



**TOGETHER**  
*for a sustainable future*

## OCCASION

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



**TOGETHER**  
*for a sustainable future*

## DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

## FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

## CONTACT

Please contact [publications@unido.org](mailto:publications@unido.org) for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at [www.unido.org](http://www.unido.org)

17724

UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

Distr.  
RESTRICTED  
IO/R.112  
13 September 1989  
ORIGINAL: ENGLISH

STRENGTHENING OF THE CHINA DYEING AND FINISHING DEVELOPMENT CENTRE

DG/CPR/87/017

CHINA

Technical report: Visit of expert in technical  
information systems\*

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

Based on the work of Brian Rostron  
Expert in technical information systems

Backstopping officer: J.P. Moll, Agro-based Industries Branch

3a/52

---

\* This document has not been edited.

ABSTRACT

Strengthening of the China Dyeing and Finishing Development Centre. Project DG/CPR/87/017/11-04

Technical Report - Visit of expert in Technical Information Systems. August 1989

The report details the activities of the Technical Information Systems Expert at the China Dyeing and Finishing Development Centre from July 31 - August 17 1989.

Visits were made to information users (mills) and information sources (institutes). A review of CDFDC work in the field of data processing was made and a discussion document presented.

A seminar on 'Collection and Dissemination of Information' was presented supported by several smaller work sessions.

The main conclusion of the report is that whilst there are adequate information networks available the electronic systems are almost unused. The recommendation is therefore made that the Centre's main job will be to get the industry to use the existing facilities whilst at the same time developing a complementary Chinese language database.

TABLE OF CONTENTS

Page Number		
1		ABSTRACT
2		TABLE OF CONTENTS
3		INTRODUCTION
4		RECOMMENDATIONS
6	I.	ACTIVITIES
6		I.A. ACTIVITY OBJECTIVES
7		I.B. ACTIVITIES UNDERTAKEN
8		I.C. ANALYSIS OF ACTIVITIES
15		I.D. FINDINGS
17	II.	DISCUSSION DOCUMENT
19	III.	CONCLUSIONS
20	Appendix 1	CONTACTS MADE DURING THE MISSION - PEOPLE AND ORGANISATIONS
21	Appendix 2	BIBLIOGRAPHY

## INTRODUCTION

As part of the project aimed at strengthening the China Dyeing and Finishing Development Centre (CDFDC), an expert in Technical Information Systems was invited to visit the Centre in Shanghai in August 1989.

During the three week visit the expert completed the previously agreed programme of work which involved:

- 1) Reviewing the Centre's progress in mastering data processing systems.
- 2) Establishing links with an international database.
- 3) Instructing staff of CDFDC on use of the system.
- 4) Holding a seminar on Information Technology.

Following the seminar a number of small working sessions was held each attended by a small group of people with specific interests.

In addition to the agreed programme the expert also produced a discussion document which formed an agenda for a series of meetings with Centre staff. At these meetings it was possible to offer advice, guidance and recommendations to the senior staff.

RECOMMENDATIONS

- 1) None of the recommendations made in this report will be of any value unless the basic requirement of a structured approach to the data processing needs of the Centre is addressed.

The prime recommendation to CDFDC is that priority be given to the establishment of a formal plan for the data processing needs of the Centre. That a written programme of targets, aims and a timetable for these is prepared and a single person is given the task of overseeing the total project. This person would co-ordinate individual projects and ensure that the past 'fragmentation' is not perpetuated. He will ensure compatibility of hardware, software, operating systems and languages (where appropriate).

- 2) An audit of the progress of the project to computerise the Chinese abstracts should be carried out. To determine:
  - What the database will be finally used for.
  - The optimum format/structure to achieve these ends.
  - With the format established, calculate the total database size, including past years and future years data.
  - With this maximum size of database determined, evaluate what machine specification and software will be required.
  - After this stage it may be decided that the project in its present form is not feasible. There is little point in continuing to input data for a further year, only to find that the database is not satisfactory. This recommendation is therefore one of some urgency.

- 3) The project concerned with lists of machinery, which is at present suspended because of computer failure, needs to be re-evaluated. Even if the machine is repaired it is questionable whether the project should be re-activated on a machine which has nothing in common with the other projects. If the machine was to fail again there is no backup and the project data becomes unavailable again. This report does not

condemn the machine but queries whether a Unix operating system, a home made program written in 'C' and 8 inch disk drive can be justified on grounds of compatibility.

The recommendation here would be to ascertain if the machine is capable of being fitted with different disk drives and if the operating system can be changed to be compatible with other equipment on site. If so, then modify it. If not, then reconsider if the project is sufficiently valuable to restart on a different machine using a proprietary database package rather than the home made version.

- 4) Discussions should be held with the Institute for Science and Technology Information in Shanghai to establish that they will be able to satisfy the Centre's needs for access to international on-line host databases - particularly access to World Textile Abstracts, Textile Technology Digest and Titus. There seems to be no justification in CDFDC duplicating these resources if they are available nearby.
- 5) There appears to be a need for training more personnel in the Centre in all aspects of the use of on-line databases. Even if they are not going to actually carry out searches themselves they need to be fully familiar with the system, as it will be through the Centre's staff that the industry will become involved.
- 6) As CDFDC will be the means of introducing this technology to the industry, it will be necessary to establish programmes of familiarisation and training for mill technologists. It is recommended that such training courses are conducted by professional trainers and not left to Centre personnel. The whole programme, of use of both international databases and eventually internal Chinese databases, depends upon the industry using the facilities. The training programme will thus be just as important as setting up the technology. Professional training must therefore be considered essential.

## I. ACTIVITIES

### I.A. Activity objectives

Within the framework of the project purpose, namely the strengthening of the CDFDC, the technical information expert was required to:

- Review the progress at CDFDC in mastering the utilisation of data processing systems.
- Establish links with an International database.
- Instruct the staff of CDFDC in the optimal use of the system.
- Prepare a technical report setting out the findings of the mission and make recommendations for further action which might be needed.

The specific tasks for the expert were further defined as:

- The introduction of new or modified software for the compilation of a register of all imported preparation, dyeing and finishing machinery. This is an ongoing survey which requires extending.
- The setting up of a database for articles and information published in China and worldwide thereby providing data retrieval services to CDFDC and STRI and to the dyeing and finishing industry of the PRC.
- The training of personnel in programming databases.
- The presentation of two lectures one reviewing existing information systems including the use of data retrieval methods and a second one concerned with which systems are best suited for retrieving articles on dyeing, printing and finishing.



I.B. Activities undertaken

In order to fulfill the requirements of the above objectives several steps were required:

- Visit and discuss with potential users of information systems, both management and technical staff, what were their needs and what were the shortcomings of the present facilities.
- Visit and discuss with the various information sources to determine what facilities they provided and how much use was presently made of these services and what plans they had already in hand to expand their own information network - this included other institutions allied to STRI/CDFDC, e.g. Textile Machinery Research Institute, Institute of Technical and Scientific Information and Shanghai Dyeing and Finishing Research Institute.
- Examine the present state of development of the technical information systems, both manual and electronic, within STRI/CDFDC - including equipment, software and personnel. Determine what they were able to do, what they were not able to do and what plans were already under consideration.
- Discuss with the members of CDFDC their overall aims and determine if they had drawn up any formal plans for the use of computers in the general field of data processing as opposed to the specific area of information technology.
- Determine with CDFDC the most suitable form of the seminar after taking into account the foregoing investigations.

## I.C. Analysis of activities

### Visits to potential users of information systems

Three mills, selected as being representative of the industry in terms of their use of computers and information technology needs, were visited and discussions held with managerial and technical staff. (These mills are identified elsewhere in the report.)

Although it is not within the terms of reference of this report, it is nevertheless of some relevance to the final findings and conclusions that these three mills all had a degree of contact with computers and data bases. In addition they had personnel who understood the technical aspects of the equipment. This equipment was used for a variety of functions including - personnel, production and instrumental colour match prediction. Particular note was made of the latter use. The most powerful computer equipment in these mills had been originally bought as part of the computer colour matching system. In each case the equipment was not functioning as a colour matching instrument, and as a result a number of potentially useful PDP 11 computers were not being efficiently utilised.

In view of the computer literacy which was displayed in these mills it was most surprising to find that there was a high degree of ignorance concerning the use of computer technical information systems, and even when there was some familiarity with the subject there was no instance where any use had been made of this information source. Technical information, when required, was apparently sought only by the use of manual searches of printed indices.

This manifest failing might be traced to:

- Lack of knowledge of what computer databases could offer.
- Insufficient knowledge or training on how to access this source of electronically stored data.

- The feeling that an electronic search would prove more costly than a manual search and an unwillingness to accept that the less efficient and more time consuming manual methods might actually cost more.
  
- In cases where the searcher for technical information did not have the necessary ability in a European language then there was an obvious reluctance to use the international databases which would seldom, if ever, be in Chinese. It was not accepted that an experienced multi-lingual searcher acting as an intermediary between the person needing the information and the database might provide the necessary link.

#### Visits to other information sources

Many sources of scientific and technical information other than STRI/CDFDC are available to the dyeing and finishing industry. In connection with this investigation one particular source of information, from amongst the several already listed earlier, was identified as being of special interest.

The Institute for Scientific and Technical Information in Shanghai provide, as a 'commercial operation', an extremely wide range of information services. There is not only a good reference library facility but the associated computerised service appears to be first class.

Of particular interest to this analysis is the possibility of utilising their facilities for searching on-line host databases in either U.S.A. or Europe. They claim to have the ability to access a number of international databases and to have agreements with the main host databases in the international textile field. Titus through E.S.A.,  
World Textile Abstracts through Dialog,  
Textile Technology Digest through Dialog.

The Institute has intelligent terminals linked to communication lines which enables them to interrogate overseas on-line hosts. They also possess some front-end software which allows more efficient use of the system.

The operator of the terminal appeared to be fully trained and familiar with the system and with the searching techniques and strategies which are needed to use the routine effectively and the command of English language was considered more than adequate for servicing the dyeing and finishing industry's needs.

If there is a possible shortcoming to the system it is the lack of high quality telecommunications network to link terminal to host. This will slow down a search and hence be more costly than would be the case in a country with a more developed data transmission network. For example International Packet Switch Stream (IPSS).

This Institute's ability to access a host such as Dialog offers a great advantage over a manual search since there are several hundred other databases on the same host which enables a searcher to simultaneously interrogate for associated information such as chemical abstracts, patent abstracts or other technology. This allows a comprehensive search to be completed in minutes rather than hours or days.

These facilities are all available, unfortunately the Institute was unable to say exactly when was the last time that the textile industry had made use of this facility. Certainly it was not in the last weeks or possibly months.

Obviously this availability of technical information, and its apparent lack of use, will form an important part of the findings and recommendations of this report.

Information technology within STRI/CDFDC

CDFDC at present use the STRI information facilities. The data available consists of an excellent library with a comprehensive international collection of serials and abstract/indices. In addition to the international publications there are :

Chinese language abstracts - Fangzhi Wenzhai

Textile abstracts of Chinese items - Zhongguo Fangzhi Wenzhai

Selected Dyeing and Finishing Articles

Chemical Fibre Abstracts

These latter are produced in China and published as serials, abstracts or indices, and together with the international collection offer a fairly comprehensive manual system.

They are however aware that much of the international data is inaccessible to many potential users because of language problems. In order to overcome this to some extent, there is an attempt to incorporate more overseas items in the locally produced publications.

In addition, there is a feeling that the inability to access on-line hosts because of language problems could be corrected by computerising their own Chinese abstracts. A start has been made to produce such a database. The equipment being used for this project was not specially selected for the task and is probably not adequate in storage capacity or power. The software was apparently selected on the basis of what was available at the time and again is possibly not the most suitable choice for this application. A combination of less than satisfactory equipment and software will almost certainly lead to disappointment. In other words, because of the potential size of the database (it will need to store several thousand records for each of the past 10 to 15 years) the storage capacity will soon be exceeded and the ability to search such a large database will be slow and difficult.

Overall data processing plans of CDFDC

The establishment of new databases, as visualised by CDFDC, ought not to be taken in isolation from the Centre's overall plan for data processing. Enquiry failed to identify such a plan and also failed to find any individual with overall responsibility for the data processing functions.

CDFDC have expressed the intention of establishing or expanding existing databases for:

lists of machinery installed in mills,  
lists of new machinery and suppliers,  
abstracts of Chinese publications.

Each of these projects has been planned independently with the result that there is a lack of standardisation in respect to hardware, software, language and operating system.

This fragmentation has resulted in an inability to transfer work from one machine to another. Thus, when one machine failed, the project being developed on it has had to be delayed for over a year awaiting repairs. With standardisation, this work could have been transferred to another machine and such delays avoided. The intention is to perpetuate this situation by continuing the project on the same equipment when it is repaired.

The lack of a structured plan for data processing within CDFDC is already adversely affecting the work. In addition the absence of a nominated co-ordinator of this work will perpetuate the situation.

Informal discussion has produced evidence that several projects are being considered in connection with the abstracts database. The first is a hope to sell the database to some, as yet unspecified, third party. The second is to transfer the database eventually from a microcomputer to a mainframe in order to overcome the storage and speed of search problems. Either of these developments could impose a set of parameters on the

structure of the database which are incompatible with the format presently being developed.

In the absence of the formal plan mentioned above we can see that the position is developing where a database is being prepared in a format determined by one set of parameters, and by the time it is completed the required format may well be unsatisfactory for sale to a third party or transfer to a mainframe.

#### Establishment of seminar content and format

The original topics for the seminar had been penciled-in prior to the expert's visit. In the course of the visits to mills and institutes, and after discussions with CDFDC, it became obvious that the original format was not the most satisfactory one.

It was considered that rather than two separate short talks, a single full day presentation would give a better chance of giving adequate treatment to a rather complex subject. Since the two original topics were closely related there would have been a very similar audience for both talks and a single day presentation would therefore be more convenient.

A full day seminar was therefore proposed and re-titled 'The collection and dissemination of information'. The morning session concentrating on what information is available, how it is collected and how it is stored. The afternoon session dealing with aspects of how to access this information and with searching procedures.

It was hoped that the lecture would introduce a number of new concepts to the audience and that interested parties could attend short 'workshops' on subsequent days, when small groups could explore areas of specific interest. This approach was calculated to stimulate the greatest interest to the widest number of people, and to provide encouragement to those who might wish to follow up some of the suggestions which were made.

This new seminar involved the preparation of a new lecture which caused the interpreter and CDFDC staff severe problems in meeting the deadline, however it was considered that the added benefits would justify the disruption caused by the change. In the event this expectation was justified by the attendance which exceeded 70 people, representing an extremely wide range of disciplines.

A transcript of the seminar was left with CDFDC for translation into Chinese and subsequent wider distribution to interested parties who were unable to attend the presentation.



I.D. Findings

The activities carried out in the section I.C. of this report lead to the following observations:

- There is already a great deal of technical information available to the dyeing and finishing technologist and researcher through a variety of sources in Shanghai. The majority of this is in the printed form.
- There are already facilities available for accessing host international databases through the Institute of Science and Technical Information in Shanghai. These do not appear to be used by the industry to any appreciable extent.
- The fragmented approach to developing individual projects is retarding progress and will become worse as the size of the databases grows.
- The choice of equipment and software for these various projects was considered to be less than satisfactory.
- The absence of a co-ordinated plan for projects, hardware, software for data processing will continue to be a major negative influence on the ability to make progress. In addition this lack of plan will make it impossible for an advisor to make constructive proposals with regard to improvements in methods, equipment or software.

This summary of findings is introduced into the report at this stage (although the subject will be dealt with more appropriately and in greater detail elsewhere), as an indication that another activity should be introduced into the mission.

Although these findings will form part of the recommendations of the report, this information will only become available to CDFDC after the expert has left China. This gives no opportunity for the Centre to correct any mistaken impressions or to discuss any remedial action which might be appropriate.

In order to remedy this it was decided to produce a discussion document during the last few days of the visit and use this as a basis for a meeting between the Centre and the expert when some of the problems could be explored and some solutions considered.

## II. DISCUSSION DOCUMENT

This document was prepared to form the agenda for an end of mission meeting between the expert and CDFDC. It was not intended that it should anticipate the recommendations of the final report.

The document covered the following areas:

- The present situation.
- What is not available.
- Steps already taken to improve the situation.
- Planning.
- Equipment.
- Software.
- Strategy for selling Chinese databases.
- Training.

Although Vice-Director Mr. Zhou stated that he agreed with the majority of the document, there were areas where differences of emphasis did occur. As these differences are possibly more important than the areas of agreement they will be explored in a little more detail.

Whilst there was full agreement that a formal plan was needed to provide a framework for all developments, there was a reluctance to accept that this should delay the progress of any of the individual projects.

The expert expressed the opinion that it was not in the Centre's best interest to continue to produce a database of Chinese abstracts before establishing :

- what format would be needed to if the database was finally to be sold to a third party,
- what format would be needed if the database required to be transferred to a mainframe at a later stage,
- whether the present hardware and software was going to be adequate when the ultimate size of the database was decided.

Whilst there was acceptance of the fact that there were some unresolved questions, the Centre expressed confidence in their ability to find solutions to these potential problems as and when they occurred.

It was accepted that in the absence of firm plans, and with uncertainty as to which direction this project would finally take, it would be difficult for the writer to satisfy CDFDC's request for recommendations as to which specific equipment and software they should employ. This decision would therefore have to be postponed.

Aspects of training were the subject of considerable discussion, particularly with regard to training people in the various advantages and techniques of on-line data base searching. Whilst there was no disagreement on the need and importance of training, the expert's opinion that this specialist area required training professionals to help to establish the program (not to do the actual training) was not accepted. CDFDC indicated that they already undertook training and would be able to conduct such courses themselves.

### III. CONCLUSIONS

The role of CDFDC in the field of information technology is potentially very important.

That CDFDC are aware of the importance is not in question. However, the practical application of this awareness may not be easy.

The problems will be in two areas.

Firstly, within CDFDC. They have the problem of establishing a usable technological Chinese language database and of developing expertise in the use of on-line host databases. Although a manual abstract system is available through STRI, there is a long way to go until the electronic systems can be considered ready for introduction to the industry.

Secondly, even when the full information technology base is firmly established it is of no value unless it is used by the industry. Therefore convincing the industry of the value of this new technology, telling them what is available and telling them how to access this information will be of prime importance.

This report would suggest that although the first stage may not be easy, the task of involving the industry as a whole may be the more difficult task.

APPENDIX 1

CONTACTS MADE DURING THE MISSION - PEOPLE AND ORGANISATIONS.

BEIJING

U.N.D.P.

Zhang Xi Wei	Programme Officer
Ministry of Textiles - International Co-operation Dept	
Zhong Changsheng	Deputy Division Chief
Zhu Xing	Senior Engineer
Chen Rong	Programme Officer

SHANGHAI

C.D.F.D.C. & S.T.R.I.

Zhou Wei-Tao	Vice Director
Cheng Cheng-Kang	Director Project Planning Dept
Xu Ninglun	Senior Engineer
Cai Pei-Wei	Senior Engineer
Cai Zhong Fang	Engineer
Gao De Quan	Editor 'Textile Abstracts'
Pan Zhengzhong	Director Information Services
Zhu Hua	Deputy Director Info. Ser.
Shanghai Textile Machinery Research Institute	
Lu Zheng-Yu	Senior Engineer
Ye Da-Xian	Senior Engineer
China Nonwovens Industry Information Centre	
Hua RongFeng	Director
Shanghai No 1 Printing & Dyeing Mill	
Sha Xuan De	Deputy Director
Zhang Jin Mei	Vice Chief Engineer
Shanghai No 3 Printing & Dyeing Mill	
Fang Zhong Meng	Works Director
Shanghai Xinguang Shirt Mill	
Xie Qin	Deputy Director
Chen Bu Ning	Chief - Technical Section

APPENDIX 2

BIBLIOGRAPHY

Online searching in Science and Technology.  
British Library, Online Search Centre.  
Science Reference and Information Service.  
ISBN 0-7123-0760-5

Horter, S.P.  
Online information retrieval concepts, principles and techniques.  
Orlando, Florida: Academic Press, 1986

Rowley, Jennifer  
Abstracting and indexing.  
Bingley, 1981  
ISBN 0-85157 336 3

Sharman, Geoffrey  
Introduction to Data Base on microcomputer.  
Addison - Wesley, 1987  
ISBN 0 201 15031 x

Salton, Gerard & McGill, Michael  
Introduction to modern information retrieval.  
Melgrow, 1983  
ISBN 0 07 066526

Rowley, Jennifer  
Organising Knowledge - introduction to information retrieval.  
Gower, 1987  
ISBN 0 566 03486 7

Dyer, Hilary & Brookes, Alison  
A directory of library and information retrieval software for  
microcomputers. 2nd edition  
Gower, 1986  
ISBN 0 566 03561 8