Role of Spacenet in Sharing Digital Resources among ISRO Libraries

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ABSTRACT

Spacenet is a Closed User Group (CUG)-based communication network of Department of Space/Indian Space Research Organisation (ISRO) catering to a variety of space community needs. It offers wide range of potential benefits both to libraries and end-users across the ISRO centres in India. Over a decade, Spacenet has evolved as a community network for the space community in India. The paper explains how the resources of various ISRO information centres are shared/utilised, digital libraries (DL) built, accessed, and institutional repositories (IRs) organised among the libraries using Spacenet.

Keywords: Spacenet, intranets, institutional repositories, digital library services, ISRO, NRSA

1. INTRODUCTION

The primary objectives of Department of Space (DoS) is promotion of space science, technology, and applications towards achieving self-reliance and assist the nation in telecommunication, broadcasting, meteorology, education, remote sensing, etc. The human resource strength of the department is 16,912 (scientific/technical: 11057, and administrative: 5135). Over the last three decades, satellite-based communication and remote sensing technologies have demonstrated their capabilities to provide services related to education, healthcare, weather, land, and water resources management, mitigation of impact of natural disasters, etc. The continuing expansion of space application programmes like Village Resources Centres, telemedicine, tele-education, disaster management support, and outreach through Direct-to-Home Television, reiterates the increasing role played by the Indian space systems in providing direct benefits to the society and for national development [1].

2. WHAT IS SPACENET?

Spacenet is a closed user group (CUG)-based communication network of Department of Space/Indian Space Research Organisation (ISRO) catering to a variety of needs of space community. It is a multimedia network using latest technology for transmission of data like audio, video through the same network simultaneously. Spacenet has contributed immensely in several space application programmes. It offers a wide range of potential benefits both to libraries and end-users across the ISRO Centres in the country. It provides multiple simultaneous access to the digital content, remote access, OPAC search facilities, multimedia capabilities, data compression, usage statistics, low-cost resource sharing, and availability of information on 24/7 basis, etc.

2.1 Configuration and Infrastructure

Spacenet configuration has been implemented by using VSAT (Very Small Aperture Terminal) network, which is highly reliable and cost-effective. The network is flexible in terms of providing Star or Mesh. Its networking architecture provides easy expansion capability both in terms of adding new stations or incorporating additional facilities in the existing stations.

The hub station of Spacenet is located at ISTRAC, Bengaluru, and remote stations at 44 different Centres/Units of ISRO/DoS across the country (Fig.1).

The network is a new generation network with end-to-end IP-based system with quality services and features for audio, video, and data. The hub station of Spacenet
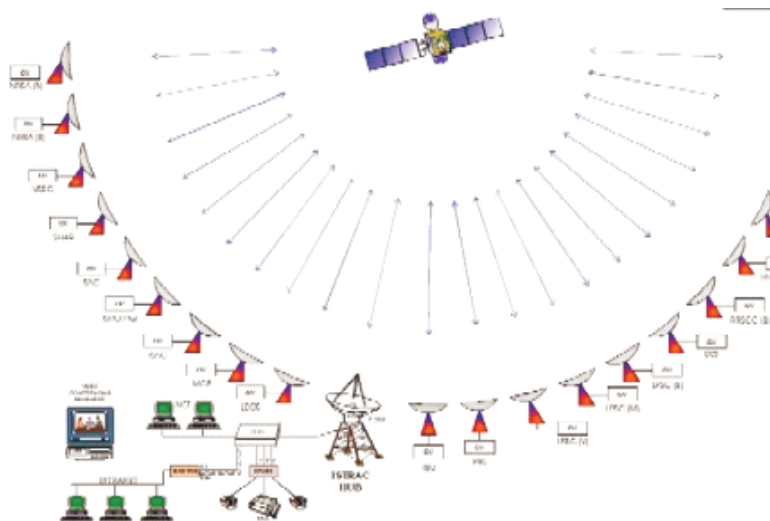
Figure 1. Configuration of the Spacenet.

comprises a 6.3 m antenna with program tracking facility. The network uses TDMA technology with bandwidth-efficient Star/Mesh topology.

3. SPACENET SERVICES

Video Conference Service (VCS): Spacenet provides group video conferencing facility allowing people of different Centres/Units of ISRO/DoS to meet face to face for exchanging information. It helps making presentations, discussing various project related issues, reviewing progress of various projects, discussing management/administrative issues, etc. and thus drastically reduces information turnaround time.

Voice/Fax: Voice services are operated in Star/Mesh mode satellite connectivity. Exchanges at respective Centres/Units are directly connected to modem with Type V four wire E&M/FXS interface [2].

Intranet Services: Intranet services among all Centres/Units are realised by dedicated data channels. It is operated in Star mode. Intranet uses the standard well-defined technologies available in Internet through the corporate LAN. Any individual or department can interact with other individual or department via E-mail, FTP and Web browsing. Bulk data transfer between any two locations is also available. Besides, Spacenet also provides bulletin boards and newsletter services also [3].

4. SPACENET: A COMMUNITY NETWORK

Community information is information targeted for a specific group which may belong to a government, academic institutions or a commercial organisation not restricted in a geographical area. The information and services delivered through these systems will cover wide information needs and specific ways of accessing information. The community information networks are locally focused and can exist on the Internet or on Intranet. Some community networks provide limited services like a portal or home-based information, while others provide Internet access, training, educational programmes, e-learning, etc. Sharing in Spacenet, because of classified and restricted nature of information, is restricted only among ISRO community and not open to the public.

4.1 Infrastructure of Local Network Facility at ISRO Centres

Each Centre, situated in a different geographical location, has a minimum of 50 to 1000 terminals having connectivity with 100 to 1000 Mbps with high-speed multiprocessor servers and powerful workstations for high data transfer rate over Spacenet [4].

5. ISRO LIBRARIES:FROM TRADITIONAL TO HYBRID LIBRARIES

ISRO libraries, with their specialised collection and services and keeping their information needs in view, have rapidly transformed over the past two decades into hybrid libraries with print and digital collection. ISRO libraries quickly moved from 'transaction' to 'interaction' by adopting modern technologies in bringing out various information products and other housekeeping services to the desktops of end users over Spacenet. On the existing Intranet, seven libraries have created their own web page to disseminate general information and services to their users. As part of digital library initiatives, most libraries offer access to digital report literature of the Centre and also to a sizable collection of commercially acquired digital resources. ISRO libraries are continuously engaged in exchanging various resources, viz., print, electronic, internally generated via file transfer, Fax, etc., for the benefits of the users.
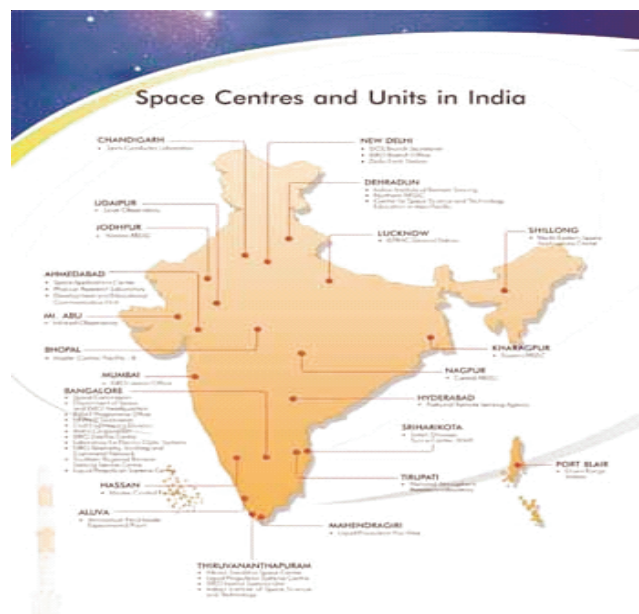
Figure 2. Space centres and units in India.

6. SPACENET: A BOON TO ISRO LIBRARIES

The library and information services and collections of each centre are specialised with respect to their projects. ISRO internally generates enormous amount of information in the form of lectures/speeches delivered by the eminent personalities of ISRO, documentary films, internal reports, re-prints, pre-prints, conference proceedings, conference papers, etc. These documents are archived and made available in digital form to all users across ISRO using Spacenet.

6.1 ISRO Libraries' Websites

The websites of ISRO libraries can be accessed via a link provided in the Spacenet. The portal describes a variety of web-based interfaces where users can easily access the library resources and services through a single access. The library information resources and services are accessed within the campus and the same can be accessed by ISRO/DoS community all over India through Spacenet.

6.2 Benefits of the Spacenet

Prior to introduction of Spacenet, libraries depended on the traditional methods like Fax, telephone, post, courier, etc. for exchanging the information within the ISRO. Spacenet, has now made video conferencing possible across the various ISRO Centres. ISRO's libraries started using Spacenet for exchanging resources in an effective way. Content distribution online has become easier using FTP access. This has resulted in remarkable increase in the user strength and also enormous savings of money and time. Other benefits of

Spacenet include:

❖ A single interface and access point.

❖ Effective document delivery systems.

❖ Enhanced search facilities.

❖ Reduced storage costs.

❖ Scope for electronic archives.

❖ Monitoring of usage statistics.

❖ Access to otherwise un-subscribed material.

❖ Developing common resources databases.

❖ Increased user base due to pushing information to desktops.

❖ General information about library, acquisition, circulars, collection, cooperating libraries, services, working hours, etc.

❖ E-resources like OPAC, journals, e-books, Internet pathfinder, space related sites, digital library, institutional repositories, etc.

6.3 Digital Libraries at ISRO

The resources at ISRO libraries are heterogeneous in nature. ISRO libraries have played a major role in providing information support efficiently and effectively to its centres throughout India using Intranet. While ISRO has a common goal to push the benefits of space research to the common man, the information needs of space scientists/technologists differ from each centre and are project-specific. To meet these demands from the users, each library had built a digital library (DL) using

DSpace supplementing their rich print collection with a common strategy to share these resources using Spacenet and various open source software. ISRO HQ, Space Application Centre (SAC), and ISRO Satellite Centre (ISAC) have created DL using Greenstone open source software developed by Southampton University. Similar DL initiatives are in progress at few other ISRO libraries. Conference proceedings, pre-prints, documentary films, news items related to ISRO, science and technology and other related topics are hosted in digital form. Facilities like browsing, searching, downloading of news items daily from websites, national newspapers, and hosting on the digital library are also available. ISRO libraries have established the digital information system in a multi-user environment. Access to information, search and retrieval from client nodes is made easy with Graphical User Interface (GUI) through web-based browser. DL at ISRO Centres are hosted on individual Intranet sites along with OPAC and other services on library home page. At present, all DL allow searching locally and collect the search results over Spacenet [5].

7. FUTURE PLANS

Most of the above mentioned services are read-only hypertext systems. It is a sort of broadcasting information to ISRO community about available services and products. Users can read what library offers. Initiatives have been taken to market, and also to provide access to the content and services on 24/7 basis to create virtual libraries through a host of free and inexpensive Web 2.0/ Library 2.0 tools such as blogs, wikis, RSS aggregators, pod casts, vodcasts, web conferencing, and instant messaging, etc. It is also planned to have federated search engine for research and retrieval of results for ISRO Libraries Information Systems, where users receive one common list of search results and are directed to the DL where the selected item is actually stored [6].

8. CONCLUSION

The role of Spacenet in the DoS is very significant. It continues to extend its networking support to several space application areas in general and to information centres of ISRO in particular. Libraries of ISRO are coming closer than ever and trying to explore new ways and means to strengthen their information support to space scientists and technologists using Spacenet. A step towards this direction is the community portals of ISRO libraries specially designed to provide a gateway to a wide spectrum of information resources and services to the end users to have cost-effective resource over Spacenet. Each portal acts as a one-stop information solution to the library resources and services to the entire spectrum of space community. ISRO libraries are being geared to adopt the latest web technologies in networking in the years to come for optimum utilisation of resources.

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