Goa: Educational Institutions Through the Ages

Edited by

S. K. Mhamai
Director

Directorate of Archives and Archaeology
Government of Goa
Panaji - Goa
2002

Price: Rs. 200/-

Published by :

S. K. Mhamai,
Director
Directorate of Archives and Archaeology,
Government of Goa,
Rua de Ourem
Panaji - Goa 403 - 001

Modern Technology For 21st Century Archives

Archana Kakodkar

Fernando Pessoa, the greatest Portuguese poet after Camões, says in his most popular poems "*Mensagem*" that a part of their soul was left in every place the Portuguese discovered. The pieces of their soul are spread from Brazil to Malacca, Macau to Japan and Africa, and India is no exception to this. It will not be an exaggeration if one said that they have left the biggest piece of their soul in Goa, in the form of the Goa Archives, for they stayed longest in Goa till 1961. The richness of Goa is described by many international and national historians. The recent scholar to join them is Dr. Jose Blanco, trustee of Gulbenkian Foundation and authority on Pessoa[1]. He says that the archives in Goa are rich and special because the material which exists in Goa is original[2]. Portuguese colonizers have also done us a favour by not transferring their archival records to their native land, when they left, like the British, French colonizers[3]. According to Dr. P. P. Shirodkar, Director of Archives, Archaeology and Museum, today it consists of 20,000 record books left by the Portuguese, Centralise call collection totals to about 2.10 lakhs record books and files, and more than 2 lakhs are still awaiting accommodation[4]. This is the result of information explosion. The standard library methods of information transfer are incapable of handling such large archives and serving users effectively. We are forced to turn to new technology for effective functioning. This paper intends to acquaint the readers with the following technological evolutions that have revolutionized the functioning of the modern archives. They are :

Digital Imaging Technology,
Machine Translation Software,
Modern Security Systems.

Digital Imaging Technology :

Electronic-skywriting is the fourth revolution in the history of communication. The first three being, speech, script, and printing. The convergence of computer and communication technologies has linked the human minds, human records worldwide, and a continuous dialogue is now possible cutting across the physical barriers[5]. Digital technology has given birth to digital libraries. Digital libraries is the only answer in sight today for the information explosion of textual databases. The best example is DIALOG DATABASE. The information stored in this textual database is so large and to transfer 1.5 terabyte of data you need 7,50,000 home computers, 1200 baud modems to work 24 hours for 375 years[6]. Thus textual databases do not serve the purpose of compact storage and transmission effectively. Therefore, modern scene is to digitise the information, that is to make it more compact. Besides, this digital technology is able to handle other elements such as sound, graphics, pictures, colour etc. This is a wider advantage of going digital. Networks such as INTERNET, INFLIBNET, ERNET etc. are the outcome of digital boom. Archives collections consist of primary documents (texts), in analog form, maps and photographs in image form and sound formats (records, videos) etc. This means information is in text, voice and video. Image formation stored in these analog formats could not be processed easily, and this led to the birth of magnetic and optical media. Modern information systems are how able to represent the information electronically (as digital signals) and to manipulate automatically at high

speed[7]. Such information represented digitally, in two states, or binary form is often referred to as DIGITAL INFORMATION. Magnetic tapes (serial access), magnetic disks (direct access), and optical disks form the basic recording and storage media in digital forms. The capture of data for electronic storage and digital processing is accomplished by manual (keyboard) and automatic (image processing) techniques. Interestingly two thirds of the information cannot be digitised by keyboard transcription as they contain signatures, drawings, images etc. or because keying-in would be highly uneconomical. Hence imaging process becomes the primary mode of converting analog image data into computer readable digital format.

An Image Database :

An image database (fig.1) becomes the near perfect replacement for traditional methods of access, which require the handling of original archival materials. Digitizing often becomes challenging as the materials such as coins, stamps vary in size and resolution. But the images have to be recorded on a single standard format. Image retrieval could be achieved through screen display, printout, CD-ROM edition, file export etc.[8]. Image capture and processing involves high resolution scanning cameras. Even though the principle of digital imaging is a decade old, digital cameras have emerged stronger only recently. Some of the leading cameras and their special features are given in **table number 1**.

The widespread deployment of digital technology is due to parallel advancement in software which allows the technology to be used by a person other than a computer expert. To bring up the picture on the monitor and to manipulate (cut, crop, reduce, brighten, sotten

diffuse, twist, emboss etc.) a host of software packages such as photoplus, photo finish, Image assistant are available. These softwares do all these things in seconds that would have taken hours in the conventional wet process. This aspect is considered as the real strength of digital imaging[9]. **Fig. 2**

Merits and Limitations of Digital Imaging Technology :

Compared to the analog form of graphic representation, digital imaging stands out as a wonder tool in the hands of the information technologists due to the following merits. Digital reconstruction of faded manuscripts, maps, photographs and other library materials of archival value is much easier. It has the capability to integrate different forms of data into new forms of representation. it permits direct and exact controls of numerous parameters, right on the monitor. It produces detailed image information for immediate utilization. With 1 to 3 million pixel CCD (charged couple devices) digital cameras provide high quality pictures.

Digital imaging is not without limitations. As a newly emerging field, it is facing new challenges. The extent of usage of digital databases depends on the power of cataloguing, indexing system which is still a concern. The reformatting projects in the archives currently involve high cost and labour. It is inhibited by cost, performance, user experience and supportive system[10]. This new media as represented in Fig.2 is the means of representation and communication of information using the forthcoming digital infrastructure. It allows interactive multipoint communication in which computer, telecom libraries and archives tend to be integrated. This convergence is obvi-

ously catalysed by the advancement in Imaging Science Technology (IST)[11]. Some of the important archival projects which are undertaken by UK academic campuses are described below.

Celtic and Medieval Manuscripts:

This is a one year pilot project with four year continuation supported by Higher Education Funding Council (HEFCE). 44 rare and fragile manuscripts (c.16,000 folios) from the Bodleian, Jesus College and Corpus Christi College are being digitalized using digital imaging technology. The compressed files will be made available via the WWW with thumbnail images and descriptive cataloguing derived from existing printed sources. The continuation project comprises medieval manuscripts each from six Oxford Colleges. Both these projects are based on a model of a high resolution, peripatetic digitization service to libraries using good conservation handling methods in which image capture equipment is transported to the manuscripts rather than manuscripts to the equipment[12].

Beazley Archive Project :

The Beazley archive is an outstanding collection of some 5000 photographs of Greek vases with associated text records owned by the Faculty of Litrae Humaniores. This will be linked to the existing database of 55,000 text records which has been available for many years. More recently project RAMA (Remote Access to Museum Artefacts), which is a part of the European Union's DG XIII RACE Telecommunication Programme, has created 12,000 photographic images from the Beazley Archive[13]. Access to both these archival manuscripts will be possible through Goa University's INTERNET connection.

Machine Translation Software :

Never before in history has there been a more urgent need to topple the linguistic barriers that divide the people of the world, that keeps many aspects of human history buried in old documents. Recent advancements in machine translation software has solved this problem. Now you can translate any foreign or Indian language into any desired language (standardized language). It consists of three parts. Input text, the translation programme, the permanent residence knowledge source i.e. DICTIONARY. Dictionary is a file of records containing the words and phrases of the source language against which the input text must match. It also includes the set of rules that are fired at various points in the translation process. Finally many systems store a bank of information about the concepts invoked by the dictionary[14]. Dictionary contains several thousand words, each word record holds formalized representation of information about how the word functions, fitted with index residing in memory[15]. This is a boon to the researcher who otherwise has to wait for getting material translated from a reputed agency or a translator which was time consuming as well as expensive[16]. Digital boom has come to the rescue of the pictorial languages like Japanese, Chinese and others. Many databases offer information other than English, for example a researcher may be looking for a legal decision of the Chinese Government pertaining to opium trade in Portuguese archives, or a Japanese trade ban on some export items, or one can upgrade his knowledge of Dutch language[17]. You can tap machine translation from your desktop too. It has several advantages. For example, you can use OCR (Optical character Recognition), CD - ROM and internal modems and faxes to capture text and graphics, download databases and exchange electronic files with archives and libraries anywhere in the world.

The cost of converting the input into the electronic file may be prohibitive and the use of OCR in combination with automatic processing and human monitoring might not make enough of a difference to warrant the introduction of machine translation. However, what is making a machine translation more feasible for information gathering purpose is the widespread availability of that in digital form. Machine translations will help in the formation of global information village and in turn global archival access[18].

Modern Security Systems :

Securing archives and museums have become very easy with the help of modern technological devices. The days of the chowkidar seem to be numbered, as the security for libraries, archives, museums, offices and homes becomes increasingly hi-tec, and gadgets flood the market. Technology has taken care of practically every movement within a library or an archive with computer keeping tabs on what gets in when and where, along with automation of various systems leading to virtual redunding of manpower, thereby leaving no scope for human error or negligence. The concept of electronic security is nascent in India. The electornic gadgetry for security falls broadly into three categories- burglar and fire alarm system, access control system, and surveillance system. Globalization and modernisation has brought with them an indisputable need for security. Foreign security brands like Radionics and Sentrol of the U.S. and Crow of Israel are the market leaders[19]. Radionics which is currently sold in India, is a pioneer in microprocessor brand, technological control panels, and fire and burglary management systems. Sentrol is the system currently used to guard the White House, and many other important

places. This system specialises in glass break sensors, smoke and heat detectors, and fire panels. The remarkable aspect of this gadget is the central management system. The gadget monitors all the installations round the clock. This will cost anything between Rs. 3,000 to Rs. 20,000 depending upon the needs of the user[20]. Modernization of archives will create the need for fullproof security.

Now let us see whether the application of modern technologies to 21st century archives is a boon or ben? The information age might seem a bonanza for the Archivist, but in some way storing and indexing has become more difficult. Paper lasted for centuries, filing cabinets could be accessed by anyone able to read. New media come and go in quick succession and storing whatever was recorded on them presents a range of problems. Computer innovation is gathering pace, but today's disks, audios and videos have a maximum life of 20 years, and are very easy to damage. Storage now means just more than filing, it requires recopying too. As one system replaces another (six months time is generally given for new invention), spare parts, repairs are difficult to do, even original manufacturers disappear from the market and close shop. Searching data requires computer knowledge and programming mastery[21].

New Type of Information to Flood The Archives:

The recent Court decision in U.S.A. has instructed the American Government to save e-mail between officials. Soon we will also be saving the same in our archives. This is all right now but if e-mail goes from simple mail to video, data will be enormous. We will face quantitative and qualitative problems[22]. Though the current

generation of digital records has a unique historical significance, writes Jeff Rothenberg, a senior computer scientist in the social policy department of the Rand Corporation of Santa Monica, California, these documents are far more fragile than paper, placing the documents of this period in danger. If valuable information is stored in floppy disks, CD-ROMs or other digital media for future use, the author warns that the changes in hardware and software technology can make these digital documents unreadable. To prevent digital documents being lost, it is essential to preserve their bit streams. That means copying the bits into new forms of media to ensure their accessibility. He says prudent steps taken now, can guarantee that todays records will still be accessible in the future[23]. Dreamy technologists dismiss these problems as teething problems. They foresee a fully digital world where everything can be copied perfectly and data will flow within formats without a hitch, housed in storage media of unimaginable density[24].

Historians of the future will find much to say about the fact that the most thoroughly recorded years in the history of humanity ended up among the least well preserved. If that is, they can find evidence with which to back the claim up.

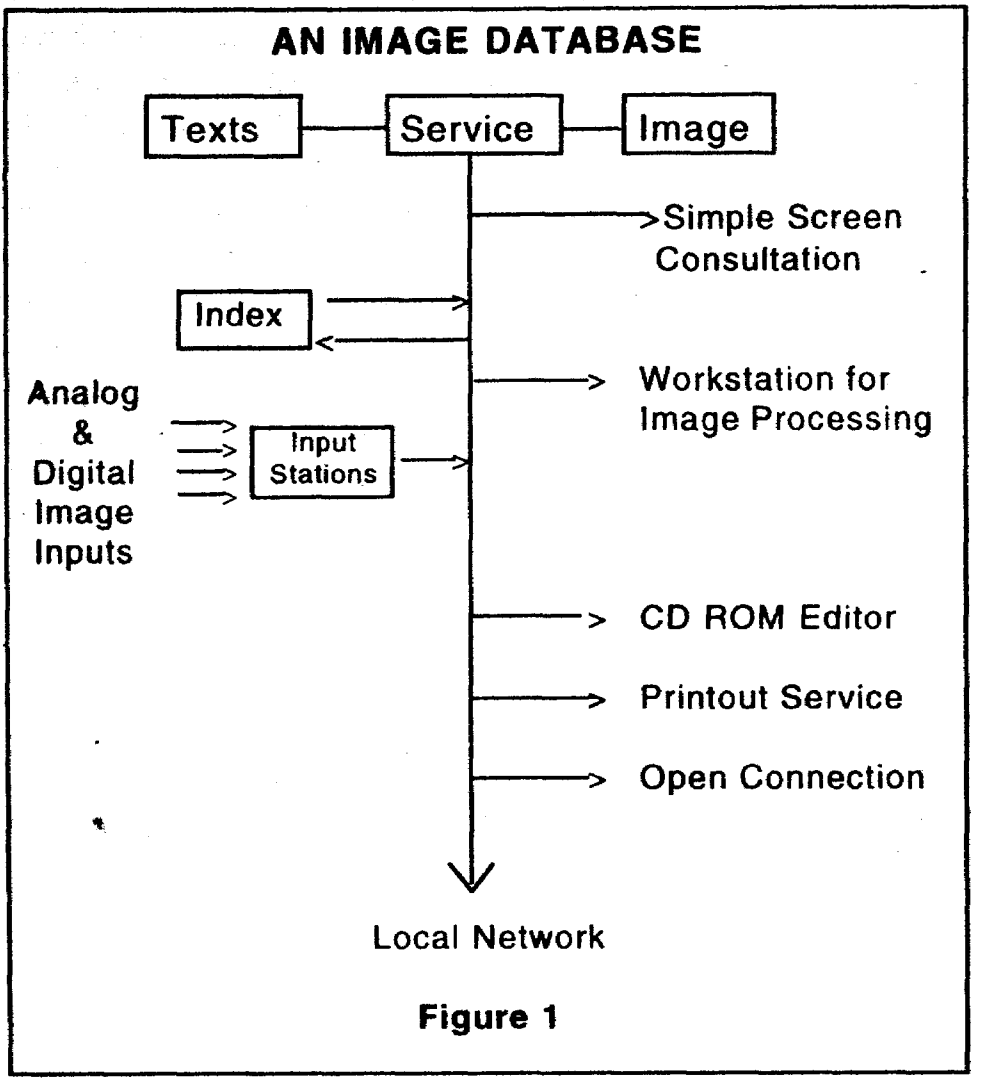
AN IMAGE DATABASE
Texts
Service
Image
Simple Screen Consultation
Index
Workstation for Image Processing
Analog & Digital Image Inputs
Input Stations
CD ROM Editor
Printout Service
Open Connection
Local Network

Figure 1

TABLE - 1
Some leading cameras and their special features

Popular digital cameras

Make/Model	Features
CASIO QC- 10	On board memory for 95 shots.
KODAC DCS 420 C	Picture stored on computer chips. Can take 48 shots. Cost $8,000. Camera with NIKON SLR. Image can be directly sent to the printer.
NIKON E-2	Imaging censor with 1.3 million pixels. Sharp pictures. Cost $1,000.
SONY	3 chips action camera.
SINAR E/Leaf 493.62	Large format, heavy duty and multiple operations.
RICOH DC-1	Can record sound also. Detachable LCD screen for instant playback. Cost $2,000.
APPLE Quick Take 150	Stores 32 Std a 16 high resolution pictures can download on to MAC or IBM PC's. Cost$1,000.

NEW MEDIA IN THE FUTURE DIGITAL INFORMATION INFRASTRUCTURE

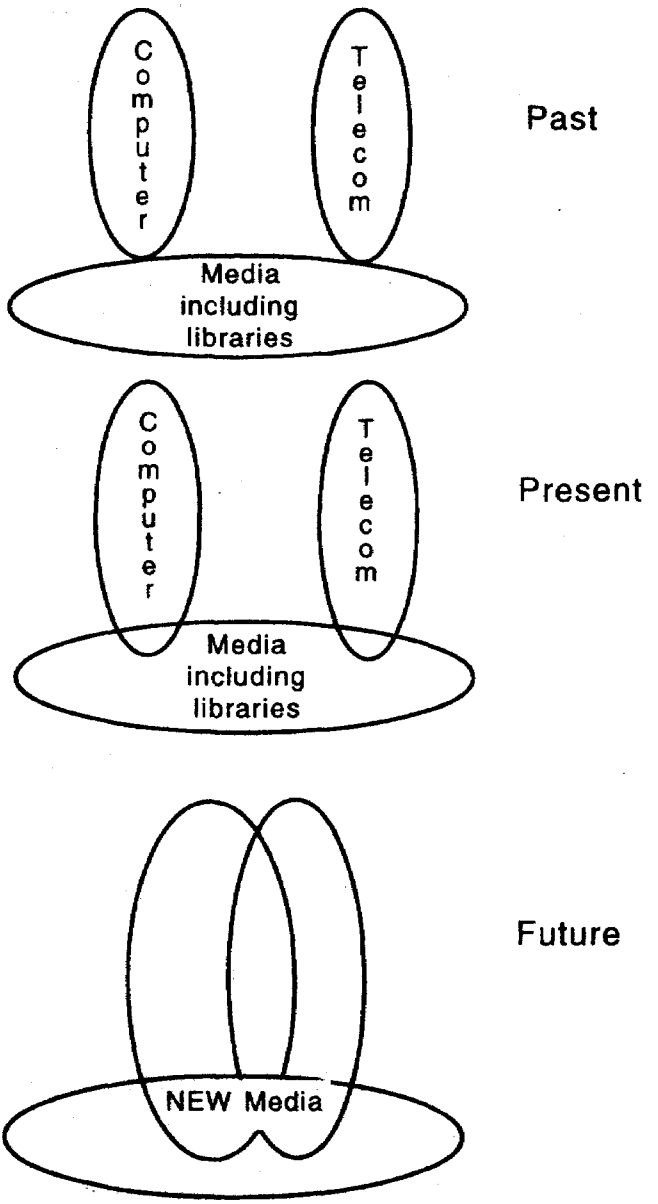

Figure 2

References

1. Blanco, Jose. Interview, Financial Express, 4th February 1996.
2. Op,cit.
*3. Krishnamurty, B, A comparative study on the archives of Goa and Pondicherry under colonial and Post colonial Era, Paper presented at 10th Seminar on History of Goa, 22-24 Feb. 1996.
4. Shirodkar, P.P., Archives in the 21st century: New Trends, New Challenges, Paper presented at Ref. No. 3
5. Singh, J. and Kalra, H.P.S, Digital Libraries : New Mechanism for Horizontal and vertical integration of information, in N. M. Malwad and others...Eds. Digital Libraries: Dynamic Store House of Digitized Information, New Delhi, New Age International Pubs., 1996, pp. 41-50
6. Kakodkar, Archana, Entering a New Civilization: Digital Libraries and its Social impact, In Ref. No. 5. pp 119-129.
7. Prakash, B.P. Digital Imaging : Technology, Trends and Impact on Libraries, Ref. No. 5. pp. 52-61.
8. Op.cit.
9. Op.cit.
10. Op.cit.
11. Op.cit.
12. Price, David J., The Digital Library on Campus : A Perspective from UK academic Environment in UK, Paper presented at SIS 96, Conference, Bangalore.18-20 Jan. 1996
13. Op.cit.
14. Kakodkar, Archana, Ref. No. 6
15. Byte, January 1993, pp. 156-185.
16. Op.cit.

17. Op.cit.
18. Op.cit.
19. Op.cit.
20. Kakodkar, Archana, Ref. No. 6
21. Financial Express, 10th January 1996, Securing for the Future.
22. Op.cit.
23. Op.cit.
24. Store Wars, The Economist, London, Sept. 18, 1993.
25. Rothenberg, Jeff, Ensuring the Longevity of Digital Documents, Scientific American, Jan. 1995. pp. 42-47.
26. Kakodkar, Archana, Ref. No. 6

Reference Bibliography.

1. Blanco, Jose, Goa Archives, Interview, Financial Express, 4th Feb.1996.
2. Op.cit.
3. See * above.