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Joint UNIDO/UNESCO/IAS* Workshop on Advanced
Information Technology Applications
and Networks Integration

11p

Odessa, Ukraine, 25-29 May 1992

REPORT**

* Institute for Automated Systems

** This document has not been edited.

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CONTENTS

	<u>Page</u>
1. RECOMMENDATIONS	1
2. INTRODUCTION	2
3. ORGANIZATION	3
4. OPENING SESSION	4
5. OBJECTIVES OF THE WORKSHOP	5
6. WORKING SESSIONS	5
7. ADOPTION OF THE REPORT	7
8. ACKNOWLEDGEMENTS	7
9. CLOSING SESSION	8
 Annexes	
I. Workshop Programme	9
II. List of Participants	10
III. Abstracts of country papers	14

1. RECOMMENDATIONS

1.1 The participants recognize the importance of the use of packet-switching for data transmission. The use of relevant CCITT, CCIR, and ISO recommendations and standards for data transmission should be applied, wherever possible.

1.2 UNIDO/INTIB should continue to organize the training workshops, possibly in developing countries such as India, Iran, Republic of Armenia, Republic of Korea and Turkey, on modern information technology applications and networks with emphasis on value added services such as EDI, EDIFACT, E-mail, etc.

1.3 Such workshops mentioned in para 2 above should be organized for people responsible for networking and be arranged in such a way to provide them with opportunities for hands-on training. In order to accumulate the experience, it is recommended that the same participants should continue to take part in future workshops, as far as possible.

1.4 UNIDO should bring to the attention of funding agencies and donor countries that informatics networking projects have priority considering the present needs of the developing countries.

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

1.6 UNIDO may explore the possibility of accessing EEC and UN databases at no cost to users in developing countries. UNIDO may provide relevant information on various other databases available world-wide.

1.7 The participants welcomed UNIDO/UNESCO strategy on the integrated approach of telecommunication/information infrastructure in Euro-Asia. It is recommended that a detailed project proposal for establishing an experimental European/Asian Packet-Switching network based on the existing telecommunication data exchange networks in UNIDO/UNESCO be prepared, not later than September 1992, for the exchange of information in the fields of:

- science and technology
- trade, marketing information, investment opportunities and regulations
- national enterprises and business opportunities
- methodology and legislation for privatization

1.8 IAS in co-operation with interested countries in Europe and Asia should prepare and send, as soon as possible, the above project proposal to UNIDO for appropriate action and copies to all participants of this Workshop for their possible involvement. The project document should include all possible hardware/software solutions for a standard low-cost telecommunication and

recommendation on establishing gateways. UNIDO may assist by seeking expert advice from countries involved.

1.9 UNIDO/INTIB and UNESCO as well as IAS in their cooperation should make maximum use of existing telecommunication infrastructure in Member States to stimulate and support the exchange of technology and business information that could be used, inter alia, to facilitate investment opportunities in developing countries.

1.10 Since Armenia, Georgia, Kyrgyzstan, Tajikistan and Ukraine have already expressed their interest to join the network, they should be included in the experimental project of Euro-Asia network. Other countries are also invited to join the network.

1.11 While the Industrial and Technological Information Bank (INTIB) have been continuing to strengthen its focal points networking system, special care should be taken to extend INTIB focal points network to the former USSR states and other countries.

1.12 Considering the geographical diversity of the network, efforts should be made to use various telecommunication networks - General Electric QUIK-COM, EARN, BITNET, IASNET, etc. Within the existing infrastructure of former USSR states, IASNET seems to be the most promising network option in these countries. However, every possible technological options for networking in these countries should be studied.

1.13 UNIDO in cooperation with UNESCO should undertake to organize a Co-ordination Committee for harmonizing technical and operational matters between various relevant informatics networks in Europe and Asia.

1.14 Countries are encouraged to study the problems associated with various coding systems for industrial information classification. UNIDO may assist by providing available reports on this subject to future workshops.

2.. INTRODUCTION

Background Information

Human Resources Development (HRD) is one of the priority areas of UNIDO activities. In line with this programme, UNIDO in cooperation with UNESCO and IAS organized a "Workshop on the Use of Personal Computers in On-line Access to Technological Data Bases", Moscow, 14-25 May 1990 (UD/INT/90/035 and XP/INT/90/041), to train information specialists from developing countries in the use of personal computers, telecommunications hardware and software for accessing remote data bases, electronic mail and teleconferencing systems. As a logical continuation of the above programme, a "Workshop on Modern Information Technology Applications and

Networks" (UD/INT/91/104 and XP/INT/91/056) was held in Moscow/Issyk-Kul, 4-15 September 1991. The latter workshop recommended, inter alia, the following:

- a) UNIDO/INTIB should conduct periodical training programmes on the use of INTIB databases and network operations for countries which are not currently connected to the INTIB network in order to encourage Member States to utilize the network; and
- b) UNIDO should continue to hold regular meetings and workshops in the field of information technologies.

As one of the direct results of the latter workshop, the participating institutions from China, India, Iran, Malaysia, Nepal, Peru, Romania, Turkey and Thailand are now connected with the INTIB electronic mail system and exchange industrial inquiries and technological information on a regular basis. Secondly, based on the request from the Ministry of Industry of Iran in setting up an information network within the country, the project Demonstration of INTIB and Assessment of the need of Developing Information System in Iran (UC/IRA/92/015) was approved envisaging a large-scale follow-up project either through UNDP/IPF or other sources of finance.

INTIB has now received requests from many countries, for example - Mongolia, Viet Nam, Sri Lanka, North and South Korea, to connect them with the INTIB networking system. Additionally, Azerbaijan, Georgia, Kyrgyzstan, Tajikistan and Armenia decided to participate in the INTIB networking system and they requested participation, at their own cost, in the planned workshop. The UNESCO Regional Office for Science and Technology of South and Central Asia (ROSTSCA) in Delhi finances Asian Informatics Network counterparts from India and Iran to take part in the workshop. Thus the Workshop is an appropriate platform to discuss ways and means on how to integrate various information/informatics networks that are in operation in Europe, Central and Middle Asia.

3. ORGANIZATION

3.1 The workshop was jointly organized by the United Nations Industrial Development Organization (UNIDO), United Nations Scientific, Educational and Cultural Organization (UNESCO) through its Regional Office of Science and Technology for South and Central Asia (ROSTSCA) and the Institute for Automated Systems (IAS), Moscow.

3.2 The workshop was held in Odessa with the assistance of Odessa State University/Teleinform.

3.3 The programme of the workshop emphasized the practical applications of network integration information and focused on the

future application of data networking in scientific, industrial and technological fields. The programme also supported the application of data networks in the development of trade and business activities in the developing countries. Emphasize was also given on the integration of the various networks existing in Asia and in the Eastern part of Europe.

3.4 The workshop was attended by 14 participants from 11 countries, one UNIDO consultant and two representatives from UNIDO.

3.5 Annex I contains the programme of the workshop. Annex II contains a list of participants.

4. OPENING SESSION

4.1 The opening session was held at the Hotel Victoria, Odessa, Ukraine. Prof. V.D. Rusov, Director, Teleinform/Odessa State University welcomed the participants, especially from the neighbouring countries. He thanked the efforts of UNIDO and UNESCO for organizing this joint workshop in Odessa and also hope that such type of joint efforts of international organizations will continue in future. He further stated that considering the recent geo-political changes, data communication networks would help in the future economic development of the Commonwealth of Independent States.

4.2 The representative of the Industrial and Technological Information Section of UNIDO welcomed the participants and described the objective of the workshop. The need of integration of national and international networks for data exchange in various disciplines such as industry, science and technology, business and market was emphasized. The representative thanked the host organization - Teleinform - for the excellent facilities and for their efforts in organizing this Workshop.

Election of Officers

4.4 The workshop was invited to elect a chairman and rapporteur. Mr. Wang Lianhai, Director, National Bureau in China, ISTIC, proposed the nomination and the workshop unanimously elected:

- Chairman: Mr. Chang Kyo Lee, Vice-President, Korea Institute of Industry and Technology Information (KINITI), Seoul, Republic of Korea
- Rapporteur: Mr. H.C. Nautiyal, Additional Director, National Informatics Centre, Planning Commission, New Delhi, India.

The participants also desired of constituting a task force for the finalization of the Workshop Report. The task force constitutes the following:

Chairman, Rapporteur and Prof. A.R. Sharafat, School of Engineering, Tarbiat Modarres University, Tehran, Iran.

5. OBJECTIVES OF THE WORKSHOP

5.1 The main objective of the Workshop was to facilitate the participating institutions in the establishment of on- and off-line linkages with UNIDO, IASNET, commercial data bases and networks. The workshop was also aimed at the integration of the existing data communication networks in Asia and in Eastern part of Europe and extending the network facilities to the former USSR states.

5.2 The main topics covered by the workshop were:

- o Training in on-line access to databanks
- o Training in application of telecommunications software
- o UNIDO/INTIB data bases and Electronic Mail Systems
- o Demonstration of commodity exchange information databanks
- o Lecture on regional informatics network for East Europe
- o Discussion: Problems and prospects for Asian and European Networks integration

6. WORKING SESSIONS

The Chairman briefed about the workshop programme and invited all the participants of the workshop to present their papers on: National Networks, Data Banks, Users: State-of-the-art and first priority needs. Annex III contains the abstracts of the participants country papers

Dr. Y. Savostisky, Deputy Director, IAS presented the history of the regular training workshop of UNIDO in the field of information technology in developing countries. About 30 countries had undergone a training-cum-practical workshop with IAS network which was sponsored by UNIDO and UNESCO. These countries have shown interest of utilizing the IASNET to facilitate the data exchange in their countries. He emphasized the importance of data exchange in the fields such as technology transfer, economic development, and trade.

The Chief of the Industrial and Technological Information Section explained in detail about the organizational structure of UNIDO and various activities being undertaken by UNIDO in the developing countries. He explained about various programmes of INTIB and their use in the various industries/various industrial organizations in Member countries. He requested the participants to explore the possibility of financing the Euro-Asia network by the respective governments. It was also brought out that depending

upon the request of the various participating countries to strengthen their information networks/and their capability to access various international databases, UNIDO may provide support for integrating the existing data networks. He also explained the various database services available within UNIDO and requested the participants to make use of the same in order to have a larger information network for the Member countries. In the last, UNIDO representative also explained about the data networks operational in Euro-Asia and felt the need of integrating these networks with various national networks of the participating countries.

The UNIDO representative made a demonstration-cum-presentation on the various databases of UNIDO/INTIB. Special emphasis was given on the Technology Supply Database which is under upgradation. He also further requested the participants to investigate the requirements of their technology database in order to implement/finalize the system. He also offered hands-on training on the databases demonstrated in order to get them familiarize with the contents and database structure.

Dr. Russov, Director, Teleinform explained the various activities of the Teleinform in Ukraine. He illustrated that the Teleinform is instrumental in providing the various databases. He further stated that CAROLINA has been formed under Odessa State University/Teleinform for real time interactive exchange of commodities and their daily transaction is around 800 to 900 million roubles. CAROLINA uses X.25 packet switch port for accessing the international databases. One of the main activities of CAROLINA is in the development of application software. CAROLINA also have an interactive electronic shop for commodity exchange. They have an analytical group to assist business people in their daily stock/commodity trading. There are 300 registered stock exchange dealers who can readily access the international databases through the packet-switch port.

Teleinform gave a live demonstration on the interactive database on commodity trading as well as retrieval of the information for further processing. Electronic trading was also demonstrated for the familiarization of the participants. The participants felt that the information in the database is of immense utility for further business transaction between the countries.

Scientists and specialists from the IAS delivered lectures on the state-of-art of the former USSR networks and automated systems in various disciplines, such as office automation, database management, computer/video conferencing and bibliographic data base search. Some of the programmes of IAS include automation of developments, distribution and installation of computer systems, data transmission, automation of management procedures, etc. The information resources of IASNET include a number of databases/ data banks such as those maintained by VINITI, INION, POISK, etc.

Demonstration-cum-hands-on training session was conducted for above databases. A number of international databases in USA/Europe were also demonstrated by IAS.

IAS also gave the details of the topology being adapted in the various networks and elaborated the project proposal of interlinking the various former states of USSR through IASNET. The cost estimate of the proposal is to the tune of 20 to 30 million roubles.

UNIDO consultant informed the participants regarding the state-of-the-art of various information services available and their possible applications in Asia and East European regions. He elaborated the technical and operational details of the General Electric QUIK-COMM communication system. He also provided the participant with an opportunity to experience on-line access to Russian and European technological databanks. The participants discussed problems, ways and possible first steps in Asian and European networks integration and emphasized the importance of the next workshop in furthering these objectives. UNIDO's representatives elaborated various services that UNIDO may provide to users in the information technology and data networking.

The participants met with the Rector and Vice-Rector of the Odessa State University. They described the long history and tradition of the University in educating very qualified professionals in various fields such as informatics, marine biology, mathematics, natural science, molecular biology, history, law, physics, etc. In addition, they explained the extensive international co-operation that this University has with other academic institutions worldwide. Odessa State University has the oldest library in Ukraine.

7. ADOPTION OF THE REPORT

7.1 After detailed discussions, the workshop participants adopted the Report. 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

8.1 The participants of the workshop expressed their deep appreciation for the efforts made by IAS/Teleinform, UNIDO and UNESCO for the organization of the workshop. They also offered special thanks to IAS/Teleinform for providing excellent host facilities.

8.2 Participants also expressed their appreciation to Mr. Chang Kyo Lee, Chairman, for his wise and constructive manner in chairing the workshop.

9. CLOSING SESSION

9.1 UNIDO/UNESCO representatives thanked the participants for attending the workshop. They appreciated the co-operative attitude of the participants and hoped that this attitude would continue for the network integration activities. Prof. I.P. Zelinsky, Rector of Odessa State University distributed certificates to the participants at the end of the workshop.

WORKSHOP PROGRAMME

- May 25, Monday**
 10.00 - Opening ceremony
 - Election of Chairman and Rapporteur
 - All participants' presentations
 National networks, data banks, users:
 state-of-the-art and first priority
 needs
 Russia/IAS
 Bangladesh
 China
 Mongolia
- 12.15 - Presentation continued
 Viet Nam
 South Korea
 Turkey
 India
 Iran
 Armenia
- 13.15 - Presentation on UNIDO/INTIB services
 15.00 - Presentation on INTIB databases and
 its demonstration
- May 26, Tuesday**
 10.00 - New information applications
 to commodity/stock exchange operations
 (JV "Teleinform" and "IAS
 presentations)
- 12.15 - Round table discussion on collaborative
 project proposals (draft ideas will be
 sent to other ex-USSR states using
 teleconferencing system for their
 participation and views)
- 15.00 - 17.00 - Visit to "Carolina" Odessian
 Commodity Exchange Office
- May 27, Wednesday**
 10.00 - General Electric Information Services:
 State-of-the-art and possible application
 in Asian and East European Regions
 (presentation and demonstration)
- 15.00 - Demonstration and training in on-line
 access to Russian and European
 technological information databanks
- May 28, Thursday**
 10.00 - Problems, ways and possible first
 steps in Asian and European networks
 integration (Round-table discussion)
- 11.00 - Formulation of Workshop recommendations
 15.00 - Adoption of Workshop recommendations
 - Closing ceremony
- May 29, Friday**
 - Bilateral and multilateral
 discussion among and between participants

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AZERBAIJAN, GEORGIA, KYRGHYZSTAN, KAZAKHSTAN, TURKMENISTAN and
UZBEKISTAN participated in the round-table discussions of the
workshop through the teleconferencing system of IASNET.

ABSTRACTS OF COUNTRY PAPERS**BANGLADESH**

Considering the importance of industrial databases in the economic development of Bangladesh, the Government has given special attention to this sector. Recently, with the assistance of UNDP/IDA, a project was taken up to improve the industrial statistics as well as to establish a databank. Also it is planned to establish Industrial and Technological Information Bank (INTIB) focal point in Bangladesh in the near future. A joint venture telephone company (foreign and government partnership) has been set up to provide communication services in Bangladesh. It is hoped that electronic data interchange networks would be established in the very near future.

CHINA

Since China adopted economic reform and opening door to the outside world in 1979, both Chinese enterprises and R+D institutions have been put into competitive markets, and they badly need timely and accurate information so as to survive, develop and prosper in such an environment. To meet their increasing demands on information, the Institute of Scientific and Technical Information of China (ISTIC), as the national information center, has set up a national information network comprising over 30 local information centres in cities and provinces with thousands of users throughout the country. Within the national network, ISTIC provides bi-directional information services in 14 industrial sectors. ISTIC has also installed over a dozen of databases. Among others, the Chinese Appropriate Technology Achievements Database and the Chinese Scientific Institutions Database facilitate enterprises to get technologies they need, and the Chinese Enterprises and Companies Database is much helpful to R+D institutions to find technology receivers.

INDIA

Government of India has set up National Informatics Centre (NIC) to promote informatics culture in the Government Departments and develop computer based Management Information Systems for decision support at various levels. NIC is in the process of setting up of a nation-wide satellite based computer communication network "NICNET" covering all districts, State capitals and the Centre in order to facilitate for development of District Information System at District level (DISNIC) and essential databases for the state and central government departments. NICNET has been planned to provide an interactive information base for decision making support in the Government administration. NICNET will thus, play a significant role in the exploitation of

Information Technology to accelerate the social, economic and cultural change in India.

ISLAMIC REPUBLIC OF IRAN

The telecommunication network in Iran is serving a population of 60 million inhabitants, has 3 million subscribers in 420 different cities, has 60,000 long distance circuits, and is connected to 35 other countries using more than 1,800 international direct dial service. The administration is using state-of-the-art technologies such as digital switching with ISDN capability, digital microwave, fibre optics, solar energy in the development of the network. Starting from this year at least 1 million new subscribers would be added to the network. A public switch data network is planned to be operational within one year. This network is based on CCITT recommendations using X.25 protocols. The initial capacity of this network is planned for 1,000 users which would be expanded to offer services to 10,000 users within two years. At present, data communication is achieved using leased lines. Iran is a member of Regional Informatics Network for South and Central Asia (RINSCA) which is evolving with the assistance of the Intergovernmental Informatics Programme (IIP) of UNESCO. Efforts are under way to invite the newly independent countries of Central Asia and CAUCASUS to join RINSCA and eventually the Regional Informatics Network for Asia and Pacific (RINAP).

MONGOLIA

The Centre for Scientific and Technological Information (CSTI) in Mongolia is the main institution responsible for collecting, processing, storage and dissemination of scientific and technical information. A number of information systems are operational in Mongolia. At present, two databases processing systems provided by international organizations are also in operation. These are INIS database on CD-ROM and foundry technical database of UNIDO. Access to databases of former socialist countries, prior to 1992 was carried out via IAS system. UNESCO is assisting Mongolia to access databases of Central and South Asian countries using satellite communication.

REPUBLIC OF ARMENIA

Armenian Information Company (ARMINCO) is managing the packet-switching data transmission network in Armenia. ARMINCO was founded with the assistance of IAS and National Service of Seismic Protection and others. At present packet-switching is done by using a concentrator which is connected to IAS packet-switching node in Moscow by 9600 bits per second lease line. Within a month, an independent packet-switching node will be operational in Yerevan. The concentrator is providing service to 16 asynchronous lines and it is connected to Moscow by a X.25 line. After the completion of the expansion, the service would be extended to 6

X.25 lines and 50 asynchronous lines. The international telephone service is provided through a SESS switch to the United States with about 400 circuits and through another switch with the capacity of more than 1000 circuits to other cities in former USSR as well as a French made switch with 30 circuits to Europe via France. These systems may be used to transmit data as well as voice communication. Armenia has a pool of engineers doing software and hardware

REPUBLIC OF KOREA

The telephone service in Korea is offered exclusively by Korea Telecommunications Corporation and currently is providing service to 17 million subscribers. From 1983, the Data Communications Corporation (DACOM) began to provide data communications services establishing a nation-wide network, DACOM-NET, with packet-switching node in five major cities. By the end of 1990, 5434 subscribers were connected to DACOM-NET. In 1991, data communication services were offered through a second entity by establishing HITEL-P network. Value added telecommunication services were completely liberalised in July 1990 and at present 30 enterprises are offering such services.

The Korean Institute of Industry and Technology Information (KINITI) became an independent organization in 1990 to produce databases in the fields of industry and technology.

RUSSIA

There are about 20 telecommunication systems delivering data transmission services in Russia. IASNET supports online access to national public databanks, in particular to ones of science/technological and industrial information (about 300 databases). IASNET integrates 18 cities in the Commonwealth of Independent States including 12 cities of Russia with leased lines for packet-switching mode data transmission and admits dial-up access from rest large cities, and uses the gateways through Vienna, Helsinki, San-Francisco, and Havana for access into foreign computer networks and 1500 databanks.

IAS is the National Center for Automated Data Exchange with Foreign Computer Networks and Data Banks (NCADE), and it was the first institution in former USSR registered in ILO as Recognized Private Operating Agency (RPOA). IAS is Russian representative in Regional Informatics Networks for South and Central Asia (RINSCA), simultaneously continuing creation of new telecommunication companies ltd. in Central Asian States of former USSR.

Telecommunication/information companies TELEINFORM (Odessa) and MARINCOM (Mariupol) are using packet-switching data transmission network in Ukraine. Both of them use packet assembler/disassemblers constructed by IAS; they are connected to

IASNET by 9600 bits per second leased lines, use X.25 standard and deliver E-mail service and online access to remote databanks including Russian and European ones.

TURKEY

Telecommunication services in Turkey are offered to the public using coaxial and fibre optics cables, radio relay systems, satellite earth stations, and open wire carrier systems. Special services such as mobile telephony, radio paging, video conferencing, packet switching data services and information services are also offered. The packet switch data services are offered through two networks. One network node is located in Istanbul and offers services in Ankara, Istanbul, Bizmir and Adana, using PADs in accordance with CCITT X.28 protocol. This node is further handed 208 X.28 ports, 20 X.25 and 8 SDLC ports. The public switch data network of Turkey is called TURKPAK with the initial capacity of 376 X.25 ports, 88 ITI ports, 96 SDLC ports, and 16 API ports offering a total initial capacity of 576 ports was inaugurated in 1989 and presently 50 countries are connected to it.

Offering of value added services to the public was entrusted to Small and Medium Industry Development Organization (SMIDO) which was established in 1990. There is a joint co-operation between SMIDO and the Middle-East Technical University on creating information centres. Various databanks belonging to Government, business, academia, etc. can be reached using TURKPAK facilities.

VIET NAM

Two networks for information exchange are being established in Viet Nam. They are network on on-going research works and projects, and the network on industrial and technological information. The National Information and Documentation Centre for Science and Technology was entrusted with the responsibility of these networks. A number of various databases have been created and used in Viet Nam. UNESCO's CDS/ISIS software package is being used for processing Vietnamese bibliographic databases. It is hoped that with the improvements in telecommunication infrastructure, on-line data transfer would be realized. At present, leased lines are being used with V.21, V.22 protocols to access the databases. E-mail and teleconferencing systems are planned for next year.