapping: GIS and Multimedia" Conference, was held at Bibliotheca Alexandrina, Alexandria, Egypt, October 21-23, 2002, few days after Bibliotheca Alexandrina was inaugurated on October 16th, 2002. The conference was sponsored and organized by the Center for Documentation of Cultural and Natural Heritage, the Ministry of Communications and Information Technology of Egypt, Bibliotheca Alexandrina, and UNESCO. The aim of the conference was to provide a forum to explore and demonstrate successful applications of information technology in the various domains related to the management of cultural and natural heritage sites. Local authorities, foreign missions, international experts, and IT mapping developers from the private sectors, were all encouraged to participate in the conference. This conference was one of six conferences around the world, commemorating the 30th anniversary of the UNESCO World Heritage Convention, comprising a virtual conference focusing on issues of World Heritage in the Digital Age. The other five conferences were held at: Beijing-China, Dakar-Senegal, Mexico City-Mexico, Paris-France, and Strasbourg-France.

Many papers were submitted from countries all over the globe, most of which were of high quality and merit. But due to the conference limited time, we were able to accept only 25 papers for presentation. Consequently, a number of papers of good quality could not be included. In addition to the contributed papers, six main speakers inaugurated the conference: 1) Dr. Ikram Fathi, representing H. E. Dr. Ahmed Nazif, the Minister of Communications and Information Technology at the time of the conference and currently the Prime Minister of Egypt, 2) H. E. General Abdel Salam ElMahgoub, Governor of Alexandria, 3) Mrs. Minja Yang, UNESCO Deputy Director, 4) Dr. Amr Azzouz, Director of UNESCO Cairo Office, 5) Dr. Faysal Abdel Haleem, representing Dr. Zahi Hawass, the Secretary General of the Supreme Council of Antiquities, and 6) Dr. Fathi Saleh, Director of Center for Documentation of Cultural and Natural Heritage and the Conference Chairman. Dr. Ismael Serageldin, Director of Bibliotheca Alexandrina, kindly accepted the invitation to present a keynote speech on the first day of the conference. The conference program also included visits to historical sites in Alexandria, and was concluded with a round table discussions resulted in the conference recommendations which is included in this publication.

On behalf of the conference committees, we would like to thank all the referees who contributed in screening the papers. We also wish to express our thanks to all those individuals who helped in organizing and presenting the conference. In particular, Lamia Fangary, Ola Seif, Maher Amer, Neveen Gaafar, Mona ElNashar, Alyaa Ali, and Hanaa Mostafa, who worked tirelessly in assisting with all of the conference arrangements.

Fathi Saleh

Conference Chairman

Cairo Architectural Heritage: 19th and 20th Century Architectural Heritage of the Downtown Area

Malak WAHBA, Ahmad EL-BINDARI, Fathi SALEH

The Center for Documentation of Cultural and Natural Heritage (CULTNAT), Cairo, EGYPT

ABSTRACT

During the period between 1860 and 1940, Downtown Cairo witnessed a major building boom that gave birth to a unique architecture combining European styles with local influences and materials. The architectural product of that era will never be equalled and we need to increase the public awareness to these historic buildings that may be less than a hundred years old. The purpose of this project is to document this endangered architectural heritage as a pilot project, using the latest technology in Geographic Information Systems (GIS) thus enabling a variety of users (for instance the municipality, historians, architects, tourists) to browse the database and to locate historic buildings.

Keywords: Cairo, architectural heritage, nineteenth century and twentieth century architecture, GIS, documentation.

1. INTRODUCTION

Founded in 640 A.D, Cairo, the capital of Egypt, has a history that extends over two millennia. Established since the Fatimid era, Islamic Medieval Cairo, which is the oldest quarters of the city, is now declared as part of the world heritage. Yet, Cairo offers a vast array of architectural styles besides the Islamic one that remain poorly documented. Despite the legislation protecting these buildings from demolition and alterations, the public awareness to nineteenth and twentieth century architecture is still not fully formed and certainly maintenance laws were not respected. Moreover, the Egyptian government has imposed some of the most stringent rent control laws in the developing world and their effects have been devastating. Consequently, Cairo's owners discontinued any investment in maintenance and the responsibility fell upon the tenants. Certainly, historic buildings suffered tremendously on average from a hundred years of neglect.

This is the case of the Downtown area of Cairo, our area of interest, developed in the latter part of the nineteenth century extending to the first half of the nineteenth century. During the period between 1860 and 1940 in particular, a unique architecture combining European styles with local influences and materials was born. Post-1940 architecture unfortunately lost any sense of uniqueness as the international style predominated the architectural scene. The architectural product of that era (1860-1940) will never be equalled.

2. CONTRIBUTION

In the wealth of studies about Cairo, only a few have documented one aspect or another of Cairo's architectural heritage; and nineteenth and twentieth century history. Some researchers have documented the history of certain neighbourhoods that have a special character, like Maadi [Raafat 1995], Heliopolis [Ilbert 1981] and Garden City [Raafat 2000b], while those who examined the Downtown area mostly focused on nineteenth and twentieth century developments [Arnaud 1996; Morgan 1999].

Despite their usefulness, such efforts lack continuity. Only one offered a thorough systematic documentation of individual buildings [Scharabi 1989] and certainly none is in digital format. Moreover, these publications are not easy to browse and do not facilitate the task for researchers.

3. PURPOSE

The purpose of this project is to document the architectural heritage of the Downtown area of Cairo in an unprecedented digital approach that crowns the attempts of a few dispersed scholars who have documented one aspect or another of Cairo's architecture. Using a Geographic Information System (GIS) that enables the user to browse the database, to view helpful information and at the same time, to locate historic buildings on a map of Cairo, this project also enables the printing of reports containing the data.

The GIS database can satisfy the needs of different users. The municipality can use it as a reference for its restoration/rehabilitation projects. Historians and architects as well as students in these fields can benefit from the wealth of information available. Moreover, tourists can benefit from the project since the area is a well-known tourist attraction offering a variety of services such as hotels, entertainment and banking facilities... etc. Ultimately, the project aspires to be used as a cultural awareness tool to all Cairenes and Egyptians.

4. DATA SOURCES

Numerous studies have been published offering an excellent overview on the development of the Downtown area [Arnaud 1996; Morgan 1999] and the evolution of nineteenth and twentieth century architecture [Sakr 1993; Tamraz 1998]. Unfortunately, these studies focused on a small number of buildings scattered around Cairo as illustrating examples.

Mohamed Scharabi's survey on the Downtown area involved the tedious task of surveying historic city maps to determine an approximate date of construction for the historic buildings of the area [1989]. He also analysed their form, their architectural style and influences. We initially used his survey, despite the fact that he overlooked a significant number of historic buildings worthy of documentation. Scharabi's survey resulted in 200 buildings in the Downtown area, while ours yielded to 600 historic buildings, not to mention that a small proportion of buildings surveyed by Scharabi no longer exist.

We also used Samir Raafat's research to gather additional information on the work of foreign architects in Cairo [2000a]. Additional fragments of information were found in other articles

such as Volait's research on the life and work of Antoine Lasciac [1989], or her survey on modern architecture providing information on some of the prominent architects of that era [Volait 1987]. Also providing some information was the photographic attempt recently put together by Myntti [1999].

The research conducted by Arnaud [1996] and later by Morgan [1999] provided data pertaining to the studied area. For instance, they provided the different periods during which sections of the Downtown area have been developed. El-Tarabily's [1997] survey on the streets of Cairo listed the frequently changing names of the streets, as well as the origin of the name.

For the architectural drawings of the historic buildings, we were able to use those gathered and published by Scharabi [1989]. Moreover, we approached public sector insurance companies, currently owning a significant proportion of buildings in the Downtown area, for the documents they possessed. For old photographs of the streets and buildings of the Downtown area, we were authorised to reproduce photographs of private collections of postcards.

The data gathering process did not only necessitate the use of the aforementioned existing surveys, documents, photographs and drawings, but it also required extensive research at some government facilities such as the Cadastral Registrar and the National Archives to obtain the ownership history of the building since its construction. Moreover, we approached the municipality for the information pertaining to the streets. Also, we had to survey a series of cadastral city maps (60 maps of scale 1:500) dating back to the late nineteenth century and the early twentieth to determine dates of constructions for the remaining 400 historic buildings. These maps also provided detailed information on property limits and building users of that time. Moreover, these were used for the digitisation of inventoried buildings.

5. SITE SURVEY AND PHOTOGRAPHY

First hand data included a site survey to determine the location of the additional 400 historic buildings, their heights, number of floors, their general use and their ground floor commercial activities. We had to conduct inquiries to residents and shop owners who have been in the neighbourhood long enough.

This project greatly relied on a visual documentation by means of photography. Systematically, each building has an identification photo, mostly taken on an angle showing two façades, the main one and one of the side façades. As well, we took a series of snapshots for each street, in order to provide sequential views of the street. The photography of the different architectural elements was necessary for the most commonly used elements as well as the unusual ones.

6. SOFTWARE SELECTION

6.1 AutoCAD 2002

The most commonly used for architectural drawing is the AutoCAD 2002. It enables the high quality digitisation over the scanned cadastral map of scale 1:500, thus producing accurate of vector layers using the details of raster data sources.

6.2 Arc View GIS 3.2

We used a GIS software to help visualise the information, reveal patterns, and trends otherwise not apparent with text files or databases. One of the most commonly used GIS software is Arc View for its resourceful set of tools for visualising, exploring, and analysing information linked to geographic locations. The following are the most important efficiency features of the software:

The availability of a variety of tools: it is possible to perform a spatial analysis, to create and edit geographic data, to carry out thematic mapping, and to create presentation-quality maps.

The possibility of accessing external databases: using Arc View's Standard Query Language (SQL), it is possible to connect to a relational database management system and issue an SQL query to retrieve records from it.

The possibility of programming: using Avenue, Arc View's programming language, menus, buttons, and tools can be customised for the application. In addition, it is possible to automate common tasks and make them part of the interface, resulting in a user-friendly interface.

6.3 Microsoft Access 2000

Concerning the database system, we opted for Microsoft Access 2000 rather than building the database on Arc View itself. As a database engine, Microsoft Access has proved to be easy to use, extremely efficient and widely used. The following are the most important efficiency features of the software:

Data management: it is possible to manage all information from a single database file, therefore facilitating data revision and edition.

Data manipulation: finding and retrieving the requested data is also an easy task carried out by formulating the appropriate queries.

6.4 PhotoAngelo Version 1.0

Among multimedia software available on the market, PhotoAngelo Version 1.0 was used for the making of photo albums whether albums of old photographs or architectural drawings. It was also used in reconstructing the street façade. We opted for this software for the following features:

Creative multimedia: it is possible to produce single files controlling the media including animation, sound and text.

The possibility of creating a stand-alone application: it is to produce executable files, relatively small in size, without any requirements to the system and that can be run directly from Arc View.

7. RESEARCH METHODS

Data from the aforementioned studies, many of which required translation, and surveys was sorted out, analysed, and entered in the database. The contents of the database are classified in four categories, the first providing general information on each building: the address, the current name by which the building is known, the former name if it has changed, and the administrative unit where it is located, whether the *shiyakha* (the smallest administrative urban unit, similar to a census tract but denser in population) or the *qism* which is the next unit in hierarchy (the Downtown area of Cairo spreads over 4 *qisms*).

The second category consists of historic data about each building: the architect who designed it, the architectural style, the period of construction, the first owner who commissioned the construction and who currently owns it.

A third category contains physical data, such as the number of floors, the gross area, the general use of the building as well as the activities in ground floor shops.

Finally, the references of data and the dates the photography was accomplished will represent the fourth category.

Additional data pertaining to the architectural heritage of Cairo, such as information on the streets of the studied area was included. For instance, the streets' frequently changing names are included. As well, the succession of building ownership or personal information on the architects, whether foreigners or locals, was also compiled.

8. DATA REPRESENTATION

On the 1991 satellite image of Downtown Cairo of a 2-meter resolution, we first outlined in yellow the historic buildings based on the site survey assigning to each a unique identification number serving to link the data stored in the database. The names of major streets are typed in orange as points of reference.

When the user performs a search, a query is simultaneously sent to the Access database engine, the results are retrieved in Arc View, and the buildings matching the search criteria are selected and highlighted on the map. The user can then browse the results of his search by viewing the buildings one by one, or simply perform a new search. The following section is a detailed description of the different searches/queries that can be carried out, followed by two illustrating examples of searches.

9. THE PROJECT

The satellite image of the Downtown area is displayed along with the layer of historic buildings. The main menu provides seven options for the user, to search the GIS using: (1) the building, (2) its style, (3) its dating, (4) its street, (5) its architect, (6) the architectural elements, or (7) to select from the map.

9.1 The Building

The possibility to search and to locate historic buildings on this map using either the name or the location:

9.1.1 The building name: selecting its current name or former name, or by typing at least three characters of the building name, whether current or former (Figure 1);

9.1.2 The building location: selecting its location on a street, in a *shiyakha* or in a *qism* (Figure 2).

Figure 1: Search by the building name

Figure 2: Search by the building location

As search results are displayed, it is possible to further browse the selected buildings for more details, whether for more information, for an album of old photographs, for architectural drawings, or for a listing of the succession ownership since the date of construction (Figure 3).

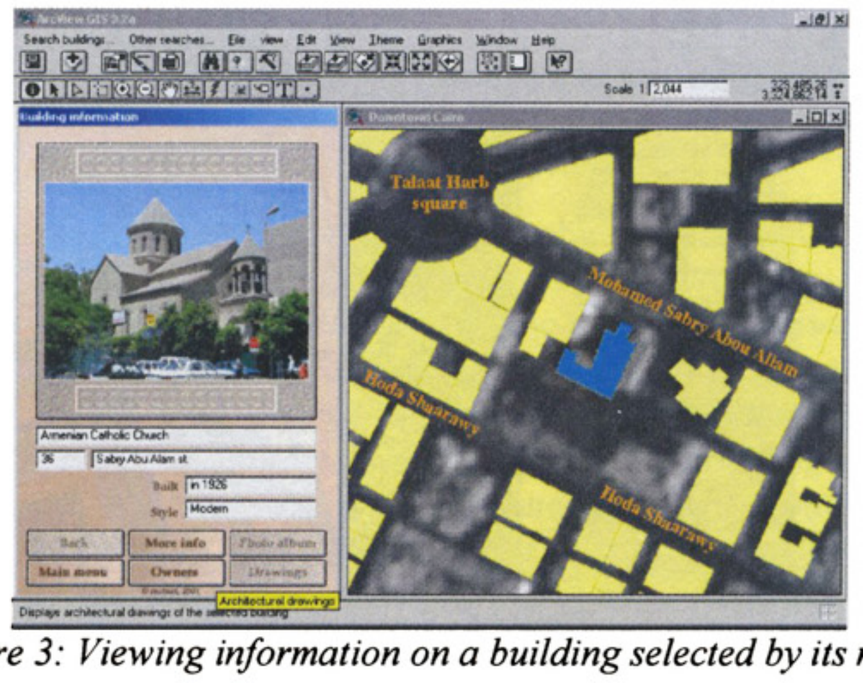


Figure 3: Viewing information on a building selected by its name

9.2 The Style

The possibility to search and to locate historic buildings on this map selecting an architectural style (Figure 4). The ten styles are: neo-classical; neo-renaissance; neo-baroque; Art nouveau; Art deco; traditional Islamic; neo-Islamic; modern; traditional, local and non-formal; or eclectic.

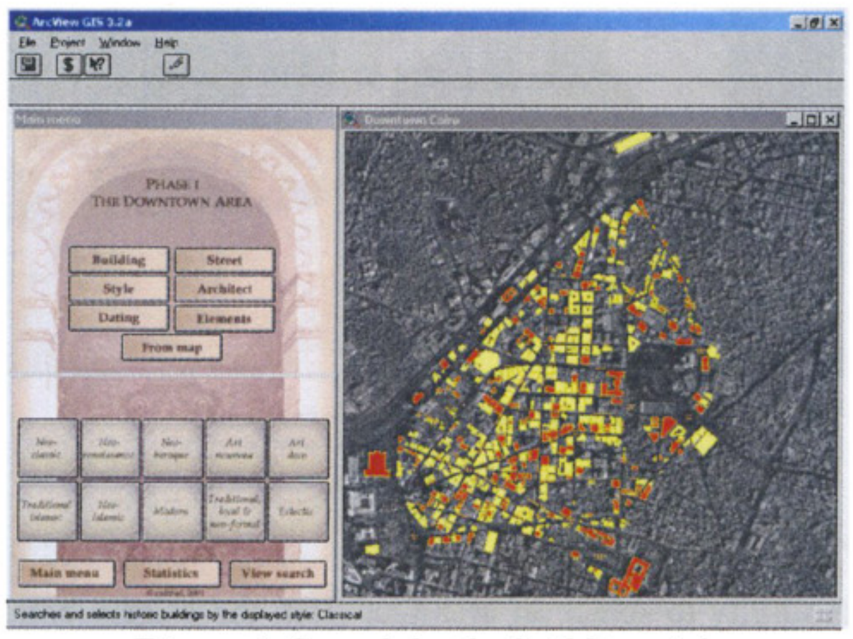


Figure 4: Search by the building style

9.3 The Dating

The possibility to search and to locate historic buildings on this map selecting a decade (Figure 5). The eight decades are: the 1870s to the 1940s.

Figure 5: Search by the date of construction

9.4 The Street

The possibility to search and to locate a street on this map selecting one from the combo box. Information pertaining to the street is displayed when a selection is made (Figure 6).

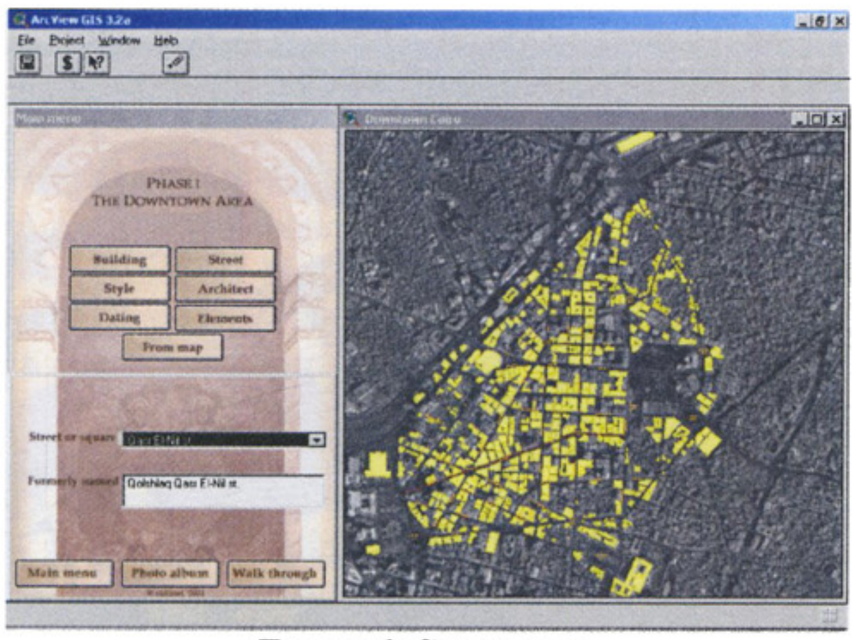


Figure 6: Street menu

An album of old photographs of the selected street, put together using PhotoAngelo software, can be viewed, requiring the user to scroll forward at his pace (Figure 7).

View of Qasr El-Nil street from Talaat Harb square
from the Lehnert and Landrock collection, photo taken around the early 1920s

Figure 7: Street photo album

9.5 The Architect

The possibility to select an architect from the combo box. When available, personal data about the architect is displayed, such as his origins, the place and date of birth, the place and date of death, where he studied and graduated, where he practised in Egypt, the highest title he held and other titles he may have held (Figure 8).

Figure 8: Search for the work of an architect

From this menu, it is possible to search and locate historic buildings by the selected architect (Figure 8).

9.6 The Architectural Elements

The possibility to view different examples of the displayed architectural elements, the doors, the windows, the balconies, the cornices, the mouldings, the domes, the roofs or the pediments (Figure 9).

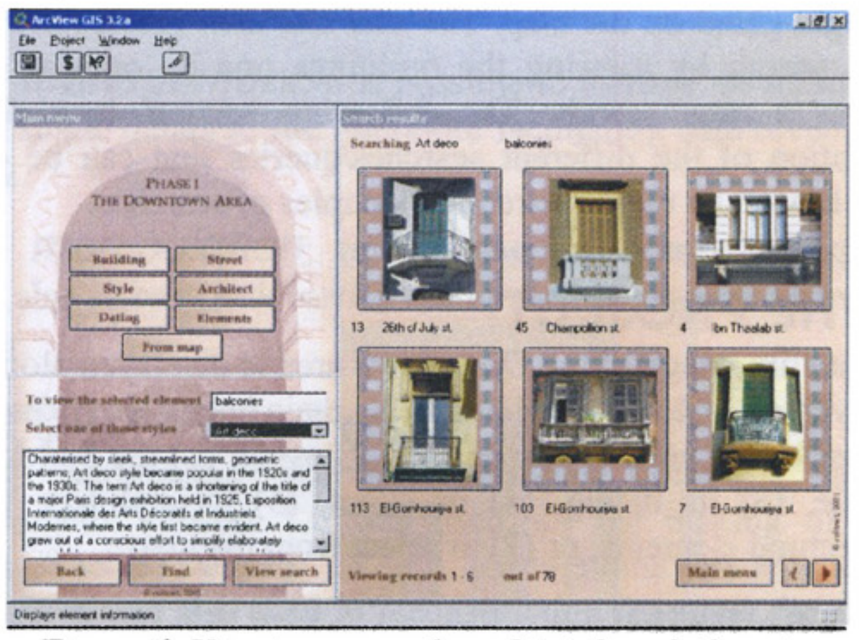


Figure 9: Viewing examples of Art deco balconies

9.7 From Map

The possibility to directly select historic buildings on the map, either a single one by clicking on it or several ones by dragging a window.

10. DELIVERABLES

The most important two products of this project, certainly featuring the widest distribution possible, are its diffusion in the form of CDs and its Internet availability. The user can browse both freely for the information previously mentioned.

Other outputs of this project included a report listing the full inventory of the 600 historic buildings, containing all the available data.

Moreover, it is possible to produce a series of articles retracing the history of buildings linking it to major events, certainly providing an insight on a period of tremendous changes to the nation, ranging from modernisation to the establishment of an independent monarchy.

Finally, tourist products such as booklets and brochures on the Downtown area can be published.

11. FUTURE WORK

The documentation of other neighbourhoods with special architecture in Cairo is underway, surveying it for historic buildings of the nineteenth and twentieth century. Then, it will be possible to replicate this for other Egyptian cities, thereby accomplishing a major effort in the documentation of Egypt's architectural heritage

12. ACKNOWLEDGMENTS

The authors would like to acknowledge the enormous contribution of Eng. Rehab El-Manharawy for the photoediting and image treatment. The efforts of all CULTNAT team members, were also greatly appreciated, in particular Dr. Basma Koura for the translation of German.

REFERENCES

ARNAUD, J-L. 1996. *Cairo: The Development of a Modern City (1867-1907).* Paris: CNRS. (in French)

EL-TARABILY, A. 1999. *Streets with a History: A Tour in the Nation's Mind.* Cairo: El-Dar El-Misriya El-Libnaniya. (in Arabic)

ILBERT, R. 1981. *Heliopolis: Cairo, 1905-1922: The Genesis of a City.* Paris: CNRS. (in French)

MORGAN, I. 1999. *Cairo, The Development of the Modern City Centre During the Nineteenth and Early Twentieth Century.* Bern: Peter Lang. (in German)

MYNTTI, C. 1999. *Paris Along the Nile: Architecture in Cairo from the Belle Époque.* Cairo: American University Press.

RAAFAT, S. 1995. *Maadi 1904-1962: Society and History in a Cairo Suburb.* Cairo: Palm Press.

RAAFAT, S. 2000a. *Cairo's Belle Époque Architects 1900-1950.* Feature article in http://www.egy.com

RAAFAT, S. 2000b. *Garden City: A Retrospective. Part 1 to 6.* Feature article in http://www.egy.com

SAKR, T. 1993. *Early Twentieth Century Islamic Architecture in Cairo.* Cairo: The American University Press.

SCHARABI, M. 1989. *Cairo, city and architecture during the period of European colonization.* Tübingen: Ernst Wasmuth Verlag. (in German)

TAMRAZ, N. 1998. *Nineteenth Century Cairene Houses and Palaces.* Cairo: The American University Press.

VOLAIT, M. 1989. An architect against the Orient: Antoine Lasciac (1856-1946) in *The Fleet to Egypt. Supplement to European Travel.* Cairo: CEDEJ. (in French)

VOLAIT, M. 1987. *Modern Architecture in Egypt and the 'Imara' Magazine, 1939-1959,* CEDEJ Dossier no. 4. Cairo: CEDEJ. (in French)

ABOUT THE AUTHORS

Malak Wahba is the project manager of the Architectural Heritage Programme at CULTNAT. She has a BSc. in Architecture, Cairo University and a MA in Geography, McMaster University, Canada. Currently responsible for the Architectural Heritage of Cairo project, Ms. Wahba's area of interest is the documentation of the cultural heritage, in particular architecture of the nineteenth and twentieth century. She may be contacted at: *CULTNAT, Smart Village, Cairo-Alexandria Desert Road, Km. 28 Abou Rawwash, Giza, EGYPT.* Email: mwahba@mcit.gov.eg

Ahmad El-Bindari is a researcher and photographer at CULTNAT. He has a BA. in Hotel Management, Helwan University, Egypt. He is currently responsible for the research, survey and photographic documentation of the Architectural Heritage of Cairo, Mr. El-Bindari's main concern is the documentation of nineteenth and twentieth century architecture, inspiring him in artistic creations, such as jewellery, handicrafts and photographic compositions. He may be contacted at: *CULTNAT, Smart Village, Cairo-Alexandria Desert Road, Km. 28, Abou Rawwash, Giza, EGYPT.* Email: *abindari@mcit.gov.eg*

Fathi Saleh is the director of CULTNAT. He is also a Professor of Computer Engineering at Cairo University. He has a BSc of Electrical Engineering, Cairo University and a PhD from Université de Paris. Former ambassador and permanent delegate of Egypt to the Unesco, Dr. Saleh's main interest is the application of new technologies in the field of cultural and natural heritage documentation. He may be contacted at: *CULTNAT, Smart Village, Cairo-Alexandria Desert Road, Km. 28, Abou Rawwash, Giza, EGYPT.* Email: *fsaleh@ mcit.gov.eg*