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Workshop on State-of-the-art Information Technology, including Indian Experience

New Delhi, 29 March - 2 April 1993

REPORT*

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* This document has not been edited.

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CONTENTS

1. RECOMMENDATIONS

1. UNIDO should advise member countries in establishing appropriate long-term informatics policies and strategies.

2. The attenders in the workshop should make an effort to create an awareness amongst government officials and decision-makers of the need for and benefits to be derived from using an appropriate information technology environment. Efforts should also be made to train and motivate the end-users to adapt to the changing technological environment.

3. The participants recognize the importance of holding such workshops in member countries to create an awareness of recent technological trends and developments in the field of information technology and to review the progress made by the member countries. Some of the topics suggested for subsequent workshcps were E-mail facilities, Electronic Data Interchange, Online Access to Bibliographic Databases. It was recommended that the next workshop be held in Ghana within the next year.

4. It is perceived that training is a pre-requisite to successful implementation of any system. In this regard, UNIDO should:

(a) organize a structured training programme to accommodate the need of users at various levels in the member countries. Using the experience of the NIC as an example, these specific areas would include nation wide networking and administration, local area networking, database development and access mechanisms. The facilities and the experiences of NIC could be utilized for this purpose. UNIDO may consider making available appropriate equipment at the workshop locations.

(b) develop local hardware maintenance capabilities to handle the day-to-day hardware problems at the level of field replaceable components.

(c) take appropriate steps to solicit country specific training requirements for the training of trainers. UNIDO should support the necessary training programmes on a regular basis.

(d) promote information technology culture in countries where a formal information infrastructure is not available.

(e) develop a mechanism to continually evaluate the training programmes to maintain consistency and quality.

(f) solicit the help of outside training and funding sources where the resources of member countries are deemed insufficient.

5. Participants recommend strong regional interaction and co-operation among neighboring countries to promote above goals and share experiences. This will lead to development of regional centres of excellence and possibly an international informatics centre for industrial applications.

6. UNIDO should consider the possibility of creating a Euro-Asia-Africa network to allow developing countries to access European databases in the field of Science and Technology.

7. UNIDO members should actively participate in worldwide commercial information technology forums. These include hardware/software user group meetings, technology special interest groups, etc.

8. UNIDO should advise member countries on database standardization issues for possible integration with international databases.

9. UNIDO should include the workshop participants in INTIBNET Newsletter mailing list.

10. Member countries should initiate promotion of such workshops in their countries.

2. BACKGROUND INFORMATION

2.1 Human Resource Development (HRD) is one of the priority areas of UNIDO activities. In line with this programme, a number of workshops have been organized by UNIDO in the field of Information Technology in order to provide know how in the area of hardware and software development, use of INTIB databases and networking for exchange of information. These workshops have proved to be the appropriate platform to discuss ways and means on how to integrate various information/informatics networks that are in operation.

2.2 The Workshop on "Modern Information Technology Applications and Networks" (UD/INT/91/104 and XP/INT/91/056) was organized jointly by UNIDO and IAS and was held in Moscow/Issyk-Kul, 4-15 September 1992. As a logical continuation of the above programme, the "Workshop on Modern Information Technology Applications and Networks Integration" (XP/INT/92/052) was held in Odessa, Ukraine, from 25-29 May 1992. Both the above workshops recommended, inter alia, the following:

a) UNIDO should continue to hold regular meetings and workshops in the field of information technologies. Such events should also be held in developing countries such as India, Republic of Korea, etc. which have developed infrastructure and where the information networks perform efficiently.

b) UNIDO should assist in setting up national informatics centres in countries such as Bangladesh, Republic of Armenia, Viet Nam, etc.

2.3 As one of the direct results of the workshops arranged by UNIDO, a number of participating institutions have been connected with the INTIB electronic mail system and exchange industrial inquiries and technological information on a regular basis.

2.4 The rapid development of the knowledge-based industry, where information, combined with new technology, such as electronics, computers and

telecommunications, creates new requirements, and substantially expands the information market. At the latest count, there are over 5000 databases available for on-line searching throughout the world. Hence, a regular training prgramme to contribute to the upgrading of the knowledge of national information/informatics centres in developing countries on state-of-the-art information technology is very essential in the changing information market.

2.5. **Why Indian Experience?**

Country paper on state-of-the-art information technology in India was presented by National Informatics Centre, Planning Commission. The paper described that NICNET is India's first nationwide satellite based computer-communication network, probably the largest in a developing country. It has more than 500 nodes geographically distributed over the country. The purpose of having NICNET is to provide computer to computer communication for Govt. users, public sectors and other users. The participants of Moscow/Issy-Kul and Odessa workshops were impressed upon the achievements made by India in the development of communication networks and recommended UNIDO to conduct an information technology workshop in the premises of NIC.

3. OBJECTIVE OF THE WORKSHOP

3.1 The main objective of the Workshop is to contribute to the upgrading of the knowledge of participants on low-cost information technology based networks, software applications and its linkages with data bases and to facilitate the participating institutions in the establishment of on- and off-line linkages with UNIDO and commercial data bases/networks.

3.2 The purpose of the workshop has become increasingly necessary, especially to developing countries to which Information Technology is relatively new, and about which more knowledge should be available, especially with regard to the variety of choices offered and also the cost of such options. With regard to options, developing countries need to be made aware of the wide areas of possible application of IT but areas which due to their limited knowledge of IT tend to be limited.

4. ORGANIZATION

4.1 The workshop was jointly organized by the United Nations Industrial Development Organization (UNIDO) and National Informatics Centre, Planning Commission, Government of India, New Delhi.

4.2 Programme of the workshop emphasized on the state-of-the-art Information Technology including Indian experiences.

4.3 The workshop was attended by thirteen participants from eleven countries including Iran, Vietnam, Madagascar, Russia, Tunisia, Korea, Sri Lanka, Bangladesh, Ghana, Yemen, India, two representative from UNIDO and two experts from U.S.A.

4.4 Annex I contains programme of the workshop. Annex II contains list of participants and resource persons. Annex III contains list of the faculty members.

5. OPENING SESSION

5.1 The opening session was held at UNDP conference hall, 55 Lodi Estate, New Delhi-110 003 (INDIA). The function was attended by about 100 officials from various Indian Ministries and Departments including Ministry of Industries, National Informatics Centre, Ministry of Information and Broadcasting and from UN organizations i.e. UNESCO, UNDP.

5.2 Mr. N Vijayaditya, Deputy Director General, National Informatics Centre welcomed the participants and guests. He thanked the efforts of UNIDO for organizing the international workshop in New Delhi. He informed that transfer of technology in developing countries is a sound component of the workshop. The workshop has been an important event as it would provide a base for technology transfer in future. He highlighted the importance of Networking in industrial development and invited collaboration from developing countries. He wished the workshop every success and welcomed any request from the participants to get acquainted with NIC and share the experience.

5.3 In the opening remarks, the Chief of Industrial and Technological Information Section of UNIDO welcomed the participants and described the objective of the workshop. The need of linking national and international networks for information exchange in various disciplines such as industry, science and technology, business and market was emphasized. He thanked the host organization - NIC - for their efforts in organizing this Workshop.

5.4 The key notes address for the inauguration function was delivered by Mr. N. Seshagiri, Director General, National Informatics Centre.
Mr. N. Seshagiri welcomed the participants, experts, UNIDO representatives and guests. Mr. N. Seshagiri gave a brief history of NIC whose main mandate is to provide computers communication support to the Government of India. He explained in brief the features of Network established by National Informatics Centre and a number of facts worth noting. For example he informed that there have been a large no. of manufacturing companies in India on which the NIC depends for its self-reliance on maintenance, spare parts and change of architecture. Facilities at NIC for low and high speed communication to facilitate multimedia, teleconferencing etc. He observed that satellite communication is not expensive if only carefully planned since there are also modular methods to increase capacity. He reiterated that India can help other developing nations if given the necessary assistance by international agencies like UNIDO, UNESCO or UNDP.

5.5 Mr. N. Seshagiri shared his experience in establishing the nationwide network. He touched the various aspects which included the problems with labour movement who feared redundancy, propagation of technology, creation of proper environment and self-reliance. He described digital communication to be poor man's communication, unlike voice, which is the rich man's communication. He explained in brief the hardware and software scenario in the country. He informed that NIC will provide full support for collaboration on concrete proposals from participating nations.

5.6 After a brief statement by Mr. Savostisky of the Institute of Automation Studies, Russia, a representative from UNIDO invited project proposals for consideration by UNIDO.

5.7 **Election of Officers**

The workshop was invited to elect a chairman and rapporteur. The following nominations were accepted by participants unanimously: -

Chairman : Mr. Y. Savostisky
Deputy Director, Institute for Automated Systems, 2a Nezhdanova Street
Moscow, 103009 (RUSSIA)

Rapporteur: Ms. Shalini Chakravorty, Senior Systems Analyst
National Informatics Centre, Planning Commission , New Delhi (INDIA)

6. **WORKING SESSION**

6.1. Workshop programme was designed to present the state-of-the-art technology. The experts from USA discussed trends and developments in the field of information technology. Lectures were arranged to present the hardware and software status in India. Guests lectures were also arranged from the private companies. The NICNET architecture and various applications operational on this Network was presented in detail by NIC faculty. The applications covered included MEDLARS, TELETEXT, CAD, DISNIC, CENSUS , INDUSTRY DATABASES, NICMAIL, TRAINING ACTIVITY alongwith experience of NICNET User.

6.2 Discussions and working session are summarized in the following paragraphs.

March 29, 1993.

THE NICNET ARCHITECTURE, INCLUDING LAN AND WAN CONCEPTS

by
Mr.N Vijayditya,
Deputy Director General,
National Informatics Centre.

The first session of the workshop consisted of a presentation by Mr. N. Vijayaditya, Deputy Director General, National Informatics Centre, primarily on the architecture of NIC's satellite communication network, NICNET. Presenting an overview of NICNET, Mr. Vijayaditya also dwelt extensively on the latest computer communication technology and LAN and WAN concepts.

Starting with a brief run-down on the NICNET project and the collaborative role played by UNIDO in the endeavour, Mr. Vijayaditya went on to describe in detailed configuration of the NICNET architecture, network hierarchy and the overall capabilities of NICNET. He also explained the communication features such as CDMA and TDMA employed by NICNET.

Elaborating on the future goals that the NICNET project hopes to achieve, he informed the participants of NIC's plans to provide an Electronic Data Interchange (EDI) facility in NICNET which will allow transmission and receipt of documents in different electronic modes. This facility will be provided on a 486 platform.

In the context of the traffic on NICNET. Mr. Vijayaditya explained the application of passport issue and management which is being computerized with using NICNET. The software for this application has already been developed by NIC and is presently at the testing stage.

With a substantial increase in the operation speed of NICNET, as envisaged, by October 1993, there was every likelihood of a corresponding increase in the throughput, emphasized Mr. Vijayaditya.

The presentation was followed by a round of discussions.

Mr. Savostisky, the Delegate from Russia and the Chairman designate of the workshop, sought a clarification on the factors contributing to the reliability of NICNET. He also wanted to know whether the banking system of the Country was inter-connected through network or any other similar communication network. He queried the speaker on the competition faced by NICNET from other telecommunication networks.

Mr. Mohammed Hamidul Hoque Bhuiyan from Bangladesh was interested in knowing the extent of coverage of the international network ERNET, specifically of the airlines industry. He also wanted to know if a central mainframe machine was necessary for a distributive data processing system.

Mr. Vijayaditya responded to all the queries extensively.

The lecture session followed by technical visit to the NIC Master Earth Station facility.

March 30, 1993.

INFORMATION TECHNOLOGY DEVELOPMENTS AND TRENDS IN USA/EUROPE

by
Mr. U Sahu,
Managing Director,
United Research,
Houstan, USA.

The second day of the workshop started with a presentation on Information Technology Developments and Trends in USA/Europe by Mr. U. Sahu, Managing Director, United Research, Houstan, USA. The main focus of the presentation was on the changes in the hardware and software markets in the last few years. He described how the market for software has grown steadily while the demand for hardware has not shown a corresponding increase. He explained how and why companies are prepared to spend a lot more money on software when compared to hardware.

Mr. Sahu presented detailed statistics on decrease in demand for main frames and peripherals with a corresponding increase in the demand for personal computers and computer series. He showed how the United States, Europe and Japan are leading the hardware and software markets while the rest of the world has a very small share.

Statistics were also presented on the trends in purchase of hardware, demand for supercomputers, mainframes, minis, workstations and personal computers in the world. Mr. Sahu's figures demonstrated how the demand for personal computers has grown at a remarkable rate along with the applications of personal computers. He stressed on the increased usage of personal computers in multimedia and in households applications. He also pointed out the importance of IBM in the computer market, especially in the personal computer market.

Mr. Sahu dwelt briefly on the various operating systems used by personal computers, the various local area networks and the increasing usage of the mailbox facility on personal computers. He singled out NOVELL's position as a major seller in the LAN market citing it as an example in which the advantage was mainly due to the fact that the Company supplied LAN software for DOS as well as UNIX based systems.

PERSONAL COMPUTERS AND WORKSTATION TECHNOLOGY

by
Mr T.K. Duncan,
Parsec Systems
USA.

In the second session of the day, Mr. T. K. Duncan from PARSEC Systems, USA, spoke on Personal Computers and Workstation Technology. He began with a discourse on the downward spiral of prices in the market paralled by an increase in performance and rise in standards in the field. He discussed the standards and conventions in the personal computer and workstation markets in detail.

The first point he raised was on communication standards, and he presented a brief overview of the CCITT, ISO, DARPa and IEEE 802 standards, He then moved on to speak on the Operating Systems and File System standards. He informed the participants about the standards set for UNIX systems. He also mentioned that UNIX standards were far more advanced than DOS standards.

Mr. Duncan described the work of the Open Software foundation --- a collaboration of vendors, users and academics for development of operating systems for the future. He spoke on the Distributed File system standards developed by them. He then moved on to the hardware standards.

BUS standards (VME64, ISA, EISA, PC BUS); Peripheral Interface Standards (SCSI, SCSI II, Serial RS 232, RS.449, Centronics, IEEE 4888 BUS) and graphic standards on workstations (XII, MOTIF, OPENLOOK, PHIGS PEX) were covered at length. There was a detailed discussion on CISC versus RISC architecture machines which brought out the pros and cons of the two systems.

This was followed by details of personal computer operating systems---DOS 6.0, Windows NT, MAC, IBMOS2, and UNIX. The DOS operating system, which is being widely used by the Developing Countries, attracted special attention. Speaking on the features of DOS, Mr Duncan was of the opinion that though DOS can hardly be considered an operating system in the context of the latest technology, the relevance of DOS lies in the fact that it is still being widely used. This, largely because of its inherent simplicity. "It doesn't matter if DOS is good or bad or different; the thing that matters is DOS is there", he said.

Mr. Duncan's approach to the subject, which consisted of analogical references to practical usage in the United States, elicited quite a few queries from the participants. Questions ranged from the compatibility of RS 422 and RS 449 standards to the relevance of using UUCP protocols as compared to X.25 RS.422 and RS449 standards, replied Mr. Duncan, should pose no problems of compatibility as a number of different protocols have already been introduced. As the use of X.25 enables communication between any two machines, while through UUCP communication can be established only between UNIX machines, Mr Duncan opined that X.25 has outclassed UUCP in relevance. The participant from Bangladesh requested for further information on X.400, which was provided by Mr Duncan.

Responding to a discussion on the relevance of notebooks Mr Sahu felt that notebook technology is advancing at a rapid pace making the notebook proposition more attractive. Replying to a request for more information on communicating through laptops, Dr N Vijayaditya, Deputy Director General, NIC, spoke of the concept of data highways which would make it possible for any type of data to be transmitted from anywhere in the world in the not too distant future.

UNIDO/INTIB NETWORKS AND DATABASES

by
UNIDO
Representative

In his presentation UNIDO/INTIB networks and databases, the chief of INTIB highlighted the following points:

Role of UNIDO in information dissemination in Developing Countries.

Assistance provided by UNIDO to Developing Countries giving them access to scientific knowledge through its international centres and research and development co-operation programme.

One of the major activities of UNIDO is to help the Developing Countries gain access to scientific knowledge and frontier technology through its international centres, said the chief of INTIB, UNIDO's activities are directed towards establishing and developing information networks with the help of locally available expertise.

Information networks for the Developing Countries have been developed in the areas of environment, energy, food technology, biotechnology and materials technology. Regional networks have been set up in Africa, Latin America, Asia and Europe.

UNIDO representative discussed the operations of the various networks and explained how these networks are helping industries in Developing Countries.

UNIDO E-MAIL SYSTEM

by UNIDO
Staff Member

The last session of the day was on the UNIDO electronic mail service. This service is available through personal computers interfaced with QUICK COMM, the world-wide electronic mail service offered by the General Electronics Global Communications Network.

Through this service, users can send and receive messages from a large no. of countries. Acknowledgements of mail are also sent to the sender after his mail is delivered to the receiver. The service can be accessed on PC LAN as well.

The participants were very interested in the service and wanted to know all details on how they could access it from countries. They also wanted information on the cost of the service. They were informed of the minimal cost and easy accessibility of the UNIDO mail service. The talk was followed with demonstration of GE Mail Service. The sample messages were sent to UNIDO staff at Vienna.

March 31, 1993

NICMAIL: THE ELECTRONIC MAIL SYSTEM OF NIC

By
Mr. P.K.Mishra,
Principal Systems Analyst,
National Informatics Centre,

The first speaker of the day was Mr P.K. Mishra who gave details of the NICMAIL services available on NICNET. The NICMAIL is NIC's endogenously developed user-friendly mail facility. It allows users to send and receive messages and transfer data files across the network. Currently there are over 450 NICNET nodes distributed geographically within the country.

The Chairman wanted to know if it was possible to integrate NICMAIL with FAX or telegraph systems. Dr Mishra informed the participants that this would be possible once the NICMAIL 400 version is operational. A complete demonstration and hands-on experience to operate the NICMAIL was given during this session.

NICET INDUSTRY DATABASES

By UNIDO
Mr. V.K. Gupta
Technical Director
National Informatics Centre

The second presentation of the day was on NIC Industrial Databases by Mr VK Gupta, who spoke in details on the industrial databases of NIC, Monitoring of Industrial Approval, Industrial Licensing, Implementation Problems in setting up Industries, Production Monitoring, Whole-sale price-index database, Foreign Collaborations, Small-scale Industries, Large and Medium Industries, Public Sector Undertakings, Minerals, Financial Analysis of Companies.

Mr. V. K. Gupta informed that the databases are operational and they have helped entrepreneurs in the area of industries in India. Details of licensing, foreign exchange, import-export regulations and requirements, state laws, assistance provided in backward areas, product pricing etc. were provided to entrepreneurs by these databases.

Speaking on the range of the databases, Mr VK Gupta said that these databases were being used by the public as well as the Government. NIC is also entering into agreements with trade associations such as the Federation of Indian Chamber of Commerce and Industry (FICCI), to enable the Industry to derive maximum benefits from NIC's databases, especially in the promotion of foreign collaborations.

The Chairman, on behalf of the participants, thanked Mr Gupta for the enlightening presentation. NIC is catering to the needs of the Country in a very practical manner through its vast resources, he opined.

Mr Sahu wanted to know if there were any plans to integrate these databases, and whether these databases were accessible from other countries.

Mr Gupta appreciated the suggestions and informed that NIC as well Dept. of Industries would be very much interested in such a proposal and necessary action has to be initiated from UNIDO.

Mohammed Hamidul Haque Bhuyan from Bangladesh wanted to know how users were accessing these databases. In reply, Mr Gupta explained how the databases were accessible through all NICNET nodes and NICNET public booths.

The participants also requested for details on the training conducted in this field for end users. Mr Gupta described the methodology of NIC training classifying the approaches as follows:

Formal NIC courses

On-the-job training to Users at the site

Informal training courses conducted at the user site.

March 31, 1993

DISTRICT INFORMATION SYSTEM OF NIC

By
Mr. M. Moni,
Technical Director &
Head, DISNIC Software Division,
National Informatics Centre.

The post-lunch session of the second day of the Workshop started with a presentation on the District Information System of NIC (DISNIC) by Mr M Moni, Technical Director NIC.

Mr Moni began with a thorough description of the structure of DISNIC through which information is being collected and processed at the grassroots level-the District-and relayed through the different layers of the Government through NICNET. He proceeded to show how the information sc collected and maintained is

being used successively by the District Administration, the State Governments and the Central Government for decision support and planning DISNIC is not just a EDP exercise, he stressed.

In the sixties, the emphasis was on hardware: in the seventies, on software; in the eighties, on databases; and now in the nineties, on Geographic Information Systems (GIS). Mr Moni demonstrated how the DISNIC project has, through the years since it was conceptualized and launched, tried to bring about a synthesis of all these aspects of information technology and at the same time adapt this technology to the conditions of a country as diverse as India.

Drawing from experience Mr Moni then concentrated on the inherent problems that had to be surmounted to make such a project operational in a developing country. He extolled the value of documentation and explained how the wide circulation of handbooks and other publicity material has helped in standardization and in simplifying the process of data collection. He also explained the method of rationalization through the 'Highest Common Factor' approach whereby diverse parameters of a given field are broken down to some common factors. These common factors are then again re-integrated to yield the highest common factor. The highest common factor is taken as the standard on which the whole approach is based.

Mr Moni went on to describe all the 27 sectors of DISNIC along with the sectoral databases. He explained the structure of the databases through flow charts and diagrams. He also gave the participants a fair idea of the status of work in each of the databases.

Speaking on DISNIC-PLAN, Mr Moni informed how the Seventh Five Year Plan shifted the emphasis of planning from the macro to the micro level thus necessitating an information system which could provide the planners with reliable and readily available micro-level information on which to base the plans. He emphasized the importance of Geographic Information Systems citing NIC's work in developing a natural resources information system in its Aligarh pilot project as an example.

In the discussion session following the lecture, the delegate from Ghana wanted to know to whether NIC's efforts at developing and information system such as DISNIC fell within the ambit of any overall policy of the Government. Responding to the question, Mr Moni explained how the very conceptualization of NIC was a conscious effort on the part of the Government. He also pointed out the role of NIC in general, and its DISNIC programme specifically, in providing the Government with a planning tool to use in all its development projects and programmes.

Mr Moni concluded his presentation with a half-an-hour documentary on the Aligarh pilot project.

March 31, 1993

NIC CENSUS DIVISION ACTIVITIES

By
Mr S.P. Rastogi,
Senior Technical Director,
National Informatics Centre.

Mr Rastogi, Senior Technical Director, National Informatics Centre, described in detail the process of computerization of 1991 census data. He started with a brief introduction on how the population of the Country is classified in census operations. He then went on to explain how the process of computerization has simplified the process of data collection and at the same time enhanced the data presentation to a large extent.

Speaking on the Primary Census Abstract of 1991, released recently, he pointed out the factor of increase in efficiency of the whole census process brought in by computerization. The village and ward-wise census data in the abstract, was first processed by the NIC State Units and then stored in the main frame computer of NIC. This Data is now accessible from all NICNET nodes of NIC spreading over the entire Country up to the district. Computerization of census has not only speeded up the entire process but has also made it possible for users in remote corners of the Country to access this data, he said. In this was in reply to a query from the delegate from Ghana who wanted to know if the data was available through NICNET.

Computerization has also enabled the census data to be made available to users on computer diskettes introducing a novel method of circulation of the data.

Mr Rastogi concluded his presentation with a live demonstration on the accessibility of the census data showing the delegates how exactly the required information can be obtained through any computer system connected to NICNET.

MULTIMEDIA FACILITY OF NIC TRAINING DIVISION

by
Mr. Gera,
Senior Systems Analyst,
National Informatics Centre.

The presentation on multimedia facilities in NIC by Mr Gera, Senior Systems Analyst, while basically concentrating on the efforts of the Organization at development of multimedia in the last two years also gave an overall picture of the development and scope of multimedia as a means of mass communication.

Mr. Gera defined multimedia as a new approach which integrates conventional data with audio, still visuals, video and animation. The different components of a multimedia workstation- personal computer, audio card, video-controller card, VCR or Laser Disk Card, monitor to display integrated output and software utilities-and their functions were described in detail.

The multimedia development programme was launched by the National Informatics Centre in September, 1991 with the two-fold objective of developing low-cost multimedia products and to provide turnkey solutions to communication hurdles through multimedia applications. Mr Gera then proceeded to describe the hardware products such as VHS card and PC-VCR Controller Card which NIC has developed. He also spoke on Multibase-a multimedia software tool developed in NIC.

The National Informatics Centre has utilized multimedia applications in training, promotion of tourism, simulation and in presentation of information on museums. Mr Gera described each of these applications in details and at the same time informed the participants of the stage of progress of NIC in these areas.

At the end of the presentation, the Chairman of the workshop initiated a discussion on the difficulties of compression of graphical information in multimedia in which the scale of compression and medium of storage were discussed.

The delegate from Bangladesh wanted additional information on the use of scanners in multimedia.

April 1, 1993.

COMPUTER AIDED DESIGN FACILITY IN NIC

By
Mr. B.K. Gairola,
Senior Technical Director,
National Informatics Centre.

Mr. B.K. Gairola, Senior Technical Director, National Informatics Centre, gave a presentation on computer aided design facilities in NIC in the first session of the day. Speaking on the advantages and disadvantages of the SESAM software, Mr. Gairola pointed out that the biggest disadvantage of SESAM is that it is basically for off-shore structural analysis. Hence, its utility falls sharply in the context of any on-shore industrial setup as in India. This affects the computer time of SESAM to a large extent and also hinders in software development.

Since 1988-89 NIC has switched the focus of CAD programme from a promotional approach to a commercial one going from finite element to the CAM range. In 1990, efforts at computer development were further diversified when NIC took up an utility mapping project.

The National Informatics Centre ventured into the world of computer aided design with its first project of analyzing a railway bridge for the Indian Railways. Thereafter, it was to undertake various other projects for both the public and private sectors. Cyclic Symmetry Analysis of the Taj Mahal, Earthquake Liquefaction Maps for earthquake prone areas, analysis of the leaf spring and crank shaft of the Maruti Car, and design analysis for the HMT Company are some of the projects in which the Organization has achieved credible success, Mr. Gairola informed underlying the utility and necessity of the projects.

Mr. Gairola then went on to discuss the merits and demerits of the Multigrade Technique of analysis as compared with the finite element approach.

However, Mr. Gairola was quick to point out the necessity of trying to compete in the world market in face of the no-demand situation in the local market in the context of developing countries.

Explaining utility mapping, Mr. Gairola presented a preview of the Organization's project to map the Okhla industrial area of Delhi as a pilot project and then, with the experience, go in for mapping the whole City of Delhi and hopefully other major cities facing congestion and other problems of over-population. He explained how utility mapping will prove useful for the civic bodies in curbing unauthorized constructions and providing amenities to the people. He also informed the participants that NIC has already signed a Memorandum of Understanding with Delhi Administration to carry out its utility mapping project.

The delegate of Bangladesh wanted more information on the administrative procedure adopted for utility mapping.

The various structures analyses in NIC were presented in the Second session by Mr. B. K. Gairola.

NIC TELETEXT SERVICES

By
Mr. S. Sarkar,
Technical Director,
National Informatics Centre.

Teletext is a mass information dissemination system developed by the National Informatics Centre. In India, teletext is called Intext and comes to viewers on Doordarshan's second channel in Delhi. The information is the form of constantly updated electronic pages. These pages are hidden in the normal television signal and broadcast in the same channel as the ongoing TV programme without disturbing it. Intext is a joint effort of the National Informatics Centre (NIC) and Doordarshan. In his presentation on teletext, Mr Sarkar discussed how the decoder -- a small electronic device-- extracts the hidden teletext pages from the incoming TV signal and displays them on the screen.

Mr Sarkar also explained the grouping of teletext pages into different magazines and how with the help of the remote control panel of the decoder, the viewer can select the magazine on the topic of his choice. For viewers without decoders, Intext provides a repeating cycle of about 35 pages during the non-programme hours on Doordarshan's second channel in Delhi. These pages are decoded and converted into normal TV programme at the teletext studio itself.

With the help of a flow chart, Mr Sarkar demonstrated how information flows from one node to another in the teletext information structure. Elaborating on the benefits of teletext, he emphasized the following features of teletext:

Easy access to terminals

Use of single terminal for multiple source of information.

Common access method

Menu-driven facilities
Intelligible screens

He also singled out the greater spread of the teletext system in a country where there are 60 million television connections against only 6 million telephone connections.

The classification of the information into easily comprehensible categories was then studied in details. Speaking on the selection of information for teletext, Mr Sarkar pointed out that only information which have wide public interest, frequently updatable and is not so widely available through other information systems should be transmitted through the teletext system.

The delegate from Vietnam wanted to know the cost of a decoder and whether Intext was accessible from Vietnam. The Chairman of the workshop commented that teletext was indeed the poor man's solution to information requirements. There were other questions on the process of data transfer from the source and the use of modem in the process. Mr. Sarkar provided suitable replies to the queries.

ON-AND OFF-LINE LINKAGES WITH EXTERNAL DATABASES

By
Mrs. L. Chinnappa, Head,
MEDLARS Division,
National Informatics Centre.

The after-lunch session, conducted by Mrs SL Chinnappa of NIC, was on International Database Services on NICNET.

Mrs Chinnappa informed the participants about the biomedical database services available from NIC. Giving a brief rundown on the Medical Literature Analysis and Retrieval System (MEDLARS) of the National Library of Medicine, the most extensively used biomedical information system in the world, she sail that it provides literature on all areas of medicine including dentistry, nursing,

cancer, AIDS, population and health. NIC has been identified and is functioning as the Indian MEDLARS Centre. It is the seventeenth MEDLARS Centre in the world. MEDLARS services are provided by NIC through NICNET and Users all over the Country are accessing the database. NIC is serving the biomedical user community in the Country by providing information from MEDLINE across NICNET. A number of biomedical institutes are connected to NICNET for access to MEDLINE.

In addition to this, NIC also provides information from a number of database on compact disks. The Centre multiuser, multi-drive CD-ROM system which Users can access either locally or from remote sites through dial-up modems. A number of S&T databases such as INSPEC, COMPENDEX, Science Citation Index, Biological abstracts etc. are available on compact disks, Mrs Chinnappa informed.

CD mastering equipments are also available in NIC. NIC plans to use this on a commercial basis in India. Besides, NIC has various document-support facilities. An on-line catalogue of the holdings of 190 biomedical libraries in India is available for Users. A compact disk--ADONIS-- with full-text documentation of 520 medical journals is being used to provide Users with complete articles. NIC can also download any of the MEDLINE journals from NLM's DOCLINE at a cost of 12 dollars for each article.

Mrs Chinnappa pointed out that NIC uses electronic mail to communicate with all other medical institutions of the world. Information from certain specialized databases such as PDQ (information on cancer) is available through E-mail.

The presentation was followed by a demonstration session of NIC's facilities in the field.

7. ADOPTION OF THE REPORT

After detailed discussions, the workshop adopted the Report and its recommendations presented by the rapporteur, Ms. Shalini Chakravorty. The workshop participants made a strong recommendation to UNIDO and the Member States for early implementation of the activities suggested at the workshop.

8. ACKNOWLEDGEMENTS

The participants of the workshop expressed their deep appreciation for the efforts made by National Informatics centre and UNIDO for the successful organization of the workshop.

9. CLOSING SESSION

The chief, INTIB, UNIDO thanked the participants for attending the workshop and summarized the event to be a very successful one. He informed that best efforts will be made at UNIDO for implementation of recommendations. He thanked Messrs. N. Seshagiri, N. Vijayaditya and Mrs. Vandana Sharma, workshop co-ordinator for excellent organization of the workshop and arrangements.

Mr. N. Seshagiri thanked UNIDO and participants for their active interaction during the workshop. Mr. N. Seshagiri jointly with UNIDO representative distributed the certificates to the participants of the workshop.

INTERNATION WORKSHOP ON STATE-OF-THE-ART INFORMATION TEHCNOLOGY, INCLUDING INDIAN EXPERIENCE

New Delhi, India, 29 March - 2 April 1993
organised by

UNIDO and NIC

Venue: A Block, C.G.O. Complex, New Delhi-3.

WORKSHOP PROGRAMME

March 29, Monday

09.00 - 10.00	-	Opening session
		Welcome address by DG, NIC Statement by UNIDO representative Opening address by Chief Guest
10.30 - 11.15	-	Self introduction of participants and their expectations from workshop
	-	Election of Chairman and Rapporteur
11.15 - 12.30	-	Lecture on State-of-the-Art low cost information technology developed by NIC Mr. N. Seshagiri, DG, NIC
		Discussion
14.00 - 15.15	-	Lecture on NICNET Architecture, including LAN and WAN concepts Mr. N. Vijayaditya, DDG, NIC
		Discussion
15.30 - 17.00	-	Technical visit to the NIC Master Earth Station, New Delhi

March 30, Tuesday

09.30 - 11.00	-	Lecture on information technologydevelopments and trends in U.S.A./Europe Dr. U. Sahu, Managing Director, United Research, Houston, U.S.A.
11.15 - 12.30	-	Lecture on latest hardware and software related to information technology in U.S.A. Mr. U. Sahu, Managing Director, United Research, Houston, U.S.A. and Mr. T.K.Duncan, Parsec Systems, U.S.A.
		Discussion

14.00 - 15.00	-	Lecture on state-of-the-art hardware and software market in India DOT
		Discussion
15.15 - 16.15		Presentation on UNIDO/INTIB databases and networks UNIDO representative
		Discussion
16.15 - 17.30	-	Presentation on UNIDO E-mail system and Hands-on session UNIDO representative

March 31, Wednesday

09.30 - 11.00	-	Lecture on NICMAIL and hands-on session
11.15 - 12.30	-	Lecture on NICNET industry databases Mr. V. K. Gupta, Technical Director, NIC
	-	Demonstration of selected NICNET databases
		Discussion
14.00 - 15.00	-	Lecture on District Information System of NICNET Mr. M. Moni, Technical Director, NIC
15.15 - 16.15	-	NIC Census Division Activities
16.15 - 17.15	-	Presentation on Multimedia facility of NIC Mr. Y. K. Sharma, Director and Head, Training Division

April 1, Thursday

09.30 - 11.15	-	Lecture on Computer Aided design facility in NIC Mr. B. K. Gairola, Director, CAD Division
		Discussion
11.30 - 13.00	-	NIC Teletex Services Mr. S. Sarkar, New Delhi
14.30 - 15.15	-	Lecture on on- and off- line linkages with external databases, e.g. MEDLARS Ms. Chinnappa, Head, MEDLARS, NIC
		Discussion

15.30 - 17.00	-	Hands-on session - MEDLARS - CD-ROM databases Ms. L. Chinnappa, Head MEDLARS, NIC

April 2, Friday

09.30 - 10.00	-	Presentation on the experience of a user on NICNET as a decision-making tool
10.00 - 11.00	-	Vendors presentation
11.15 - 12.30	-	Panel discussion on information technology (participants and international experts) NIC faculty members
	-	Discussion on future UNIDO information technology training programme
14.00 - 15.00	-	Adoption of Workshop recommendations
	-	Closing Session

WORKSHOP ON STATE-OF-THE-ART INFORMATION TECHNOLOGY, INCLUDING INDIAN EXPERIENCE

New Delhi, India, 29 March - 2 April 1993

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