INFORMATICA ED EGITTOLOGIA

ALL'INIZIO DEGLI ANNI '90

a cura di

Francesco Tiradritti

BULZONI EDITORE

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Fathi Saleh, Mahmoud Maher Taha[1]

AN INTEGRATED INFORMATION SYSTEM FOR THE EGYPTIAN ANTIQUITIES ORGANIZATION (EAO)

Introduction

In 1989 the Informatic Center of The Egyptian Antiquities Organization has obtained a computer system based on up-to-date standard hardware and software technologies. The system started with an 80386 processor and within the same year it was upgraded to an 80486 based processor. It has a 16 Megabyte memory, 12 terminals and 360 Megabyte mass storage. The system makes use of two standard operating systems: UNIX and MSDOS.

In a short time after the installation of the hardware, an integrated database system was developed in collaboration with the team from the faculty of engineering at Cairo University. This database was written in Foxbase making use of the existing archeological coding system that was proposed by the group *Informatique et Égyptologie*. This coding system was modified and adapted to suit the requirements of the informations available at the Egyptian Museum. Another part of the database was built on the ISIS program supplied by the UNESCO. This new database included all textual parts of available references in the Egyptian Museum such as «Le Catalogue General» and «The Maspero Guide Book». Currently a system is under development to link the two databases.

The development of the databases started with the collection of the Egyptian Museum which contains about 90,000 items. As

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1. Fathi Saleh (Faculty of Engineering, Cairo University) and Mahmoud Maher Taha (Information Center of the Egyptian Antiquities Organisation, Cairo).

pilot project, the collection of king Tutankhamun was fully entered and processed by the computer system. After the system was established for the Egyptian Museum, a similar database for the Islamic Museum was started. This necessitates full arabisation of the Foxbase and ISIS databases in order to handle the Islamic data in arabic. Two other databases are on their way. These are the Coptic and Graeco-Roman databases.

In the next phase of development these databases will be coupled to two other informatic systems. The first system is the existing microfilm library. The second system is a laser disc based imaging system.

The Hardware System

The center started getting its hardware system in 1989. At that time it was required to procure a hardware system that would follow the latest trends in technology and make use of the easiness of the modern technology. Sticking to the industrial standards of today, a system was chosen based on the 80386-Intel microprocessor that would also allow multiuser system. This selection would allow upgrading in the future as the technology developes in the Intel micro processor series. Within one year of practice, the system was upgraded (with few more expenses) to an 80486 based micro processor system. The existing configuration have the following components (see Fig. 1)

- 80486 Intel based micro processor system
- 80487 Coprocessor
- 16 Megabyte memory exapandable to 64 Megabytes
- 360 Megabyte mass-storage expandable to 720 Megabytes
- 12 arabic/latin terminals expandable to 32
- Laser Printer
- 8 ink-ject printers

The system is also linked to some IBM micro-computers and will be linked in the future to a Video disc player.

The System Software

The system software was chosen to be an industrial general purpose operating system. This decision was based on the possibility of exchanging informations in the future and on the availability of vast software library and tools for such software systems. The systems used are UNIX operating system and DOS (under UNIX through VPIX utilities). Due to the nature of the application, both information and textual types of databases were needed. Sticking again to standard products of the DBase family, Foxbase was chosen which, together with the 486 processor, gives a reasonable fast response for retrieval. As for the textual database, the CDS/ISIS of the UNESCO was selected. This choise was based on the recommendation of the group *Informatique et Égyptologie* and on the presentation given by professor van der Plas at Cairo University. An important feature of the system requirements is the inclusion of Arabic facilities. There are commercial tools that arabises Foxbase and other standard products. But the ISIS was not initially arabised. A group from Cairo University and Utrecht University had successfully arabised this package during the last year. Finally, in order to display both the information and text contents of both types of databases, WINDOW 3.0 was adopted, as it allows the opening of several windows and the displaying of the contents of different applications simulatanuously. Fig. 2 shows the general overview of the system software that is used in the center.

Application Development

Fig. 3 shows the sequence of most important cultures that succeeded in Egypt during the last 5000 years. It started with

the pharoanic (ancient Egyptian) culture that lasted for about 3000 years. It was followed by Ptolemy and Roman eras. Then Egypt became a Coptic country for about six hundred years till the Arab came to Egypt in the middle of the seventh century and Egypt became a part of the Islamic culture. This succession of cultures resulted in a wealth of cultural inheritage that is not comparable to any other part of the world.

Building an information system for the Egyptian civilization automatically divides itself into the four major culture shown in the diagram. This also explains why there are four main museums in Egypt. Each of these museums belongs to one of the four cultures. As a time plan, it was decided to start by building an information system for the ancient Egyptian museum first, followed by the Islamic museum, then the Coptic museum and finally the Graeco-roman museum.

The Need for Universal Coding Systems

Because the ancient civilisation sections in most of the international museums, such as the Louvre, the British Museum, the Metropolitan Museum etc... represent a very important part of these museums, and also because scholars of Archaeology are spread all over the world, the building of databases for museums and archaeological sites should be based on well established universal coding system. Several efforts have been done to develop such systems, most of which are summarized (for the handling of the Egyptian civilisation) in the publication *Informatique et Égyptologie* 7, published in Paris in 1990. Some strategic ideas were also addressed in the lecture given by Professor van der Plas (from the Center for Computer Aided Egyptological Research - Utrecht University) at Cairo University and at the Egyptian Society of Information Management (SIM) in December 1990 about «Integrated International Egyptological Database Systems».

This coding system is in general based on fixed lists for the different attributes of any archaelogical object. An example of those fixed lists is given in Saleh 1990. This fixed list method would allow of having the same terminology in different places. It also avoids spelling errors above all when data entry is performed by native operators not mastering the English language with which information is written.

Cairo Museum Application

The Cairo museum application was developed around the concepts given in Saleh 1990, based on definition of certain attributes for every object as given in Fig. 4. Another important factor in dealing with the Cairo Museum object is to take into consideration the numbering systems already existing. Bothmer 1972 summarizes the different numbering systems used in the Egyptian Museum. The main numbering systems are:

- Journal d'Entrée number (JE): this is the main inventory, the register of the Cairo museum, in which each object was to be entered as soon as it reached the museum.

- Catalogue Général number (CG): in this numbering system, the objects are grouped under categories:
1 - 1294 statues
11001 - 12000 archaic objects
20001 - 20780 stelae of the Middle Kingdom
etc.

- Maspero Guide Book number (G.): since the early days of the museum, a descriptive guide book for visitors had been published. In order to facilitate the tour of the galeries and to give quick reference to the printed text in front of the monument, each important piece received a number which pasted to, or

nailed on, the base or simply painted on a small wooden block which was set on the floor.

Data entry sheet

A data entry sheet for the Cairo Museum must contain, besides the different information about the object, all numbering systems of this object. The numbering system, beside its identification function, would refer to the different texts written in the guide book and the «Catalogue Général» mentioned before.

The data entry sheet designed for Cairo Museum was based on contents of the «Journal d'Entrée» log book and extended to include the other numbering systems for cross referencing. An example of this data sheet is given in Fig. 5.

It was very clear from the nature of the museum information that there will be a need for combining the information of the data sheet with the texts of the different references such as the «Guide Book», the «Catalogue Général», etc... that immediately raised the need for the use of both information and textual databases.

Integrated Museum in Database System

Fig. 6 shows the details of the integrated database system for the Egyptian Museum. As mentioned before, each object is described by its attributes in an informative object database (Foxpro database was used for this purpose). The fields of this database would also contain the «Guide Book» number, the «Catalogue Général» number, the bibliographic number and the video disc image numbers.

Four textual data bases are then created (using ISIS database). One for the textual content of the «Guide Book», a second one for the textual content of the «Catalogue Général», a third one for a general term archaeological dictionary and the

fourth database for the bibliographic data. These textual databases are linked to the Foxpro database using the Window 3.0 software which allows simaltanuous display of both information and corresponding texts. In the near future it is expected to link this system to an image base contained in a video disc. Also a facility for displaying some hieroglyphic texts will be available.

Cooperation with Other Organizations

In order to develop this integrated information system for the Egyptian Antiquties Organization, close technical cooperation took place between the Information Center of the EAO and computer department of the faculty of engineering at Cairo University, the Information and Decision Support Center (IDSC) of the Ministry of Cabinet Affairs and the Central Agency of Public Mobilization and Statistics (CAPMAS). Cooperation with international societies such as the group *Informatique et Égyptologie* had started and it is expected that this type of cooperation would be extended to other organizations (see fig. 7).

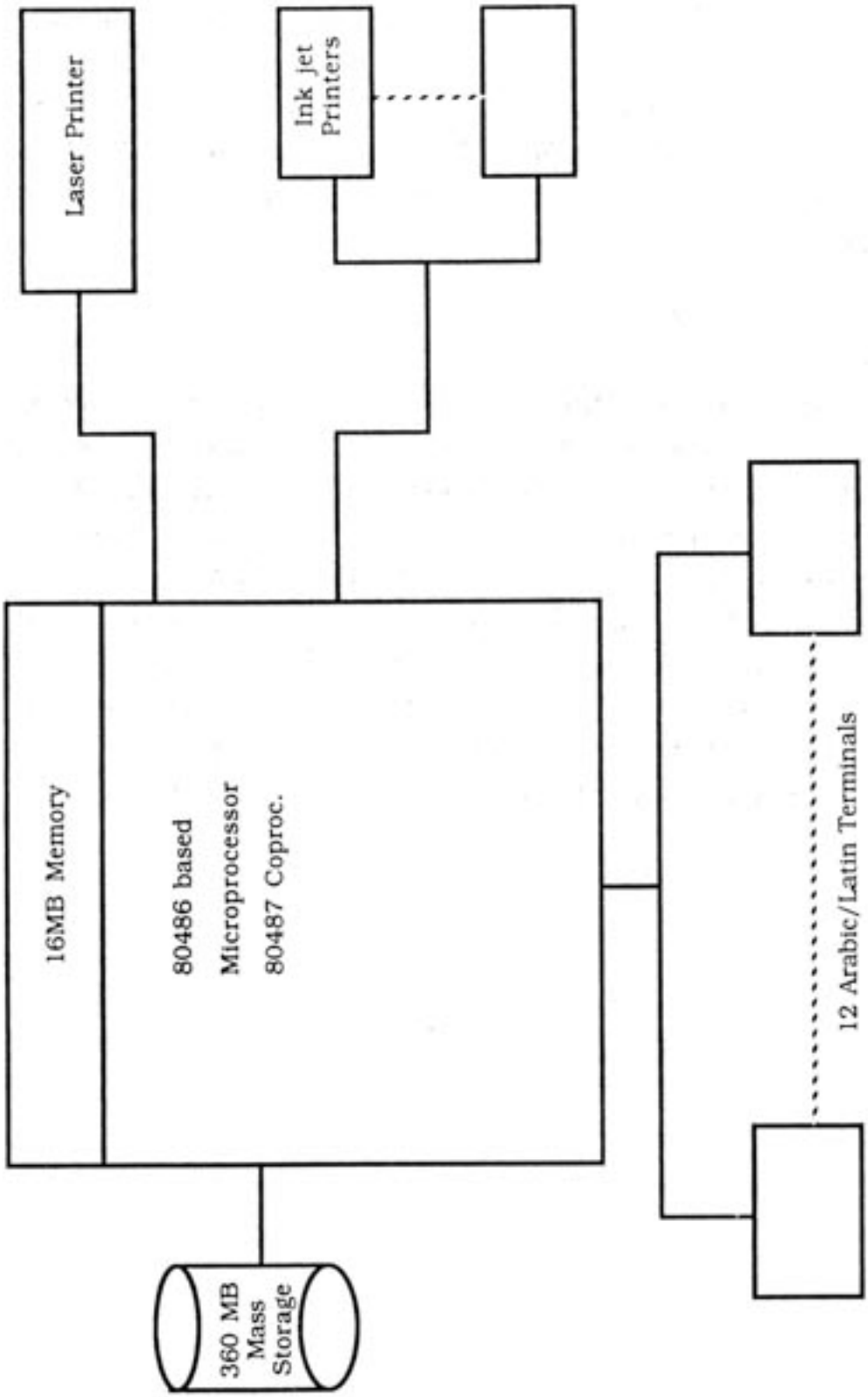

Figure 1 Hardware Configuration

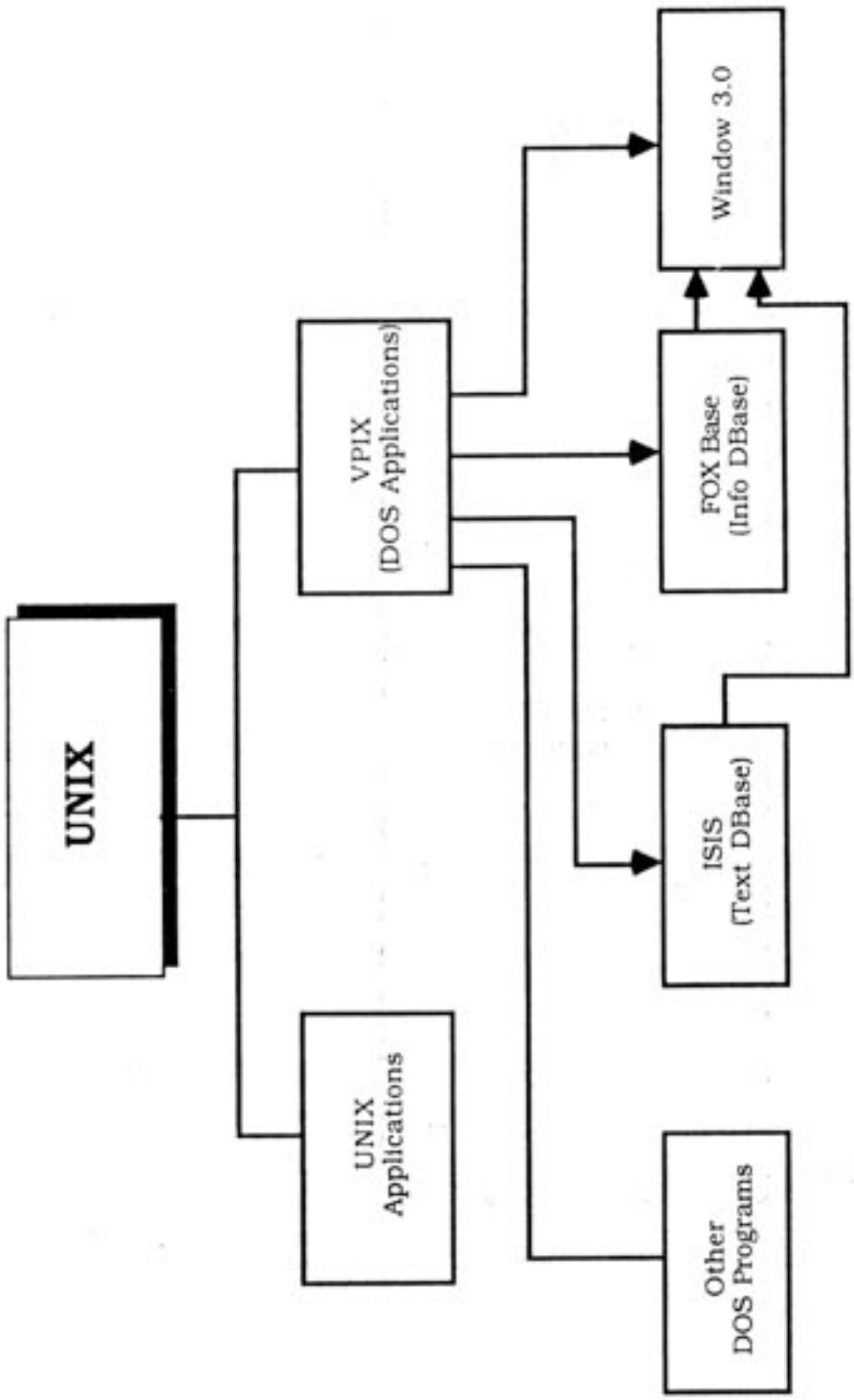

Figure 2 System Software

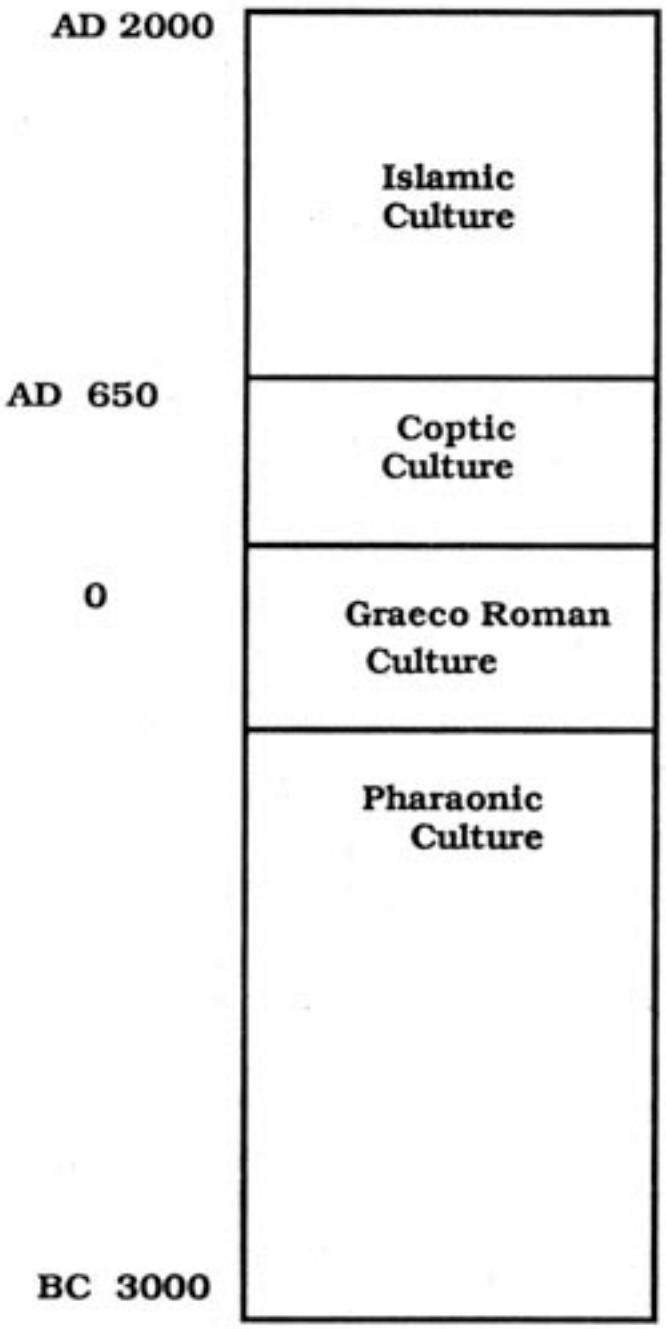

Figure 3 Succession of Cultures in Egypt

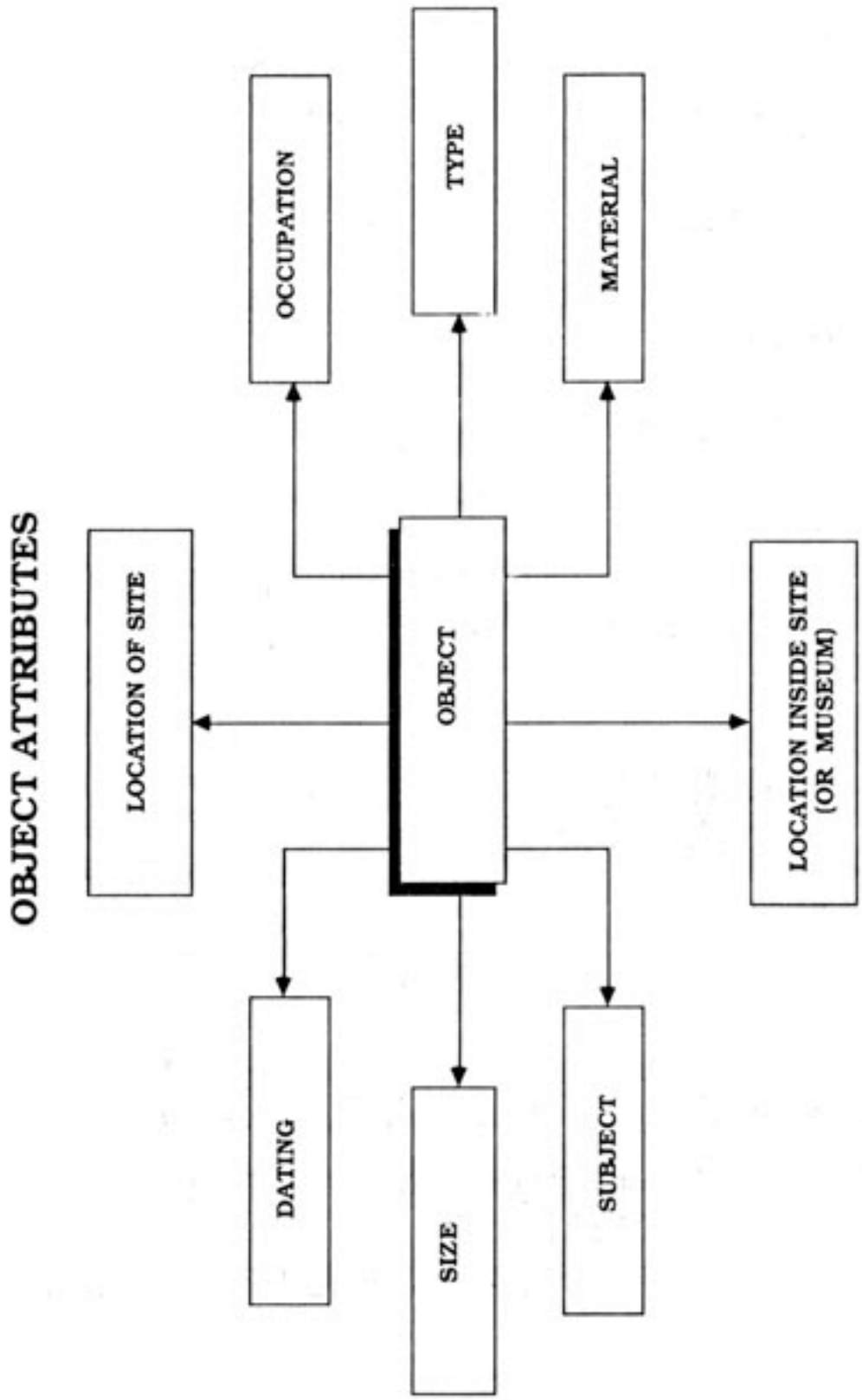
OBJECT ATTRIBUTES
OCCUPATION
TYPE
MATERIAL
LOCATION OF SITE
OBJECT
LOCATION INSIDE SITE (OR MUSEUM)
DATING
SIZE
SUBJECT

FIG (4)

FIGURE 5

DATA ANLYSIS SHEET
FOR
ANTIQUITIES OF EGYPTIAN MUSEUM

SEC: ☐☐☐ JE: B ☐☐☐☐☐☐☐ E ☐☐☐☐☐☐☐ CG: B ☐☐☐☐☐☐☐ E ☐☐☐☐☐☐☐ EXC.NO: B ☐☐☐☐☐☐☐ E ☐☐☐☐☐☐☐

SR: B ☐☐☐☐☐ E ☐☐☐☐☐ G: ☐☐☐☐ TR: B ☐☐☐☐☐☐☐☐ E ☐☐☐☐☐☐☐☐

BASIC DISCRIPTION :

☐☐☐☐☐☐☐ 1- CATEGORY :_____

☐☐☐☐ 2- SUBJECT :_____

3- DESCRIPTION:_____

_____

_____

☐☐☐☐☐☐ 4- NAME :_____

TITLE(s): ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

_____ _____ _____

☐☐☐☐ ☐☐☐☐ ☐☐☐☐

_____ _____ _____

☐☐☐☐☐☐ DATING:_____ DYNASTY:_____ KING:_____

☐☐☐☐☐☐ PROVENANCE:_____

SITE :_____

☐☐☐☐ PLACE :_____

LOCATION IN MUSEUM :_____

MATERIAL(s): ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

_____ _____ _____

☐☐☐☐ ☐☐☐☐ ☐☐☐☐

_____ _____ _____

HEIGHT: ☐☐☐ WIDTH: ☐☐☐ LENGTH: ☐☐☐ DEPTH: ☐☐☐

THICKNESS: ☐☐☐ DIAMETER: ☐☐☐ WEIGHT: ☐☐☐

MICROFILM LOCATION:

REEL : ☐☐☐☐ FRAME : ☐☐☐☐

VIDEO FRAME NUMBER : ☐☐☐☐

PUBLICATION NUMBER(S): (1) ☐☐☐☐ (2) ☐☐☐☐ (3) ☐☐☐☐

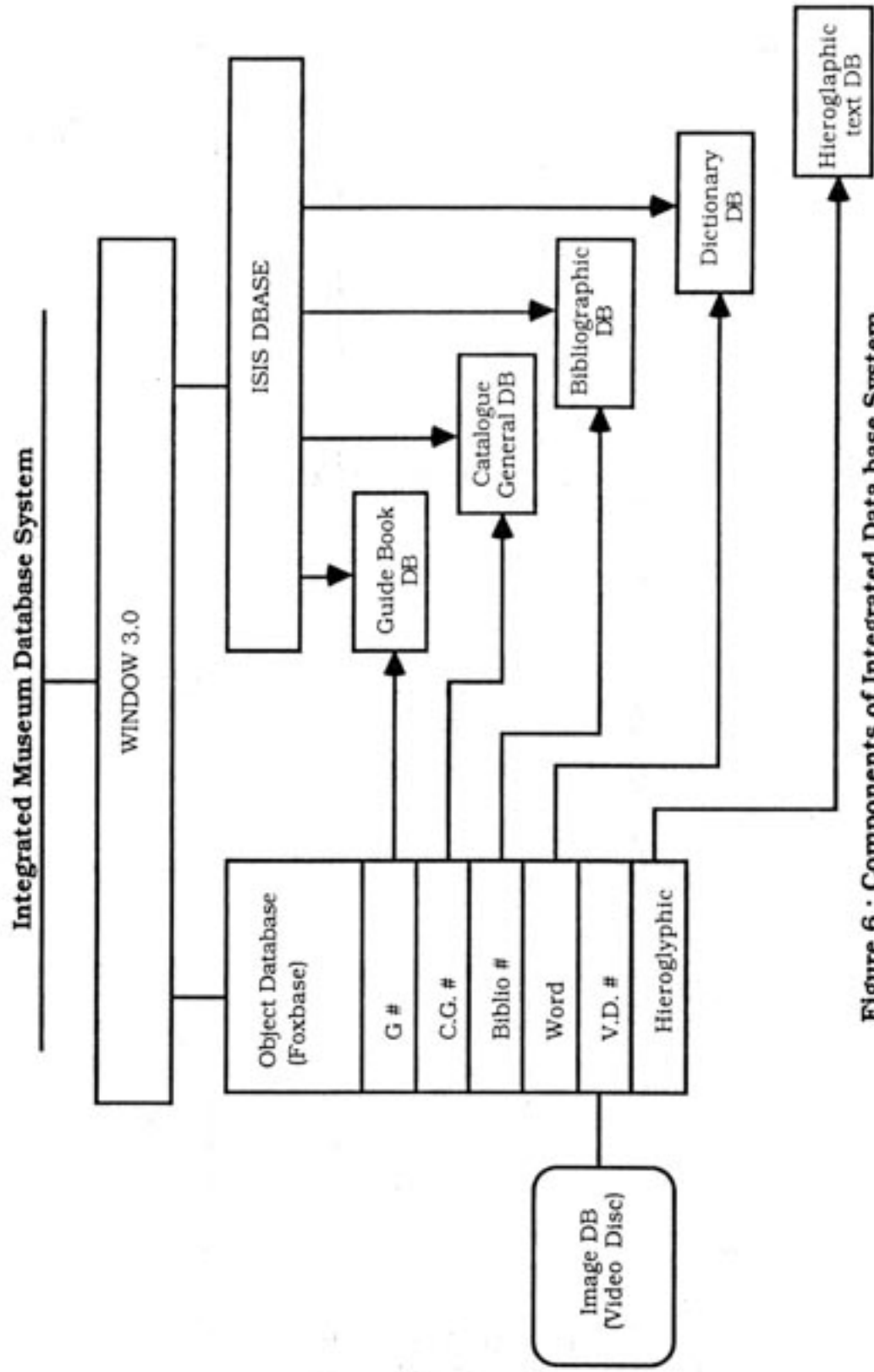

Figure 6 : Components of Integrated Data base System

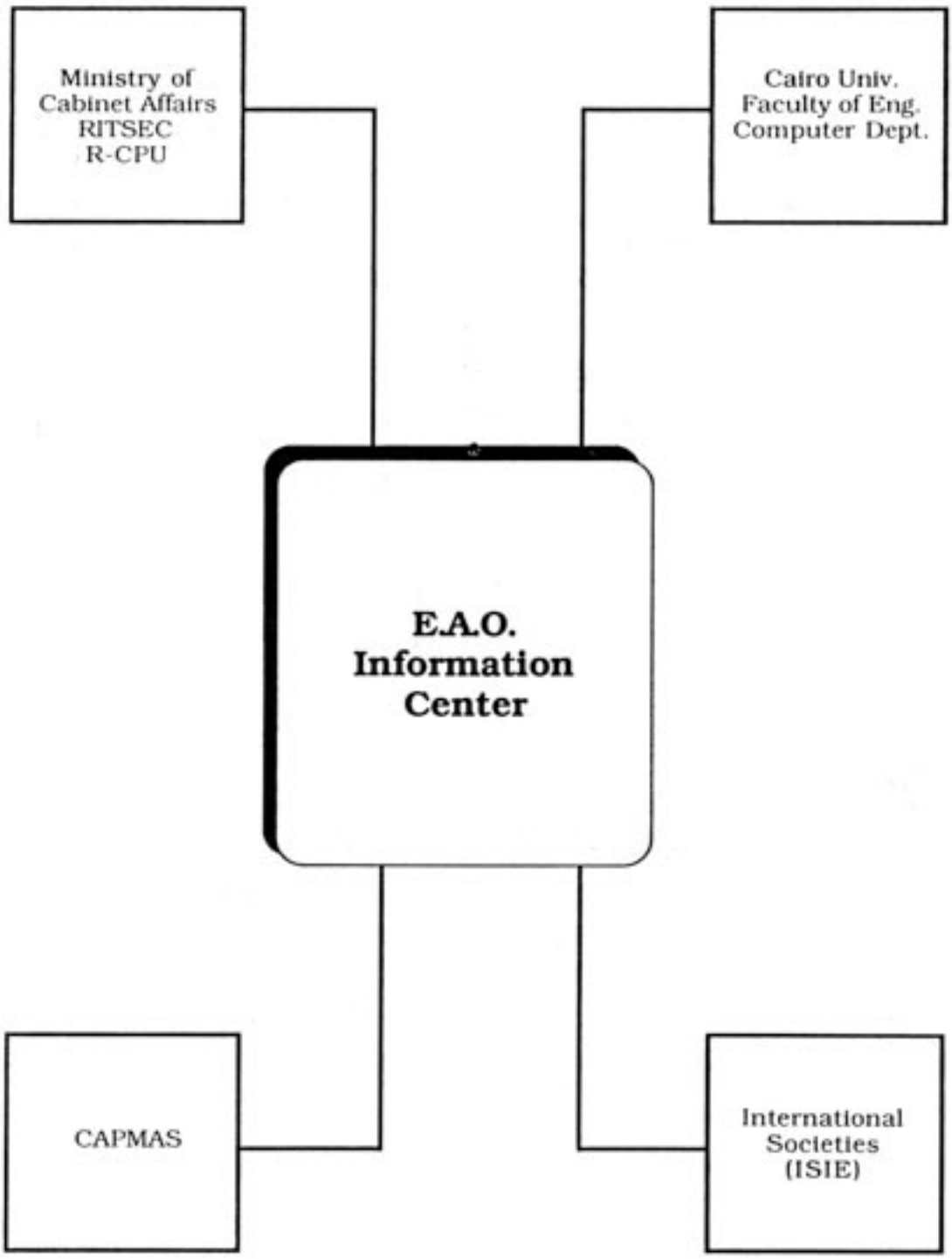

Figure 7. Organization Cooperating with E.A.O. for System Development