

Towards a National Collection: Metadata Aggregation of Digital Cultural Heritage

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The Preserving and promoting cultural values are essential for the sustainable development of the country, which is a complex task. In the past few decades communities have embraced digital technologies to gather, record, and organize their collection in a systematic way to enhance its discoverability which empowers diverse audiences worldwide. Galleries, Libraries, Archives, Museums (GLAMs), cultural organizations, and memory institutions go beyond the physical display and engaged in transforming the online exploration of cultural artifacts and historical archives by harnessing innovative technologies. Cultural content in digitized form is an important resource and providing online access to these resources enhances their visibility, which can in turn contribute to the economic growth of the country. The potential of digital technology can also be utilized for bringing multiple cultural heritage collections together for better visualization and accessibility. However, standards-based and compatible technologies for the digitization process are essential for their uniformity and interoperability so that they can eliminate the challenges associated with discoverability and usage of resources by potential audiences. Cultural heritage aggregators are platforms that can address the difficulties of discoverability in cultural heritage resources by enabling search across multiple cultural heritage collections and improving access to the contents. This study gives an overview of the various Indian initiatives to safeguard the cultural heritage assets of the country, and its major digital initiatives in this direction, and highlights the need for an Indian aggregator platform for a national collection of cultural heritage.

Introduction

The culture, tradition and heritage play a key role in nation building and exceptionally contribute to the socio-economic development. Culture is an identity of a community or a religion and a country as a whole and is a connecting link to the present with its glorious past. They are the valuable symbols of the journey of humanity through millions of years living in the remains of ancient civilizations and their records. Heritage is anything that is considered important enough to be passed on to the future generations. Hence, cultural heritage can be expressed as living entity developed by a community in the past and passed on to next generations (Tuna et al., 2015). It keeps the community attached to their religion, traditions and beliefs and is one of the key measures that provide a sense of unity. Cultural heritage is the legacy of physical artifacts and intangible attributes of a group or society that is inherited from past generations (Falser 2015). Conservation of cultural heritage contributes significantly to better understand the development of a particular society over time. All its rich and ancient cultural heritage and traditions are to be protected. For effective preservation and conservation, proper planning and development without losing its cultural values is

required. To develop and retain a sustainable national identity the concerned needs to know the value of the cultural stock, the technologies to be used to conserve and the policies and legislations available to safeguard them. Cultural heritage cannot only be considered as an economic asset and a tourist attraction, but also as an asset embedding invaluable knowledge resource, identity factor and a contributor to social cohesion and stability (Copernicus SEA, 2022). Protecting the natural, built and cultural heritage assets of the country inherited from the past and transferring them to future generations is the responsibility of each individual as well as the government. The cultural heritage assets of a nation also is to be used by the people for education, research, creation and recreation.

The potential contribution of cultural heritage to community development throughout the world is evidently huge (Baycan and Girad, 2011). India is a cultural hotspot and is fascinating. The culture of India is unique in the world. India has also lost most of its identity and culture, which is really not a good sign. Hence conserving the existing items of heritage as a common property of the people for the future generations is the responsibility of the present. Government of India (GoI) has initiated many such initiatives in this direction.

Identification, documentation and promotion of cultural heritage has a central role in future strategies of the information society. Digitization efforts by the GLAMs and cultural oriented institutions enable them to showcase the cultural treasures to the public. Digitizing the national collection and making them available through digital platforms will make the collection more accessible, increase public understanding, and thereby allow the collections to be used more widely (Lee, Sean). In India many of the cultural heritage information systems are developed in isolation, maintained by different organizations and they follow different metadata standards. Access, search and utilization of such cultural contents have to be made easy to find, use and share by eliminating the barriers between different collections. It is essential to identify the potential benefits of displaying and providing cultural heritage in a digital medium, allowing for different interactions with physical objects (Murray, 2011). Emergence of digital technologies has disposed many issues that prevent access to cultural heritage contents as an ideal and potential solution. Recent technological developments enable organizations to reach a broad spectrum of people with different backgrounds and to facilitate the contextualization of cultural heritage artifacts in an unprecedented way, thus opening up new horizons in experiencing cultural heritage (Stiller and Petras, 2015). In the context of cultural heritage aggregators act as independent digital libraries and accumulate digital cultural heritage materials from different sources across GLAMs, languages, institutions, domains or disciplines. According to Zygierewicz 'digital cultural heritage' as cultural resources that were created in digital form (for example digital art or animation) or were digitised as a way to preserve them (including text, images, video, and records) (Zygierewicz, 2019).

Cultural heritage collections are a fundamental feature of information organization systems, providing technical capabilities for retrieving and evaluating content within large aggregation (Wickett et. al., 2013). Aggregators work with cultural heritage institutions to offer innovative and customized ways to discover contents. They gather data and make it accessible to the people with an improved and standardized metadata

form. Cultural heritage items are heterogeneous in form hence the work related to its metadata standardization is a complex process. For example, the location of a same cultural heritage item can be different. Aggregator embeds additional information to items they accumulate from different sources to enhance its discoverability by refining the search results. They strive for meaningful and organized representation of the digital contents which are authentic and trustworthy to provide rich search experience to the users. However, some aggregators either cover a single domain or aggregate contents across the domain. Number of records possessed by an aggregator platform is considerably differs from systems. The success of an aggregator platform is measured not in the user collaborator but in the size of its collection. However, the objective and mission of the aggregators can differ from one to other. Hence it is very essential is to develop a cultural heritage aggregator platform to standardize the access to digital cultural heritage of the country aiming towards a national virtual collection.

2. Literature Review

Metadata aggregation is a kind of centralized effort which aggregate the metadata generated by various cultural heritage organizations for their resources to enhance its accessibility. Such aggregators can better enable wider discovery and reuse of the resources. Being the part of aggregator network will considerably reduce the implementation and technical cost and also the effort to bring interoperability. According to Freire et al. (2018) implementation of technological infrastructures for data aggregation have high costs and are particularly demanding on the data providing institutions. There are many such studies and efforts to justify the need for cultural heritage aggregators. Europeana for Europe is one of the largest such cultural heritage metadata platform. The study of Concordia et al. (2010) state that Europeana (The European Cultural Heritage aggregator) is not just another digital portal or library but an application programme interface from which many other uses of the data can be derived. Many researchers have studied on the aggregator aspects of cultural heritage and the characteristics of national portals. Few of such studies are, Wijesundara and et al in their study proposed a metadata model to aggregate CHI which is specific to Sri Lankan cultural heritage materials. (Wijesundara et al., 2016). The study of Pierantoni et al. (2015) on the Digital Repository of Ireland (DRI), the Irish national cultural heritage aggregator states that in many science gateways metadata is generated from the automated analysis of data sets, whilst in the DRI, much of the metadata are manually created by specialised users. Studies indicate that there have been several efforts in different countries to design data portals to integrate digital cultural heritage into a single platform.

3. Objectives

This study gives a general overview of the cultural heritage and its conservation activities in India. Further it examines the need for establishing a central organization to aggregate the contents pertaining to the whole Indian cultural heritage domain for promoting the usage of cultural heritage assets of the country.

The specific objectives of this study are

- i. To provide a general overview of the cultural heritage conservation activities in India
- ii. To compare the activities of select aggregators of international importance

iii. To assess the need for a national digital cultural heritage collection regulated by an aggregator in India

4. Indian Heritage

India holds more than five lakh heritage structures which include the structures protected by Archaeological Survey of India (ASI) (Gireesh Kumar, 2021). In India, as of now (July 2022) only 40 heritage sites are being included in UNESCO's World Heritage List and it consists of 32 cultural, 7 natural and 1 mixed site. Figure 1 represents the state-wise location of each site with their year of inscription in parenthesis.

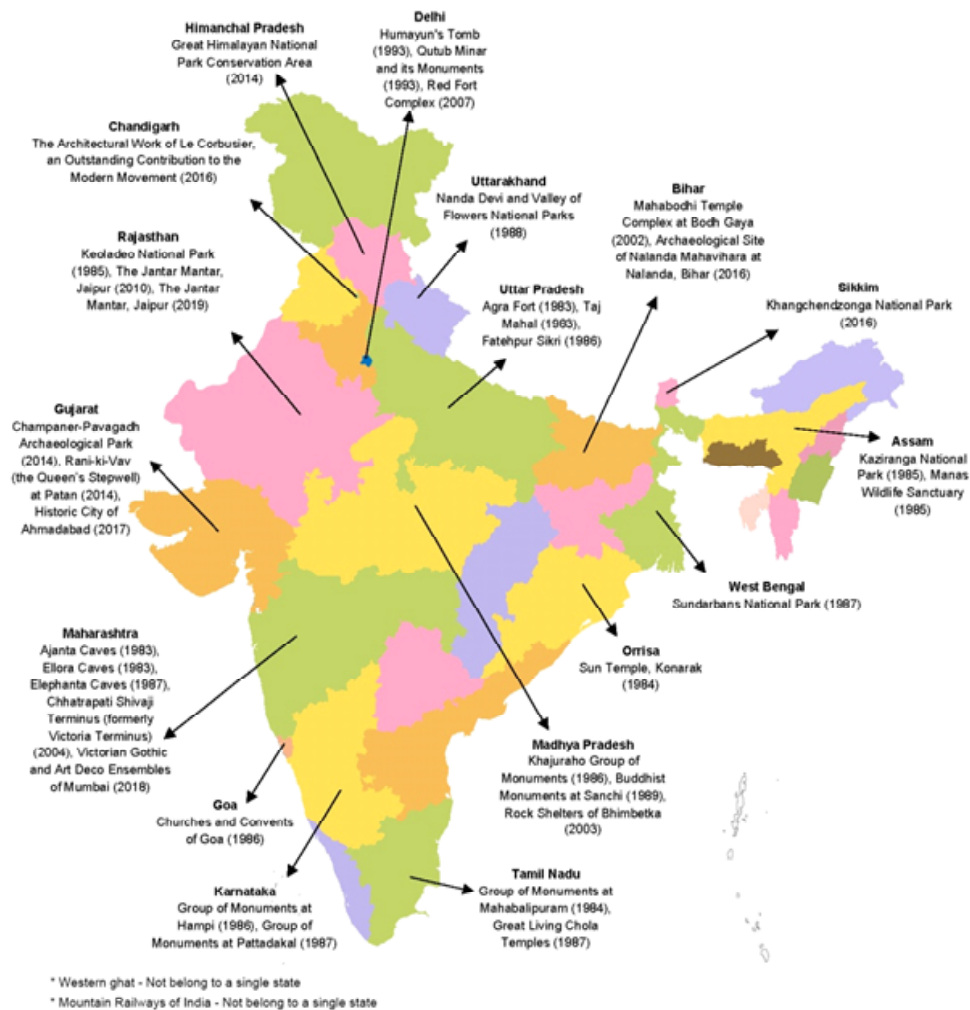


Figure 1: State wise representation of CH in India by UNESCO

Similarly, there are 14 Intangible Cultural Heritage (ICH) elements inscribed by UNESCO in its World Representative Lists of the ICH of Humanity. It includes Kutiyattam, Sanskrit theatre; Tradition of Vedic chanting; Ramlila, the traditional performance of the Ramayana (2008), Ramman, religious festival and ritual theatre of the Garhwal Himalayas, India (2009), Chhau dance; Kalbelia folk songs and dances of Rajasthan; Mudi yettu, ritual theatre and dance drama of Kerala (2010), Buddhist chanting of Ladakh: recitation of sacred Buddhist texts in the trans-Himalayan Ladakh region, Jammu and Kashmir, India (2012), Sankirtana, ritual singing, drumming and dancing of Manipur (2013); Traditional brass and copper craft of utensil making among the Thatheras of Jandiala Guru, Punjab, India (2014), Yoga; Nawrouz, Novruz, Nowrouz, Nowrouz, Nawrouz, Nauruz, Nooruz, Nowruz, Navruz, Nevruz, Nowruz, Navruz (2016), Kumbh Mela (2017) and Durga Puja in Kolkata (2021).

5. Initiatives to protect and preserve the cultural heritage

Indian Government has taken various measures to conserve the cultural heritage and support the documentation processes. It has achieved many outstanding achievements in protecting, preserving and promoting the cultural values. Most noted ones in this direction are as follows. In 1976 National Research Laboratory for Conservation of Cultural Property (NRLC) has been established to preserve and conserve the cultural heritage of the country. In 1996, National Culture Fund (NCF) has been emerged to augment Government's effort in heritage conservation and promotion. Further, to provide a comprehensive list of intangible cultural heritage the national list of intangible cultural heritage is initiated in the year 2003. In order to protect the ICH of the country, it has launched another initiative 'Safeguarding the Intangible Cultural Heritage and Diverse Cultural Traditions of India' in the year 2013. The scheme has now listed more than 100 ICH elements apart from the 13 elements inscribed by UNESCO in its World Representative Lists of the Intangible Cultural Heritage of Humanity. Another scheme initiated by Ministry of Minority Affairs in 2014 is 'Hamari Dharohar' with an objective to preserve rich heritage of minority communities (identified as Christians, Muslims, Buddhists, Sikhs, Parsis and Jains) of the country. One more initiative of GoI named HRIDAY (Heritage City Development & Augmentation Yojana) started in the year 2014 for a period of four years aimed at the holistic development of 12 heritage cities focusing inclusive heritage linked urban developments. In the year 2015, GoI under Ministry of Tourism (MoT) initiated another project with an objective to revitalize the structure including the infrastructural facilities and other amenities of the heritage cities through PRASHAD (Pilgrimage Rejuvenation and Spirituality Augmentation Drive) and identified and selected 12 cities from different states. In 2015, GoI formed the National Institution for Transforming India (NITI Aayog).

In 2017 also MoC launched another project 'National Mission on Cultural Mapping (NMCM) with the objective to preserve the cultural heritage of the country and to build a comprehensive database related to cultural heritage to bring all the cultural activities under one umbrella. Recently the project has been handed over to Indira Gandhi National Centre for Arts (IGNCA), New Delhi. In the same year with an envision to

develop the tourism amenities at heritage sites, GoI sets a collaborative effort of MoC, MoT, ASI along with the States and Union Territories known as 'Adopt a Heritage: Apni Dharohar, Apni Pehchaan'. The project aimed to encourage the public and private sector companies and firms including the individuals to adopt, develop and maintain the select heritage and monuments including tourist's sites across the country. Selection of the sites and monuments are based on its tourism scope in terms of tourist's footfalls and visibility, and the firms adopt the scheme is known as 'Monument Mitras'. Ministry of Science and Technology launched another programme in the same year 'Science and Heritage Research Initiative (SHRI)' to strengthen and promote scientific research and development activities and knowledge preservation pertaining to heritage objects.

Many libraries of national importance are also involved in digitization and documentation of cultural heritage resources such as National Library of India, Nehru Memorial Museum and Library (NMML), Khuda Baksha Oriental Public Library, Asiatic Society Mumbai, Connemara Public Library, Rampur Raza Library, National Manuscript Library, etc. are also involved. There are many organizations, institutions, and agencies under various central, state and local governments, NGOs, private trusts, and owners involved in managing heritage inheritances across the country and advocating on behalf of the issues associated with cultural heritage. Non-Profit Organizations are also actively become part of cultural heritage protection. National Folklore Support Centre (NFSC), Tribal Cultural Society, India Lost and Found Foundation (ILF), Indian Trust for Rural Heritage and Development (ITRHD), Tamil Nadu Rural Art Development Centre, Development and Research Organization for Nature, Arts and Heritage (DRONAH), Rupayan Sansthan (Rajasthan Institute of Folklore), Folkland-International Centre for Folklore and Culture, Indigenous Cultural Society are few among them.

The other non-governmental agencies like Tribal Cultural Society, Tamil Nadu Rural Art Development Centre, National Folklore Support Centre (NFSC), Agriculture, Dairying, Industries, Tree Plantation, Handicrafts, Handlooms and Horticulture and the Integration (ADITHI), Assam Sahitya Sabha, India Lost and Found Foundation (ILF), Open Heritage Foundation (OHF), Development and Research Organization for Nature, Arts and Heritage (DRONAH), Indigenous Cultural Society, Folkland-International Centre for Folklore and Culture, Indian Trust for Rural Heritage and Development (ITRHD), Rupayan Sansthan (Rajasthan Institute of Folklore) etc., are also working towards creating awareness and showcasing the efforts to conserve India's cultural heritage.

Sangeet Natak Academi (SNA), Kalakshetra Foundation (KF), National School of Drama, Sahitya Academi (SA), Nava Nalanda Mahavihara, Adivasi Lok Kala Academy, APCEIU (The Asia Pacific Centre of Education for International Understanding), Asia-Pacific Cultural Centre for UNESCO (ACCU) are few among them which continuously promote conservation of tangible and intangible cultural heritage of the country. Organizations such as Bharat Kala Bhawan, Varanasi; Archaeological Museum, Sarnath, Conservation Laboratory, Pune, International Council on Monuments and Sites (ICOMOS), National Museum, New Delhi; Indian Heritage Society (HIS), Mumbai, Databank on Indian Art and Culture and the Gandhi Theerth,

Jalgaon, National Handicrafts and Handlooms Museum(Crafts Museum) etc., perform digitization and digital preservation to document the cultural heritage. The Indian National Trust for Art and Cultural Heritage (INTACH) is India’s largest non-profit membership organization dedicated to Heritage conservation.

6. Digital Initiatives to Conserve Cultural Heritage

Preserving the cultural heritage assets of a country is conserving the authorities record to prove the contributions made by a particular country to its human civilization. Loss of such records and items are loss to the civilization. There are many cultural heritage institutions, archives, museums and libraries in India which conserve and preserve the cultural heritage materials in both physical and digital form. In India, several initiatives of the Government started in this direction. India has diverse and unique identity considering its cultural community and heritage and we believe in the value of it. There are many cultural heritage project initiatives handled by individuals, institutions, GLAMs and memory institutions in India. Table 1 represents some of the major efforts by GoI in documenting the cultural heritage of the country.

Table 1: List of selected cultural heritage portals, GoI.

| Portal | URL |
|--|---|
| Museums of India | https://museumsfindia.gov.in/ |
| Indian Culture | https://indianculture.gov.in/ |
| National Digital Library of India | https://ndl.iitkgp.ac.in/ |
| “Must See” Indian Heritage | https://asimustsee.nic.in/ |
| National Gallery of Modern Arts | http://ngmaindia.gov.in/ |
| National Mission on Cultural Mapping | https://www.culturemap.in/ |
| Indira Gandhi National Centre for the Arts | https://ignca.gov.in/ |
| Incredible India | https://www.incredibleindia.org/ |
| National Mission for Manuscripts | https://www.namami.gov.in/ |
| National Archives of India | http://nationalarchives.nic.in/ |
| National Museum Institute of Art History, Conservation and Museology | http://nmi.gov.in/ |

Non-Government Organizations (NGOs) like INTACH, Birla Academy of Arts and Culture, The Arts and Cultural Heritage Trust (TAACHT), The Museum and Arts Consultancy (MAC), Aga Khan Heritage Trust etc., are also involved in the heritage conservation process. National Virtual Library of India (NVL) is another project of GoI under MoC that started with an objective to pool the information of the entire Indian cultural heritage in the digital platform and provide them single window access.

7. Digital Cultural Heritage of India-Challenges and Opportunities

Digital access to cultural heritage to be provided in a relevant and meaningful way to enhance its discoverability and to retain its sustainability. The presentation of digital objects by cultural heritage institutions on their respective web platforms is a great opportunity to showcase resources, facilitate access for researchers, and engage with new audiences (Raemye, 2020). However, the lack of coordination between such different online collections and catalogues is becoming a major barrier to get access to the cultural heritage resources to the researchers as well as the public. Coordination of digitisation between institutions and the various cultural domains leads to reunification of dispersed collections or the linking of seemingly disconnected documents and artefacts (Commission of the European Communities, 2008). Also, the lack of a centralized mechanism to aggregate and ingest data from the diverse repositories keeps them isolated and less discoverable to the general public. The catalogues maintained by them are largely unstructured. There was no such effort to bring all such specific collections created for conserving the cultural heritage together as one collection and provide unlimited access to the public. Also, there is no integrated information system pertaining to any of the cultural sites in India at a large level. Studies indicate that no comprehensive attempt to use information and communication technologies to document and manage the data on Indian heritages with focus on attracting international interest (Gireesh Kumar and Raman, 2022). There is a need to develop a reliable information system to support researchers, administrators and concerned departments and organization that will be involved in conservation of the heritage of the region. Such system will also serve as a unique source for researchers on different disciplines. National record-holding institutions have to contribute and support the initiatives. Any such stand-alone databases need to be linked and any such scattered records also need to be linked up. However, its accessibility, inclusivity and sustainability are to be ensured.

8. Need for Cultural Heritage Aggregators

India as a country with rich cultural heritage treasures need to have an aggregator platform to provide the cultural heritage resources in a systematic and customized way with a single access point. A national scale aggregator platform is essential to pool all the cultural content scattered across the various memory institutions in a standardized form to provide single access point. Such aggregators can better enable wider discovery and reuse of the resources by applying practices and technologies that cannot be applied sustainably at the level of each digital collection (Freire et al., 2020). The aggregators have to work with the cultural organizations and GLAMs, communities and individuals to aggregate their metadata. Aggregators act as a single cultural information space for gathering and making available the digital cultural stock produced by different cultural organizations and GLAMs. Aggregators have to develop their own independent infrastructure to execute the services and their functions should not be limited only as an aggregator but also to follow best practices to accomplish metadata standardization, customization with an incredibly enhanced content search and discovery facilities with multilingual support. Also, they have to provide a better user experience to interact with the contents and to promote its use. Aggregators have to collect the associated metadata, follow

international standards and provide access with latest technologies. Discoverability of cultural heritage resources is typically addressed by forming networks, where a central organization provides search and access services based on collecting the metadata associated with these resources (Freire et al., 2020). aggregator provides a single window platform to search all things and connect to reliable digital collections from all the content partners. The content providers have to be willing to share their metadata records, however the digital object remains held with the data partner. The contents can be videos, audio recordings, newspapers, maps, photographs, artworks, news reports etc. They also have to offer advice and support in the digitization process, licensing, accessibility etc. They are catalyst for digital transformation across the GLAM and cultural heritage institutions. The aggregator platform has to make the country's cultural heritage accessible to the world by aggregating the metadata of the cultural heritage contents. There should be a multilingual search facility, as well as scattered digital cultural heritage contents with semantic tagging (Gireesh Kumar, 2022). In India, absence of such a national virtual platform aggregating all the cultural heritage metadata from various sources keep the digital heritage resources isolated and reduce its discoverability and usage at large. According to the statement of Freire et al., several technological solutions from the Web are available and they look promising for simplifying the implementation of the metadata aggregation scenario in cultural heritage (Freire et al., 2017).

8.1 Digitization Standards

A digitization process requires series of planning and execution activities. Decision on creating a new digital content or digitizing the existing material is the primary step towards a digitization process. Digitization standards are to be followed. Metadata enable a database rich in its functionalities and retrieval process. Different institutions use different metadata standards for holding the digital heritage. The efficiency of discovery of digital objects is depends on the quality metadata incorporated with the system. Consistency, semantic accuracy, syntactic validity, completeness, accessibility, conformity, auditability, accuracy, appropriateness, interlink, interoperability, clarity, scalability, comprehensiveness are the factors determines the richness of the metadata. However, the metadata should ideally be provided in one of the international archival standard formats. Visual Resources Association's Core Categories for Visual Resources (VRA Core), Categories for the Description of Works of Art (CDWA), The Making of America II (MOA2), Dublin Core Metadata Element Set (DC) (Wang, 2020) are some of the metadata standards used in the cultural heritage domain. Indian cultural heritage contains a vast and extensive collection of both tangible and intangible inheritances. Hence a suitable metadata schema is required ensure any data loss. However, if particular data providers do not adopt the standard in their digital cultural portal, then the aggregators can perform the standardization by mapping and feeding the standard description they developed. Similarly, adopting thesaurus and controlled vocabularies for the standardization of terminologies also mandatory for its uniformity and discoverability.

Sharing the data helps the provider to bring the contents to new audiences and to empower and accelerate their digital transformation. It can dissolve barriers between different collections across GLAM and other memory institutions. It enhances user engagements and can open India's cultural treasures and unique collections to the world. It enhances visitor numbers; diversify virtual access as well as works for a visually diverse audience. It can act as a unique source of reference for researchers using digital technologies to access and interact with the collections. It helps to unlock the cultural assets for new research purposes and audiences online, discovered, accessed, and researched and offers economic, social and cultural benefits

9. International Scenario

The researchers have found that many cultural heritage aggregators are working at national and international levels in other countries to map the metadata of their cultural heritage resources from various cultural and memory institutions to provide them access in a customizable and more meaningful way. Table 2 compares some such popular cultural heritage aggregator portals of selected countries aim to promote the national cultural heritage resources.

Table 2: Comparative list of cultural aggregator portals of selected countries

| SI No. | Launch Year | Country | Initiative | Funded by | No. of entries* | URL |
|--------|-------------|-------------|------------------------------|--|-----------------|---|
| 1 | 1997 | France | Gallica | Ministry of Culture | 8461164 | https://gallica.bnf.fr/accueil/en/content/accueil-en |
| 2 | 2007 | Germany | Deutsche Digitale Bibliothek | Federal Government | 42409334 | https://www.deutsche-digitalebibliothek.de/ |
| 3 | 2008 | Italy | CulturaItalia | Ministry of Cultural Heritage and Activities | 3400000 | http://www.culturaitalia.it/ |
| 4 | 2008 | New Zealand | DigitalNZ | Department of Internal Affairs (New Zealand Government) | 31606825 | https://digitalnz.org/ |
| 5 | 2008 | Austria | Kulturpool | Federal Ministry for Arts, Culture, the Civil Service and Sport Austrian and Federal Ministry of Education Science and Research | 230000 | http://www.kulturpool.at/ |
| 6 | 2008 | Belgium | Erfgoedplus.be | Department of Culture Youth and Media | 150000 | https://www.erfgoedplus.be/ |
| 7 | 2011 | Netherlands | Digital Collectie | Ministry of Education, Culture and Science - National Strategy for Digital Heritage | 2500000 | https://digitalecollectie.nl/ |

| | | | | | | |
|----|------|-------------------------|--|--|----------|---|
| 8 | 2013 | United States | DPLA (Digital Public Library of America) | Private Foundations and Government Agencies | 44918855 | https://pro.dp.la/about-dpla-pro |
| 9 | 2013 | Portugal | Registo Nacional de Objetos Digitais | Ministry of Culture National Library of Portugal | 150000 | https://mod.bnportugal.gov.pt/rmod/ |
| 10 | 2015 | Estonia | E-Varamu | European Regional Development Fund | 17907747 | https://www.e-varamu.ee/content/about/ |
| 11 | 2015 | Greece | Search Culture.gr | Ministry of Digital Governance | 800487 | SearchCulture.gr |
| 12 | 2016 | Singapore | Roots | Ministry of Culture, Community and Youth The National Heritage Board | 105630 | https://www.roots.gov.sg/ |
| 13 | 2020 | Australia & New Zealand | Digital Pasifik | Australian Government Department of Foreign Affairs and Trade | 295085 | https://digitalpasifik.org/ |

(*No of entries counted as of 10th August 2022)

The objectives of these portals are to communicate the various aspects of their nation's culture such as heritage landscape, literature, musics, etc., and to make the digital cultural heritage contents available to a wide audience. The retrieval of these resources are based on their metadata. These national level portals empower its users to self-learn and maximize access to the shared history, culture, and knowledge. It is evident from the compilation that many of the aggregators listed above are contributing to Europeana, one of the largest aggregators in the world. It is further emphasized that the national portal created for unified cultural heritage collection can also be contributed to the international aggregators for better access and more comprehensive coverage.

10. Model Aggregator Framework

An independent, non-profit organization that should operate the activities of cultural heritage aggregation. The team has to work with all the digital initiatives in the cultural heritage domain of the country and encourage them to provide the data. The collaboration network has to be opened to all interested organisations, institutions and GLAMs across the country who works in the field of heritage and its research field to contribute. Setting up regional and state-level aggregators to coordinate with the national level further ease the process. The interested institution has to take the responsibility to become a member as domain aggregator or regional aggregator and through that the data can be shared to national as well as

international aggregators. Any interested institution with cultural heritage resources can be a member of the network by making a formal MoU (Memorandum of Understanding). No membership fee is involved at any stage of contribution and there will be no legal status too. The ownership of the digital content remains with the data providers. Any copyright protection or cultural heritage legislation associated with the digital cultural heritage content also remains with the owning institution. National aggregator has to gather metadata either directly from the data providers or through domain or regional aggregators and has to perform data conversion and data validation works. It has to develop a data model (like EDM) which has to be maintained by a strong and democratic community of experts working in the field of digital cultural heritage. There are several ontologies in the field of cultural heritage such as Dublin Core (DC) Metadata Elements, DC Terms, Europeana Data Model (EDM), CIDOC-CRM, Simple Knowledge Organization System (SKOS), Functional Requirements for Bibliographic Record (FRBR), AAT, BIBO, CiTO, FaBio, HiCO etc. are few such popular frameworks. Suitability of such ontologies are sometimes to be measured in terms of the concepts associated with the cultural heritage data. Stakeholders will have the facility of a content discovery platform with GUI (Graphical User Interface) to search and discover the resources with the options to choose such as content type, collection, institution, formats, subjects, license, period, chronology etc. provided by the aggregators. The interface of the heritage information system should be smart enough to combine different features to enable the retrieval process to be easy to the users. Individual information search strategies need to be incorporated with the user interface.

Aggregators' Forum also has to be formed to have discussion by the community members and to support those cultural institutions providing data and content. The forum should also advocate the GLAM and Memory institutions to follow a better digital practice that support openness, transparency and reuse of digital cultural heritage. They have to be trained in creating good quality digital assets in standardized formats. Figure 2 represents the model framework for creating a national-level digital heritage portal and its workflow.

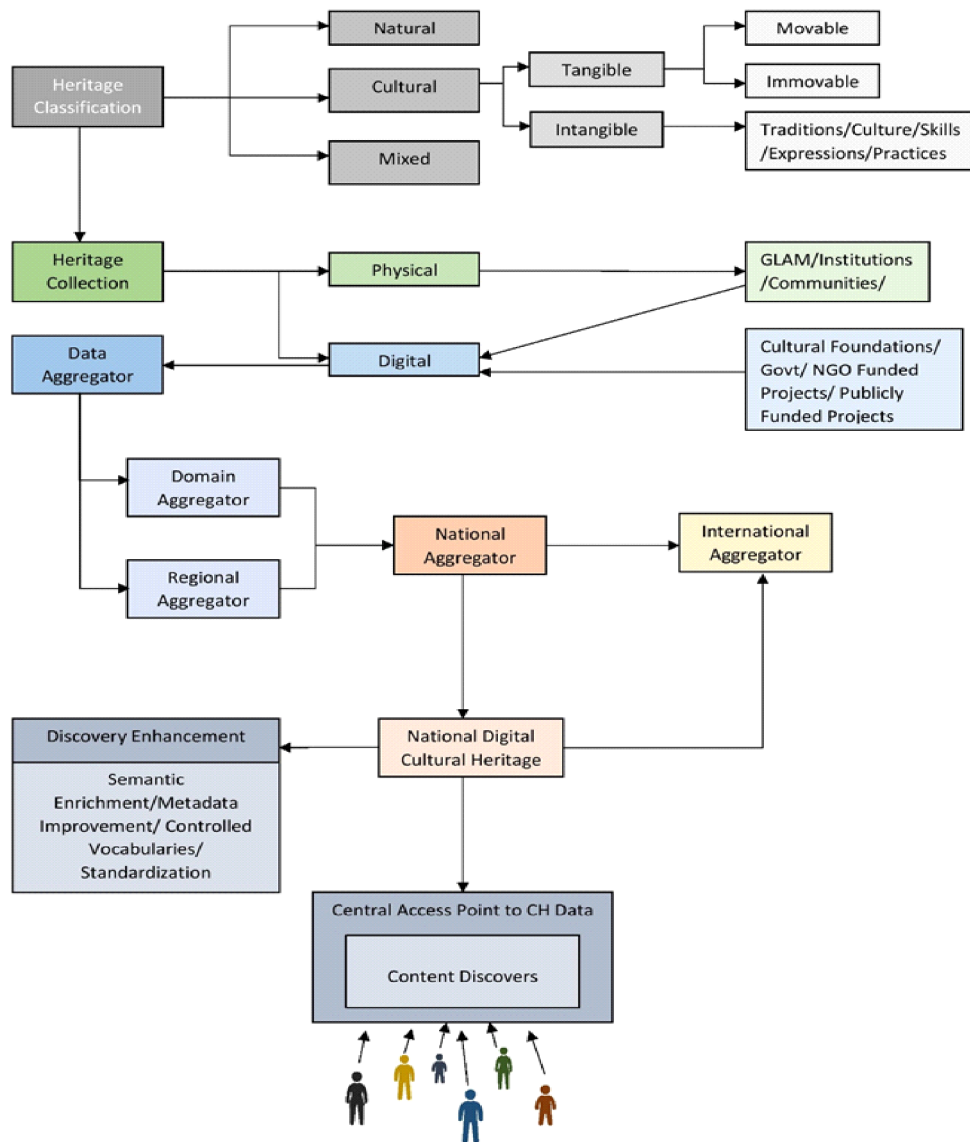


Figure 2: A model framework for creating a national-level digital heritage portal

11. Practical Implications

Since long India is a member in Executive Board of UNESCO. Recently the country was elected to the World Heritage Committee of the UN’s cultural organization from the Asia Pacific region for a term of four-year term (2021-2025). UNESCO has two Offices in India, the New Delhi cluster office for eleven countries in South and Central Asia (Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Mongolia, Myanmar, Nepal,

Pakistan and Sri Lanka) and most recently the MGIEP – the Mahatma Gandhi Institute of Education for Peace and Sustainable Development, a Category I UNESCO Institute established and fully supported and funded by the GoI (MEA). Apart from the government schemes, many other institutions and organizations made their attempt to conserve and preserve the cultural heritages in India. Many renovations process and activities are continuing to reclaim the cultural heritages and to boost tourism in India. More than thousand museums are instrumental in preserving, protecting and propagating the cultural heritage and also involved in educating the society. Development of cultural heritage sites through all these schemes has increased the footfall of tourists and private sector participation. Development and access to an exclusive digital archive of cultural heritage would be great support to administrators, tourist department and development administration as well as culture department and conservation activists. Such a national virtual collection can act as a heritage register to have the inventory list to monitor the conservation status, documentation, policies and can take measures to safeguard the heritage.

Millions of cultural heritage items and available in the country are scattered or isolated. Working on digital cultural heritage to share and promote will be highly heritage so that it can be used and enjoyed by educators and researchers, creatives and culture lovers across the world. Developing a national level aggregator platform for providing a single window access to digital cultural heritage in a standard format with more customized way can greatly improve its visibility, accessibility and usability. It enables to aggregate into a trusted repository and act as a reference point for India culture online which can foster research and development. Ultimately it can act as a platform representing the diversity of our cultural heritage to connect to other users pathways and share own discoveries.

12. Conclusion

The aggregation is a single-entry point to the trusted sources of shared knowledge. Advancements in information and communication technologies, organization of information with assisted technologies and the availability of various retrieval methods work well with cultural heritage documents to easily, effectively and accurately access the resources. India has to make a major investment using digital technology to create a unified national collection of cultural heritage to maintain its world leadership in digital humanities. It can help the users to get access to its cultural heritage treasure beyond the physical boundaries of their location and can make a lead in setting the global standards in the field. Creating a unified virtual national collection of GLAM, heritage organizations and memory institutions using digital technologies will lead to the development of a future national virtual cultural heritage collection to promote the cultural diversity of the country. Such a unique portal can contribute to an open, knowledgeable, and creative society to maintain global leadership in digital humanities and arts research. A global standard needs to be followed for building the cultural heritage collections which can enhance the collaboration between the countries. Community engagement must also be a core element in the activities.

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