

ARCHIVING COLLECTION IN ARCHITECTURE COLLEGE LIBRARY: A SURVEY AT KRVIA LIBRARY, MUMBAI

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Pedagogy of architectural education and libraries are phenomenal in terms of teaching-learning and collection in their libraries. They typically refer to measured architectural drawings. Architecture teaching-learning systems generate innovative ideas and skills which are presentable in a better way with the help of various ICT tools, and the libraries need to archive all those for future reference. However, in the modern context, architectural institutes have initiated their studio performance in digital form. Old architectural handmade measured drawings have been shifted to a digital version, which becomes a ready-made primary resource for a library to archive. The present article emphasizes on how an architecture college library can cultivate resources by archiving the institutional literature. Hence, a survey was conducted on Kamla Raheja Vidyaniidhi Institute for Architecture (KRVIA) library users to know the types of research reports produced by using various ICT tools in the teaching-learning system as well as in the library to archive the same.

Keywords: Archive, Architectural data, Architecture College library, Collection, In-house literature, KRVIA Library.

INTRODUCTION

The architectural education system is all about teaching design to construct any infrastructure for a society. The architectural education system and library collection are peculiar compared to the other academic disciplines. It helps individuals develop their art skills to make a better environment. Roman architecture was the history of architectural art and design in 6000-5000 B.C. Architectural design started with stone and wood cutting and reached up to a digital process to make all the art and design. The history of Indian architecture education system indicates that the British started with a one-year diploma called 'Draughtsman' to make architectural drawings, and later it became a five-year bachelor course called B.Arch. With time, the system of teaching and learning has changed abruptly with the emergence of several technologies. In the present context, the architecture education system has implemented various graphical software for different purposes.

The discipline has no particular textbook to learn the course. Students need to refer to all kinds of resources related to architectural design, environment, and architecture history. Apart from books, theses, reports, geographical resources and architectural drawings, they also need to analyse the current environment and market position of real estate. The syllabus includes study trips to acquire knowledge on existing society, where the students need to make adequate numbers of measured architectural drawings.

Architecture learning and teaching systems were traditional till the end of the 19th Century. Architecture education started using ICT tools in the 20th Century to enhance the teaching and learning system. Multimedia and ICT tools were introduced to learners and teachers like projector, web board, and various graphical software. Earlier, architectural drawings were made by hand, but now students started creating those drawings in software like AutoCAD and Photoshop, which gave a new perspective to the education system.

Architecture college library users are frequent visitors to their library to develop their architectural skills. They refer to books, dissertations/theses, project reports, maps, films and drawings. In this present era, the faculty and students of architecture education utilize various graphics design software to generate and present their skills which become readymade primary resources for a library to archive. Architecture college library gives importance to collect drawings as the course is about making designs for infrastructure. It collects in-house reports which are generated from their curriculum

activities. The present architecture college libraries are initiating to archive their institutional literature to enhance their teaching and learning process.

ABOUT KRVIA AND THE LIBRARY

Kamla Raheja Vidyanidhi Institute for Architecture and Environmental Studies (KRVIA) is one of India's renowned institutes for architecture education. The institute is situated in the heart of Mumbai city. Under the aegis of KRVIA, embraces three courses along with some projects which involve governmental planning. It has a five-year bachelor (B.Arch.), two master courses (M. Arch.) and fellowship programmes. KRVIA has a design cell which conducts quality research on architectural discipline.

The architecture teaching-learning process has witnessed a change at KRVIA since its inception, and implementation of ICT has transformed the scenario of architecture education and its library. The institution started use of software like AutoCAD and CorelDRAW to make architectural measured drawings and designs. Gradually, many software like 'ZWCAD' and 'Bricks' were started experimenting by teachers and students in the teaching-learning system at KRVIA, triggering a proliferation of respectable numbers of research architectural drawings reports. Consequently, a survey was conducted among the KRVIA library users to collect information on what type of literature generates with the help of ICT tools while teaching and learning the discipline.

In the year 1992, the KRVIA library started with the inception of the institute. The library was

initiated with a collection of reference books, and various materials required for an architectural institute. The library implemented Web OPAC in the year of 2010 and embarked on an archival programme to create an Institutional Repository (IR) in 2012 with DSpace software. The library also executed QR code and social media to alert library users about the new arrival and access to e-resources. Apart from these services, the library also conducted a workshop on KOHA software in 2018 to train library professionals to promote world standard open source software for library automation. The library also conducts summer and winter internship programmes for archival purposes. The KR VIA library archives architectural drawings, reports, bachelor and master thesis, institutional publications and fellowship reports in the Institutional Repository (DSpace). Apart from all these literatures, it also archives faculty members' publications, question papers and posters of various events.

REVIEW OF LITERATURE

Quite a lot of literature on collection, use and archive of grey literature and archive technology were studied for the survey. Only a few relevant kinds of literature on the topic have been reviewed and presented below:

Robinson et al. (2019) stated that grey literature refers to literature that is not published and not available through commercial publishers. Grey literature is published by all the organizations in various forms and formats. The study was done on 21 libraries that disseminate scientific information in Jamaica, West Indies. They found that it was challenging for most of them to access grey literature from their

organizations. 62% felt that grey literature should be made available in institutional databases. 93% agreed to raise awareness about the value, use, and digitization of grey literature to disseminate to a large community. Kulhavy et al. (2017) reviewed the status of digitization and preservation of natural resources for a North American University in 2017 and stated that digital collection must include supplementary materials along with published resources. The authors suggested that collecting faculty publications, research projects, e-books, journals, galleries and e-thesis etc., to add to the library collection and make it available to the public to help policymakers, researchers, educators and the community.

Nimoni (2019) highlights in his article that a systematic written policy for collecting and sharing information needs to establish to ensure end-users needs. The author studied information resource development policies of 20 PULINET member libraries and found that the libraries of PULINET have written policy to develop resources, and 80% was accessible to the public. The author also found that the PUBLINET libraries allocate budget in collaboration for purchasing electronic resources. Geetha and Kishore (2019) mentioned in his article that capturing an institution's documents and photos have been a natural first step for libraries. The article revealed that digitization with the open-source software 'Omeka' and digital publication could potentially impact the contributor and the readers. They also mentioned that even a small organization could offer special services to the public by publishing institutional publications.

Jalgaret al. (2019) elaborated on various social media, which has brought remarkable capabilities in data handling. Facebook, WhatsApp, Telegram, Instagram, Pinterest, YouTube, LinkedIn are the most famous media to interact and share information among the community. They stated that social media is the essential stage in this modern world for sharing continuous information. Shah and Bano (2020) emphasized 'Smart Library', indicating adopt successfully and implementing accurate digital technology in libraries. According to them, an intelligent library must-have features like book transaction analysis, navigation by GPS, checking of availability, maintenance of infrastructure, QR code, Book reservation status, virtual library tour, and mobile alerts. Dhanasekara(2020) outlined that social media like Facebook, WhatsApp, and Twitter are valuable platforms for sharing knowledge. The study surveyed 200 user's opinion on using social networking used by libraries and found that most of the users used 'Facebook' and do 'like' to the library service 'announcement of new books' most.

Erbil(2013) highlights that Knowledge management in an architectural firm needs time, financial investment, subject and technology expertise. The author surveyed the knowledge management practice in Turkish architectural design firms and found that though Turkish architectural firms have enough technological infrastructure, they could not perform competently due to a lack of information technology knowledge. The article specified that understanding the significance of knowledge management and the technological system is

essential for organizations. Prasad and Madalli(2019) elaborated in their article that digital curation is an initial assignment in research data management which is generally skilled by the library and information science professional. They indicated that data management must include data acquisition, validating data, converting data files into a standard format to ensure interoperability and long-term preservation, selecting metadata and classification of data, adding a licence, archiving, distributing, and backup data.

Basumataryet al. (2019) stated that preserving and managing research data can be the perspective of the institute and the researcher by giving access to the public. They indicated that a librarian must have skill in information housekeeping, organizing resources and creating metadata which play a vital role in retrieval and managing research data. Library of Congress (2021) offers classroom materials to help their teachers use primary resources. The website offers primary resources to teachers and lesson plans and professional development modules, which is open and easy to access. Dhiman (2010) mentioned in his article that Institutional Repository (IR) became a necessary part of an academic institute in order to preserve their intellectual records. The article revealed that the Institutional Repository has some unique characteristics than a traditional institutional archive, it usually aimed to archive research and teaching materials rather than institutional records. The author also mentioned that the core purpose of an IR is to deposit publications and

research output to share knowledge among learners.

According to Sing(2019)big data and data mining can influence directly or indirectly library administration and services. The author stated that only library automation would not be a viable solution until libraries cannot discover intellectual information from an abundance of a database. It is possible if the traditional library starts a data mining process with the existing library. Sheeja et al. (2013) articulated in his thesis titled, 'Collection and Assets Management: One University Library's Journey to the Future' that academic library collection and assets are a challenging task in this digital era. The authors reported on the current problems and prospects of collection and assets management of the University Library of Cochin University of Science and Technology (CUSAT) and suggested the future requirements. The article specified that the University's intellectual assets are archived in their institutional repository called 'Dyuthi'. The repository has more than a thousand reports consisting of preprints and post-prints of intellectual output, thesis, teaching-learning materials, conference proceedings, and scholarly publications. The study also suggested involving advanced training on the library management system, space management, collection management, information literacy for the future.

Cherukodan (2015) has stated in his thesis titled 'Measuring the Maturity of Open Source Software for Digital Libraries: A Case Study of

DSpace' that it is the most popular and widely used digital library software in the world. DSpace software comes up with many new features with every newly released version. It comprises three layers, and they are the application layer, business layer and storage layer. The application layer helps to communicate with the world; the business layer offers authorization and workflow, and the storage layer deals with the storage of metadata and content.

RESEARCH GAPS

The research gap was that none of the scholarly publications addressed collecting and archiving in-house architectural literature. The majority of the scholarly articles were on archive and creating digital resources, but the collection and selection of architectural and engineering drawings and research reports are almost nil. In India, nearly all architecture college libraries are running with old traditional culture. Hence, the research felt to articulate the KRVIA library system to collect architectural documents for archiving.

OBJECTIVES OF THE STUDY

Architectural institutes generate ample in-house research reports which can be beneficial in the teaching-learning process. The study's objective is to know the types of research reports generated by teachers and students with the help of ICT tools in an architectural institute. The study will help the librarians of architecture colleges know the kinds of literature generated with ICT tools by teachers and students and its importance to collect those in-house literatures for archiving.

METHODOLOGY

To fulfil the objective of the study, a survey was conducted among 125 selected library users of the KRVIA library to collect data. The KRVIA library has a total of 468 library users, which consist of 400 B.Arch. students, 40 M.Arch students, 2 Research fellowship and 23 full and part-time faculty members. The survey selected all the faculty members, including two research fellows, as their numbers are less and students were selected by using a simple random sampling method. 80 students were selected randomly from 400 B.Arch. (i.e. 20 from each hundred) and 20 students from M.Arch. (i.e. 5 from each ten). A Google form was designed and distributed among 125 users to collect data, and 94 users responded to the survey.

DATA ANALYSIS AND FINDINGS

The survey initiated to study the role of ICT tools in creating various research reports in the present scenario of teaching and learning systems in architecture discipline at KRVIA. Data was collected from the library users of KRVIA, Mumbai in February 2020 by distributing a Google form among 125 students, faculty members and research scholars. A total of 94 users responded to the survey. However, data was downloaded in a CSV file and analyzed in an excel sheet with formulas.

Designation of targeted library users

The table 1 shows that the questionnaire was shared with 23 full-time and part-time faculty members and 22 members responded to the survey. The survey was also responded to by 57 UG students, 13 PG students and 2 research scholars.

Table 1: Designation of targeted library users

Sl. No.	Designation	Questionnaires Distributed	Responded to Questionnaires
1	Faculty Members	23	22
2	UG Students	80	57
3	PG Students	20	13
4	Research Scholars	2	2
	Total	125	94

Use of different Graphical software

It was found from the survey that out of 125 KRVIA library users, 94 were using the following software to teach and learn the discipline. The table represents use of 'Adobe Suite' which is a combination of three software, Photoshop, InDesign and Illustrator are used by 17 faculty members, 64 UG students, 14 PG Students and

both the research scholars. AutoCAD is used by 13 faculty members, 42 UG students, 12 PG students and 2 research scholars. CorelDraw is used by 35 UG students and 8 PG students. This kind of software can be used to design posters, brochures, magazines, architectural design, books etc.

- i. **Adobe Suite:** Architecture students mostly use it though the software is outdated and discontinued by the company. It includes many facilities like Photoshop, InDesign and Illustrator and Adobe Premiere Pro etc. Adobe InDesign is desktop publishing software. It gives a package of all the tools like designing a model until it becomes a final publication. This type of software helps to create posters, drawings and even edit videos recorded in any events. Architectural learners tend to record all the activities for future reference, and they need to edit those as per their requirement.
- ii. **AutoCAD:** AutoCAD is proprietary software for drafting and designing which was released in 1982. Architectural students create their measured drawings by using various features of this software.
- iii. **Coral Drawing:** It is also a graphical design editing suite which has many provisions for editing a graphical design. It was released in 1989.

Table 2: Use of different Graphical software

Software	Faculty Members	UG Students	PG Students	Research Scholars
Adobe Suit (Photoshop, InDesign and Illustrator)	10+4+3=17	42+17+5=64	12+2+0=14	2+1+1=4
AutoCAD	13	42	12	2
CorelDRAW	0	35	8	0

3D Computer-Aided Software

The table 3 reveals some 3D graphical design and virtual reality (rendering) software which are used by the KRVIA library patrons. SketchUp is used by 5 faculty members, 25 UG students, 6 PG students and 2 research scholars. Rhinoceros is used by 17 UG students. Grasshopper is used by 1 faculty member, 3 UG students and 4 PG students. Adobe Premiere Pro is used by only 1 faculty member and 5 UG students. Lumion is used by 7 UG students and 1 research scholar. Twinmotion is used by only 9 UG students. V-Ray is used by 10 UG students and 1 research scholar.

These computer-aided designs and rendering software helps to create and design measured architectural drawings with 3D effect. It can be

operated in any application like windows, Linux or macOS. Some of the examples are:

- i. **Rhinoceros:** Robert McNeel developed this software in 1980, and it is commercial software. It is used to create measured architectural drawings.
- ii. **Lumion:** It is mostly used for architectural design making. It gives life to any design and can be used to add reality to any drawing and can present it in a better way. Most important is that it is very user-friendly software.
- iii. **Vray:** It is also similar to imaginary rendering software that helps to ornament any graphical design.

iv. Adobe Premiere Pro: It is video editing software which was released by Adobe system on 23rd September 2003.

v. Twinmotion and VRay are also video editing software to create an architectural project.

Table 3: 3D Computer-Aided Software

Software	Faculty Members	UG Students	PG Students	Research Scholars
SketchUp	5	25	6	2
Rhinoceros 3D	0	17	2	0
Grasshopper	1	3	4	0
Adobe Premiere Pro	1	5	0	0
Lumion	0	7	0	1
Twinmotion	0	9	0	0
VRay	0	10	0	1

Building Information Modeling (BIM)

The table 4 presents ArchiCAD BIM used by 1 faculty member and 5 UG students. Autodesk Revit is used by only 2 UG students and 1 PG student. These software are used to create and present all kinds of skills needed for building construction. It is used by many professionals like landscape designers, contractors and plumbing engineers etc.

i. ArchiCAD: It is about architectural building information management software. It can be used to generate design required for building construction. It was launched in 2018 by 'Hungarian company Graphic soft'.

ii. Autodesk Revit: It was launched by Autodesk on 5 April 2005. It immensely helps architects and mechanical, structural and plumbing engineers.

Table 4: Building Information Modeling (BIM)

Software	Faculty Members	UG Students	PG Students	Research Scholars
ArchiCAD BIM	1	5	0	0
Autodesk Revit	0	2	1	0

Use of Miscellaneous Software

The table 5 indicates that GIS is used by only 2 faculty members, 2 UG students, 8 PG students and 1 research scholar. Whereas Google Earth is used by 12 faculty members, 39 UG students, 11 PG students and 1 research scholar. KooZA/rch is an experimental research platform for

architecture discipline, and one of the 2 research scholars used this platform. Only one faculty member used ODK.

Geographical data provider software: This software is a source of editing, viewing and analyzing geographical data.

- i. **QGIS:** It is open-source software. It was released in 2002 and can be operated even in Android too.
- ii. **ODK (Open Data Kit):** It is an open-source software to collect, manage and use data among a community.

Today's information society has a bundle of ICT tools available in the market to present various skills. Though many of the graphical design software are proprietary, still several open-source editing software are available. The most important thing is some of the proprietary software companies give free access to educational institutes to develop society.

Table 5: Use of Miscellaneous Software

Software	Faculty Members	UG Students	PG Students	Research Scholars
Geographic Information System(GIS)	2	2	8	1
Google Earth	12	39	11	1
KooZA/rch.	0	0	0	1
ODK (Open Data Kit)	1	0	0	0

Archive of In-house Literature in the KRVIA Library

The KRVIA library initiated archiving institutional literature in the Institutional Repository (IR) with DSpace software since 2012 as it is worldwide popular for creating an IR. The library collects selected drawings and reports of studio projects, study trips, exchange programmes

and exhibition are conducted on many different occasions. The drawings and portfolios are processed under library internship programmes to make a book format report. Some of the examples of archived architectural drawings and images created in graphical software by KRVIA architectural students during their course are given below:

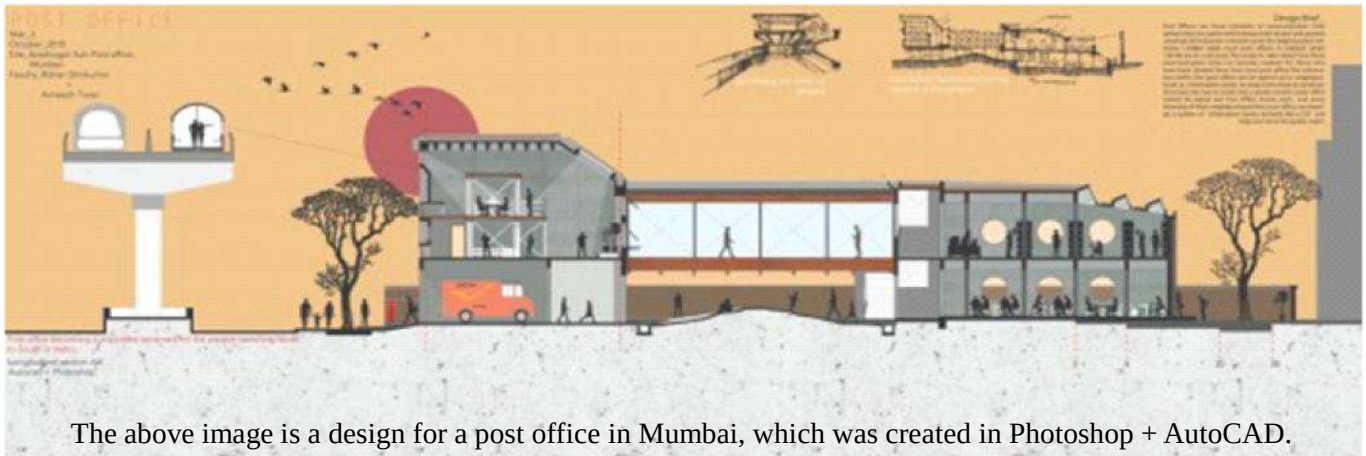


Mayo Memorial Hall

Above image is a handmade measured architectural drawing which was created in a study trip to Allahabad.



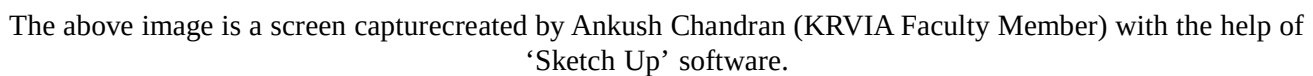
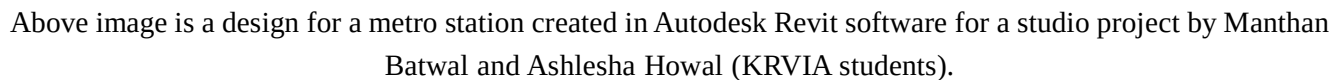
The above drawing is from BRAJ Studio created with the help of software Photoshop and AutoCAD in a study trip to Mathura-Vrindavan, archived in the KRVIA digital library.



The above image is a design for a post office in Mumbai, which was created in Photoshop + AutoCAD.



Above mentioned image was created in ArchiCAD (BIM) software.



CONCLUSION, RECOMMENDATIONS AND PLAN OF ACTION

Architecture colleges create numerous architectural drawings and reports which are never published or commercially available in the market. What kind of research reports generated in an architectural institution was inquired and found that teachers and learners of KRVIA engender various architectural drawings and research reports which can be very useful for the teaching-learning process. The institute's teachers and learners have utilised different software to generate those reports faster and with a better effect. As the librarian of the KRVIA library, the researcher had also experienced using those reports by the library users. Especially in the COVID-19 period, those resources helped students and faculty members to complete their projects on time. It depends on the librarians and architecture institutions to initiate an institutional repository to collect those in-house grey literatures and archives to give access to the library users.

RECOMMENDATIONS

Based on the survey findings, the following recommendations are made:

1. An architecture college librarian can delve into all-important or selected research reports produced in the various activities, including studios under the course curriculum.
2. A library can archive all those collected in-house literature in their Institutional Repository.

3. The library can conduct an orientation programme on awareness of submitting and archiving those reports to get maximum institutional literature benefits.
4. An architecture college library can initiate to endorse teachers and student's representative to select and compile in-house research reports for archiving purposes.
5. Architectural institute's activities are primarily the exhibition kind in nature. Hence, social media are most useful to share those design exhibitions and workshops within a large community.

Plan of Action to archive in-house reports

1. A policy must be framed to implement the action of collect and submit in-house reports to the library.
2. All library users must know the importance of the archive purpose and rules.
3. The librarian must take care of the copyright part of their reports.
4. A separate budget can be proposed for the purpose.

This survey has found that most of the resources or reports produced from all the architectural institute activities are value-added resources for learners and teachers. The vital part is that most of the reports are generated in e-version, which became easy to make available online. An institutional repository offers an opportunity to archive in-house institutional literature and make it open to the public. The KRVIA library has played a vital role by nurturing various materials to enhance the teaching-

learning system by archiving institutional literature. The institutional repository helps library users refer to the ideal works of their seniors' and faculty members.

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