REVOLUTIONIZING LIBRARY SERVICES FOR EMPOWERING LIBRARIES AS INITIATORS AND PARTNERS IN INNOVATION: A CASE STUDY OF ICAT

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Abstract :

Over its six-decade existence, the Technical Library at ARDE known as Information Centre for Armament Technology (ICAT), Pune, has exhibited consistent developmental growth, evolving from a traditional Technical Library into a modernized and versatile ICAT. This case study aims to inspire library administrators to enhance their services and facilities for user engagement.

The paper delves into ICAT's innovative approach and its experiences with introducing creativity across various facets of the library's operations. These encompass library automation, digital library development, Web 2.0 applications, institutional repository management, information services, website development, physical facilities, Library Week programs, and intensified interaction with the user community. The document outlines the processes and benefits associated with embracing innovative techniques, projecting a future scenario wherein libraries assume non-traditional roles.

In conclusion, the paper emphasizes the imperative for libraries to reassess their service and facility strategies, positioning themselves as the focal point of activities within their parent organizations. It underscores that innovation is not merely an option but a necessity in this evolving landscape.

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1. Introduction

Amidst the era of technological progress and the globalization of information via the Internet, a prophecy emerged suggesting the imminent extinction of libraries, foreseeing their gradual obsolescence. Google was hailed as the successor to traditional libraries, casting a shadow over their relevance. Faced with this ominous outlook, the library profession found itself compelled to reinforce its significance and validate its continued existence. This survival instinct spurred the adoption of a diverse range of innovative practices, breathing new life into the concept of a 'library' and compelling users to recognize the indispensable role played by libraries and their dedicated professionals.

In response to the changing global landscape, progressive modern libraries have embraced a policy of adapting to new techniques to better serve their user communities. The Information Centre for Armament Technology (ICAT), which serves the Armament R&D Establishment (ARDE), falls into this category of forward-thinking libraries.

ICAT stands out as one of the premier libraries within the Defence R&D Organisation (DRDO) framework. Originating as a conventional library catering to the research needs of defense scientists by housing and circulating various publications, it evolved over time. Through a proactive approach in providing information products, ICAT gradually transformed into its current modern avatar—an exemplary hybrid library. This modern incarnation boasts a rich collection of printed publications, including books, journals, reports, standards, and other technical documents. Simultaneously, it maintains an ever-expanding digital collection of similar publications in electronic format. In its new form, ICAT not only addresses the needs

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of Armament Scientists but actively contributes to the creation and shaping of future Armament Technology.

ICAT Collection
As on December 2023

Printed Resources		E- Resources	
Books	15000	E-Books	12000
Tech Reports	15770	CDs	1400
Current Periodicals	118	E-Reports	17000
Bound Volumes	6387	E-Standards	70000
Indexed Articles	25443	E-Patents	1068
Standards	7000	e-Journals	560
Reprints	350	Tech papers/ presentations	20105
Rules& Regulations	504	Photographs	762

Table: ICAT's print & digital collection

2. Broad Spectrum Of Innovative Approachs :

2.1   Library Automation :

Keeping pace with libraries in the modern era, this library has implemented library automation, initially using locally developed software for database creation and circulation records, and then procuring a commercial Library Management Software package (LibSys), achieving computerisation of all library operations and creating databases covering all collections held by the library. Customisation of LibSys was done as per our requirements that resulted in robust database of various collections. Special care was taken to maintain the Article database in LibSys in which more than 22000 core journal articles are available for search and retrieval. With the entry of E-resources in the form of reports, database services, and institutional publications, suitable digital library management software called DSpace has been introduced.

2.2   IT Infrastructure :

The foundation of an extensive array of information services for users was laid upon the presence of diverse print and digital collections. Recognizing the immense potential of these services, meticulous steps were taken to establish a robust IT infrastructure. ICAT now operates on three networks: Intranet, Internet, and National Knowledge Networks (NKN). The infrastructure includes three servers housed in a dedicated server room, 48 computers, 17 printers, and 6 scanners—all essential IT equipment connected to these networks, ensuring 24 x 7 access to ICAT's digital collections.

For dedicated study and research, specialized research and study carrels equipped with desktop facilities have been set up, catering to serious readers. Presently, ICAT proudly boasts

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a modern IT network that disseminates information about all ICAT facilities and services to every ARDE user. With a simple click of a mouse, users can access a robust print collection exceeding 60,000 items, over 100,000 digital publications, current awareness services, personal circulation records, and more.

2.3 Total User Satisfaction :

The driving ethos behind every facility and service offered by ICAT revolves around the philosophy of 'Total User Satisfaction.' This user-centric approach is encapsulated in the ICAT motto, which emphatically declares, "Readers are not mere users; they are the very purpose of our existence." Upholding this philosophy requires continuous efforts and engagement with users, providing updates on ongoing and proposed research plans for specific user groups or research teams, actively seeking feedback, and conducting deliberate studies on the information requirements and profiles of distinct research teams.

Recently, the formalization of user profiling has been implemented through the 'Gyandoot' service. ICAT professionals proactively engage with target groups to share knowledge, develop subject profiles, and document user requirements. This proactive outreach strategy, rather than waiting for users to visit the library, has become a successful practice at ICAT. Anticipating user needs and providing services accordingly has become a hallmark of ICAT's approach. This guiding principle not only leads to the creation of new and innovative information services but also adds value to the routine information services provided by ICAT.

2.4 Value-added Information Service :

A Current Awareness Service (CAS) is commonly offered by all special libraries, listing new additions to various library collections, or new journal articles indexed by the library. ICAT also offers its users one such service, 'Armament Information Service (AIS)'which has seen a transition from a cyclostyled paper version to a computerised print-out format to an online service available on the ICAT website. It lists new books, reports and standards added to the ICAT print collection as well as indexed journal articles 2. The innovative value addition has been the provision of links to full-texts of the titles/articles listed in this CAS or Contents pages of such new publications, enabling the users to get a broader perspective of relevant items. This was the result of a co-ordinated information connectivity and transfer between the Libys and DSpace databases. Prevalent CAS such as ArmaFocus, a monthly bulletin containing brief content of latest development ion armamnet and related areas, Newspaper Clippings Service (NPC) and Director's Information Service (DIS), comprising copies of important journal articles, were provided to users stay updated. The reach of this service which started out as e-mail alerts to 250 scientists, was expanded to all users when its link was provided on the ICAT website and on ArmaBlog.

A similar user-oriented approach has resulted in value addition to the Online Public Access Catalogue (OPAC) service. Availability of the digital counterpart of any item listed in OPAC is clearly indicated in the electronic resource field/title field to enable the user to locate the title in the DSpace repository.

2.5 Digital Library Development :

The evolution of the ICAT digital library segment has been driven by the implementation of inventive concepts. Actively seeking relevant e-resources in the market, the

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library conducted thorough internet searches. Independent e-publications were duly identified, registered, and cataloged in their respective DSpace databases. In cases where the e-resource constituted a full-text database, such as the Micropat Full-text Patents database, efforts were made to pinpoint subjects pertinent to users. Patents related to these subjects were downloaded and incorporated into the DSpace E-Patents database. The overarching goal was to retrieve and preserve pertinent documents from comprehensive databases with limited validity periods, thereby maximizing the utilization of available information resources. This policy has since been consistently applied to all subsequent e-databases acquired by ICAT.

At ICAT, the emphasis on preserving quality content has consistently fueled collection development. Procuring an e-database goes beyond a mere transaction involving payment and installation; instead, the library treats usage as a variable to be actively determined. The resources receive ample publicity through LAN announcements to ensure maximum utilization. Moreover, ICAT's extraction and upload of pertinent content contribute to preserving crucial aspects of these e-resources in the DSpace repository. This distinctive approach to procurement, utilization, and resource preservation serves as a unique selling proposition (USP) for ICAT.

2.6   Access to E-Journal through DRDO E-Journals Consortium :

In 2009 when the DRDO E-Journals Consortium was formed by the Defence Scientific Information& Documentation Centre (DESIDOC), the parent body of all the Technical libraries /Technical Information and resource Centres (TIRCs) of more than 50 DRDO institutes, ARDE obtained free access to 450 e-journals of six Publishers. The link to this consortium was given by ICAT on the campus-wide internet network. Due publicity was given to this rich resource and multiple user training sessions were conducted to ensure optimum utilisation of the E-journals treasure house. Moreover, remote access to this consortium resource was enabled for 300+ ARDE scientists. These efforts won the appreciation of our user community, establishing ICAT as an excellent facilitator of E-information. Another new ICAT initiative was evident in the formulation of a team of research scientists, to whom relevant subject specific journals from the consortium titles were allocated for scrutiny of contents and identification of important articles which would then be indexed by the ICAT team for upload on DSpace Articles Database. ICAT took upon itself the task of indexing the general science and defence related journals available through this consortium service. ICAT defies the commonly held belief that what comes free is not valued by the recipient – it makes every possible effort to derive maximum benefit from even a free resource such as the E-Journals Consortium database. With this innovative approach in proper implementation of E-Journal access, Head- ICAT of ARDE is representing 9 Armament Cluster Laboratories in the Monitoring Committee of e-Journal consortium.

2.7   Institutional Repository :

The ICAT digital library on DSpace 3 is the result of a well-planned strategy which focused on acquisition of free and purchased E-resources from every possible source. A major part of the DSpace repository is in fact the Institutional Repository, which comprises of in-house generated documents of the following types:

- Technical reports
- Technical manuals/User handbooks
- Annual reports

- Ballistic/Range/Firing tables
- Specifications
- Engineering drawings
- Conference proceedings of ARDE hosted conferences
- Proceedings of conferences attended by ARDE personnel
- House Journals , Newsletters
- Trade literature
- Teaching/Course Material
- ISO documents
- Technical papers for conferences
- Articles for journals
- PowerPoint presentations made by ARDE personnel
- Students' project reports
- Guest lectures/presentations
- Digital photos/videosof ARDE events/trials
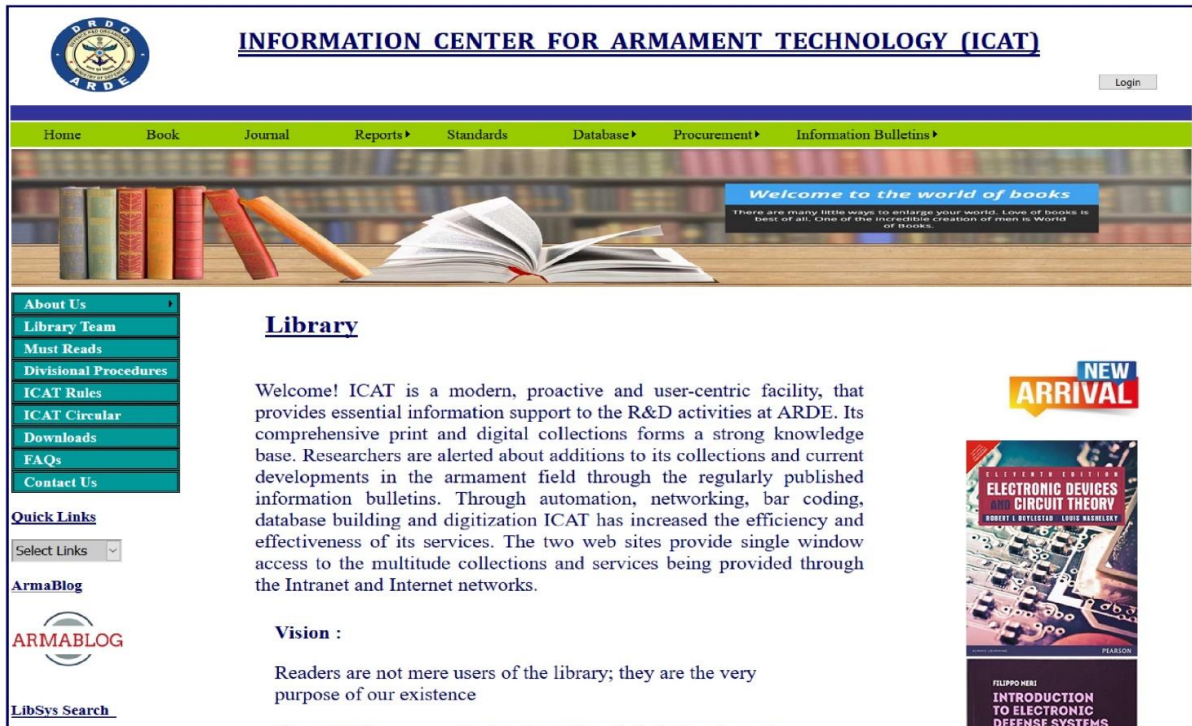

Fig: Dspace Repository at ICAT

ICAT is the holder of all such institutional records and publications in print and soft copy versions. The formal decision to take on the responsibility of developing and maintaining the institutional repository to give open access to the institute's intellectual property, gave ICAT a new role to perform. All the sources and channels through which the intellectual property of ARDE is generated were tapped for possible inputs to this repository. Besides formal announcements requesting institutional members /groups to forward copies of any material published by them, the ICAT team has made it a practice to keep eyes and ears open to learn about any material generated within ARDE, which could be added to the institutional repository. This resourceful attitude has put into place a collection of continually expanding and informative databases of ARDE's indigenous intellectual property.
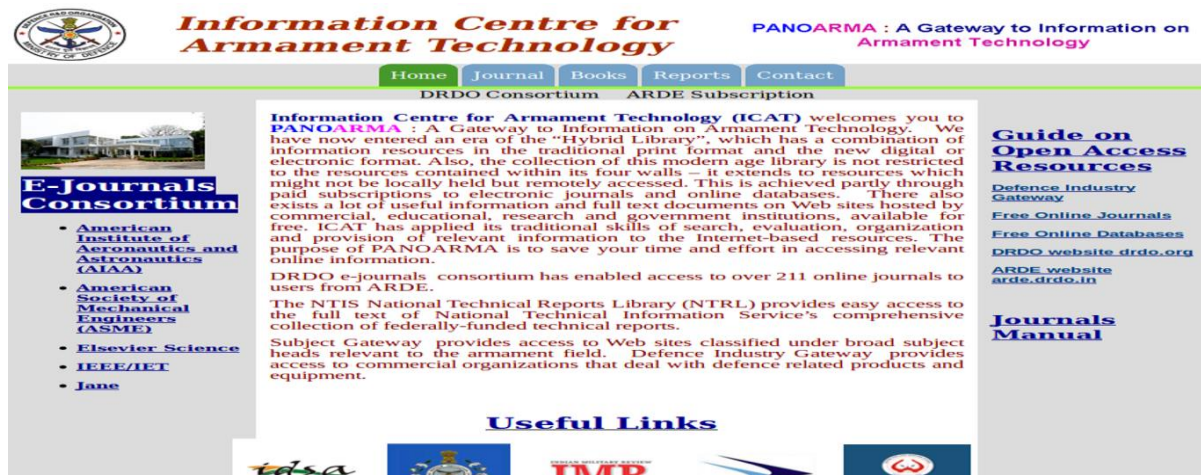
2.8 ICAT Websites :

To project the unique facilities and services of ICAT, a major initiative was taken by

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designing of comprehensive ICAT websites - the 'Intranet website' and the 'Internet website'. Security regulations do not allow merging of internet and intranet communication link within ARDE campus. Hence two separate user-friendly websites, fulfilling different objectives, were designed and have since undergone periodic content audit, resulting in improvements and incorporation of additional updated features.

The Intranet website provides single window access to ICAT, connecting users with its content- ICAT facilities, functioning and services thus giving users a comprehensive projection of ICAT potential and capabilities. It provides access to Libsys OPAC, New Arrivals, DSpace Respository, E-databases, current awareness services, ArmaBlog, User account, Overdue publication lists etc.

The Internet website, PanoArma, provides a subject gateway armament related information and an access point to electronic databases such as McGraw-Hill e-books, e-journals Consortium etc.

Both the ICAT websites provide campus-wide access to E-resources of various kinds.

A major interaction between user and library occurs in the form circulation of publications. This transaction is facilitated by the user-friendly circulation module and OPAC. The user can study his/her transaction, get information about issued publications and reserve books.

Library users are increasingly wired and it's incumbent to meet them on their virtual turf and speak in a language that they understand. Libraries can no longer assume that clients will come to them- they need to put themselves where their current and potential clients already are, which is online. The ICAT websites facilitate this vital interaction with users.

2.9 Arma as a brand service name :

'Arma' world has become the brand name of ICAT services where a range of services from database to full text services were provided to users to assist in their research and development work. Various service such as Armablog, Armapedia, Armagloss, ArmaFocus Armagyan genertate various relevant content. The content within these name of services is a knowledge repository of armament and related areas.

2.10   NPTEL content on Local Network :

ICAT offers a specialized service through the provision of academic information on the NPTEL (National Program for Technology Enhanced Learning) platform, addressing the knowledge enhancement needs of scientists and engineers employed at ARDE. This service delivers audio-visual lectures presented by experienced engineering faculty and talks by learned professors from institutions such as IITs and the Indian Institute of Science, Bengaluru. While these lectures are freely available on the internet, ICAT has streamlined access for end-users by acquiring all the lectures from IIT Mumbai and storing them on two 4TB hard disks. The content is then made accessible through LAN using the ICAT website platform, saving valuable time for the users.

2.11   ICAT Physical Facilities :

At ICAT we have given due importance to providing a physically welcoming appearance to the library because it is important to create an environment that stimulates & encourages learning. A building with glass walls gives the library an open and inviting look. The surrounding greenery and fountain areas add to the ambience. Physical facilities encourage use of ICAT by individuals and groups. If study carrels provide private pockets for serious study and research, the Technical Discussion Room offers a place for small research groups to have brainstorming sessions. A medium size Conference Hall with LAN and projector facility serves as a venue for ICAT meetings and is equally is demand by others groups to have discussions, presentations and meetings. Two classrooms with projection facilities are additional sources for lectures. The digital classroom infrastructure promotes video conferencing and E-learning courses. Through video conferencing facility ICAT became a partner with project group in many technical discussions.

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Fig: ICAT Building

The large enclosed exhibition hall used for 'Book Exhibitions' also serves as a venue for Arts &Crafts exhibitions on the institute's Foundation Day and many other occasions. ICAT has understood the need to change with the times. It has recognised the social and interactive nature of physical library space and tried to maximise this new potential of a library. In the words of Washington State University Director of Libraries, VirginiaSteel, "Group study, art exhibits, food and coffee, talking, not whispering : this is the new library".

ICAT too has no 'Silence' boards. It offers ample areas for groups to walk in and hold discussions. An added attraction is provided in the form of a ' Steaming Mug' cafe facility, which offers snacks and beverages to users amidst the green gardens- an ideal place for informal discussions, providing seating capacity for official meetings too. It is often remarked that a cup of coffee can achieve a lot of things. Many a great idea can take birth at such a place. The ICAT café may very well convert the Information Centre for Armament Technology into an Idea Centre for Armament Technology.

Fig: Group discussion at ICAT Cafe

2.13   User Awareness Programmes

Making users aware of the facilitating services of the library is consciously attempted through periodic user's awareness programmes and orientation to new recruits, explaining the layout the library, its functions and facilities and providing training in the use of Libsys OPAC and DSpace repository as well as online E-resources.

2.14   Team ICAT

CAT is actively marketed as a place where the ARDE community can come together

to access both traditional and digital resources. The users are encouraged to express their information requirements, after which every effort is taken by the ICAT team to lead the users to the rights information sources in the library's print and digital collections.

In certain instances, to ensure user satisfaction, ICAT employs online resource sharing and document delivery services, tapping into the E-resources of sister libraries. With internet access and subscriptions to extensive online databases, the librarian becomes a 'Cybrarian' or information ambassador, guiding users to maximize the use of tools and services provided by the library. ICAT Cybrarians project an image of indispensability within the ARDE research community, utilizing technological advances to reach users through innovative services.

ICAT has consistently embraced the philosophy of embedded librarianship, integrating itself into the ARDE landscape. Team members actively participate in both technical and non-technical activities, and as part of an innovative approach, ICAT has begun attracting ARDE activities into its premises. For instance, during the Library Week 2019 event at ICAT, collaboration with a specific research group, Infantry Weapons and Ammunition, resulted in an exhibition showcasing information resources on defense, complemented by a display of actual weapons. Expert lectures on these weapons were also conducted, providing a platform for studying developments in the field, handling weapons, and engaging in high-level discussions on various developmental aspects. The success of this initiative sets the stage for hosting similar events in the future, solidifying ICAT's presence within the ARDE community.

2.15 Virtual vs Physical Readers :

The evolving landscape of libraries and the changing perspectives within the user community underscore the increasing importance of establishing a meaningful connection between resources and their users. ICAT's digital library, built on DSpace, has garnered significant appreciation and usage from the tech-savvy generation. The virtual leadership of this digital library, reflected in usage statistics in section 2.7, demonstrates steady and satisfactory growth.

Despite the prevalence of online information, scholarly research articles and personal academic enrichment often necessitate in-depth solitary study of printed publications, a facet in which ICAT boasts a rich collection. To attract readers to this physical repository of information, an innovative initiative called PRAISE (Promotion of Reading At ICAT for Scientific Enhancement) was introduced, offering enticing rewards. Additionally, to bring attention to important books nestled on shelves, especially during courses or Continuing Education Programs (CEPs), Topical Displays were organized. This inventive approach has successfully increased engagement in reading areas, promoting a broader awareness of the wealth of information available in printed form.

2.16 Innovative Competitions :

Innovative competitions have been devised during library week events to draw attention of our user community to ICAT:

- A Treasure Hunt requiring readers to locate publications by their books numbers
- A Library Quiz to gauge users' knowledge of their own library
- Suggestions for Library competition to invite useful ideas for implementation at ICAT

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Such Library Week items have succeeded in celebrating that entity called library, imprinting upon the users' minds the important role played by ICAT.

2.17 Attractive Displays :

Innovative signage and display boards are an attractive feature of ICAT. Special mention must be made of the 65 inches Large Screen Display near the ICAT lobby, which enables day-long scheduling of interesting videos, be it the ARDE film or ARDE inspirational song or topical videos such as selected videos from the famous TED Talks, the coverage of Chandrayaan-II launch or Yoga Demonstration on International Yoga Day. A poster depicting Dr.SR Ranganathan and his five laws occupies pride of place at the circulation counter, reminding us to imbibe these principles in the working of ICAT.

3. Innovation Vis-À-Vis Five Laws at ICAT :

Innovating practices are implied in the observance of the five laws and ICAT practices give evidence of this.If 'Books are for use' we have devised a detailed book selection process to ensure that the most useful books will be procured. The PRAISE initiative and links to full-text publications in OPAC and topical displays reflect our new efforts to ensure compliance of the laws stating "Every reader his book'' and "Every book its reader". The successful development of the digital library offering information at users' desktops enables us to "Save the time of the reader". Indicators of our recognition that " Library is a growing organism" are to be found in plenty. The transition to a new ICAT building with increased ambience and augmented IT infrastructure and other new physical facilities; procurement of Kindle readers for new generation readers; the increasingly multifunctional scope of ICAT; the proposed procurement of useful software such as Ithenticate Orignality Check Software to detect plagiarism to standardise and correct official correspondence and documents – these developments reflect ICAT's growth in size and scope, motive and intention reaching beyond traditional library frontiers.

4. Starter And Partner Role Of ICAT :

ICAT recognises the importance of innovative library services, which will establish it as a partner in the parent institution, so much so that in the future any activity planned at ARDE would consider involvement of ICAT.

With such a innovative approach in work ICAT has become a partner in major activities of ARDE which can be summarised as follows:

Are you in search for information/knowledge ? Access ICAT's valuable knowledge base

Planning a preliminary/feasibility study? Access ICAT's valuable knowledge base

Want to discuss a technical issue over Coffee/Tea ? Sip and talk at ICAT café

Want to spend a peaceful hour reading a book? Head for ICAT reading hall

Planning a committee meeting? See if the ICAT conference hall is free

Seeking a venue for a weapons display?   Consider ICAT space

Wish to hold an Art &Craft exhibition? Use the ICAT exhibition hall

Planning a presentation for a small audience?   See if the ICAT classroom is available

Want to conduct an E-training session?   Use the ICAT digital classroom

Need to schedule a video conferencing?   Try the ICAT NKNconferencing facility

And even, missed your tiffin/lunch box today? Head towards ICAT cafe

Conclusion :

An inventive approach to delivering information services is essential for maximizing user engagement and satisfaction. As libraries explore innovative services, there should be no limits, paving the way for boundless possibilities in the future. Libraries, functioning as multi-functional centers, can attract the parent community and play a pivotal role as information providers, contributing to institutional objectives and fostering personal and professional achievements within the parent organization. To achieve this, self-evaluation is imperative, employing the benchmark of the Five I's: Idea, Innovation, Implementation, Impact, and Improvement.

This paper suggests that library leaders must cultivate an infrastructure and environment conducive to creativity and innovation. It emphasizes that the key to success lies in fostering a Positive Attitude, Out-of-the-Box Thinking, Fast Decision-making Processes, and Team Work. By adopting these principles, libraries can position themselves at the forefront of transformative information services, ensuring their continued relevance and impact.

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