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FEDERAL REPUBLIC OF NIGERIA

Terminal report*

Prepared for the Government of the Federal Republic of Nigeria
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

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* This document has not been edited.

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EXPLANATORY NOTES

Currency

The official trading value of the local currency, the *Naira* was 0.232 United States dollar (USD) (i.e. 1 USD was equal to Naira 4,20) at the starting time and 0.137 USD (i.e. 1 USD was equal to Naira 7,25) at the termination of the project.

Acronyms and short terms

(Items marked by an asterisk are acronyms and full names of databases established at FIIRO/INDICES)

Short form	Full form
* AID	Answered Inquiries Data
* CAPSTAN	Colorants, Additives nnd Preservatives Standards
* CASE	Current Awareness Service on the Economy
CD-ROM	Compact Disk - Read Only Memory (opto-electronic medium for the storage of large amount of data on a small, machine -readable disk)
* COMPRESS	Company Profiles for Extension and Similar Services
* DANTE	Data on Available Nigerian Technologies
FIIRO	Federal Institute of Industrial Research, Oshodi
FSTA	Food Science and Technology Abstracts
IDC	Industrial Development Centre
IIA	Industrial Information Adviser
INDAB	Industrial Abstracts
INDICES	Industrial Information Centre and Extension Services (at FIIRO; the names are used together as FIIRO/INDICES)
INTIB	Industrial and Technological Information Bank (established at UNIDO)
* ITEM	International Technology Market
* MAIL	Mailing Addresses - internal list

Explanatory notes - continued

	PADIS	Pan-African Information and Documentation System
*	PAIR	Patent Information Retrieval
*	PIPE	Product and Industry Profiles Extracts
*	RADIO	Research and Development Information On-line
	SDI	Selective Dissemination of Information
*	STEP	Scientific, Technical and Economic Publications
	TIBI	Technical Information Bulletin for Industry

ABSTRACT

Personal author: Erik I. Vajda
Corporate author: UNIDO
Title: Terminal report
Project title: Federal Institute of Industrial Research,
Industrial Information Centre, Phase II.
Project number: DP/NIR/83/021

The purpose and the long-term objective of the project was to develop a national industrial information centre, with the function to supply a wide range of information on industrial production technologies and other subjects of interest for the industry. Project activities were started in October 1986 and terminated in February 1989. The immediate objectives, to establish, improve and strengthen information services, tailored to the information needs of users, to establish industrial extension services, to set up computerized information facilities, to start regular training activities on industrial information, to provide an advising service to industrial institutions in their in-house information development and to build links with sectorial, national, regional and international information networks were attained by the project activities. The Industrial Information Centre and Extension Services at the Federal Institute of Industrial Research (FIIRO/INDICES) became a centre with an up-to-date local area network of micro-computers. Computerized databases on technologies, research and development projects, company data and management data are maintained and used for information services by a trained and skilled staff. Regular and individual services are based on these databases and on other sources of information, including data obtained from international networks and database producers. Data from national sources are gathered and inputted. Further development is recommended to build a coordinated national network of databases for industrial information, linked together via computer-to-computer data transfer facilities. This network should have a gateway to regional and international networks. Continuity of services and in acquisition of information sources should be ensured. Awareness of industrial information services should be further improved. Extension services, as well as training and advisory services on industrial information should be continued.

INTRODUCTION

The *background* of the project was the awareness of the Federal Government of Nigeria, that under changing economic *conditions* due to the decrease in world oil prices, industrialization and self-support became vital for the economy of the country. The Government recognized the need for building up adequate information facilities at the national level as an essential prerequisite for rapid and planned economic growth. Industrial information exists in enormous quantities and is needed by all sectors of industry and its infrastructural organizations. However, the required industrial information can only be made available if up-to-date information technology and effective information services are available. The government asked for support to build up these facilities.

Previously an industrial information project was already initiated and executed (DP/NIR/75/069, Development of an Industrial Information Centre). This information centre was established at the Federal Institute of Industrial Research, Oshodi (FIIRO). During the period 1979 - 1982 a number of activities were initiated: the documentary basis of information services was strengthened, on the basis of the assessment of information needs and industries and on the identification of information sources, the staff of the information centre was trained to build and maintain information services, industrial information publications were published and regular services were started.

This previous project was *funded* by the United Nations Development Programme (UNDP) and the Federal Government of Nigeria and executed by the United Nations Industrial Development Organization (UNIDO). Its main result was the establishment of the industrial information centre and the growing use of its services by researchers, engineers and technologists. Although the continuous running of some services could not be always assured and the growing tasks required further manpower development, the use of new information technology and additional services, the basis for further development was created.

Official arrangements were made in 1982 to *seek assistance* for further development by a new project, being introduced as the second phase of the development of the industrial information centre. This was *approved* by the competent officials of the government and UNDP in 1983. The project *became operational* in October 1986. It *terminates* in February 1989 although some supplementary purchase of equipment and execution of fellowships will be still going on at this time. *The co-operating agency* was the Federal Institute of Industrial Research, on behalf of the Federal Ministry of Science and Technology.

Contributions of UNDP and the government were as follows:

Total of *UNDP contributions* in USD	
as stated in the project document	513,650
as stated by the last mandatory revision	513,276
disbursed or obligated (31/12/1988)	473,566
rephased for 1989 (disbursal under way)	39,710
total of expenditures	513,276

if exactly the rephased amount will be disbursed.

Total of *Government contributions* in Naira	
as stated in the project document	500,000
spent in cash and kind	565,000

A part of this amount is estimated, because expenditures spent on the regular work of the library of FIIRO as well as on services started before this project can not be delimited entirely.

More detailed data and explanations on contributions are given in Annex 5.

The original ***objectives*** of the project were (abridged description):

1) To establish, improve and strengthen *industrial information services*, tailored to the information needs of industries.

2) To establish and organize *industrial extension services*.

3) To establish *computerized information facilities* and services.

4) To set up a *training* unit for manpower development *in industrial information* .

5) To provide *advising services* to industrial institutions in their *in-house information* development

6) To build up *links* with sectorial, national, regional and international *information networks.*

The original objectives were *not revised.* The way to attain objective 4) was slightly modified, because it proved to be more feasible to set up training in industrial information based on the common efforts of the Industrial Information Centre and Extension Services (INDICES) and the general training unit of FIIRO, than to set up an independent training unit in industrial information.

The objectives of the project were *attained.* In some cases more was attained as envisaged by the project document and the work plan, in other cases the results are more modest. However, the results are at least satisfactory in all fields and can serve as a solid basis for further development.

The *training* of the staff of FIIRO/INDICES was one of the most successful sides of the project. Ten members of the staff were trained (or will be trained before the end of the project) abroad on courses or by tailored on-the-job training in the framework of thirteen individual *fellowships.* Detailed data are given in Annex 3. In addition internal courses and seminars were organized by the training expert. Members of the staff took part as lecturers, assistants and/or trainees in the three pilot training courses organized by FIIRO/INDICES (see Chapter I, Section F.) *Informal on-the-job training* was given to the national staff by the experts on every significant aspects of industrial information activities, on the use of computers, audio-visual equipment etc. Not only oral explanations were offered, but many written procedures and specifications were prepared, explained and discussed. The *results of training* were positive in most cases. Some institutions, selected for practical training abroad dealt more with the explanation of their

everyday activities than with the proposed and thoroughly defined training subject. This happened, however, only in some isolated cases and did not influence the overall effectiveness of training efforts.

Ordered ***equipment*** has been *received except for* items 6, 8 and 10 of purchase order 15-8-H0883, items 8, 9, 10 and 11 of purchase order 15-8-HC1038, as well as items 3, 4, 5, 6, 7 and 8 of purchase order 15-8-H1[illegible]. Some defective items of equipment have been sent back to the vendor for replacement, but have not been returned till date. Some requisitions are also under way using the funds rephased for equipment purchase for 1989. *Outstanding consignments* will be received and inspect by the Resident Representative's Office and by FIIRO. No *year-end inventories* have been received by the international and national staff. All *non-expendable property record forms* sent by the office of the Resident Representative have been signed and are available at the office mentioned above. Most equipment arrived in 1988 and property record forms on these items have not been sent to FIIRO till date. A proposal has been prepared on the *transfer* of the disposed equipment to the Government. A copy of it is attached as Annex 7. The equipment met the *specifications and requirements*, except for the defective equipment mentioned above and some others showing functional problems which are under discussion with the suppliers. These problems of the Polaroid Palette and some databases on CD-ROM (compact disc - read only memory), are however, not significant in comparison to the well functioning equipment.

No ***subcontracts*** were awarded.

Substantial information, included in the above introduction, following the guidelines for the submission of terminal reports will not be repeated in the body of the report.

RECOMMENDATIONS

1) FIIRO should act as a pilot basis and a potential node for the establishment of a national network of databases and information services for industry. This network should be the nucleus of a coordinated national information system. It should provide for the multiple availability and use of existing databases, for the coordinated and compatible development of new databases as well as for the connection of the national industrial information network to regional and international networks and other information resources.

2) All information services and databases established at FIIRO/INDICES should be maintained continuously. Regular services should be sent to the users keeping their deadlines. Input to the databases and new acquisitions of printed and machine readable information sources, as well the online access to remote databases should be regular. The manpower and the financial resources (including foreign exchange), which are needed to achieve this continuity should be thoroughly planned and made available.

3) The potential users of industrial information should be made aware of the existence and value of the information services of FIIRO/INDICES. All means of publicity (sending circulars, leaflets, advertising, meetings, cooperation with national bodies in the field of industry and related fields) should be used for this purpose. The services should be user-friendly and regular feedback should be established to find out the further needs and requirement of users.

4) Industrial extension services should be strengthened and follow the plans and guidelines as started in 1987/88. For this reasons additional qualified manpower (two engineers and/or technologists) should be invited to join this service. They should be trained to attain the methodological knowledge on extension services and on the information sources and services developed by, or accessible to FIIRO/INDICES by the experienced members of the staff.

5) Further technical, financial and legal efforts should be made to establish the regular connections between FIIRO and the international hosts (computerized services) offering online access to databases. Similarly, the access to the pilot electronic mail network of UNIDO/INTIB should be ensured. The national telecommunication services should be made aware of the fact that the establishment of reliable connections to data networks is not only a prerequisite for the further development of industrial information services but also a trial process for the establishment of a national network.

6) FIIRO/INDICES should continue the training of information officers and information users by courses and practical demonstrations. Training material acquired and prepared by the international experts and the national staff, as well as the audio-visual equipment purchased for training needs should be used. At least three courses per year are proposed. In addition FIIRO/INDICES should use its computers and its information techniques to advise industrialists and their information officers on the setting up of information facilities. Some paid services (e.g. desk-top publishing made on order) could also contribute to the dissemination of up-to-date information techniques.

7) Special attention should be paid to those databases of FIIRO/INDICES (INSTF, FIIRO, COMPRESS), which are based on the collection of data from companies, research institutes, universities and other producers of information. The circulation of questionnaires should be repeated if necessary, those not supplying data should be urged but also helped in the compilation of the data by extension officers.

8) Some databases, which are not yet operational, but have been planned and have an established framework (PAIR, CAPSTAN and AID) as well as further databases, as needed by the users of information should be completed, following the general and special rules, which have been set up in co-operation by the international and national staff of the project.

9) A high level of accuracy and standardization should be ensured for the further development of databases and services. The patterns and structures of specifications and written procedures as prepared for the project should be followed in the future, too. The specifications, regulations and

codes of practice (in-house standards) should be updated if necessary. They should be at the disposal of the members of staff working in the given field and they should comply with them. Performance standards should be a kind of such regulations.

10) The pricing policies of FIIRO/INDICES should be consolidated and a price list of information services should be prepared, including subscription prices and conditions for regular services, individual prices for inquiries, copying and other non periodical services as well as discounts for sustaining members of FIIRO/INDICES.

I. ACTIVITIES AND OUTPUTS

This chapter is organized by planned project activities as described in the work plan. Outputs produced by the international and national staff are referred to in the context of the activities.

A. Assessment of information needs

The assessment of industrial information needs was done by various means. *Visits* were paid to large, medium and small scale industries by the industrial information adviser (hereinafter IIA) and by members of the national staff, including officers of industrial extension services. A list of companies visited by the IIA is included in his first Technical Report (see Annexes 10. and 11. Contacts established with industrial and related associations (e.g. Manufacturers Association of Nigeria, Nigerian Association of Small-scale Industrialists, Nigerian Association of Chambers of Commerce, Industry, Mines and Agriculture) as well as with *Industrial Development Centres (IDC's)* in state capitals proved also to be very useful. The IDC-s were informed on the activities of FIIRO/INSTICES at a special meeting and their facilities planned for 1985.

Training activities and various *publicity* actions were combined with the assessment of information needs. The results were used in the planning and establishment of information services and databases.

Nevertheless, from the assessment of information needs it can be concluded, that these *needs are latent* in many cases and should be revealed and even provoked by publicity actions, training of information users and by publicizing the positive experiences of those making use of information services.

B. Organization of information services

The *basic principles* for the establishment and development of information services were defined by the IIA and the national counterpart. It was taken into consideration that the major part of information services should

be based on databases established by FIIRO, but these databases should not duplicate the work made by others. They should be based on the selection of data already processed by other information services and completed by those data which can be collected and processed by FIIRO/INDICES only (e.g. data on technologies developed in Nigeria, Nigerian research and development projects, data of Nigerian companies). In the case of data processed by others and selected for inclusion into the databases of FIIRO/INDICES, the national needs and interests should be taken into consideration, and if additional data would be needed, they should be included in the information services through the use of internationally available databases. The use of internal or external databases should depend on the type of information services, as well as on the nature and subject of the user's inquiry.

On this basis a *wide and versatile system of services* has been established. Some of the services existed already at the beginning of the project but these were strengthened and transformed concerning both their content and computer technology. Most information services now available are services aiming at the continuous supply of industrial information to the users. The *current industrial information services* of FIIRO/INDICES are:

Industrial Alerting Service (IAS),
Current Awareness Service on the Economy (CASE),
Technical Information Bulletin for Industry (TIBI),
Selective Dissemination of Information (SDI) standard profiles and tailored profile services.

The features (sources, subject, frequency of issue, characteristics of contents and arrangement) of the current information services are described in Annex 9. The preparation of these services is either computer-assisted or computerized. Procedures were set up and on-the-job training was given on the selection, formulation, marking, indexing and editing of information for these services. The current information services are prepared in a user-friendly form, containing the instructions on their use. The original documents referred to in most information services are placed at the users' disposal on request. The services can be subscribed. Sustaining members of FIIRO/INDICES get most current services free of charge.

The *Technical Inquiry Services* are the most important retrospective information service of FIIRC/INDICES. This reference and referral activity has been set up long ago, but now its technology and the available information sources changed radically. Traditional sources of information (reference books, printed directories and other collections of data) are still used but the databases established at FIIRC/INDICES and imported in machine readable form (CD-ROM and floppy disks) remarkably enlarged the possibilities of finding the requested information on technologies, research and development results and any other subject. Staff members of FIIRC/INDICES were trained on information retrieval techniques and related matters by the international experts and also by individual fellowship training. Details on the computer-readable databases are given in Section 5. of this chapter and in Annex 16.

The use of data, not being imported to FIIRC, but stored in remote databases, will be made possible by *online* access to the host computers of online centres via telecommunication networks. Major steps were done to establish such connections but the available telecommunication lines still need qualitative improvement.

The various information services are backed by a *document procurement service*, which makes the requested documents available in original or by copies. Copies are made from documents in the holdings of the FIIRC library, or at other special libraries in the country (see also the union list of serials, mentioned in Section 5. of this chapter) or they are asked from abroad. The use of the copying services of the British Library is supported financially by the British Council.

C. Industrial extension services

The establishment *of regular contacts with industries* through assessment of their operational problems and provision of advice and relevant information for solving the problem (as this activity has been described in the project document) is the task of the industrial extension services. Certainly other information services will also provide advice to solve operational problems of industries, but the establishment of extension services was essential to assist those industries in problem solving, which are not aware of the existence and use of information services or are not able to find out the

reasons behind their problems. These are first of all indigenous *small and medium size companies*, which cannot afford to set up facilities for problem-solving information resources. The extension services became also essential, because they can help in addition to the use of information available at FIIRO/INDICES by consulting experts and other sources of relevant information.The importance of extension services was also stressed by the formulation of the name of the Industrial Information Centre and *Extension Services* (INDICES).

The team of extension officers is made up by specialists (engineers, technologists) in various subject areas. They were trained on the use of information sources and on the methods of planning and executing extension services. *Guidelines for extension services* were prepared using the advice of the IIS. The extension officers pay visits to those companies asking for advice. In addition, however, "extension visits" are regularly planned by FIIRO/INDICES to such companies who do not know about the existence of this service. The size of the country does not allow to visit every company. Intermediaries (e.g. associations, industrial development centres) help to contact those who need help in problem-solving to the extension services.

D. Design and implementation of computing facilities

The planned activity was the "design and development of a computerized industrial information data bank taking into account the best ways and means for providing proper maintenance services to the computer and other equipment". For the design and creation of databases being the components of the industrial information data bank, reference is made to Section E. of this chapter.

The computing facilities (hardware, software and manpower) were planed on the basis of the *tasks to be solved by computers*. Therefore a preliminary plan of the databases has been drawn up, taking into account the information needs and the planned information services. The estimated size of backfiles and of regular updates, as well as the average size of data records was the starting point for this plan. The planning tool was the

account the establishment of further databases, other applications of computers for industrial information (e.g. desk top publishing), as well as the necessary back up capacity.

The considerations mentioned above led to the planning of a *local area network of microcomputers*, using appropriate software for database management, information retrieval, editing and desk top publishing. The plans were discussed with various national bodies, which are planning or designing the establishment of data banks and similar relevant sources of industrial information. Although in most cases the development plans of the interested institutions were not yet ready, there was a general agreement on the planned configuration and so *compatibility issues* will probably not cause serious difficulties in further development.

Details on the planning, design, purchase and installation of computer software and hardware are presented in the technical reports of Mr. A. Yelsei, computer expert. A listing of major equipment is given in Annex 6.

The staff of FIIRO/INDICES has been increased by the head of the computing center, by a systems analyst, by operators of the computers and by maintenance engineers and technicians. The *personnel* of the computer centre was *trained* by the computer expert and by fellowship training. [illegible] engineers and technicians got specialized training in troubleshooting, repair and maintenance of computer equipment.

A significant stock of *spare parts* and auxiliary equipment was purchased to ensure the continuous work of the computers. Measures were taken to ensure the maintenance and updating of software.

E. Creation of databases.

The establishment of a permanent machinery for collection and processing of locally available information/data for feeding into the computer on a continuous basis (as the activity was described in the project document) has been accomplished by the planning, design and establishment of various databases. A list of established databases is given in Annex 9. These databases are used together with *purchased databases*, containing a big volume of information, which should, as a rule, not be duplicated in the local [illegible].

Two databases of FIIRO/INDICES contain *bibliographic references* to and abstracts of selected publications and patent documents respectively. The selection of data for these databases is made from abstracting and indexing services (journals) as well as from primary journals and other documents available at FIIRO. The later group of sources is only used if the given publication is not abstracted and indexed by the available abstracting and indexing services. Items are *selected* from the point of view of their specific importance for Nigerian industries. Inquiries and profiles of subject interest of users, national development plans, actual problems of research and development are taken into consideration for the selection.A part of the content of the databases duplicates the content of major international and foreign national databases, but it proved to be advantageous if the most frequently required information is available in the local databases.

Other databases contain *locally collected information* on available technologies, on research and development projects and on various data of industrial companies. The input to these databases is based on questionnaires compiled by FIIRO/INDICES. To get the questionnaires completed is time-consuming efforts, but the data are of extraordinary importance. For their databases contain data on technologies a database of industry profile and a database containing data on technologies available in other countries. specialized database has been designed on regulations and standards concerning food additives.

A database containing data on answered inquiries and a computerized mailing list (i.e. database of users of industrial information) are important tools for the *management of the industrial information centre*.

The *specifications* for the establishment of the various databases were prepared by the IIS or by the national staff, following his advice. Specifications (procedures) were also prepared to ensure the continuity of the collection of data and their preparation for input. Worksheets and auxiliary programs for database maintenance and use were prepared by the national expert. The *multiple use of databases* (downloading of a part of the database and the use of the databases established by FIIRO/INDICES for data capture and exchange) was introduced whenever possible. *On-the-job training in* data capture and retrieval was given by the IIS and the trained expert.

F. Training programmes on industrial information

The planned activity was the organization of regular training programmes for industrial information/documentation personnel throughout the country. The scope was widened by the inclusion of *training courses for industrial managers*, as well as for engineers, researchers, technologists and other *end users of industrial information*. The idea behind this decision was that managers cannot plan and create the information facilities of their companies without this knowledge and that managers, engineers and all end users of industrial information services should be made aware of the existence and use of industrial information services.

For the organization of regular training activities of industrial information *training equipment* (including hardware, software and training materials) was purchased and installed, the *organizational framework* for training was created (by appointing an organizer of training courses in FIIPO/INDICES and defining the tasks of the training unit of FIIPO in information training), practical, task-oriented *curricula and material* for [illegible] were prepared and pilot training courses were organized. The training equipment of FIIPO/INDICES is versatile and modern. Its special feature is that it makes various kinds of demonstrations possible, including the demonstration of the use of computers and their use for industrial information. Staff members of FIIPO/INDICES will be the *lecturers of future courses*. They were prepared for this task by on-the-job training, given by the training expert and by their participation at the pilot courses.

Details of these activities are available in the technical reports of the training expert and in Annex 4.

G. Assistance to industries in organizing their information facilities

The *training* of information personnel, managers and users of information, covered by Section F, is the most important activity of FIIPO/INDICES to provide assistance in the organization of in-house information facilities of industries. However, other means and ways are also used and have been prepared by project activities.

The *extension officers* of FIIRO/INDICES, visiting industrial companies for problem-solving have the permanent task to draw the attention of managers to the necessity of using appropriate information services and to the fact that information oriented tasks within a company require the appointment of at least a part-time information officer. The later should be trained on obtaining and using industrial information. This task is included in the guidelines for industrial extension activities.

FIIRO/INDICES is prepared to give advice on the organization of information facilities by *consultations and on-the-job training* of informatic personnel. The members of the staff have been prepared for this task by their own training and by taking part in consultations, were advice was given by the international experts. Until now two types of advisory activities were asked for: general advice was sought on setting up information facilities in governmental bodies and research institutions and practical advice and demonstration was asked for on various computer applications, e.g. desk top publishing. It is hoped that the result of further publicity activities will be only the growing awareness of information services but also advisory activities.

II. Establishment of links with national, regional and international information centres

There are no specialized *national information centres* in Nigeria except for FIIRO/INDICES. However, visits were paid to those institutions (ministries, institutions for the promotion of various industrial and related activities, research centres, universities, libraries) which maintain collections of data or documents. Some of these institutions are supposed to be nodes of planned national network of data banks. In spite of principal agreement on the *principles of cooperation*, in most cases significant practical results were not achieved. One of the reasons is the lack of coordinated planning in this area, but also if the partner was ready to cooperate, the development stage of database-based plants did not reach the level that would make practical cooperation possible. However, some agreements were achieved, e.g. with the National Institute of Policies and Strategic Studies, with the Raw Materials Research and Development Council on the *coordinated development and national*

use of databases. On more details reference is made to the first technical report of the computer expert and the second technical report of the IIA. (see Annexes 10. and 11.)

An important cooperative issue is the preparation of a computerized *union list of serials* (journals and similar periodical publications) in the holdings of Nigerian research institutes. This list (database) will make the document procurement much easier, because copies of articles can be obtained by the information units and by the users from that institute which has the publication in its holdings. On the establishment of this database advice was given by the IIA.

Possibilities of *regional cooperation* were sought for by FIIRO/INDICES. Letters were written to headquarters of the Pan-African Documentation and Information System (PADIS). Unfortunately no reply was received. The national focal point of PADIS was the National Library of Nigeria, but [illegible] did not exist at this time. However, FIIRO/INDICES regularly [illegible] the information services (publications) of PADIS. The services and activities of FIIRO/INDICES were presented to Dr. P.C. Lambo, the Regional Director of UNDP for Africa. He expressed his satisfaction and stressed the necessity of the regional network of African databases. This has been taken into account and included in the Recommendation 11 in this report.

International information centres and systems including the best governmental professional systems, like the International Food Information Service as well as major national systems being used on international scale via international networks, e.g. Dialog Information Services were contacted to make use of their services. The most effective co-operation was established with UNIDO/INTIB (Industrial and Technological Information Bank). FIIRO/INDICES became the Nigerian focal point of INTIB. It cooperates with INTIB in answering industrial inquiries, receives the INTIB databases and supplies national input to them. It is supposed to enter into the INTIB electronic mail network of INTIB, but the lack (see below) of adequate telecommunication facilities prevented the use of this network.

International information sources and services are effectively used by means of importing *international and foreign databases in machine readable form (on CD-ROM or floppy disks)*. This was initiated by the international experts. Now the use of databases on CD-ROM is a regular activity, what is used for the information services of FIIRO/INDICES. The regular updates to the Food Science and Technology Abstracts (FSTA) of IFIS will be obtained on floppy disks. Negotiations of IFIS and UNIDO are under way on this matter. This cooperation was proposed by the international project team.

International information sources should also be used via *online information searches in remote databases*. Many efforts were made to ensure this possibility for Nigerian information users. However, until the date of the preparation of this report the online connections could not be established because of the low quality of the leased telecommunication lines. Hopefully the quality of the connection can be improved and the online use of international databases will complete the sources of industrial information. The [illegible] software, legal and training prerequisites were created by project activities.

FIIRO/INDICES strives to establish cooperation with industrial information centres and bodies promoting industrial development in other developing countries. By means of written proposals and personal contacts, further efforts [illegible] to develop the practical cooperation. The establishment of [illegible] promoting industrial development was included [illegible] as a separate item of activities. These activities [illegible] the activities listed in sections C and H respectively.

I. Training of FIIRO information officers

These activities are reflected in the Introduction and in Annex [illegible]. The *fellowship training* was extraordinarily important because of the use of new information technology and because the staff was extended by a number of new members. They had the very important industrial/technological/scientific background, but not the special knowledge on industrial information techniques. Their fellowship training (the preparation and execution of some fellowships is still under way) and the on-the-job training mentioned in the sections provided for attaining this knowledge.

II. ACHIEVEMENT OF IMMEDIATE OBJECTIVES

A detailed report on the achievments is given in Chapter I. The following sections *do not repeat the content of Chapter I.* but serve as reference tool to find those activities and outputs which are related to the immediate project objectives. A summarized evaluation on the achievement of the given objective is included.

A. Development of information services.

The development, improvement and strengthening of industrial information services, tailored to the information needs of industries was achieved by the activities described in Sections A. and B. of Chapter I. There was no significant deviation from the related parts of the work plan. The activities dissemination of information services were slightly modified. The range of services seems to be satisfactory. Further publicity activities and training courses will contribute to their increased use by industries.

B. Establishment and organization of industrial extension services

This objective was achieved by the activities, aiming at the establishment of regular contacts with industries through assessment of their operational problems and at the provision of advice and relevant information for the solving of these problems. These activities are described in Section C. of Chapter I. and met the requirements set up by the schedules and targets of the work plan.

C. Establishment of computerized information facilities and services

Sections D. and E. as well as B. (on services) in Chapter I. contain the details on the achievements of the targets of computerization. Some more was achieved than described in the work plan, because the installed computer facilities made it possible to use the computers not only for the research of the industrial information data bank (databases) but also for other, related tasks, first of all for the computerized production of publications (desk top publishing).All databases,which have been planned were established, although the input to some of them was delayed because of dif-

ficulties in data collection. Some further databases (in addition to those included in the work plan are in an advanced planning stage. The stock of computer readable data was radically extended by the import and installation of databases in CD-ROM. This was not planned in the work plan but added to the targets by the international project team in consultation with the national counterparts, to use the enormous possibilities of this new technology. Some details on this achievement are dealt with in Section II. of Chapter I.

D. Setting up a training unit for manpower development in industrial information

The introduction contains the formal deviation from this objective, i.e. the organization of regular training activities in the field of industrial information by cooperation of the general training unit of FIBO and the industrial information centre. Section F. of Chapter I. reports on the achievement of the relevant targets of the work plan. Some more was achieved as planned by the inclusion of information users to the target audience.

E. Provision of advising services to industries in their in-house information development

As mentioned in Section G. of Chapter I. which contains the report on the related tasks, the advisory activities were combined with training courses and with the demonstration of the information methods introduced by FIBO/INDICES. Additional advice was given by the extension officers. A more extended advisory activity would be possible if the industries would recognize their needs for in-house information management. The development of this awareness is a continuous task of FIBO/INDICES.

F. Building up links with sectorial, national, regional and international information networks

The detailed report on the relevant activities and outputs presented in Section H. of Chapter I. shows very diverse results. The work done conforms to all formal schedules and targets in the work plan and although the work plan contained targets on the establishment of online information retrieval facilities which did not result necessarily from the objectives. However the

results concerning links with national (sectorial and general) and regional networks (centres, institutions, systems) are not satisfactory. The reasons behind this situation are not weaknesses of the project activities but circumstances which can only be changed on national or regional level. Further efforts are needed for the regular online connections with international networks and systems.

III. UTILIZATION OF PROJECT RESULTS

The results of the project *are already utilized* to a large extent by the users of industrial information, by the information centre itself, by FIIRO and by related institutions. Nevertheless, considering the number of Nigerian industrial companies and other users of industrial information, the use of the results is still limited. The development of the use of established services is rapid but needs support by publicity actions and cooperative measures.

The *future utilization* depends first of all on the continuity of activities and services of FIIRO/INDICES. The management and the staff of the centre is able to ensure this continuity, if some development requirements (factors, as mentioned below) will be met. However, the full utilization of the results requires also a higher level of cooperation and coordination.

The *main factors affecting the effective utilization* of project results are:

- the useful maintenance of the equipment,
- the continuous acquisition of information sources including those acquisitions which need foreign exchange,
- the strengthening of the manpower of FIIRO/INDICES by industrial extension officers,
- the updating of the professional knowledge of staff members, via internal training and information on information,
- the continuity of services and publicity work
- the establishment of the telecommunication facilities for international online connections and
- the future national and regional cooperation in this field.

In the recommendations these factors were taken into consideration.

IV. CONCLUSIONS

The following conclusions can be drawn as a result of observation and from the experiences gained during the project:

a) The use of *high information technology* for industrial information in developing countries is not only possible but also necessary for the effective provision and use of information.

b) The development of *manpower for industrial information* (including the further development of the staff of FIIRO/INDICES) can and should be based on the invitation of engineers, technologists, economists and similar professionals and on their training in information management and technologies.

c) The development of the *"information awareness"* of industrial managers is not less important for the development and use of information services than the establishment of the services.

d) Cooperation on the national, regional and international level is the key question of the development of industrial information. The coordination of information efforts on the national level is a prerequisite of the cooperation on the regional and international levels.

e) A permanent framework for the cooperation of *information centres and related institutions in developing countries* would be a useful mechanism for the exchange of experiences and for cooperation.

Annex 1.

THE INTERNATIONAL STAFF OF THE PROJECT

Name and nationality	Function	Dates of missions	Duration m/m
Erik I. Vajda (Hungarian)	Industrial Information Adviser	06/10/86-19/12/86	2.5
		21/04/87-22/07/87	3.-
		12/04/88-30/06/88	2.6
		18/01/89-21/02/89	1.1
		Subtotal	9.2
Andrew S. Yeiser (American - USA)	Computer Expert	24/05/87-24/10/87	5.-
		10/04/88-20/12/88	8.3
		Subtotal	13.3
John H. Petrie (British)	Industrial Information Training Expert	15/06/87-25/07/87	1.4
		24/04/88-08/07/88	2.5
		Subtotal	3.9
		Total	26.4

Annex 2.

SENIOR NATIONAL COUNTERPART STAFF

(Dates of service are only included if the staff member was not on service during the whole project time)

Specializations	Name and post	Dates of partial service
Head of FIIRO/INDICES and of the national counterpart staff	Mr. R.O. Sodipe Chief Research Officer	-
Head, Industrial Extension Services, editor of INDAB, TIBI	Mr. B.A. Aluko Principal Research Officer	-
Head, Database input, indexing,technical inquiries	Miss O.A. Glover Principal Research Officer	-
Head of the Computing Centre	Mrs. B.N. Dungor Principal Res. Off.	Dec. 1986-
Reader services, document procurement	Mrs. E.O. Onabanjo Principal Techn. Off.I.	-
Training course organizer, CASE database and service	Miss P. Ozulonje Principal Technical Officer II.	-
Scanning sources, abstracting, indexing, input preparation	Mrs. O. Adesanya Senior Research Officer	June 1987-

Annex 2 - continued

Scanning, abstracting, indexing; input to DANTE database	Mr. O.G. Omotoye Senior Research Officer	June 1987-
Scanning of sources, abstracting, indexing, input preparation	Miss O.I. Taylor Senior Research Officer	June 1987-
Systems analyst of the computer centre; MAIL and COMPRRESS dbases	Mr. D.O. Ahorituwere Senior Research Officer	June 1987-
Computer maintenance engineer	Mr. S.O. Lampejo Principal Techn. Off. II.	Jan. 1989-
Desk top publishing, computer operations	Mr. S.F. Akinrinmade Senior Technical Officer	-
Preparation of library material for input	Mrs. C.K. Aluko Higher Technical Officer	-

Annex 3.

FELLOWSHIPS AWARDED TO MEMBERS OF THE NATIONAL PROJECT STAFF

(Items, marked with an asterisk at the name are planned fellowships)

Names	Institution and country	Subject field	Duration
1. O.O. Adesanya	International Food Information Service, F. R. Germany	Abstracting and indexing	6 weeks
2. D.O. Ahorituwere	Volunteers in Technical Assistance, USA.	Course on industrial information services	8 weeks
3.*D.O. Ahorituwere	Institution to be selected. U.K.	Systems analysis, programming	4 weeks
4.*A.A. Ajala	Institution to be selected. U.K. or Hungary	Preparation of AV training tools	3 weeks
5. B.A. Aluko	TECHNONET ASIA, Singapore	Industrial Extension Service	10 weeks
6. B.A. Aluko	Asian Institute of Technology	Course on sci. and tech. information	13 weeks
7. B.N. Dungor	UNESCO (Paris)	CDS/ISIS software application	2 weeks
8. O.A. Glover	European Space Agency and other institutes. Italy. - Nat. Tech. Info. Centre and Library. Hungary	Application of computers in information. Retrieval languages.Online search.	10 weeks

Annex 3. - continued

9. O.G. Omotoye	See number 1.	See number 1.	6 weeks
10. E.O. Onabanjo	Institute for Development Studies. U.K.	Application of computers in information	6 weeks
11. R.O. Sodipe	Nat. Tech. Inf. Service. USA. Inst. for Dev. Studies, Prod. Engineering Res.Assoc.U.K.	Computerized library and information services	4 weeks
12.*R.O.Sodipe	British Library and institutions to be selected. U.K.	Machine readable bibliographic records.	3 weeks
13. O.I. Taylor	See number 1.	See number 1.	6 weeks
		Total:	81 weeks.

Annex 4.

TRAINING COURSES

FIIRO, 7 - 17 June 1988

(For details and curriculum see the technical report DP/ID/SER.A. 11036 of J.H. Petrie, training expert)

1. Course for chief industrial executives

   Subject: Information resource management
   Duration: One and a half day
   Number of substantial lectures: 5
   Number of tours: 1
   Number of open forums: 1

2. Course for middle managers

   Subject: Information resource management : Industrial development through the harnessing of scientific, technological and business information
   Duration: Three days
   Number of substantial lectures: 11
   Number of tours: 1
   Number of open forums: 1

3. Course for heads of information services and libraries

   Subject: Operation of corporate information services : Acquisition, storage and retrieval of information in a modern library setting
   Duration: Four days
   Number of substantial lectures: 14
   Number of practical sessions: 2
   Number of open forums: 1.

Annex 5.

DATA ON THE INTERNATIONAL AND NATIONAL CONTRIBUTIONS TO THE PROJECT BUDGET

I. International contributions(US dollars)

Type of expenditure (main budget line)	Planned amount (latest revision)	Disbursed, obligated (31. 12. 1988)
19-99 PERSONNEL	217,174	201,272
39-99 TRAINING	81,844	67,852
49-99 EQUIPMENT	207,158	195,588
59-99 MISCELL. COSTS	7,100	8,854
99-99 PROJECT TOTAL	513,276	473,566

- continued -

Annex 5. - continued

II. National contributions(Nigerian Naira)

Type of expenditure (as in project doc.)	Planned amount	Actual expenditures, in cash and kind*	
PROJECT PERSONNEL	184,780	salaries,cash	285.098
EQUIPMENT AND MATERIAL	265,000	estimated	210,000
TRANSPORT, COMMUNICATIONS, MAINTENANCE, STATIONERY	42,720	estimated	65,000
MISCELLANEOUS	7,500	estimated	5,000
PROJECT TOTAL	500.000		565,000

* It is hardly possible to make exact estimates. The salary data are exact but it is almost impossible to separate the costs of the project from the regular library manpower costs. Other costs are estimated on the basis of experiences.

Annex 6.

MAJOR ITEMS OF PROVIDED EQUIPMENT

a) **Computers end related equipment**

5 PC/XT compatible microcomputers
3 PC/AT compatible microcomputers
2 Toshiba 1200 lap-top computers
5 Epson LQ 850 printers
3 Epson GQ 3500 Laser-printers
3 Color monitors
2 Philips-100 CD-ROM player
4 AT 1200 modems
2 Wangtek tape recorders
4 converters
1 spare hard disk
uninterruptable power supplies
(spare parts not listed, partly delivered)

b) **Computer software**

MICROSOFT DOS 3.30
MOUSE OPERATING SOFTWARE
CLIIPPER (DBASE 111TM COMPILER)
MICROSOFT MACRO ASSEMBLER 5.0
TURBO BASIC - IBM version
TURBO PASCAL 34.0
MICROSOFT FORTRAN COMPILER
MICROSOFT COBOL COMPILER
DBASE III PLUS
MICRORIM R: BASE
SUPER PROJECT EXPERT
PARADOX
XEROX VENTURA
LE PRINT
WEBSTER'S NEW WORD WRITER

Annex 6. - continued

(computer software continued)

SIDEKICK

PAGEMAKER

WORDSTAR 2000

MICROSOFT WORD

AUTOCAD

LOTUS - 123

c) Audio-visual equipment

1 Panasonic video-cassette-recorder

1 Hitachi video-cassette recorder

1 Philips portable video cassette recorder

1 Panasonic video-camera

1 Grundig 26 inch color TV

1 Grundig 14 inch color TV

2 Kindermann Famulus 2 overhead projector

1 Kindermann Famulus Mobil overhead projector

2 sound/slide projector

1 ea. Polaroid Palette and camera adapter

1 Polaroid power processor

1 Polaroid illuminated slide mounter

1 Nikkon camera

1 Nikkon speedlight

1 Caramate remote control

1 Caramate headphone

2 projector screen

1 Bilora - Profilo tripod stand

1 large camera tripod stand

5 Stavol voltage regulator

(Bags, lenses accessories are not listed)

d) Other equipment

1 Peugeot 505 car

4 Carrier Model 51XMA117BR room airconditioners

Annex 7.

LETTER TO THE UNDP RESIDENT REPRESENTATIVE ON THE TRANSFER OF EQUIPMENT

Erik I. Vajda
UNIDO Industrial Information
Adviser
Federal Institute of
Industrial Research, Oshodi
(FIIRO

Oshodi, 16 February, 1988.

Re: DP/NIR/83/021, Transfer of purchased equipment.

Dear Mr. Malik,

I shall terminate very soon my last mission in the framework of the project referred to above. Before leaving the field I make herewith a formal proposal to transfer the equipment purchased by this project tc the Federal Government of Nigeria. The purchased equipment (mainly computers, their peripherals and audio-visual training equipment) is effectively used at the Federal Institute of Industrial Research, Oshodi for the collection, processing, retrieval and dissemination of industrial information, as well as for the training of information officers and users of information.

Although project cars are not always transferred to the government after the termination of a project, my proposal concerns the purchased project car, too. The establishment of industrial extension services is one of the most important achievements of the project. The extension service, however, cannot cope with its tasks if the extension officers are not able to visit the industries for identifying and solving their problems. For these reasons I propose the transfer of the project car and its use for activities started by the project.

I would take this opportunity to thank you and your officers for the support of the project activities and for the help in my personal problem solving.

Yours sincerely

Erik I. Vajda
Industrial Information
Adviser

Mr. Chandra P. Malik
Resident Representative a.i.
UNDP Res. Rep.'s Office
11 Queen's Drive
Ikoyi, Lagos.

Annex 8.

THE DATABASES OF FIIRO/INDICES

a) Bibliographic databases

STEP (Scientific, Technical and Economic Publications) contains bibliographic references, abstracts and subject indication by descriptors. Its sources are abstracting and indexing services and primary literature, first of all journals. Its content is selected from the point of view of the needs of the Nigerian industries.It is the main source database for the Industrial Abstracts, for the SDI services and is also used for technical inquiries The database is operational.

PAIR (Patent Information Retrieval) is similar to STEP, but this database includes specific data on patent documents. Its sources are first of all patent information services. The selection of items and the use of the database is also similar to STEP. The database has been established, but the input to it will be started only now.

CASE (Current Awareness Service on the Economy) is a database for a single information service. Their names are also identical. It contains references to articles and news in Nigerian newspapers. It is operational.

PIPE (Product and Industry Profiles Extracts) is a computerized index to the industry profiles published by UNIDO, the National Technical Information Service (USA)and other institutions and is used first of all for answering technical inquiries.It is operational.

CAPSTAN (Colorants, Additives, Preservatives Standards) contains the identification data and subject indication of national, foreign and international standards and other regulations in this particular subject field. It will be used for special inquiries. Its creation is under way.

b) "Factographic" databases

DANTE (Data on Available Nigerian Technologies) consists of descriptions of technologies, identification and administrative data, and subject indication for retrieval. It is based on questionnaires circulated by FIIRO/INDICES and completed by owners of the technologies. It is used for various services but first of all for inquiries. The input to the similar database of UNIDO/INTIB is prepared from the slightly modified records of the DANTE database. It is operational.

RADIO (Research and Development Information Online) is composed from records on research and development projects in Nigeria. The content of the records is similar to those in DANTE. It is also based on completed questionnaires.It will be used in addition to current services and inquiries for the publication of the directory on ongoing research in Nigeria. It is operational.

ITEM (International Technology Market) is a counterpart of DANTE. It contains data on technologies available outside the country. Until now ITEM was identical with the relevant UNIDO/INTIB databases. It is planned to establish ITEM by downloading of data from the UNIDO databases and by their completion from other sources.

COMPRESS (Company Profiles for Extension and Similar Services) is also based on questionnaires. It contains data on the products of companies, on materials and equipment used by them, but also the description of their subject interests and their interest in the services of FIIRO/INDICES. It will be used for answering inquiries but also for the management of services and publicity actions of the centre. It is operational.

c) Databases for the management of INDICES

MAIL (Mailing Addresses' Internal List) is a computerized mailing list of the centre. The addresses can be selected by various criteria.

AID (Answered Inquiries' Data) will help the information officers not to duplicate the information searches but to use the earlier relevant search results for new inquiries. It is not yet operational.

THESAURUS is the database of the controlled search language vocabulary which contains the keywords (descriptors) used for subject indexing and their relations.It is operational.

Annex 9.

THE CURRENT INFORMATION SERVICES OF FIIRO/INDICES

Industrial Abstracts (INDAB)

This publication contains bibliographic references (or sometimes references to available technologies or R & D projects), abstracts and various elements of subject indication (descriptors, classification symbols). The items are arranged in a subject oriented order. Cross references are given if appropriate. The material for the publication is selected from the databases of INDICES, first of all from STEP and PAIR, occasionally from DANTE, RADIO, ITEM and CAPSTAN. This means that the selection criteria of these databases will also define the selection criteria for INDAB; industrial information of primary importance for Nigerian industries will appear in it. The selection of the material for inclusion is done by experts, the sorting and editing is computer-assisted. INDAB is issued quarterly; bimonthly publication is scheduled for the future. The subscribers can obtain the original documents (their copies) from the document procurement service of INDICES.

Current Awareness Service on the Economy (CASE)

The service offers references to articles and news appearing in all significant Nigerian newspapers. It is a fully computerized selective service. The subscribers can define the branch of industry and the problem which should be the criteria for the automatic selection. The form of the service is the delivery of computer printouts to the user, every two weeks. The original newspapers are available in the FIIRO library

Technical Information Bulletin for Industry (TIBI)

TIBI is a serial publication, which is issued irregularly, 2-3 times a year. Every issue contains the description of a new or improved technology. The further issues will also include a part with references to other valuable sources on the subject.

Selective dissemination of information (SDI)

The main aim of SDI is to select and provide all available information on a given subject being defined by the user (subscriber) and not a single item of information what would be out of this subject scope. The form of the SDI service is similar to that of INDAB and CASE respectively (see above), i.e references and abstracts are being sent to him on computer printouts. The user can define his query in consultation with the officers of INDICES. Two types of SDI services are offered: on broad subject fields a so called standard-profile service and on special subjects the "tailored" profile service. The sources (databases for standard profile selection are the same databases as for INDAB (see above). For tailored profiles computerized search will be made in these databases but also in very large databases imported to FIIRO in machine readable form (CD-ROM, floppy disks). The original documents are made available by the document procurement service.

Annex 10

PROJECT DOCUMENTATION

Note: Short substantial references are presented only. For bibliographic references to reports see Annex 11. References.

1. Planning

1.1 Project document - 1985
1.2 Work plan - 1986 (see also enclosed to Technical Report - 2.1)

2. Technical Reports

2.1 E.I. Vajda: Planning, designing and starting the development of information sources, texchnologies and services - 1986
2.2 J.H. Petrie: Training activities for the development of information services for industry (interim report) - 1987
2.3 A.S. Yeiser. Support for computerization of information services (first part of split mission) - 1987
2.4 E.I. Vajda: Further development of industrial information services, computerized databases, training in industrial information and co-operative activities - 1988
2.5 J.H. Petrie: Training activities for the development of information services for industry - 1988
2.6 A.S. Yeiser: Support for computerization of information services (second part of split mission)

3. Project Performance Evaluation Report - 1987

4. Memorandum for the tripartite review meeting. Further progress of the project - 1988. (see also enclosed to Technical Report - 2.4)

5. Terminal Report - 1989

Annex 11

REFERENCES

1. Development of an Industrial Information Centre. DP/NIR/75/069. Terminal Report / Prepared by S. Parthasarathy, Senior Industrial Information Expert of the United Nations Industrial Development Organization, acting as executing agency for the United Nations Development Programme. - Vienna, 1979-2-21. - 28 p.

2. Federal Institute of Industrial Research, Industrial Information Centre, Phase II. DP/NIR/83/021. Technical report: Planning, designing and starting the development of information sources, technologies and services / Prepared for the Government of Nigeria by UNIDO, based on the work of Erik I. Vajda, Industrial Information Adviser. - Vienna, 1986-12-09. - 64 p.

3. Federal Institute of Industrial Research, Industrial Information Centre, Phase II. DP/NIR/83/021. Technical report: Training activities for the development of information services for industry (interim report) / Prepared for the Government of Nigeria by UNIDO, based on the work of J. Howard Petrie, Industrial Information Training Expert. - Vienna, 1987-07-21. - 36 p.

4. Federal Institute of Industrial Research, Industrial Information Centre, Phase II. DP/NIR/83/021. Project Performance Evaluation Report / Prepared by UNDP (Lagos) and UNIDO. International project coordinator. Erik I. Vajda. - Vienna, 1987-11-20. - 26 p.

5. Federal Institute of Industrial Research, Industrial Information Centre, Phase II. DP/NIR/83/021. Technical report: Support for computerization of information services (first part of split mission) / Prepared for the Government of Nigeria by UNIDO, based on the work of Andrew Yeiser, Computer Expert. - Vienna, 1987-12-02. - 34 p.

6. Federal Institute of Industrial Research, Industrial Information Centre, Phase II. DP/NIR/83/021. Technical report: Further development of industrial information services, computerized databases, training in industrial information and cooperative activities / Prepared for the Government of Nigeria by UNIDO, based on the work of Erik I. Vajda, Industrial Information Adviser. - Vienna, 1988-06-21. - 46 p.

Annex 11 (contd.)

7. Federal Institute of Industrial Research, Industrial Information Centre, Phase II. DP/NIR/83/021. Technical report: Training activities for the development of information services for industry / Prepared for the Government of Nigeria by UNIDO, based on the work of J. Howard Petrie, Industrial Information Training Expert. - Vienna, 1988-07-13. - 39 p.

8. Federal Institute of Industrial Research, Industrial Information Centre, Phase II. DP/NIR/83/021. Technical report: Support for computerization of information services (second phase of split mission) / Prepared for the Government of Nigeria by UNIDO, based on the work of Andrew Yeiser, Computer Expert. - Vienna, 1988-12-06. - 29 p.