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Joint UNIDO/ISTIC Workshop on the  
Formulation of Industrial and  
Technological Information Service  
System for Small and Medium  
Industries of China

Beijing, P.R. China, 6-10 April 1987

DRAFT REPORT\*

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TABLE OF CONTENTS

	<u>Page</u>
I Conclusions and recommendations	1
II Introduction	17
III Summary of resource persons' papers	22

ANNEX

I Work programme	31
II List of participants	34
III List of documents and country papers	40
IV Definition of SMI in China	41

I.

CONCLUSIONS AND RECOMMENDATIONS

1. Preamble:

1.1. China is a developing socialist country characterized by vast territory and large population, relatively weak economic infrastructure, surplus of labour force and unbalanced economic development between provinces as well as towns and counties. Since 1979, when the country began to carry out the reform of economic structure, Small and Medium Industries (SMIs) including the township enterprises, and urban collective enterprises have made rapid progress. Small and medium industries, with their greater flexibility and adaptability eminently succeeded in meeting the social and economic needs of contemporary situation.

1.2. The vigorous emergence and dynamic growth of small and medium industries is not an accidental social phenomenon.

They unmistakably reflect the world trend. SMIs are full of pioneering spirit, respond quickly to rapid changing market and adapt themselves to the situation created by new technological revolution sweeping the world.

1.3. China is engaged in modernization. The development of SMIs is of immediate significance and importance to national economy. Chinese "small" enterprises are "big" in view of their pre-eminent position in national economy and the role played by them.

1.4. According to 1986 statistics, there were only over 5,000 big enterprises while 400,000 small and medium enterprises in urban areas and over 10 million of township enterprises in rural areas account for 75 per cent of total national output value. The labour force employed in SMIs is 60 per cent of the total

industrial employees in the country. They have made tremendous contribution in invigorating Chinese economy.

1.5. The contributory factors responsible for the powerful emergence of SMIs in national economic scene is not far to seek. SMIs have comparative advantage over large enterprises because their capital investment is much less, have much shorter gestation and pay back period, have much greater job creation potential. The needs of technology and process know-how is not so very sophisticated. Many SMIs are able to use locally available resources and labour force to produce goods to meet local needs. They restrict the migration of rural labour force to large cities and help in emergence of a new vibrant, dynamic and satisfying civilisation in rural areas and small towns. They hold a promise of good life to the rural poor. Thus, small and medium industries in China have a very bright future.

1.6. However, quite a few problems, which inhibit the healthy and vibrant growth of SMIs, are now discernible. Poor equipments, obsolete technology, inadequate infrastructure and facilities, relatively underdeveloped skills of labour force, and their inability to meet rapid changing consumer demands throw great burden on SMIs. Information is vital for SMIs, but financial and intellectual possibilities for acquiring them are very limited.

1.7. In order to promote healthy growth of SMIs and to ensure their sustained prosperity, particularly of those in rural areas, the State Science and Technology Committee has launched a "Sparks Program" which addresses itself to the invigoration of local economy with science and technology. Within 5 years, 500

demonstration projects and 100 new production lines have been proposed to be developed as well as 1 million persons to be trained in order to assist SMIs with latest and updated relevant technologies.

1.8. China possesses a formidable institutional infrastructure from national to town levels to maintain information delivery system. The national comprehensive, "Institute of Scientific and Technical Information Center" (ISTIC), 33 specialized national level information centres of various ministries under the State Council, 29 provincial information service institutes, and 430 specialized information exchange groups, represent high potential information resources of the nation. Their facilities need to be more fully harnessed and utilized and at sometime upgraded for the benefit of SMIs.

1.9. SMIs of China are poised, in a determined and significant manner, to take off to the new era of international competitiveness and challenging consumer demand satisfaction.

1.10. International co-operation in information service promotion is vital and needs to be adequately promoted. Exchange of information based on acquired experiences and expertise, could considerably help in accelerating the pace of industrialization. It is important for developing countries like China to acquire an adequate flow of information on technologies because the country has to catch up with other countries where industrialization process began several decades ago. Developing countries can bypass the long road of technical experimentation and learning by

means of access to the research results in information technology through out the world community/nations concerned at considerably less cost.

## 2. Objectives and Goals of New Information Service System for SMIs:

- . Recognising the role of SMIs in the Chinese national economy;
- . Taking note of wide spread professionally equipped institutional infrastructure of the information service system;
- . Realising the importance and need for strengthening existing institutions to service more adequately the felt needs and demands of SMIs.

"The UNIDO/ISTIC Workshop on the Formulation of Industrial and Technological Information Service System for Small and Medium Industries of China" held at Beijing from April 6-10, 1987 recommends the followings.

2.1. SMIs, as users of "Information Service Systems" (ISS) should occupy a place of pride and should be in the center of all planning, designing and development of ISS.

2.2. ISS must adequately, effectively and efficiently meet activities, the needs and demands of SMIs taking fully into consideration the varying social and economic conditions in various parts and regions of the country.

2.3. The ISS should be based as closely to SMI clusters as administratively possible to encourage personal interaction, appraisal and monitoring of needs of SMIs and effectiveness and

efficiency of services offered.

2.4. ISS should be enabled, by appropriate support measures, to handle information on a wide range of issues. These issues related to, among other things, scales of production; process planning; selection of equipment and machinery; raw materials; imports or manufacture of parts and components; quality control; productivity and standardization; negotiations for acquisition of technology; use of patents and know-how; labour and skill requirements; capital for investment and working capital; marketability, etc.

2.5. It will be necessary to study the ISS of China with a view to strengthening them to meet the needs and demands of SMIs in harmony with national policies and priorities for technological development.

2.6. It will also be desirable to ensure that flow of information to ISS itself is unrestricted and uninterrupted. Continual flow of information and data relevant and useful to ISS is an essential pre-requisite for ensuring effectiveness and efficiency. Information channels must not be allowed to get silted by unwanted and redundant information.

2.7. There is a need for close linkage of ISS with consultancy enterprises, engineering organizations, R+D institutions, universities, libraries, academic societies and the like, in order to secure cohesive, coherent and co-ordinated information assistance to SMIs.



2.8. The conventional and traditional information delivery systems are still relevant. They, however, need to be updated and upgraded. Stream of modern information technology should flow along with traditional and conventional system.

2.9. To achieve the aforesaid objectives, development of human resources should receive priority attention.

2.9.1. Information service cadre, professional and trained, need to be created/developed at national, provincial, county and town levels, organically linked in a meaningful manner.

2.9.2. Scientifically designed and appropriately supported comprehensive training program for the ISS personnel and users at all levels should be deemed to be an important constituent of the National Information Policy (NIP).

2.10. There is a need to strengthen national policy structure for industrial and technological information for the benefits of SMIs. The NIP should provide for:

- (i) strengthening of existing institutions servicing information needs;
- (ii) better communication facilities;
- (iii) better access to resources;
- (iv) training of ISS personnel and users;
- (v) undertaking research, study, survey and publications;
- (vi) facilitating easy access to SMIs to technology and information within the country and from outside;
- (vii) Helping in developing information markets for dispensing of information products;
- (viii) Co-ordination between information agencies at national and provincial levels; and

(ix) Promotion of international coöperation in building information network.

### 3. Measures

To achieve the aforesaid objects and goals, the workshop recommends following measures to be taken with a sense of urgency and speed at various levels.

#### 3.1. National level:

3.1.1. The "Sparks Program" should be so oriented as to meet more fully the needs of SMIs, particularly those located in under-developed/emerging regions or areas. Appropriateness of technologies need to be stressed, synchronised with skill development of SMI personnel and creation of related infrastructure, more particularly, communication.

3.1.2. The industrial and technological information service of different national level agencies and institutions should be appropriately co-ordinated through the envisaged national information network to maximize the benefits and optimize utilization of their facilities, sharing of experiences and perceptions of SMI activities, conditions, needs and demands. Besides strengthening such lateral ties, they should also be harmonised with international or regional agencies in order to prevent repetitive import of information technologies, sharing of information resources and maintenance of information flow.

3.1.3. Information institutions and/or national level agencies promoting them should take effective measures to promote new

information products, specific to the needs of SMI, step up commercialisation of such products and carry out compensatory information services so as to meet the requirements of growing information markets.

3.1.4. The national data base and infrastructure, of ISS both hardware and software need to be greatly strengthened by provision of adequate financial and trained manpower resources. The data base should have both domestic technologies and scientific research achievements component and information on international sources for induction of relevant and appropriate technologies and industrial information to meet the needs of SMIs.

3.1.5. Information service agencies should continually be exposed to world industrial and technological information system by acquiring necessary information tools, participating in international/regional conferences, workshops, seminars, fairs, and establishing meaningful contacts/relationship with recognised experts, individuals, groups and agencies.

3.1.6. Personnel of ISS should establish closest possible rapport with users and the problems and handicaps of SMIs, and should be understood by them with a view to providing necessary assistance through properly re-packaged and re-processed information products.

3.1.7. National level standardisation of ISS is desirable and should be attempted. This will include information collection, data processing, production, transmission and delivery to the enterprises.

3.1.8. Advisory services to enterprises have played useful role in the promotion and well being of SMIs. They have helped in scientification of decision making and sustained progress of enterprises, both technologically and commercially. Co-ordination amongst advisory organisations should be brought out to enhance their efficiency and effectiveness.

3.1.9. Institutions like CIEIC and China-TICS, which possess information collection and dissemination resources and have established communication channels both within the country and abroad need to establish their presence at provincial level and forge links with information institutions under industry ministry.

3.1.10. A periodic comprehensive survey of activities, conditions and information needs of SMIs, working environment, institutional infrastructure, delivery system and its impacts on SMI, effectiveness, user response, and all other related matters, should be undertaken. This task could be most appropriately entrusted to ISTIC with necessary domestic and international resources back-up.

3.1.11. Institutions like ISTIC and CIEIC should provide facilities for establishment of permanent Technology Trade Centre (TTC) in their new buildings. TTCs should engage in multi-channelled, multi-directional and multi-layered technology trading activities. TTCs should ultimately emerge as national depository of marketable technologies.

3.1.12. SMIs should be motivated, inspired, encouraged and assisted

by national level institutions through their own agencies or in co-operation with other grass root agencies, to form information exchange group, managed by SMIs on co-operation basis, to acquire latest information technologies, systems and information. Such grouping should be voluntary in character, but entitled to state support. Different enterprise level specialised information exchange groups could in turn be linked with each other for mutually agreed purposes. Such collective action could include information acquisition and interpretation, hiring of experts, maintaining of information personnel, purchasing of related hardware and software, sharing of acquired information and experiences.

3.1.13. Establishment of effective and meaningful ties between information institutions in developed regions and those in economically backward regions within the country should be encouraged and materially supported.

3.1.14. Mass media has important contribution to make towards the popularization of science and technology. Chinese television has already extended its co-operation in widespread dissemination and interpretation of technological and industrial information. In-house facilities to design special information programmes addressed to SMI viewers, need to be created to supplement the contribution of agencies like ISTIC and CIEIC. Radio and national newspapers should continue to extend even greater attention to information delivery system. Efforts may also be made to exchange S&T popularization programs with other international, regional or national mass media.

3.1.15. Stream of modern information technologies should flow alongside conventional and traditional delivery system, which, of course, need considerable improvement in their coverage and quality of service. Modern technologies will include computerized storage and retrieval systems of national data base appropriately linked to international/regional data bases as well as to provincial level systems. Recruitment and training of personnel to handle modern information technology, should be undertaken with speed and priority.

3.1.16. Research on indigenous information technologies and information delivery systems should be inbuilt into national information policy. The Government should provide necessary financial backup to such research work focusing on:

- (i) information marketing and information commercialization
- (ii) changing information needs and demands of SMIs
- (iii) information service systems for enterprises in changing national and world economic environment
- (iv) modes and efficiency of enterprises on the utilization of information and information management system
- (v) other related matters

3.1.17. The concept of sister relationship amongst financial institutions, information and research and advisory institutes, and SMIs need to be accepted and fostered. Such institutes should establish sisterly affectionate relationship with SMIs.

### 3.2. Provincial and county levels:

3.2.1. Provincial level information service institutions, being nearer to beneficiary users should equip themselves with

necessary capabilities to interpret their needs and demands and match them with requisite information products appropriately repackaged and re-processed.

3.2.2. Trained ISS personnel at provincial level should undergo refresher training at regular intervals. Training should incorporate understanding of problems of SMIs.

3.2.3. Trainer's training is important to extend coverage of training programme at county and town levels. Trainers' training should be undertaken by provincial level institutions with necessary support of provincial authorities and national level institutions.

3.2.4. Scientific and technological information institutes at the provincial levels should be oriented and broad based to meet also the industrial information needs of SMIs. Industrial information inputs should be provided to them, on an on-going basis, by appropriate agencies at national level.

3.2.5. Scientific, technological and industrial information package should subserve the felt needs of SMI users--adequately appraised and evaluated. Requirements of information by SMI users may not be necessarily regular and hence ISS at provincial level should gear itself to service demands as and when they occur.

3.2.6. Special attention need to be paid to setting up information sub-systems at the county and town levels. At present, almost 500 of 2069 counties of China possess full-time information

workers. However, working environment is not conducive to efficient handling of information service. The environment, support systems and facilities, communication and skills of information personnel need to be improved. Wherever necessary placement of experts and/or information consultants or practitioners should be encouraged.

### 3.3. Enterprise level:

3.3.1. Enterprise to enterprise co-operation in procurement, exchange, sharing, and interpretation of information products and experiences is vital to the sustained growth of SMIs and needs to be encouraged.

3.3.2. Information management and utilization systems within enterprise should be strengthened.

3.3.3. Enterprises should develop capabilities to assess and evaluate their information needs, convey such needs to ISS in prescribed manner, acquire information products, make efficient use of such products and provide feed back to the "suppliers" of information service.

3.3.4. Realising that right information at right time from right sources is vital to the health of enterprises, SMIs would be well advised to treat information as an essential input like capital goods, raw material, finances etc.

3.3.5. SMIs capable of possessing and maintaining independent information system and personnel should be given necessary fiscal and other encouragements. In other cases, SMIs should get at



least one staff member trained in information management.

3.3.6. SMIs should fully utilize the services of information agencies at various levels and keep them informed of their problems and benefits accruing to them from their services.

3.3.7. SMIs should fully co-operate and assist in data collection by relevant agencies based at national and provincial levels.

#### 3.4. International level:

##### 3.4.1. UNIDO's role

- (i) UNIDO should associate itself in the follow-up of the recommendations of the workshop.
- (ii) UNIDO should explore the possibility of providing training opportunities and facilities to select information personnel in appropriate institutions abroad in member countries on modern information technology.
- (iii) Agencies in China should consider the possibility of joining Technology Supply Database Club (TSDC) of UNIDO. They should also serve as national level extension agencies to Industrial Inquiry Exchange Service (IIES). Provincial level agencies should also agree to serve as focal points/nodes envisaged under the IIES.

3.4.2. Industrial and technological information programmes exchange should be encouraged amongst China and UNIDO (INTIB) members.

3.4.3. Exchange of directories of enterprises and/or information resources in various UNIDO member countries indicating their capabilities should be encouraged. Wherever feasible, such directories should be computerized.

3.4.4. UNIDO should help facilitate the flow of international and regional resources into China, and identification of training and networking opportunities which would accelerate pace of industrialization of China.

3.4.5. Thirty seven international information terminals existing within China should perform on-line retrieval from several international data bases. UNIDO should prevail on well-known data bases to permit linkages with Chinese terminals for on-line retrieval on nominal or considerably reduced costs.

3.4.6. International and regional non-governmental organizations like World Assembly of Small and Medium Enterprises (WASME), World Federation of Engineering Organizations (WFEO), International Development Research Centre (IDRC), Technonet Asia etc. should extend their areas of activities to serve the information needs of SMIs of China through appropriate Chinese organizations like ISTIC, CIEIC etc. Chinese organizations should actively associate themselves with activities of these organizations.

#### 4. Follow-up:

4.1. Co-ordinating mechanisms need to be established at national and provincial levels for taking appropriate measures for the acceptance and implementation of the relevant recommendations of

the workshop.

4.2. There should be a periodic appraisal of the implementation to identify further emerging information needs and demands of users in SMIs.

4.3. Pilot projects for securing close interaction between SMIs, R+D institutions, specialized agencies, financial institutions, and information service institutions should be started, closely monitored and evaluated. SMIs should be associated with information service institutions through advisory services.

4.4. The recommendations of the workshop need to be widely disseminated particularly at enterprise level.

4.5. Possibility of honoring a few enterprises, nationally selected on the basis of guidelines, which record marked improvement in their performance and achievements by efficient utilization of information services should be considered.

#### ACKNOWLEDGEMENT

The participants as well as resource persons in the workshop expressed their deep appreciation to UNIDO for organizing this timely workshop. They expressed their heartfelt gratitude to the State Science and Technology Commission, Government of P.R. China and the Institute of Scientific and Technical Information of China (ISTIC) for providing excellent host facilities.

## II. INTRODUCTION

### 5. Background Information

5.1. In December 1975, UN General Assembly in its Resolution 3507 (XXX) reaffirmed the "need to enable developing countries to have access to specific information on advanced and other technologies requested by them, as well as on the new uses of existing technologies, new development, possibilities of adopting them to local needs, and the needs ... to select technologies which meet their requirements". In this context, the Executive Director of UNIDO was requested to establish INTIB (Industrial and Technological Information Bank).

5.2. One of the basic obstacles of industrial and technological information flow to small and medium industries (SMIs) is the absence of an efficient and effective institutional arrangements for handling information on a wide range of issues. These issues relate to, among other things, products and processes.

5.3. Moreover, existing institutional arrangements for the collection, processing and dissemination of industrial and technological information do not meet the needs and demands of SMIs. The necessary information was not able to collect through conventional documentation services alone. And, these institutions, whether they deal with information or extension services are, often oriented to serve large industries rather than small industries.

5.4. The supply of industrial and technological information alone is not sufficient. The recipients should have the capacity

to digest it. Due to their limited capacity, small entrepreneurs can hardly overcome these problems and, hence, formulation of information service network is needed in China to complement and support the ISTIC information activities.

5.5. In this connection, UNIDO/INTIE agreed with the Institute of Scientific and Technical Information of China (ISTIC) to convene a 5-day Workshop on the Formulation of Industrial and Technological Information Service System for SMIs of China in Beijing, 6-10 April 1987.

## 6. Objectives

6.1. The objective of the workshop was to facilitate and accelerate industrial and technological information flow to SMIs of China through the formulation of national industrial and technological information network service system for the proper selection of technologies and equipments, for improvement of existing SMIs as well as the establishment of new SMIs.

6.2. The meeting discussed the following themes:

- (i) Role of SMIs in the industrial and economic development of developing countries;
- (ii) National industrial and technological information policy for SMIs;
- (iii) Identification, assessment and evaluation of industrial and technological information needs of SMIs;
- (iv) Industrial and technological information delivery and service mechanism to SMIs; and
- (v) Formulation of national industrial and technological information service system for SMIs of China.

## 7. Organization

7.1. The workshop was held in Beijing, P.R. China, from 6-10 April 1987 with host facilities provided by ISTIC. The workshop was attended by 25 representatives from various provinces of China. UNIDO provided 9 international resource persons, whereas ISTIC provided 7 national resource persons. The list of participants is attached as Annex II.

7.2. Host organization, on behalf of the co-organizer, Mr. Bao Jingzhang, Deputy Director of ISTIC, welcomed the participants. In his welcoming address, Mr. Bao mentioned that there is an obvious character in Chinese economic structure that small and medium industries are taking a great important place both in the number and the total national output value. Thus, we can see that in booming China's economy and realizing the four modernizations it is very important to speed up the reform and to promote the development of small and medium enterprises and township enterprises as well.

7.3. The UNIDO representative Dr. H.W. Pack, Senior Officer described the prime objectives of the workshop and expected outcome. He mentioned that presently 360,000 industrial enterprises in China are small and medium industry category employing less than 189 people, i.e. 90 per cent of total enterprises are SMIs. China is also the largest producer of manufactured goods in the developing world. For these reasons, role of SMIs in China is vitally important to the development of not only national economy but also regional economy. Therefore, the formulation of a viable industrial information network is timely needed, sharing information - technology and experiences

among provinces as well as among the Asian countries. He also stressed that UNIDO programmes in industrial and technological information field may be characterized as an integrated and complex activity covering not only the various possible stages of process, but also the broadest possible industrial sectors and potential as well as the existing implications and impact on national economy. Therefore, UNIDO feels that because of very broad experience and diversified multi-disciplinary approach to industrial information transfer, it stands ready to assist China at any time.

7.4. Mr. Wang Tingjiong, Director of Department of S+T Information, State Science and Technology Commission, The People's Republic of China, inaugurated the workshop. In his keynote address, Mr. Wang mentioned that China is engaged in modernization. Due to limited funds and inadequate technical manpower, in China it is not possible to set up many big enterprises in the near future. The development of small and medium business, therefore, is of immediate significance to China. He also stressed that Chinese small and medium enterprises are "big" as well as "small". They are "small" in size. Nowadays, average number of employees in most of Chinese township enterprises in rural area is about 100, in some places, only a dozen. When he refers them "big", it is because the number of the small and medium enterprises is big and the roles they played in national economy are great. The reason why small and medium enterprises could have developed so fast is because they are most suitable to the current Chinese circumstances. In order to promote healthful development of the small and medium enterprises, especially rural ones, the State Science and Technology Commission has launched a "Sparks Programme" which has

been approved by the State Council. This program has enjoyed very enthusiastic and effective support from various provinces, government agencies as well as rural areas. The State Science and Technology Commission wished to extend full support to the successful completion of this workshop with practical recommendations for implementation by P.R. China.

### 8. Election of officers

8.1. The Workshop elected the following officers for the conduct of its proceedings:

Mr. Bao Jingzhang (P.R. China) - Chairman

Mr. C. Agrawal (India) - Vice-chairman and Rapporteur

### 9. Report:

9.1. The Report was adopted at the concluding session of the workshop on 10 April 1987.

9.2. The workshop adopted the agenda as given at Annex-1.



### III. SUMMARY OF RESOURCE PERSONS' PAPERS

10. Mr. C. Agrawal, World Assembly of Small and Medium Enterprises (WASME) focused on:-

- (i) Role of Small and Medium Industries (SMIs) in socio-economic development of developing countries,
- (ii) Pre-requisites for promotion and development of SMIs,
- (iii) Need for industrial and technological information services for development of SMIs, and
- (iv) Role of World Assembly of Small & Medium Enterprises (WASME) in development of SMIs (with particular reference to industrial and technological information).

10.1. Mr. A.F. Ito, Technonet Asia, in his paper, explained that realizing the significance of SMIs, many favourable attributes have been accorded the sector, such as:-

- o The Industrial Revolution was accomplished largely through small and medium industries.
- o The development of small and medium industries is a precondition to economic development.
- o Small business is big business.
- o Small and medium industries are the engine of economic growth.
- o Small is beautiful.

10.2. He concluded his paper saying that small and medium industries' development has to be approached on a country level; development, by definition, is a time consuming process; a unified approach of promoting SMIs is needed; significant benefits can be derived by developing countries in promoting

their respective SMIs by inter-country technology sharing and transfer; the micro approach (firm level assistance) and macro approach (creating and maintaining a favourable environment) must go hand in hand; and a strong organized private sector is an important partner in SMI development.

10.3. Mr. Liang Zhanping of ISTIC, in his paper, explained on functions of SMIs, their problems, countermeasures, etc. and concluded that the paper is only to enumerate some experimental facts in the course of development of township enterprises and analyze in length and sum up the self-evident phenomena with an aim to help people to have an understanding better and deeper than the existing level of township enterprises. No astonishing conclusion is made here. As a matter of fact, it is impossible to do so, because China is now in a transition of a rather broad scale and things in practice can accomplish their own renovation only in a candid situation with nothing covered up. Township enterprises mushroom at the time when China's reform of economic structure goes deeper, development of which is beyond our past experiences in rural construction. They can be perfected constantly only in practice.

10.4. Speaking on the Government policy on Industrial and Technological Information (ITI) in Korea, Dr. T.T. Lee outlined the diverse measures and policy instruments available in Korea specifically related to SMIs. He also explained major performances and recent proposal on new ITI system as well as ITI policy for SMIs in Korea. He suggested that first, the most effective way to generate market and technology, as a prerequisite to the market, lies in the creation of technology-

intensive model factory and subsequent demonstration of its successful operations. Second, let SMI entrepreneurs visit the model factory so that they can be given the opportunity of learning through the real world exposure. Third, local data bases and on-line information network be designed and built-up reflecting their benefits such as service capability which enables to overcome time and geographical barriers. A high initial investment costs and reluctance of users caused by unfamiliarity with the new system are usual problems. Ever-decreasing cost of computers will relieve the problems of cost, and the problem of resistance will be resolved as users become educated and recognize a favourable effect of the system. With reference to Korean experiences, SMIs are always heavily tied up with the day-to-day operations of their business, consequently they can hardly afford to pay attention to new resources. Therefore the Government has to take the lead by investing in those areas indicated above.

10.5. Prof. Zhou Zhiyou of ISTIC pointed out that:-

- (i) The SM enterprise is a comprehensive economic body which in itself calls for a diversified information needs.
- (ii) SM enterprises are in a position of fierce competition. To survive and develop, they have to strive to acquire in time up-to-date information through certain channels.
- (iii) The leaders at all levels in SM enterprises have come to understand the importance of information to the correct decision making. However, there needs a process for the transformation of their recognition into action. They need to be clear about how to do well the information work, therefore, the training

work for them should be strengthened.

- (iv) The technical personnel and information workers in SM enterprises are very small in number (the latter account for only 2.7%) and low in quality. They are accustomed to collect information by use of social intercourses (e.g. business trips, meetings and visitings etc.). This is far insufficient. The popularization and dissemination of the information knowledge (especially the knowledge on the search and use of documents) should be enhanced and the work should be carried out by the society and mass media.
- (v) The existing conventional pattern of scientific and technical information work has been far unsuitable to the information needs of SM enterprises which become increasingly diversified and comprehensive, hence, a new system reform should be carried out from top to bottom.
- (vi) Attention should be paid to giving the assistance in information materials, funds and facilities to SM enterprises to create the necessary working conditions for information works.

10.6. Madame A. David of World Federation of Engineering Organizations (WFEO), explained on analysis of information needs of SMI, characteristics of useful information for SMIs, method for identifying information needs, etc. She concluded that without information, SMI, as any industry cannot function and develop. But, SMIs, are totally dependent of a national information structure especially in developing countries. Such information means have to be designed for being adapted to: the

specific conditions determining the acquiring of information, by SMI, especially confidence for the information supplier - the specific characteristics of SMI in the country - the country context especially as regards its economy, the industrial development policy and the role of SMI in the industrial policy.

10.7. Mr. Zhao Gongda, Director of CIEIC explained main tasks of China International Economic Information Centre (CIEIC) as well as the Approval Procedure of Technology Transfer/Licensing Agreement in China.

10.8. Mr. Liu Shao Wen of China-TICS explained ISTIC activities related to SMIs as well as China - TICS. He also covered the following topics:-

- New trend of S&T information in China
- What ISTIC should do before the serious challenges?
- How to serve SMIs by ISTIC?

10.9. Mr. Wei Jia-Yu of ISTIS, explained briefly on the information needs of an information services to SMIs in Zhanghai area, including on-line bibliographical search as well as SDI services.

10.10. Dr. Leon V. Chico's paper was presented by Mr. A.F. Itao. The paper consists of

- Information needs by SMIs
- Information gap
- Regional information networking mechanism, etc.

He concluded that

- (1) by effectively deploying in proportion

of its own technological manpower for advisory work, a developing country can be technologically much more self-reliant than has hitherto been imagined. What is most needed is not fancy new systems, but an indigenous capacity to apply well-known and readily available technology to overcome actual problems as they are encountered on the floors of the factories that are there today.

- (ii) The transfer of technological information can be effectively achieved if properly processed - in TECHNOMET's case, by the industrial extension officer who acts as the link between the entrepreneur, who often is not capable of recognizing his problems and identifying his needs, and the sources of information, which can provide more relevant information when the request is more specific.
  
- (iii) Developing countries have much to share with each other in terms of technological information, processes and expertise for the benefit of SMIs. What is needed is the stimulus to spur this cooperation and interchange and even bring to the surface this capability - the role of which can be properly undertaken by international assistance agencies. Empirical evidence - as reported in cases that are being compiled - indicates that technical information obtained from countries with similar stages of development is far more useful and relevant than that imported from highly developed countries.
  
- (iv) Where applicable, incentives must be given for the use

of technologies with the greatest labour intensity. Industries with maximum employment potentials should be identified and promoted. Present incentives, in many developing countries, tend to encourage capital-intensive large scale industries (duty-free importation of equipment, tax holidays, and other fiscal incentives).

(v) "New" technologies should be developed in the third world that are as efficient on a small-scale and labour intensive as on a large scale and capital-intensive - and shared among developing countries. Such technologies are unlikely to be developed by industrial countries, which do not need them.

(vi) The so-called transfer of technology is not a one-way affair - from developed to developing countries. In some cases, as supported by actual experiences, developing countries have the capability to make this transfer a two-way affair.

10.11. Mr. Keo-Sang Lee of DACOM, Korea, explained on-line networking for information delivery to SMIs, based on the Korean experiences, covering such topics: traffic characteristics of on-line information delivery; telecommunication service in Korea for on-line information delivery; suggestion of on-line information network for SMIs, etc.

10.12. Mr. Kyong-Hee Yu of DACOM, Korea, explained SMIs linkage with external data bases, based on Korean experiences, covering such topics; use of external data bases; information sources for SMIs; change in on-line user habit; structure of data base

industry, etc.

- (i) He further suggested that to meet the SMI information requirements, it is suggested that the technical interpretation activities would be more helpful to SMI rather than the fast delivery service. On-line interactive information service is not always good method for SMI.
- (ii) It is my understanding that some 20 institutes in China already have experiences in using Dialog, Orbit and BRS. They are mostly Bibliographical and secondary data bases. In these data bases, Chemical Abstracts, INSPEC, NTIS, Patents, Compendex, Medlars, Biosis, PROMPT are quite popular not only in Korea but in Japan and elsewhere. So, it is not necessary to talk about the selection of data base. But it is recommended to follow up the newly produced data bases.
- (iii) What kind of information is really needed? Academics need easy access to scholarly information, businessmen need to be constantly aware of changes in the economic environment to compete effectively. Chief Executive Officers need daily, and sometimes hourly, updates to make sound business decisions.
- (iv) In closing, I would like to repeat the well-known guiding principle of the information service, the 4Rs: "The Right information to the Right user at the Right time and in the Right form".



10.12. Mr. R. Lafond of IDRC, outlined the issues to be considered in the establishment of National Information Services for SMIs. He concluded that the essential aspect is that the system should be custom designed to meet the particular needs of Chinese small and medium industry and should be user oriented to fulfill the needs. Since such an information system can take several years to develop, activities could be developed in a progressive manner and adjusted during the development phase if necessary according to the feedback obtained from users.

WORK PROGRAMME

Sunday, 5 April 1987

- Participants/resource persons arrival

Monday, 6 April 1987

08.00-09.00

- Registration

09.00-10.30

- Opening ceremony session

Welcome address

by Mr. Bao Jingzhang  
Deputy Director of ISTIC

Address

by Dr. H.W. Pack, Senior  
Officer  
UNIDO representative

Address

by Mr. A. Sissingh, SIDFA  
UNDP representative

Keynote address

by Mr. Wang Tingjiong  
Director of Dept. of S&T  
Information, State Science &  
Technology Commission, The  
People's Republic of China

10.30-10.45

- Coffee break

10.45-12.30

- Election of Chairman and Rapporteur

- Presentation of paper on "Role of SMI in the industrial and economic development of developing countries": an overview

by Mr. C. Agrawal, World  
Assembly of Small and Medium  
Enterprises (WASME)

by Mr. A.F. Itao of Technonet  
Asia

- Presentation of papers on theme I:  
"National industrial and  
technological information  
policy for SMI"

- . Chinese experiences  
by Mr. Liang Zhanping
- . Korean experiences  
by Dr. Yong-Teh Lee

- Discussion

13.30-17.00

- Presentation of papers on theme II:  
"Identification, assessment and  
evaluation of industrial and  
technological information needs of  
SMI" (including energy-efficient  
technology)

- . Chinese experiences  
by Mr. Zhou Zhiyou

- . World Federation of  
Engineering Organization (WFEO)  
Experiences by Madame A. David

- Discussion

Tuesday, 7 April 1987

09.00-17.00

- Presentation of papers on theme III:  
"Industrial and technological  
information delivery and services  
mechanism to SMI"

- .. Chinese experiences  
by Mr. Zhao Gongda

By Mr. Liu Shao Wen

- .. International experiences

- . Inquiry service and  
extension service  
by Dr. Leon V. Chico

- . On-line networking system  
by Mr. Keo-Sang Lee

- . Linkage with external  
databases  
by Mr. Kyong-Hee Yu

- . Information handling  
capability build up  
by Mr. R. Lafond

- Discussion

Wednesday, 8 April 1987

09.00-12.30

- Presentation of papers on theme IV:  
"Formulation of national industrial  
and technological information  
service system to SMI of China"

- . ISTIC proposal
- . UNIDO proposal
- . Participants proposal

14.30

- Discussion
- Formulation of proposals on specific action-oriented programmes in conjunction with the conclusions and recommendations

Thursday, 9 April 1987

- Study tour

Friday, 10 April 1987

09.00

- Consideration and adoption of conclusions and recommendations

14.30

- Illustration of INTIB Technology Supply Database
- Demonstration of computer on-line system

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LIST OF DOCUMENTS AND COUNTRY PAPERS

1. Aide-memoire
2. Role of Small & Medium Industries in Economic Development of Developing Countries - by C. Agrawal
3. Role of Small and Medium Industries in Industrial and Economic Development of Developing Countries - by A.F. Itao
4. The Prospect for Township Enterprises in China: Functions, Problems and Countermeasures - by L. Zhanping
5. National Industrial and Technological Information Policy for Small and Medium Industries of China Based upon Korea Experiences - by Y.T. Lee
6. The Information Needs of Small and Medium-sized Enterprises in China - by Zhou Zhiyou
7. Identification - Assessment and Evaluation of Industrial and Technological Information Needs of SMI - by A. David
8. How to Serve the Small and Medium Enterprises in China by Z. Gongda
9. How S&T Information Serves Medium and Small Enterprises - by Liu Shao Wen
10. A Brief Introduction to the Information Needs of and Information Services to Small and Medium Enterprises in Shanghai - by Wei Jia-Yu
11. Industrial and Technological Information Delivery and Services Mechanisms to Small and Medium Industries: The Technonet Asia Experience - by Dr. L.V. Chico
12. On - Line Networking for Industrial and Technological Information Delivery to Small and Medium Industry - by K.S. Lee
13. Industrial and Technological Information Delivery and Service Mechanism to Small and Medium Industry/ Linkage with External Data Bases Based upon Korean Experiences - by K.H. Yu
14. The Establishment of National Information Services for SMI - Some Issues to be considered - by R. Lafond
15. Chinese Proposals on the Formulation of Industrial and Technological Information Service System for Small and Medium Industries of China

DEFINITION OF SMI IN CHINA

1. Large, small and medium-sized enterprises

There are two criteria which divide the enterprises into large, small and medium-sized ones:

(1) Division according to the enterprise's annually production capability of products. For instance, as far as the integrated complex of iron and steel is concerned, the enterprises which produce annually over 1,000,000 tons of steel are large ones. While, those with over 100,000 tons and below 1,000,000 tons are medium-sized ones. And those with below 100,000 tons are small-sized ones. Another example is cotton textile mills. Those with over 100,000 textile spindles are large ones. While, those with over 50,000 textile spindles and below 100,000 textile spindles are medium sized ones. And those with below 50,000 textile spindles are small-sized ones. There are different dividing criteria defined respectively according to enterprises which produce different products.

(2) For some enterprises, we do not take the annual production capability as a dividing criteria, but take the original value of fixed assets as the criteria which divide the enterprises into the large, small and medium-sized ones. Taking the universal equipment factories in engineering industry as an example, those possessing the original value of fixed assets over 30 million yuan are large enterprises. While, those with over 8 million yuan and below 30 million yuan are medium-sized ones.

And those with below 8 million yuan are small-sized ones.

## 2. Township enterprises (or rural enterprises)

Township enterprises mainly refer to the following four types of enterprises.

The first one is collective enterprises, i.e., the industrial enterprises run by villages and towns, it was called brigade and commune enterprises in the past, it's ownership belongs to the whole people of the village or town. They are the backbones of the township enterprises. It's staffs, fixed assets and output value are 80 per cent of those totally in enterprises of the whole country.

The second one is joint household enterprises. This is a new organizational form of cooperative economy emerged in China rural areas in recent years. Taking various forms, these enterprises are voluntarily run by the peasants of several, dozens and even hundreds households. For instance, the enterprises are run through pooling capital or collecting money as shares. Those enterprises in partnership are run by labourers along with certain amount of money paid for shares. Those are run through evaluating the price in kind as money paid for shares. There is also technology "joint-venture" partnership, etc.

The third one is individual enterprises, i.e., the rural household enterprises. Generally speaking, these are run by households and allowed to hire a few of labourers, but its scale is small. According to statistics, there are now over 2 million household enterprises in the whole country. The differences

exist between present individual enterprise and private factory before liberation, because it contains some new aspects of socialist cooperative nature such as productive materials possessed, profit distributed and staffs' pay and conditions, etc.

The fourth one is joint enterprises. In recent years, after breaking through the limits of ownership and administrative divisions and under the principles of voluntary, equality and mutual-benefit, many joint enterprises are run in the form of combination between different ownerships such as collective versus collective, collective versus individual, and collective versus the whole people. Some enterprises are run in the form of domestic co-operation, some are run through introducing foreign capital or compensatory trade. This kind of joint enterprise breaks through the long-term closed condition of rural industry in the country. It is beneficial for the flow of talent people, technology, equipment and funds to the township enterprises.