OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

Distr.
RESTRICTED

UNIDO/IS/R.39
28 February 1986

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

ENGLISH

FIELD MISSION REPORT ON THE INDUSTRIAL AND TECHNOLOGICAL INFORMATION SYSTEMS IN NIGERIA, ZAMBIA, TANZANIA, KENYA AND EGYPT*

Prepared by

M. El-Toukhy**
and
A. Yudin***

* The views expressed in this paper are those of the authors and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

** Academy of Scientific Research and Technology, Cairo, Egypt.

*** USSR State Committee for Science and Technology, Moscow, USSR.

V.86-52773

TABLE OF CONTENTS

		Page
Preface		ii
Abstract		iv
I.	Conclusions and recommendations	1
II.	Introduction and background information	11
III.	Objectives of the mission	12
IV.	Outputs of the mission	13
V.	Activities of the mission	16
VI.	Action programme (Follow-up)	18
Annex		
I.	Documents used during the mission	21
II.	Questionnaire	23
III.	List of specialists consulted	26
IV.	Abbreviations and addresses	30
V.	Schedule of meetings	34

PREFACE

The supply of information at the country level in particular for the priority sectors identified by the Lagos Plan of Action is crucial for the success of the Industrial Development Decade for Africa. The position in this regard at present needs considerable improvement. Several African countries do not have an industrial information system themselves and in many cases where they have such facilities they are mostly in the nature of documentation services. They also suffer from lack of adequate resources to obtain on a systematic basis information from external sources.

According to the UN General Assembly Resolution 3507 the Industrial and Technological Information Bank (INTIB) was established in 1980 to facilitate and accelerate industrial and technological information flow to developing countries for the selection of alternative technologies and equipment and to reduce the preparation time of feasibility studies.

At present INTIB helps to the creation of national industrial and technological information systems and network in Nigeria, Zambia, Tanzania, Kenya and Egypt, which have been selected as a part of the IDDA programme and was provided with technical assistance to strengthen its national information system.

By establishing links with INTIB selected personnel in the information systems and services could also be made familiar with the methods of collecting processes and disseminating problem-oriented information to industry. This process will also result in other advantages. The flow of information among the strengthened national information system and services can be promoted and links also established with possible regional mechanisms, such as the African Regional Centre for Technology (ARCT).

The persons contacted (see Annex III) included officials responsible for development in the field of industrial and technological information existing and potential users of information, as well as specialists like engineers, documentatlists and programmers, etc.

Acknowledgements are made to the UNIDO staff members Messrs. V. Podshibyakin and H.W. Pack for the excellent organization and briefing of the mission.

The mission is grateful to the UNDP officers in Lagos, Lusaka, Dar-es-Salaam, Nairobi and Cairo for their kind co-operation and assistance which facilitated the success of the mission. The mission is also thankful to Mr. F.A. Shonubi from the Nigerian Society of Engineers, Mr. J. Banda from Village Industry Service, Mrs. W.N.A. Nyonyi from Tanzania Industrial Research and Development Organization, Mr.P.B. Imende from Kenya Industrial Research and Development Institute and to Dr. M. El-Toukhy from Academy of Scientific Research and Technology, whose briefing, reference materials and organizational efforts proved to be of great assistance to the mission.

ABSTRACT

The report is the result of a mission to information systems and services in Nigeria (October 19 - 27, 1985), Zambia (October 28 - November 2, 1985), Tanzania (November 4 - 9, 1985), Kenya (November 10 - 17, 1985) and Egypt (November 18 - 22, 1985).

The mission was intended to assess the existing and potential information systems and services, to assess national focal points of INTIB in these countries, to assess existing and potential users of industrial and technological information based on their specific needs and priorities and also to assess the nature of information services required by the INTIB in detail and communication with INTIB headquarters.

Needless to say, the identification of national focal points of INTIB in these African countries was the most important task of the mission.

The following national focal points are proposed:

- in Nigeria:

  Federal Institute of Industrial Research, Oshodi (FIIRO);

- in Zambia:

  Small Industries Development Organization (SIDO);

- in Tanzania:

  Tanzania Industrial Research and Development Organization (TIRDO);

- in Kenya:

  Kenya Industrial Research and Development Institute (KIRDI);

- in Egypt:

  The Egyptian National Scientific and Technical Information Network (ENSTINT).

The first part of the report presents conclusions and recommendations of the mission and the second part presents recommendations dealing with INTIB follow-up activities.

The report is supplemented by the questionnaire prepared by UNIDO Secretariat with summary information of the various information systems and services visited (see Annex II).

I. CONCLUSIONS AND RECOMMENDATIONS

1. Even the brief acquaintances with situation in the information systems and services of several African countries show that under the present conditions establishment of industrial systems and services cannot occur spontaneously. Establishment here is now fully dependent upon global factors, local factors being weak and poor. The driving force of any information system and services is to be found outside the African continent. The global factors adversely affecting backward economies call for the introduction of the objective behaviour of African countries for reliance on the principle of planning. The objectives of Lagos Plan of Action outline the only way to cushion the devastating impact of global factors on African countries.

2. Main problems faced by the organizations in Nigeria, Zambia, Tanzania, Kenya and Egypt on information field are following:

Nigeria

- lack of statistical and patent information;
- lack of hardware and software to process and analysis data;
- lack of adequate training for professional staff;
- shortage of basic resources, such as funds and staff.

Zambia

- local market can't satisfy demand for the right technical and general literature on small industries;
- industrial information is often scattered in different formats;
- shortage of professional staff;
- lack of equipment to use in publications;
- lack of acquisition of information documents;
- lack of sources of information;
- lack of transport for disseminating information.

Tanzania

- creation of telecommunication links between information bodies;
- acquisition of up-to-date information material;
- lack of trained manpower;
- lack of computer equipment;
- formulation of situation specific information answers;
- small collection of different databases;
- response time from some countries is very long;
- collection of information from the metal industries;
- lack of general information policy in the country.

Kenya

- lack of computer equipment;
- shortage of trained (qualifed) manpower;
- lack of information on availability of appropriate technologies, machinery and markets;
- lack of enough funds for expansion and improvement;
- lack of enough trained personnel;
- limited information material;
- lack of effective utilization of available information of the information centres by users;
- complete absence of an organized information system and service.

Egypt

- lack of enough funds for computer equipment;
- high turnover of qualifed staff due to small salaries.

3. A preliminary study of the existing information systems and services in the organizations and institutions shows that the structure of the INTIB national network in the considered enterprises could be follows:

Nigeria

National Focal Point:

- Federal Institute of Industrial Research, Oshodi (FIIRO)

Focal Points:

- Manufacturers Association of Nigeria;
- Nigerian Industrial Development Bank;
- Nigerian Society of Engineers;
- Federal Ministry of Science and Technology;
- National Library of Nigeria;
- Ministry of Industries.

Zambia

National Focal Point:

- Small Industries Development Organization (SIDO)

Focal Points:

- National Council for Scientific Research - Documentation and Scientific Information Centre;
- Technology Development and Advisory Unit of the University of Zambia;
- Institute of African Studies of the University of Zambia;
- Ministry of Agriculture;
- Development Bank of Zambia;
- Zambia Industrial and Commercial Association;
- Zambia Bureau of Standards;
- National Food and Nutrition Commission.

Tanzania

National Focal Point:

- Tanzania Industrial Research and Development Organization (TIRDO)

Focal points:

- Tanzania Industrial Studies and Consulting Organization (TISCO);
- Ministry of Industries and Trade;
- Institute for Production and Innovations;
- National Institute for Productivity;
- Metal Engineering Industries Development Association;
- Tanganyika Development Finance Company Ltd.;
- Small Industries Development Organization (SIDO);
- Tanzania National Scientific Research Council (TANRIS).

Kenya

National Focal Point:

- Kenya Industrial Research and Development Institute (KIRDI)

Focal Points:

- National Council for Science and Technology;
- Industrial Development Bank Ltd.;
- Kenya National Chamber of Commerce and Industry;
- Ministry of Commerce and Industry (Information and Documentation Section);
- Industrial and Commercial Development Corporation;
- Kenya Industrial Estates Ltd.;
- Agro-chemical and Food Company Ltd.;
- Egelton College;
- East Africa Industries Ltd.;
- Directorate of Industrial Training;
- Ministry of Transport and Communications;
- Kenya Bureau of Standardization;
- Kenyatta University - Appropriate Technology Centre.

Egypt

National Focal Point:

- Egyptian National Scientific and Technical Information Network (ENSTINET) - The Academy of Scientific Research and Technology

Focal Points:

- Egyptian Documentation and Information Centre for Agriculture (EDICA);
- Centre for Educational Technology (CET);
- Engineering and Industrial Design Development Centre (EIDDC);
- National Information and Documentation Centre (NIDOC).

4. Examination of the existing information systems shows that they often have bilateral and international co-operation. Among the participants of the co-operation one can find:

Nigeria

- Central Bank of Nigeria;
- Federal Institute of Industrial Research;
- Federal Ministry of Science and Technology;
- Nigerian Institute of Architects;
- Federal Office of Statistics;
- Nigerian Association of Chamber of Commerce, Industry, Mines and Agriculture;
- British Library;
- Tropical Production Institute, London;
- AGRIS;
- INIS;
- Multi-sectoral Information Network.

Zambia

- SIDO Library;
- National Standard Bodies;
- International Standard Organization;

- Africa Region Standard Organization;
- Institutional Libraries in Zambia;
- Rural Information Service;
- University of Zambia;
- National Scientific Council for Research;
- INTIB;
- Zambia Broadcasting Services;
- Canadian Broadcast Service;
- Socially Appropriate Technology International Information Services (SATIS).

Tanzania

- Tanzania Industrial Studies and Consulting Organization;
- Small Industries Development Organization;
- University of Dar-es-Salaam Libraries;
- Tanzania Industrial Research and Development Organization;
- Bureau of Statistics;
- National Scientific Research Council.

Kenya

- African Regional Organization for Standardization;
- British Standards Institution;
- National Council for Science and Technology;
- Kenya Industrial Research and Development Institute;
- Kenya Bureau of Standards;
- Industrial Development Bank;
- Industrial and Commercial Development Corporation.

Egypt

- Egyptian Documentation and Information Centre for Agriculture (EDICA);
- Centre for Educational Technology (CET);

- Engineering and Industrial Design Development Centre (EIDDC);
- National Information and Documentation Centre (NIDOC).

5. The recommendations with regard to the national information systems stem immediately from their basic tasks and functions. Generally, the main tasks of the national information systems consists in providing necessary industrial and technological information for specialists occupied in the spheres of management, R and D, production and operation, services and trade, i.e. practically in all branches of economy. On the basis of this main task before the national information systems, the latter's functions can amount to the following main orientations:

- Preparing and assigning primary industrial information;
- Stock-taking and registration of industrial and technological infromation via formal and non-formal channels;
- Selection, systematization, storage and retrieval of primary documents (creation of information retrieval system);
- Primary documents processing;
- Communication of industrial and technological information to users;
- Organization and functioning of the information systems;
- Management of these information systems.

6. The function of preparing and assigning primary industrial information should ensure in putting the entire information into the system and selecting the most effective and economical channels for information transmission.

7. The industrial information stock-taking and registration should meet the recommentations which provide for a strict distribution of recording registration functions between information bodies which are part of the respective systems and also carrying out the measures guaranteeing the complete accession of the recorded industrial information sources. The function of stock-taking and registration should provide for monitoring and a maximally complete recording and co-ordination of the registration

of the industrial and technological information created both within the framework of the national information systems and beyond it and transmitted via both formal and non-formal channels.

8. Selection, systematization, storage and retrieval of primary documents should meet the recommendations ensuring the creation of information retrieval systems and reference retrieval facilities for them. This function should provide for the possibility of their accurate, complete, rapid, convenient and economical retrieval for a further utliization of the respective information by users.

9. The primary documents processing should be in accord with the recommendations providing for non-recurring analytico-synthetical processing of industrial information in terms of the latter's content. This function should provide for bibliographic processing, annotating, abstracting, indexing and extraction of factual evidence from documents with the view to the organization of data bank in various subject areas and also industrial information synthesizing.

10. In communicating the industrial and technological information to users, provision should be made for a multiple and multi-goal utilization of the results of the non-recurring information processing. This function should provide for communication, retrieval and communication in any mode of the system's work, and namely in the "enquiry-answer" mode, in the mode of selective dissemination of information and in the information publications mode. And in case of each mode one should observe the requirement of communicating information in the form of primary documents, (abstracts, annotations, bibliograplic descriptions), evidence extracted from primary documents, and also in the form of synthesized industrial and technological information analytical and comparative reviews, references, etc.).

11. The organizational pattern and functioning of the industrial information system should ensure the improvement of the organizational principles and methodological basis of information work with a view to creating a clear-cut and impressive information system. This function

should be implemented on the basis of the existing theoretical, economic and juridical fundamentals, and also methodological, organizational and procedural principles involved in the functioning of the system.

12. The management of the national industrial information systems should ensure the co-ordination of information work in various areas of activity, planning of R and D on the industrial data problems, raising the qualifications, and training of workers for information bodies.

13. The national industrial information systems should ensure information transmission both via formal and non-formal channels. The formal channels include the organizationally formalized and constantly operating communication channels and the main kinds of documents, such as books, articles, patent descriptions, reporting and standard-type technical documentation and also documentation about industrial goods. The non-formal channels of communication include those in which the main role is played by scientists, specialists and engineers themselves, and which do not possess organizationally formalized and constantly operating interaction mechanisms: oral interventions at conferences, meetings, symposia, talks, correspondence, exchange of preprints and impressions, and also documents, such as protocols of tests, acts about reception of equipment, etc.

14. One of the recommendations with regard to the national information systems consists in putting the flows of information transmitted via formal and non-formal channels into a better order. For this purpose it is necessary to unify and standardize the forms in which information is presented with a view to its subsequent recording by machine-systems; to develop a normalized series of information carriers (including machine-carriers on punched tapes, magnetic tapes and discs, microfilms and microfiches); and also to develop a normalized series of industrial and technological information transmission methods, including the standardization of interfaces between computers and communication channels. This should make it possible to achieve a necessary speed, completeness and effectiveness of transmission of the entire industrial and technological information and also to achieve the inter-systems exchange of information at the computer level.

15. One of the major recommendations with regard to the national industrial information systems consists in ensuring the compatability between all the links which are part thereof. Compatability is achieved by the commoness of their organizational structures, the uniformity of information retrieval language, the interface of the technical facilities, the uniformity of mathematical support, the single procedure for industrial and technological information collection and processing and the unification of documentation and information coding.

16. The complex of technical facilities as used in the national information systems should ensure the processing of information flows on standard carries and solve the follwing basic tasks:

- automated input of information into computers;
- information processing with the aid of computers and calculating and punched-card equipment;
- information storage and automated retrieval;
- automated output of information from computers;
- transmission of computer information to the system's subscribers;
- information copying and duplication.

17. Taking into consideration the above-mentioned INTIB's mission could recommend using hardware of kind "IBM PC" and software of kind CDS/ISIS. In that case UNIDO in further will provide for supporting in installation of hardware suggested and dissemination CDC/ISIS among INTIB focal points of developing countries.

18. The national industrial information systems of these countries should be based on the principle of the national combination of the centralized and decentralized approaches to the process of collection, storage, generalization, processing, retrieval, issuing and dissemination of the industrial and technological information. The impact of the negative features of each approach can be minimized only if the advantages of both approaches are utilized in the system to a maximal extent.

19. The centralization in constructing the national industrial information systems makes it possible to pursue a single general state policy with regard to the main questions when the tasks of the developing and improving information systems are being solved; and it ensures the necessary co-ordination between the individual links of the systems and their organizational, technological (methodological), mathematical (programmatic) and technical compatability.

20. The decentralization in disseminating makes it possible to organize information provision for any categories of users in accordance with their demands and needs and to implement the principle of the direct communication between any user and any information body which is part of the national industrial and technological information system.

21. As far as a national information policy is concerned we can be said that the national authorities need to consider the establishment of national industrial and technological information system based on a network of information centres as a keystone of economic development. Since the establishment of the national information system is a long-term, complex and expensive enterprise, it has to be designed and implemented under the auspices of the Government.

II. INTRODUCTION AND BACKGROUND INFORMATION

22. The Lagos Plan of Action and the Final Act of Lagos proclaimed the 1980s to be the Industrial Development Decade for Africa. Its qualitative and quantitative objectives as specified in the Lagos Plan of Action envisaged regional self-sufficiency and self-sustained growth, the achievement by the African countries of a 1.4 per cent share in the world's industrial production output by 1990.

23. More to the point, it was also programmed that by the mid of the Decade, the basis was to be set up for the development of key industries indispensable for the achievement of self-reliance. The final resolution of the Fourth General Conference of UNIDO on the Industrial Development

Decade for Africa asked UNIDO to improve and intensify its assistance to African countries in their priority actions for the preparatory phase (1982-1984) and in identifying, formulating and carrying out projects during the implementation phase (1985-1990) of the programme of the Decade.

24. The supply of information at the country level in particular for the priority sectors identified by the Lagos Plan of Action is crucial for the success of the Industrial Development Decade for Africa. The position in this regard at present needs considerable improvement. Several African countries do not have an industrial information system themselves and in many cases where they have such facilities they are mostly in the nature of documentation services. They also suffer from lack of adequate resources to obtain on a systematic basis information from external sources. INTIB provides an international infrastructure on which they could draw upon to strengthen themselves by establishing links with INTIB selected personnel in the information systems and services could also be made familiar with the methods of collecting processes and disseminating problem-oriented information to industry. This process will also result in other advantages. The flow of information among the strengthened national systems and services can be promoted and links also established with possible regional mechanisms such as ARCT. The preparation of industrial profiles and information packages by INTIB could also be oriented towards the needs identified in Africa.

25. It is against the above background that the mission has carried out its activites, made the present consolidated report inlcuding recommendations for INTIB and African information co-operation.

III. OBJECTIVES OF THE MISSION

26. The main objective of the expert mission under the contract RP/RAF/85/621/11-59, was to assist selected countries of Africa in the establishment of INTIB national focal points as well as in strengthening national information systems and services and carry out in these countries the following duties:

(a) assess the existing and potential information systems, services and network;

(b) assess national focal points of INTIB on their specialized field of industrial and technological information activities;

(c) assess existing and potential users of industrial and technological information based on their specific needs and priorities;

(d) assess the nature of information services required by the INTIB in detail as well as modalities of linkage and communication with INTIB headquarters;

(e) ad-hoc advise on redesigning or expansion of the existing industrial and technological information service system including selection of software and hardware as well as assessment of manpower requirements and training needs for the information systems.

IV. OUTPUTS OF THE MISSION

27. The end-users of the industrial and technological information in these countries in question can be classified as follows: engineers, economists, programmers, project managers, whereas institutional users are: development banks, development corporations, colleges, institutes, university researchers, information and documentation centres, R and D organizations, etc.

28. The main sources of information requested are: information of alternative technologies, project materials, marketing data, factographical and bibliographical data, characteristics of new materials and up-date equipment, technical reports, market development trends, etc. The basic industrial and technological information expressed by users are concerned with: design of new products, manufacturing the product, development manufacturing equipment, establishment of flowsheets, selling and servicing the products, collection and processing of technological information of innovations and improvements, standard specification, and expert requirements.

29. Many of the industrial and technical users are vitally interested in receiving primary technical documentation, on-line access to data bases,

the creation of both selective information dissemination and current awareness service and also in the establishment of data bases in their fields of activities.

30. Estimates of information staff, technical and financial resources are as follows:

Information staff:

	Nigeria	Zambia	Tanzania	Kenya	Egypt
Professional	76	20	20	43	
Supporting personnel	152	13	13	157	

Hardware

Nigeria

WANG PC X 2, SIRIUS

Zambia

MEPAS, COMMODOR, IBM PC

Tanzania

Texas Instrument (on-line terminal), Apple III; WANG-2200; Apple IIE X 2

Kenya

IBM PC, SPECTRUM ZX, ICL ME 29/B7, IBM SYSTEM 34, IBM PC 526, WANG PC X 4

Egypt

(not known)

Software

Nigeria

COBOL, RPG, BASIC, LOTOS

Zambia

COBOL, BASIC

Tanzania

BASIC, COBOL, ALGOL

Kenya

CDS/ISIS, BASIC, COBOL

Yearly budget (in US dollars)

	Nigeria	Zamiba	Tanzania	Kenya	Egypt
US$	250,000	300,000	55,000	185,000	*

* Data not available.

31. The following INTIB contributions are expected:

- financial assistance towards acquisition of documentary sources;
- sponsorships for international courses and meetings;
- acquisition of all INTIB publications;
- participation of INTIB in establishing industrial and technological information systems;
- financial support of information projects;
- technical information in 20 sectors of INTIB information activity;
- acquisition of information in the field of standards and patents;
- acquisition of computers compatable with IBM PC and APPLE II, III;
- organization of joint pilot projects;
- all possible assistance in improving the industrial and technological information systems.

V. ACTIVITIES OF THE MISSION

32. An inventory of industrial and technological information systems in these countries include the information systems in the following organizations:

Nigeria

- Nigerian Society of Engineers;
- National Library of Nigeria;
- Federal Ministry of Science and Technology;
- Federal Ministry of Industries;
- Nigerian Industrial Development Bank;
- Manufacturers Association of Nigeria;
- Federal Institute of Industrial Research, Oshodi.

Zambia

- Development Bank of Zambia;
- National Food and Nutrition Commission;
- Technology Development and Advisory Unit of the University of Zambia;
- Small Industries Development Organization (SIDO);
- Zambia Bureau of Standards;
- Agricultural Engineering Section of Ministry of Agriculture;
- Village Industry Service.

Tanzania

- Tanzania Industrial Research and Development Organization;
- National Institute for Productivity;
- Tanganyika Development Finance Company Ltd.;
- Metal Engineering Industries Development Association;
- Tanzania National Scientific Research Council;
- Tanzania Industrial Studies and Consulting Organization.

Kenya

- National Council for Science and Technology;
- Kenya Industrial Research and Development Institute;
- Industrial Development Bank Ltd.;
- Kenya National Chamber of Commerce and Industry;
- Commercial Development Corporation;
- Egelton College;
- East Africa Industries;
- Appropriate Technology Centre of Kenyatta University;
- Kenya Bureau of Standardization;
- Ministry of Commerce and Industry - Information and Documentation Section;
- Ministry of Transport and Communications.

Egypt

- Egyptian National Scientific and Technical Information Network of the Academy of Scientific Research and Technology (ENSTINET);
- Egyptian Documentation and Information Centre for Agriculture;
- Centre for Educational Technology;
- Engineering and Industrial Design Development Centre;
- National Information and Documentation Centre.

33. Shortage of co-ordination and bilateral links between the information systems presented above are recognized by officials who are responsible for industrial and technological information system. Therefore the creation of communication links between information systems is a very important task to be done.

34. Absence of national industrial and technological information policy is considered by information specialists as the main constraint which makes the information system establishment impossible.

35. While the INTIB national industrial and technological information network is being built attention should be given to the problems of creation of telecommunication links in these countries, as, at present, these links are very poor. The INTIB national network is proposed as a result of the mission.

36. Bilateral links between the countries' information systems and their co-ordination leave much to be desired. The importance of strengthening bilateral links and co-ordination in this area is widely recognized by the professional staff dealing with the industrial and technological information systems.

37. There is a poor statistical structure in the country. The organizations are therefore faced with collecting data for its various operations: traditional statistics such as gross output, value added, employment, wages and salaries, production indices, etc., as well as compilation of published statistical information, such as input-output tables, industry census, annual survey of industries, etc. are often requested by industrial and technological information end-users of having information systems.

38. During the discussions according to selection of hardware and software for information systems, ad-hoc advises were given by the mission. It was recommended for the INTIB focal points to install hardware compatable with IMB PC and software of kind CDC/ISIS.

VI. ACTION PROGRAMME (FOLLOW-UP)

39. The creation of INTIB national focal points net-work is co-operated with a problem of computerization of the INTIB focal points. Computerization could be started on a time when not of all focal points have their computers or utilize ones. It should be rather understood as a development strategy in which each member state focal points could take part increasing its involvement according to its needs and available funds.

40. The development strategy should be a general frame of co-operation aimed at final computerization of national focal points. Taking into consideration the cost effectivenes trend of computerized information systems the computerization of INTIB focal points in African countr es seems inevitable. Nevertheless in the initial stage of the development strategy the basis for information exchange and search must be established.

41. The target of the initial stage of the development strategy should solve three problems:

- What kind of classification system of industrial information must be in accordance with INTIB activities?
- What minimum set of data must be in accordance with INTIB activities?
- What will be computer format of the data according to the computer in INTIB unit in UNIDO Secretariat?

42. It is necessary to solve these three strategic problems at the international level. It should be prepared as the result of official expert group recommendations (concerning the first and the second problems). The second expert group recommendations (computer specialist group) should propose the solution for the third problem taking into consideration ISO standards in the field of exchange data by magnetic tapes, discs and on-line access.

43. Stage one could start with one operating central computer in INTIB headquarters answering the national focal points requests and disseminating information according to the established profiles. In this case INTIB has to assist African countries in the information service manpower building.

44. Stage two begins when besides the INTIB computer there are other computers in national focal points but without on-line links between them. It is necessary to note that all other national focal point without computers, implement activities as in stage one.

45. In stage three all national focal points have computers connected on-line to the INTIB computers. As a result for the national focal point in stage three no mailing is needed and files of INTIB and focal point computer could be reached and exchanged. It should be noted that other national focal point could work at the same time in stage two or one.

46. It is necessary to note that computerization of national focal points is last step in the process of ordering the flow of information, because before purchasing of a computer system, a detailed study should be undertaken to determine its configuration and software requirements.

ANNEX I

Documents Used During the Mission

I. General Documents

1. A Programme for the Industrial Development Decade for Africa, prepared jointly by the Economic Commission for Africa, the Organization of African Unity and the United Nations Industrial Development Organization, New York, 1982.

2. Lagos Plan of Action for the Economic Development of Africa 1980-2000, International Institute for Labour Studies, Geneva, 1981.

3. Role of INTIB, (ID/WG.450/13), 20 September 1985, UNIDO Secretariat. Round Table Discussion of an Advisory Group of INTIB Users, Vienna, Austria, 23 - 27 September 1985.

4. Sung Jin Choi, Guidelines for the Formulation of National Industrial and Technological Information Policy, INTIB Secretariat.

5. Ching-Chih Chen, Microcomputer Use in Libraries in the U.S.: Current and Future Trends, UNSECO - Upils Asian Regional Seminar/Workshop on the Application of Microcomputers to Library and in Information Management, Dillman, Quezon City, 29 October - 2 November 1984.

6. Bankowski J., Wysocki A., Guidelines for the Establishment or Redesign of Industrial and Technological Information Service System, Including Selection of Software and Hardware, Warsaw, September 1985, INTIB Secretariat.

7. Industrial and Technological Information Bank - Questionnaire, IDDA Project RP/RAF/85/621.

II. Nigeria

1. The Nigerian Society of Engineers and its Programmes by R.I. Salawu, P.M.B. 104, Yaba, Lagos - Nigeria.

III. Zambia

1. National Council for Scientific Research (NCSR), October 1985, Lusaka.

2. The University of Zambia, Technology Development and Advisory Unit Handbook.

3. International Food Policy Research Institute Report, Printed by Mutlimedia Zambia for the Publishers National Food and Nutrition Commission, 1985.

4. The Zambia Industrial and Commercial Association, Newsletter.

IV. Tanzania

1. Metal Engineering Industries Development Association, Dar-es-Salaam (MEIDA) - Habari, July 1985.

2. Tanzania Industrial Research and Development Organization (TIRDO) Dar-es-Salaam, Newsletter, September 1985.

3. The Institute of Production Innovation (IPI), a link between the Faculty of Engineering and Tanzanian Industry (FOE).

4. Institute of Production Innovation, University of Dar-es-Salaam.

5. Directory of Technical Information Resources in Tanzania, 2nd Edition, December 1983.

6. Sadec Industrial Development Activity, Annual Conference, Mbabane, Swaziland, 31st January to 1st February 1985.

V. Kenva

1. Kenya Industrial Research and Development Institute, by Katambo Wakano, Nairobi.

VI. Egypt

1. The Egyptian National Scientific and Technical Information Network (ENSTINET), The Academy of Scientific Research and Technology, Monthly Current Awareness, Cairo.

ANNEX II

Industrial and Technological Information Bank

IDDA Project (RP/RAF/85/621)

Questionnaire

Objective: Assess existing/potential information service institutions/organizations and their activities

Name of Institute/Organization: Country:

Address of Institution/Organization: Telex/Cable:

Telephone/Telefax:

Nature of Institution/Organization: Public/Private/Semi-private

Name of Director/Interviewee:

Year of Establishment:

Objectives/Functions of Institution/Organization:

Number of Information staff:

Professional:

Supporting personnel:

Information Service Activities:

List of Publications: Quarterly/Yearly Publications:

Industrial Inquiry Service (Sectors/Inquirers/Source of Answers/ Number of Inquiries/Character):

Extension Services:

Selective Information Dissemination/Current Awareness Service:

Ad-hoc Advisory Services:

Source of Fund: Government/Private Budget for Information Activities:

List of Hardware/Software:

Main Problems Faced by the Organization on Information Field:

Contents of Advice Given by UNIDO Experts:

Comments to be as INTIB Nodes by Institution/Organization:

Linkage with Other Information Institutions/Organizations:

List of Demand/Needs of Information Users:

Linkage with INTIB:

Industrial Inquiry Service

Possible Areas:

Ways and Means:

Trainings/Seminars/Workshops Conducted by the Institution/Organization

Expectation from INTIB:

Ad-hoc Service Request and Project Document:

Industrial Information Policy:

Non-Focal Points for Co-ordination Request:

Recommendations to Government:

ANNEX III

List of Specialists Consulted

Nigeria

Eng. A.O. Faluyi	President Nigerian Society of Engineers
Dr. T.I. Obiaga	Director Industrial Science and Energy Research Federal Ministry of Science and Technology
Mr. Simeon B. Aje	Director National Library of Nigeria
Mr. G.O. Akajiobi	Assistant Director Industrial Data Bank and Investment Promotion Division Federal Ministry of Industries
Mrs. O.W. Ajayi	Controller P and D Department Nigerian Industrial Development Bank
Mr. Uzoz E. Okeke	Assistant Director Manufacturers Association of Nigeria
Mr. R.O. Sodipe	Chief Research Officer Federal Institute of Industrial Research, Oshodi

Zambia

Ms. B. Chilesha	Technology Development and Advisory Unit The University of Zambia
Mr. Vamoer	Executive Director National Food and Nutrition Commission
Mrs. J. Mapoma	Chairman Village Industy Service
Mr. Likulunga	Head Promotion Division Development Bank of Zambia
Mr. G. Tembo	Head Agriculture Engineering Section Ministry of Agriculture

Mr. S.A. Mwambazi	Director Zambia Bureau of Standards
Dr. C.O. M. Ngandwe	Director Small Industries Development Organization (SIDO)
Mr. Mushipi	Head Documentation Centre National Council for Scientific Research
Mr. Humphrey J. Samuchapi	Chief Executive The Zambia Industrial and Commercial Association
Dr. S. Moyo	Director Institute for African Studies University of Zambia

Tanzania

Mr. E.L. Kamuzora	Director General Tanzania Industrial Studies and Consulting Organization
Mr. J. Harbison	Chief Technical Advisor Tanzanian Industrial Research and Development Organization
Mr. A.J. Chillumanga	Director Planning and Research Section Ministry of Industries and Trade
Mr. W.C. Kasenga	Executive Director Chamber of Commerce
Mr. E. Th. Protzen	Technical Manager Institute of Production Innovation
Mr. K.Y. Dachi	Managing Director National Institute for Productivity
Mr. A.U. Kibona	Studies and Research Manager Tanzania Investment Bank
Mr. Ake. Schilstrom	Chief Consultant Metal Engineering Industries Development Association
Mr. D.G. Mbaya	Director Project Appraisal, Tanganyika Development Finance Company Ltd.

Mr. L. Magai	Director Training and Ext. Servicce Small Industries Development Organization
Mr. Mteleka	Deputy Head Science and Technology Department Ministry of Planning

Kenya

Dr. Robert O. Arunga	Director Kenya Industries Research and Development Institute
Mr. P.N. Omusi	Director Kenya National Chamber of Commerce and Industry
Mr. B.W. Maina	Manger Research and Appraisal Division Industrial Development Bank
Dr. F.J. Wagati	Secretary National Council for Science and Technology
Mr. John P.N. Simba	Executive Director Industrial and Commercial Development Co-operation
Mr. A.M. Shikhule	Operations Manager Kenya Industrial Estates
Mr. K.S. Shenoy	General Manager Agro-Chemical and Food Company
Dr. Mutuku Nzioki	Director Technology Department Egelton College
Mr. J. B. Wambura	Technical Director East Africa Industries
Mr. George K.N. Mengua	Directorate of Industrial Training
Mr. H.H.O. Awuor	Chief Materials Engineer Ministry of Transport and Communications
Mr. F.B. Maiko	Deputy Director Kenya Bureau of Standards
Dr. Herick Othieno	Director Appropriate Technology Centre

Egypt

Prof. Dr. Mohammed M. Kamel	President Academy of Scientific Research and Technology
Prof. Dr. Mohammed B. Fayez	Director National Research Centre
Prof. Dr. Ali Ali Hebeish	Director ASRT President Office
Prof. Dr. Yousef Khalil Mazhar	Director Engineering and Industrial Design Development Centre
Mr. Ahmed Abdel Bassit	Director The Egyptian National Scientific and Technical Information Network
Eng. Maissah El Mahdy	Director Engineering and Industrial Design Development Node
Eng. Ibrahim Zaki	Director Agricultural Documentation and Information Centre
Ms. Hodda Sharawy	Director Information Section National Information and Documentation Centre
Dr. Hussein Abdelah	President Organization for Energy Planning

ANNEX IV

Abbreviations and Addresses

Nigeria

FIIRO	Federal Institute of Industrial Research, Oshodi Blind Centre Road Cappa Bus Stop, P.M.B. 21023 Ikeja Lagos, Nigeria
Fed. Ministry of Industries	Federal Ministry of Industries Federal Secretariat Complex Phase 1, Room 989, Ikoyi Lagos, Nigeria
NIDB	Nigerian Industrial Development Bank NIDB House 63/71, Broad Street P.O. Box 2357 Lagos, Nigeria
NLN	National Library of Nigeria 4 Weslay Street Lagos, Nigeria
MAN	Manufacturers Association of Nigeria 37 Marina, Unity House P.O. Box 3835 Lagos, Nigeria
Fed. Min. of S and T	Federal Ministry of Science and Technology 9 Kofr Abayomi Street V.I. Lagos, Nigeria
NSEPC	Nigerian Society of Engineers Professional Centre Plot PC 11, Victoria Island Lagos, Nigeria

Zambia

SIDO	Small Industries Development Organization Lusaka
UNZA	University of Zambia P.O. Box 32379 Lusaka

ZINCOM	The Zambia Industrial and Commercial Association Lusaka
DBZ	Development Bank of Zambia Lusaka

Tanzania

TIRDO	Tanzania Industrial Research and Development Organization P.O. Box 23235, Dar-es-Salaam
TISCO	Tanzania Industrial Studies and Consulting Organization P.O. Box 2650, Dar-es-Salaam
UTAFITI	Tanzania National Scientific Research Council P.O. Box 4302, Dar-es-Salaam
MFIDA	Metal Engineering Industries Development Association P.O. Box 5891, Dar-es-Salaam
IPI	Institute of Production Innovation University of Dar-es-Salaam P.O. Box 35075
SIDO	Small Scale Industries Development Organization P.O. Box 2476, Dar-es-Salaam
NIP	National Institute for Productivity Ohio Shee, P.O. Box 2021
TIB	Tanzania Investment Bank Samora Avenue P.O. Box 9373, Dar-es-Salaam
TDFL	Tanganyika Development Finance Company Ltd. TDFL Building, Ohio/Uponga Road P.O. Box 2478

Kenya

KIRDI	Kenya Industrial Research and Development Institution P.O. Box 30650, Nairobi

KNCCI	Kenya National Chamber of Commerce and Industry P.O. Box 47024, Nairobi
IDB	Industrial Development Bank National Bank Building Harambee Avenue P.O. Box 44036, Nairobi
NCST	National Council for Science and Technology P.O. Box 30623, Nairobi
MCI	Ministry of Commerce and Industry P.O. Box 30418, Nairobi
ICDC	Industrial and Commercial Development Corporation P.O. Box 45519, Nairobi
K.I. ESTATES	Kenya Industrial Estates Ltd. P.O. Box 78029, Likoni Road, Nairobi
KITI	Kenya Industrial Training Institute P.O. Box 74494, Nairobi
MOTCO	Ministry of Transport and Communications P.O. Box 11873, Nairobi
KBS	Kenya Bureau of Standards Mombasa Road P.O. Box 54974, Nairobi
ATC	Appropriate Technology Centre Kenyatta University P.O. Box 43844, Nairobi

Egypt

ASRT	Academy of Scientific Research and Technology 101, Kaser El Ainy Street,Cairo, Egypt
ENSTINET	The Egyptian National Scientific and Technical Information Network 101, Kaser El Ainy Street, Cairo, Egypt
EDICA	Egyptian Documentation and Information Centre of Agriculture Ministry of Agriculture El Dokky, Cairo, Egypt

OEP	Organization for Energy Planning 1, Eashah El Taymoriah Street Garden City, Cairo, Egypt
EIDDC	Engineering and Industrial Design and Development Centre 213, The Pyramids Road, Giza, Egypt
NIDOC	National Information and Documentation Centre El Tahrir Street, El Dokky, Cairo, Egypt

ANNEX V

Schedule for UNIDO INTIB Field Mission

Nigeria: from 19 - 26 October 1985

Monday, 20 October 1985

9.00 a.m.	Meet with Dr. Shonubi at UNIDO office
11.00 a.m.	Mr. R.O. Sodipe Chief Research officer Federal Institute of Industrial Research, Oshodi (FIIRO)

Tuesday, 21 October 1985

10.oo a.m.	Mr. Okeke Manufacturers Association of Nigeria
11.30 a.m.	Mrs. Ajayi Nigerian Industrial Development Bank

Wednesday, 22 October 1985

10.00 a.m.	Eng. I.O. Faluyi Nigerian Society of Engineers
12.00 a.m.	Resident Representative UNDP Office, Nigeria

Thursday, 23 October 1985

10.00 a.m.	Dr. Obiaja Federal Ministry of Science and Technology, Nigeria

Friday, 24 October 1985

10.00 a.m.	Mr. Aje, National Library
12.00 a.m.	Mr. Akajiobi Federal Ministry of Industries

Zambia: from 28 October - 3 November 1985

28 October 1985

9.00 a.m.	UNDP/UNIDO Lusaka
9.30 a.m.	Mr. Mushipi National Council for Scientific Research

11.00 a.m.	Ms. B. Chileshe The University of Zambia
14.00	Dr. S. Moyo Institute for African Studies
29 October 1985	
9.00 a.m.	Mr. G. Tembo Ministry of Agriculture
14.00 p.m.	Dr. C. Mgandwe Small Industries Development Organization (SIDO)
15.00 p.m.	Mr. Likulunga Development Bank of Zambia
30 October 1985	
9.00 a.m.	Mr. J. Samuchapi The Zambia Industrial and Commercial Association
11.30 a.m.	Mr. S.A. Mwambazi Bureau of Standards
14.00 p.m.	Mrs. J. Mapoma Village Industry
31 October 1985	
9.00 a.m.	Mr. Vamoer National Nutrition Commission
1 November 1985	
9.30 a.m.	Mr. Bekele, UNDP

Tanzania: from 4 - 10 November 1985

4 November 1985	Arrival by KA480
5 November 1985	
8.30 a.m.	Mr. Ouattara Resident Representative, UNDP
9.30 a.m.	Mr. E.L. Kamuzora Director-General, TISCO

11.30 a.m.	Mr. J. Barbison, Chief Technical Adviser, TIRDO
14.00 p.m.	Mr. W.E. Kasenga, Executive Director, Dar-es-Salaam Chamber of Commerce

6 November 1985

9.00 a.m.	Mr. A.J. Chillumangu, Director, Planning and Research, Ministry of Industries and Trade
14.30 p.m.	Mr. E. Th. Protzen, Technical Manager, IPI

7 November 1985

9.00 a.m.	Mr. K.Y.A. Dachi, Acting. Managing Director, National Institute for Productivity
11.30 a.m.	Mr. A.U. Kibona, Studies and Research Manager, Tanzania Investment Bank
14.30 p.m.	Mr. Ake Schilstrom, Chief Consultant, MEIDA

8 November 1985

8.30 a.m.	Mr. D.G. Mbaya, Director, Projects Appraisal, TDFL
11.00 a.m.	Mr. L. Magai, Ag. Director, Training and Ext. Services, SIDO

9 November 1985

10.30 a.m.	Mr. Mieleka, Deputy Head, Science and Technology Department, Ministry of Planning and Economic Affairs

Kenya: from 11 - 18 November 1985

Monday, 11 November 1985

8.00 - 8.30 a.m.	Resident Representative, UNDP, Kenya Att: Mrs. L. Josich
8.40 - 9.30 a.m.	Dr. R.O. Arunga, Director, Kenya Industrial Research Development Institute, Nairobi

Wednesday, 13 November 1985

10.00 - 11.00 a.m.	The Executive Director, Industrial Development Bank, P.O. Box 44036 Att: Mr. P. Ondiek
11.15 - 12.00 a.m.	The Managing Director, Industrial and Commercial Development Corporation, P.O. Box 45519, Nairobi Att: Mr. Simba
2.15 - 3.30 p.m.	The Director, Kenya Bureau of Standards, P.O. Box 54974, Nairobi Att: Mr. J. Osundwa

Thursday, 14 November 1985

10.30 - 11.15 a.m.	Director, Appropriate Technology Centre, Kenyatta University, P.O. Box 43844, Nairobi Att: Dr. E. Othieno

Friday, 15 November 1985

10.00 - 11.00 a.m.	The Principle, Kenya Industrial Training Institute, P.O. Box 280, Nakuru Att: Mr. Oehieng
12.00 - 1.00 p.m.	The Principle, Egelton College, P.O. Njoro
10.00 - 11.20 a.m.	The Secretary, National Council for Science and Technology, P.O. Box 30623, Nairobi
11.30 - 12.30 p.m.	The Chief Executive, Kenya National Chamber of Commerce and Industry, P.O. Box 47024, Nairobi
2.15 - 3.30 p.m.	Department of Industry, Ministry of Commerce and Industry, P.O. Box 30418, Nairobi Att: Mr. Onkendi
4.00 - 5.00 p.m.	The Permanent Secretary, Ministry of Planning and National Development

Tuesday, 12 November 1985

8.30 - 9.30 a.m.	Chief Materials Engineer, Ministry of Transport and Communications, P.O. Box 11873, Nairobi Att: Mr. E.E.O. Awuor

10.00 - 11.00 a.m.	Technical Direcotr, East Africa Industries, P.O. Box 30062, Nairobi Att: J.H.G. Wambura
11.30 - 12.30 p.m.	Director, Directorate of Industrial Training, P.O. Box 74494, Nairobi Att: G.K.N. Mbugua
2.30 - 3.30 p.m.	Kenya Industrial Estates, P.O. Box 78024, Nairobi Att: Operations Manager

Egypt: 18 - 23 November 1985

Monday, 18 November 1985 — Arrival at 11.00 a.m.

Tuesday, 19 November 1985

8.30 - 9.30 a.m.	Ms. Omnia Gomaa UNDP Office, Cairo
10.00 - 10.30 a.m.	Prof. Dr. Mohamed Kamel President, Academy of Scientific Research and Technology, Cairo
10.30 - 11.00 a.m.	Prof. Dr. Ali Ali Hebiesh Head, Office President of the Academy
11.15 - 13.30 p.m.	Mr. Ahmed Abdel El Bassit Director, Egyptian National Scientific and Technical Information Network

Wedenesday, 20 November 1985

8.30 - 10.30 a.m.	Eng. Dr. Yousef Khalil Mazhar Director, Engineering and Industrial Design Development Centre (EIDDC), Cairo
10.30 - 12.30 p.m.	Eng. Maissah El Mahdy Director, Industry Node in EIDDC, Cairo
13.00 - 14.00 p.m.	Eng. Ibrahim Zaki Ibrahim Director, Egyptian Documentaton and Information Centre for Agriculture, Ministry of Agriculture, Cairo

Thursday, 21 November 1985

8.30 - 9.00 a.m.	Prof. Dr. Mohamed B. Fayez Director, National Research Centre, Cairo

9.15 - 9.30 a.m.	Prof. Dr. Ahmed Naiem Director, National Information and Documentation Centre (NIDOC)
9.30 - 11.00 a.m.	Ms. Hodda El Sharawy Chief, Information Section in NIDOC
11.30 - 13.30 p.m.	Prof. Dr. Hussien Abedalah President, Organization for Energy Planning, Cairo
Friday, 22 November 1985	Holiday