

# Impact of Digital Heritage and Heritage Computing

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(Received 27 November 2018; Revised 20 December 2018; Accepted 18 January 2019; Available online 24 January 2019)

**Abstract** - Heritage Computing is a conception developed to preserve and nurture India's rich heritage mirrored in various ancient literary works, scientific discoveries etc. written in various scripts. Through Digital medium using computers, Heritage Computing keeps this ancient works alive and available to all in most conducive manner. Heritage Computing is of great importance in country like India where multi-lingual people belonging to different religions live together with diversified cultures. India, to its credit has 22 scheduled languages, heritage & classical languages along with eight hundred widely used dialects, each of these are imbued with values. Hence preserving and passing on to future generation is a necessary.

**Keywords:** Digital Heritage, Heritage Computing, JATAN, C-DAC, C-Vyasa, PandulipiSamshodhaka

## I. INTRODUCTION

Heritage Computing and Digital Heritage is the need of an hour for the heritage-rich country like India. The "Digital India" campaign aims to equip every citizen of the nation to utilise digital medium at par with developed countries. But it is also crucial that, digitised society may deteriorate the cultural and heritage roots of our country. To prevent this, the umbrella of "Digital India" has extended itself with an initiative of Heritage Computing through Digital Heritage. Over the last 25 years, C-DAC (Centre for Development of Advanced Computing)[1] has been pursuing pioneering research in Language Technology and Heritage Computing. C-DAC an organization in India, involved in standardization and representation of heritage scripts such as Grantha, Vedic, Samavedic, modi, etc.

## II. OBJECTIVES OF DIGITAL HERITAGE AND HERITAGE COMPUTING

1. The ancient epics, literary works are multi-lingual. These are preserved in Museums and various heritage centres. These scripts are used worldwide by the students of Archaeology, Philosophy and for various artefacts. Hence conserving and converting them into digital data is most needed.
2. Standardization and representation of heritage scripts such as Grantha, Vedic, SamaVedic, Modietc, in their own texts but in digital format, to facilitate Indian students, as 90% of Indians are well-versed with native language than English.
3. Representation of heritage scripts in English to facilitate international students.

## III. HOW DIGITAL HERITAGE AND HERITAGE COMPUTING IS ACHIEVED

The following processing tools are used to accomplish the objectives:

### A. C-Vyasa

C-Vyasa Sanskrit authoring system is a word-processor for writing articles in Sanskrit. This tool has utilities like sorting, searching, indexing and file-conversion. The tool has links to all Vidyasthanas[2]. Veda Ratnakara, a comprehensive package covering Rig-Veda, YajurVeda, and SamaVeda. C-Vyasa is developed with facilities to browse, search and retrieve details for Samhita, Brahmana, Aranyaka, Upanishad, Kramapatha, Padapatha etc. The C-Vyasatool can also be used to type information in rare Indian scripts.



Fig. 1 On-screen keyboard to assist typing vedic accents for Rig-veda, Yajur-veda, Samaveda etc.

### B. PandulipiSamshodhaka

PandulipiSamshodhakais manuscript processing software. This tool is useful to scholars in preserving, processing and analysing the manuscripts. This tool is augmented with the software to perform manuscript image processing. This software can also be used to create catalogue of manuscripts, and also content creation for manuscript images. PandulipiSamshodhaka supports both ISCII and Unicode based storage. Support to Vedic accents and Grantha script is provided with the software.



Fig. 2 Image of PandulipiSamshodhaka

The above two tools also involve developing CD for RSKs to assist learning Sanskrit through Computer. C-Vyasa&PandulipiSamshodhakatools can also be used in the development of Analytical Tools for large scientific knowledge-base in Grid Computing Environment.

#### IV. APPLICATIONS OF DIGITAL HERITAGE AND HERITAGE COMPUTING

##### A. JATAN - Virtual Museum Builder

“Jatan” stands for Preservation and Nurture. Here, the antiquities of museum are preserved and nurtured in digital way. [1] Virtual Museum Builder is presently deployed at 10 national museums and around 15 state museums.

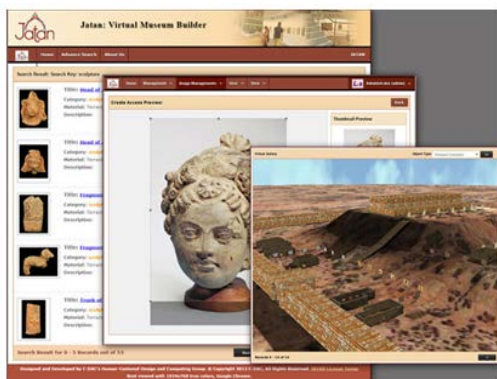


Fig.3 JATAN- Virtual Museum View

“Jatan” - This Virtual museum helps in digital preservation and providing online access to heritage information resources for various purposes like education, research and tourism...etc. This enables the museum antiquities to access online for the benefit of tourists, teachers, students and researchers. Museum antiquities can provide information about history of the civilization, lifestyle, culture, traditions, ancient knowledge of science and technology and overall human evolution. A virtual museum involves following major activities:

1. Metadata description and linking of digital contents

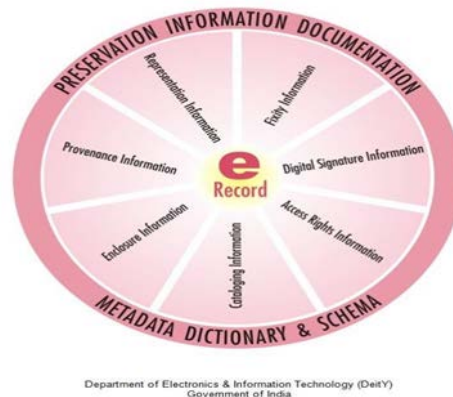
2. Providing online access to heritage information resources
3. Access through mobile devices and kiosks

National Repository and Portal for Museums of India is an example of virtual museum which provides online access to ten national museums placed across different geographical locations. These virtual museums are now directly accessible from anywhere. Virtual museums can be linked with school education for providing various learning resources to benefit the students.

#### V. STANDARD FOR PRESERVATION, INFORMATION, DOCUMENTATION (EGOV-PID) OF ELECTRONIC RECORDS

This Egov-PID proposes to store metadata, automatically after the final e-record is created by the e-government system.

Such preservation of information and its documentation is necessary only for those e-records that need to be retained for long durations (e.g. 10 years, 25 years, 50 years and beyond) and the e-records that need to be preserved permanently as per the requirements specified in the ISO 14721 Open Archival Information Systems (OAIS) Reference Model[3].



Department of Electronics & Information Technology (DeitY) Government of India

Fig.4 Department of Electronics & Information Technology DeitY Government of India

#### VI. DIGITAL PRESERVATION – CENTRE OF EXCELLENCE

Centre of Excellence for Digital Preservation at C-DAC [4] has developed digital preservation guidelines and standard for e-governance to ensure that the electronic records are stored in a producible manner. The digital preservation standard has been notified and adopted for all e-governance applications by the Ministry of Communications and Information Technology, Government of India.

##### A. Digital Preservation System For Disposed Cases

Digital Preservation System for disposed cases for courts has been developed and implemented under National Digital Preservation Programme.

### *B. Digital Library of India*

Digital Library is a mission to create a portal for the Digital Library of India which will foster creativity and free access to all human knowledge. As a first step in realizing this mission, it is proposed to create the Digital Library with a free-to-read, searchable collection of one million books, predominantly in Indian languages, available to everyone over the Internet.

C-DAC, has established regional mega scanning centre for digitization of rare and copyright free books of various regions in India including the North-Eastern region. The aim is to create a portal of heritage books and manuscripts for the Digital Library of India, which will foster easy and free access to all human knowledge.

### **VII. DRAWBACKS OF IMPACT OF DIGITAL HERITAGE AND HERITAGE COMPUTING**

Though Digital Heritage and Heritage Computing can preserve many things, still it need to be fine-tuned[5]. Although the languages are preserved by storing them in a digital medium the languages cannot be fully stored in a digital medium as some intricate parts of the script in a language cannot be digitalized, which means that some minute beauty of the language will be left behind and the beauty may slowly decay over time. Though digitized data can be easily retrieved it's a very big task to digitize them. It

needs a lot of time and patience to search for the literary works in the language and also the grammar of the language.

### **VIII. CONCLUSION**

Though Digital Heritage and Heritage Computing can prevent the language from extinction, we as a child of the language should contribute something to our motherlanguage. We could not simply let our mother language die out of insanity, as it is the important duty for us to keep our mother language live. Heritage Computing is a fast growing field in computing. This has grown rapidly in recent years and it is still growing at very fast rate. We are in the 21st century which is going to face the computer revolution or the fourth industrial revolution.

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