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DRDO LIBRARIES NETWORK

8.0 INTRODUCTION

A network is a pattern of communications between more than two parties - it is more than simply a two way dialog. A data network is comprised of three or more information systems connected together to exchange signals that enable transfer of information of various kinds. The most basic network can be seen as having only two kinds of parts, intelligent devices which process data, and the linking mechanisms for connecting them together to allow on-line electronic exchange of this data.

In Otherwords, network may be described as a combination of nodes (places or persons, representing users) and links (links joining the nodes a representing channels of communication). Information network regulates information flow among various constituents of the system. It involves more than two information units, inter-related by continuing transactions often in support of a common operation or service, the objective being the improvement of services and reduction of costs, which is normally achieved by effective resource sharing.

8.1 DEFINITION OF NETWORK

Tauebacum,¹ defines computer network as inter-connected collections autonomous computers. Computers are said to be inter connected. If they are able to exchange information. Connection could be either by copper wires, lasers, microwaves or communication satellites.

Purser,² defines network as physical network, which is said to
consist of all internal switching codes, their Inter connecting links and the links leading to external connected devices. The external devices themselves, Computers and terminals collectively referred as a data terminal equipment (DTE). The DTE is attached to physical network rather than forming part of it.

The purpose and functions of networks is to transmit the representations of information or signals between interconnected devices through the medium. Representations of information may be speech, text, pressures, measurements, etc. The signals may be either analogue or digital.

8.2 AIMS AND OBJECTIVES OF DRDO NETWORK

1. To promote sharing of resources, through computerised networking:

2. To assist member libraries in information processing:

3. To develop collection of development programme:

4. To facilitate and promote delivery of documents via, file transferring:

5. To create a centralised data base:

6. To promote electronic mail:

7. To coordinate with international linkages:

8. To utilise the existing Library and information software, their resources and services:

9. To provide information precisely and exhaustively accessible within a reasonable minimum time, in a manner which is convenient to the users:

10. To assist technological innovation research and development: and
11. To fulfill the needs of the user, providing current and exact information with an economical cost for maximum benefit.

8.3 HARDWARE CONNECTIVITY:

Most network components consist of both hardware and sophisticated software that together orchestrate the various communication processes allowing the application programmes running in one computing device to link and communicate with similar or sometime different application programmes running in other computing devices.

Network hardware includes on premise equipment off-premise facilities, and the transmission media used to physical, electronically connect them. But making physical connections between equipment with transmission media is only the most basic several functional levels of network communications.

8.4 SOFTWARE INTEROPERATABILITY:

Software programmes that direct computing devices, communication activities and secure the links that connect them must usually reside within the processing equipment at each end of a communication session and these set of software must be compatible. As a network becomes more complex, the software that performs the necessary telecommunication functions also becomes more complex and assumes an increasingly important role.
DRDO Regional Network Centres

Northern Region, New Delhi.
DESIDOC - Regional Center

DIFR, New Delhi
SAG, "
INMAS, "
DIPR, "
DTRL, "
CEES, "
ISSA, "
DIPAS, "
FRL, Leh
SASE, Manali
DRDE, Gwalior
ADRDE, Agra
PEE, Balasore
ITR, "
IRDE, Dehra Dun
DEAL, Dehra Dun
DL, Jodhpur
DMSRDE, Kanpur
DITM, Mussoorie
TBRL, Chandigarh

Western Region, Pune.
ARDE - Regional Center

IAT, Pune
R&D (Engineers), Pune
ERDL, Pune
NCML, Bombay
VRDE, Ahmednagar

Southern Region, Bangalore
GTRE - Regional Centre

ADE, Bangalore
LRDE, "
CASSA, "
CABS, "
MTRDC, "
CAIR, "
DEBEL, "
CRE&D, (A/c), "
CRE&D, (Eng), "
ASIEO, "
CVRDE, Madras
DFRL, Mysore
NPOL, Cochin

Eastern Region, Hyderabad
DRDL - Regional Center

RCI, Hyderabad
DLRL, "
ANURAG, "
DMRL, "
NSTL, Vizak
8.5 NETWORK OPERATION:

The network operations have advanced to the point where entire architectures have been specially developed and carefully evolved to structure the complex functions and activities supported by complicated network communications.

8.6 INFORMATION SYSTEMS:

Technological advances in information systems and the improvement of computer architectures and applications have had a profound effect on communications networks. Development of new telecommunication and network technology has in turn effected development of computer technology, engineering design.

8.7 DATA COMMUNICATIONS:

Data communications between computers is dependent on the physical connections made by transmission media, which form physical links that enable exchange of instructions, data, files and programming messages among information systems.

Information systems issues vitally affect networking and are in turn affected by network issues. Demand for greater and faster through continues to mount to the point where the development of larger band width, higher speed network conduits are becoming cost-justified for network operators while remaining economically scaled for network users.

8.8 CENTRALISED V/s DISTRIBUTED

The distribution and ongoing development of computing resources within the organisation are of two distinct tendencies. Centralised data
processing with the familiar data centre is administered by MIS, and follows company wide administration routines. Distributed processing increasingly follows the client-server model of micro computing. LAN architectures is generally more workshop task-oriented and is often used where non-repetitive agendas are the norm.

8.9 NETWORK ENVIRONMENT

Trends in the evaluation and operation of networks themselves continually prompt development of better network management tools.

8.10 NETWORK ARCHITECTURE:

Clear understanding of network management functions is difficult with a solid foundation in network architectures themselves. Network architectures are grand schemes, umbrella frameworks that establish the structure portico interactions between two communicating devices.

8.11 NETWORK MANAGEMENT:

Network management systems have traditionally designed to manage WANS consisting of four major familiar components:

- A central processing unit (CPU)
- Telephony or carrier circuits
- Data communications equipment
- Terminals
8.12 INTERNATIONAL STANDARDS ORGANISATION:

The ISO realise the growing importance of network management invoice, data and image communications. Accordingly it has initiated a process of defining standards for a set of information structures, services and protocols - richer than those currently afforded by TCP/IP - Upon which equipment and service vendors and users worldwide can agree standards of this type would enable multivendor connectivity and interoperatability of communication networks and provide a structure for the exchange of management information across different network types. Without such standards each network would require gateways which
translate information and management signaling from one proprietary set of protocols to another.

ISO management standards will support rather than replace proprietary architectures enabling many different makes and models of computer to exchange information through common protocol conversions accepted by all vendors and implemented in their major product lines.

8.13 AEROSPACE NET:

The Aeronautical Research and Development Board (AR&DB), Government of India working for the development of Aeronautical Engineering in India has number of panels connected to aeronautics. Out of these panels one of the panels which looks after the information field is called Aerospace Information Panel (AIP). This panel consisting of ancient Library Science professionals and Aerospace scientists, suggested in one of its meeting to set up a network preferably in Bangalore for Aerospace organisations since majority of the Aerospace organisations are situated in Bangalore.

The panel is working to achieve this goal. This task has to be implemented in number of phases. Initially all the Aerospace libraries in Bangalore should come together to share the resources electronically over the network and enter into an MOU to effect the system and services.

The organisations working in this field are identified. To quote a few ADA, NAL, ISRO, IISc, GTRE, CORE, ADE, HAL, CASSA, CABS, etc.

In the second phase the bibliographical data i.e. the catalogue of each of the participating Libraries be converted into machine readable form, using CCF (common communication format). The hardware
facilities such as computers, modem, direct telephone lines and software for communication, data management be provided.

In the third phase these libraries be linked on line using PSTN lines initially and switch over to data communication links gradually to increase the transactions. Among aerospace libraries, this system gradually linked to the natural net.

The present move on BALNET (Bangalore network) will help this system to become more faster and include other (S&T) libraries within this bracket. A set of standards be created followed for management of data and continuously monitored. Initially a distributed data management be adopted and gradually centralised system may take over which depends on the need and data exchange requirements.

The role of AIP of AR&DB in this direction is very encouraging and practicable. The financial help to develop and manage the system will be extended for AR&DB and other Government Bodies. A cooperative effort and dedication among the Information Managers of Aerospace Libraries will make this a reality.

The technicality of setting up of the network as explained in this chapter will be followed. The network will be taken up by a body set up for this purpose and manage systematically from installation of hardware, development of software and data input. An expert team will monitor the utility and changes as and when called on the users demand will be implemented. The Aerospace organisations will play a vital role in this direction. The network will definitely helps the scientific community.
8.14 UTILITY OF THE PROPOSED NETWORK:

An integrated library and Information service system will make use of Information Technology for building up a suitable networking in defence area in Bangalore and it provides:

1. **Shared computer resources through network proposed.**
2. **It provides** communication interlink for organised and cohesive information flow and use.
3. **It helps to process information at different levels of aggregation.**
4. **It provides scope for collaborative and continuous** research with cross-functional specialty team towards missions and target activities.
5. **Multimedia integrated packages of information with built-in-and adoptive user friendly inter-face facilities.**
6. **Instant and continuous** document and information access through global networks of library and information services.
7. **To promote sharing of resources among all types of libraries in Bangalore by developing a network of libraries.**
8. **To promote delivery of documents to develop specialised bibliographic bases, projects, specialists and institutions.**
9. **To coordinate with other regional, national and international networks for exchange of information and documents.**
10. **To undertake all such activities that promote the resource sharing among the libraries in Bangalore city with adequate use of the present information technology and also the gadgets.**
The perfect findings covered in this chapter about the networking facility in defence research pursuits elaborating different facets of this network will certainly help the scientific community at large for making use of information of macro and micro level.

The various findings of the analysis are scattered throughout the chapters. Therefore these are collected in one cohesive fashion and projected in the next chapter IX along with relevant recommendations and suggestions.
REFERENCE


7. Bartee, T.C. Editor Data Communications, Networks and Systems, DATA transmission/Computer Networks/Data systems 681.327.8 N85.

