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GUIDELINES FOR THE FORMULATION OF NATIONAL INDUSTRIAL AND TECHNOLOGICAL INFORMATION POLICIES - BASED ON INDIAN EXPERIENCE*

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GUIDELINE ON THE NATIONAL INDUSTRIAL INFORMATION POLICY BASED ON EXPERIENCE OF INDIA

Introduction:

Recognising that information should be accurate, adequate and timely for supporting decision making regarding the industrial and technological activities, the Government of India started computerisation of its industrial and technological information in the mid-70s. With a very modest attempt of computerisation of industrial licensing data at the Directorate General of Technical Development (DGTD) in the Ministry of Industry. though a token beginning of computerisation ensued, substantive informatics activities began only in 1980 when the National Informatics Centre (NIC) under the Electronics Commission, Government of India, started the computerisation of information systems of various Divisions of the Ministry of Industry. The status of informatics development as coordinated by NIC is given in Annexure-I with details of the databases concerning the Secretariat for Industrial Approvals (SIA), DGTD and the Development Commissioner for Small Scale Industries (DCSSI). As of 1985, though most of these databases have been developed or in advance stage of development, it should be admitted that there is no explicit policy for industrial and technological information. Recognising the need for formulating an explicit industry and technology information policy, the opportunity provided by this UNIDO sponsored study was taken as a means for developing the first outline for the evolution of such a policy guideline.

1. Information as a Resource:

In a developing country like India where a planned approach to the creation of industrial production capacity and utilisation of available technological resources, it is essential to have readily retrievable information on demand, licenced capacity, details of implementation of licences, demand-supply gap, economical scale of production, appropriateness of technological resources available, availability of capital goods and raw-materials, availability

of specialised manpower and training facilities, details of earlier collaborations approved and implemented, etc. Such information would help take optimal decisions in the meetings of the SIA, DGTD, DCSSI and the subject-wise administrative departments.

When a computerised information system as outlined in Annexure-I, is made fully operational an information service can be launched for the use of the Ministry as a whole, as a measure of indicative planning. Research laboratories also will benefit by such information as they can plan import substitution through indigenous development well in time to bridge the demand-supply gap.

In view of the catalytic role of information, in causing growth of the industry through more optimal decisions taken and its ability to bring about interaction between the users and the policy makers, it is essential to treat information as a commodity. This position accentuates further by computer-aided analysis of information and making avilable analysed or processed information to industrialists, technologists, designers and researchers.

2. **Utilisation of Information:**

Information that is not available adequately, accurately and timely, loses its value. To make available adequate information on industry and technology it is necessary to create comprehensive industrial information system for the country as a whole. As information is a costly commodity, it is essential to exercise discremination and strict control on what information that should be put into the database. In the absence of information, the tendency will always be towards adhocism in decision making or decision making based on the unquantified intuition of a few people. However, to collect, collate and store all information relevant to industry and technology would be prohibitively costly

solution. The best mid-course approach is to work out a hierarchy of information layers from themore massive but less important layer to less massive but more important layer. The former should be included more and more in statistical or summary form and the latter more and more in deterministic, quantitative, qualitative and descriptive form with as much detail as possible, i.e., the former will be at macro level and the latter at micro level.

The need for accurate information calls for a careful planning of the information collection procedures and practices. In the databases outlined in the Annexure, sophisticated validation programs have been prepared for a mechanised cleaning of data and information through numerous validation checks. It is proposed to build in feed-back checks and corrective methods to enable a continuous evolution of accuracy of the information system.

The timeliness of information has been built into the system through efficient computer-based retrieval techniques through a query facility. For this reason as well as to enable updation of the databases, the system is increasingly being developed around Database Management Software (DBMS). Through the combination of the above - adequacy, accuracy and timeliness - increased use of information quantitatively and qualitatively is being accomplished.

3. Problems of end-users:

In ideal terms, the end-users of a national industry and technology information system would be the following:

i) Government departments who have decision making responsibility in the area of industrial licensing and technological projects, e.g. SIA, DGTD, DCSSI and

other Departments/Divisions of the Ministry of Industry; Monopoly and Restrictive Trade Practices Commission (MRTPC), Department of Company Affairs, Department of Public Enterprises and administrative Ministries/ Departments like Department of Electronics, Department of Textiles, Department of Chemicals & Petro-chemicals, etc.

ii) Decision makers in organizations responsible for promotion of industrial and technological growth, e.g., National Industrial Development Corporation (NIDC), Indian Standards Institution (ISI), Industrial Extension Centres (IEC), District Industrial Centres (DIC), National laboratories and other R&D organizations.

iii) Industrial enterprises/companies in the public and private sector.

The problem faced by each category of users are as follows:

i) When information systems are situated within the Government, the third category of end-users find it very difficult to access information. It will be necessary to consciously plan for opening out the information system for querying by interested people outside the Government.

ii) Access to information sources also gets restricted due to commercial overtones if these are set up by commercial organizations. However, accesses are provided if appropriate price is paid and information is treated as a saleable commodity.

iii) Access also gets limited due to certain legal or statutory restrictions. For example, if a company imports capital goods or raw materials, it is unavoidable that the name of the company, explicitly or implicitly, has to be suppressed to avoid creating a situation of industrial espionage.

iv) Unless adequate networking facilities are provided with a planned compatibility of hardware and software in the network, the end-users may have to wait too long or they may have to undertake journeys just for collecting the information.

v) The end-users should not be given access to remote terminals from the computer having the data bank.

4. Barriers to the flow of industrial information:

Numerous barriers have been discovered while evolving the integrated industry information system. Some of the more important barriers are outlined below:

i) Reluctance on the part of particular divisions in the Government to allow flow of information to the public due to numerous reasons. It may be in the nature of beliefs, like "information is power" and "transparency of information is erosion of power". As this is an unhealthy practice, Government intervention is sought for breaking this barrier.

ii) Habituation to adhocism in decision making makes some Government officials to disregard the importance of information and the resulting lethargy to deal

with information acts as a barrier to the flow. This is being remedied by inculcating a computer-based work culture in the concerned Government departments thereby bringing a better awareness regarding information.

iii) Whatever information is kept in manual or semi-manual form and are not available on magnetic storage media, are very difficult to be retrieved whenever the need arises. If the data on information is massive, such manual or semi-manual retrieval would be either impossible or extremely time-consuming. This is sought to be remedied by specifying all the categories of information which have to be statutorily kept on magnetic storage media.

iv) Lack of availability of information in a computer communication mode with remote access facility makes it time consuming for an end-user to make use of the centralised database. This is sought to be remedied by hooking on the industry information system to a nation-wide network of computers being evolved, called NICNET.

v) Query system works well if the information is well organised. So far, one could not see the trees for the wood. This is sought to be remedied by the evolution of the distributed database for the industry and technology information.

vi) The DGTD quarterly returns which have to be submitted by all organized sector units, is either delayed or defaulted by the industry enterprises in the organized sector. This can be traced to either lethargy or to preventing certain information being brought to the notice of the Government for fear of adverse

repercussions. This is sought to be remedied by developing an automatic reminder system to keep track of the receipts of returns.

vii) Lack of standardised formats for information collection which is of appropriate detail. If the information collection proforma is too detailed, the chances of getting the returns are smaller. If it is too condensed, valuable information required by the Government and the industry may be lost. A compromise solution is being evolved to meet the best of both.

II. NECESSITY FOR NATIONAL INDUSTRIAL AND TECHNOLIGICAL INFORMATION POLICY

Whereas adhoc decision making concerning industrial growth can be minimised by an industry and technology information system, the adhocism in the design of the information systems itself can be minimised by consciously formulating a viable set of industrial information policies. The national level policy frame-work is required to prevent creation of non-standardised databases at different places and different states. It is for this reason that in the Indian Industrial Information System being developed jointly by the Ministry of Industry and the National Informatics Centre, standardisation of format/questionnaire, software and as far as possible hardware, are being taken up. In the absence of such a standardisation, retrieval of answers to queries in the distributed database would become very difficult. A well formulated policy will also minimise the investment in building information systems by making the effort put in for each sub-database proportional to its priority outlined by the policy.

1. Definition of National Policy:

The National Policy has to be defined in terms of the following major attributes:

i) Whether or not to put a given information on magnetic storage media.

ii) Whether or not a given information has to be put in the National Industrial Information Archive.

iii) The level of abstraction of the information for storage and retrieval.

iv) "Need to know" criteria

v) Level of confidentiality and level of protection required

vi) Whether some information has to be collected statutorily and if so in what form and at what levels, by whom.

vii) Cost of different types of information

viii) Statutory provisions for building information obligation in each project, programme and organization.

ix) Statutory provisions for fostering coordination between sectors, between organisations and between projects.

x) Statutory provisions for interfacing information policy with industrial policy.

xi) Statutory provisions for integrating information policy with technology policy.

xii) Identification of ownership of information and protection thereof.

xiii) Statutory provisions for archiving industry information.

xiv) Policies concerning access to external sources of industry information.

xv) Statutory obligations, concerning information, on decision making bodies.

xvi) Statutory features of the integrated industry information system.

2. **Policy Needs of end-users:**

Earlier we identified three major categories of end-users, viz., Government and decision making bodies, promotional bodies and enterprises. As far as government as an end-user is concerned, their necessity for such a policy frame work arises from the following considerations.

i) The Government is able to obtain from the industry, promotional agencies and others information adequately, accurately and timely.

ii) Inter-departmental exchange of information is facilitated for mutually supporting the decision making which depend upon correlatory databases.

iii) Obtain feed back information and process for evaluating industrial and technological polcies during the course of implementation so that if there is something wrong with the policies they can effect mid-course correction of the policies.

iv) The Government can minimise economic offence by industries and enterprises who flout industrial and technological policies.

A need for such a policy frame-work for promotional measures arises from the following consideration:

i) Receive information on the demand-supply gap and determine the type of promotional activities that have to be designed and implemented to fill the gap.

ii) To forecast the industrial and technological needs in the years ahead and work out a perspective plan for the industry.

iii) Receive and analyse information in the interface between industry and technology and correlate them for deciding the best technology for an industrial activity.

At the enterprise level, the policy frame-work supports the following requirements:

i) Information on Government's industrial and technological policies with a view to decide the plans of the company or enterprise over the short, medium and long terms.

ii) Obtain information on the promotional activities under way so that the industry or enterprise can plan proper and beneficial utilisation of the efforts of the promotional agencies.

iii) Utilise the information to create production capacities for bridging the demand-supply gap.

iv) To receive information and analyse the competitive position in the industrial activities with reference to the status of implementation of licences and collaborations.

v) To contribute to the integrated information system so that the Government and promotional agencies are in a better position to take decisions beneficially to the growth of the industrial sectors.

3. **Economic Impact of a Policy:**

The policy frame work can be so designed as to have maximum impact on national economic development. The following are typical beneficial consequences:

i) Enabling the Government to take optimal decisions on the parameters and imparatives of the growth of an industry through adequate, accurate and timely information.

ii) Through timely feed-back information on the impact of policies implemented, correct the policies in desired directions.

iii) Through timely feed-back information on economic offenders, an ethical frame work for the growth of the industry can be evolved.

iv) An upto-date data bank on information concerning raw-materials required, capital goods required, power required, water requirement, land requirement etc., and a region-wise perspective planning can be developed for an industrial estate or export processing zone or other groups of industrial activities.

v) Through information concerning purchase of technology and knowhow requirements, indigenous R&D efforts can be made more purposeful and oriented towards industrial growth.

vi) Perspective information enables the planning for meeting specialist manpower requirements of the growing industry.

4. Neccessity of Laws and Regulations:

As described above, there is need for statutory obligations and statutory provisions for collecting, collating and processing of industrial information. Otherwise, people may not send information on a regular basis.

Already DGTD has a Parliament approved mandate for statutory collection of information on a quarterly basis from the organised sector. But these provisions are grossly inadequate to bring in not only an information discipline but also a culture of analysis of information for assisting decision making.

The law and regulations governing information policy for industry with regard to confidentiality and proprietory of information submitted through the returns is essential as the flow of information from one company to another may upset the competitive equilibrium between companies.

5. Existing Industrial Information Policy Frame-work:

So far, India has not formulated an explicit policy frame work for industrial and technological information except through the Industrial Policy Resolutions. For example, the following is a typical statement from the Technology Policy Statement (TPS):

> "5.5 Technological information - the availability of an efficient system of collection and analysis of relevant technological information including cost and other economic aspects, is a pre-requisite for the appropriate choice of the technologies. This will considerably enhance the possibility of obtaining favourable terms and conditions in acquisition of

of technology. Such a technology information base will be established."

Implicitly a policy frame-work is evolving in view of the fact that Government information on industrial systems are being evolved and set up by the National Informatics Centre. The following are some of the more important implicit policies:

i) Industrial information system will be organised in the form of a distributed database integrated through a multi-node computer - communication network with widely spread dissemination points through a large number of interactive terminals being set up around the country under NICNET.

ii) A large number of input formats have been designed with specific reference to computerisation requirements and standardised for compliance by all users.

iii) Multi-level consolidation of information from the micro level to the macro level has been evolved giving an implicit policy frame work for the extent of details required at various levels of hierarchy.

iv) A mechanism is being evolved for the costing of information at various levels.

III. FORMULATION AND IMPLEMENTATION OF NATIONAL INDUSTRIAL AND TECHNOLOGICAL INFORMATION POLICY

With specific reference to the Indian experience, various observations on the formulation and implementation of the national policy are outlined below:

1. Formulation of the Policy:

In India, the formulation of the industrial and technological information policy is being carried out on a multi organisation interactive basis. The background preparation includes the bringing out of systems analysis reports and feasibility reports on a wide variety of topics concerning industrial and technological information policy. Between the National Informatics Centre and the Ministry of Industry and associated organisations so far, about 6 such reports are available. Supplementing these efforts, are the brain-storming sessions conducted by the various Development Councils under the Ministry of Industry who analyse various problems concerning information requirements and make recommendations to the Ministry.

The role of the Ministry of Industry is one of priority setting, decisions on statutory obligations as well as decisions on standardisation of formats.

The role of National Informatics Centre is one of formulating policies on the hardware, software and network development for processing industry information. NIC also maintains industrial information archives and as such has a role in policy formulation concerning the same.

Any policy frame work prepared by the Ministry of Industry with or without the assistance of the National InformaticsCentre, goes to the Cabinet Secretariat for apprisal, put to the Cabinet for approval and if necessary, especially where statutory provisions are required, is put before the Parliament for approval.

2. **Implementation of the Policy:**

The responsibility for the overall strategy of implementation is with the Ministry of Industry. It also has the responsibility for taking decisions on dissemination. The role of NIC in the implementation of the policy is in the setting up of appropriate computer-based infrastructure like hardware, software, network development, installation and operation. NIC does not have any rights over the information processed by it and its network and hence no direct dissemination responsibility.

There are a number of private organisations who give data services concerning the industry like Tata Services Limited and the Centre for Monitoring Indian Economy who commercially service information requests on industry information.

3. **Inter-linkages between Industry, Technology and Information Policies:**

The Industry information Policy which is being evolved dove-tails with the industry policy mainly in the following manner: Maximum correlation is worked out with the allocation of business rules of the Ministry of Industry and the Industrial Policy Resolution.

The linkages between information policy and technology policy is carried out for .naximum conformity with the technology policy statement 1983.

The linkage between information policy and economic development policy is worked out in maximum conformity with the economic policy statement for the five year plan given by the Planning Commission.

4. Resource availability:

The National Informatics Centre is presently carrying out an inventory of primary information resources for industrial information. This report is expected to be completed by the end of 1986.

During the course of the evolution of the industry information system, it was felt necessary to have statutory provisions for the pooling of major information resources and towards this end, bring about enabling laws and regulations. This proposal is in the initial stages of consideration.

One of the first exercises taken up by the National Informatics Centre is the setting up of standardised formats for the collection of industry information with specific needs of computerisation in simplicity of operation in its purview. The major sources of information will be connected as a node of NICNET as soon as NICNET spreads to the all India level.

5. Assessment of Information Demand:

The need for an integrated systems analysis of the demand profile in the country has been keenly felt. Basically, such a demand analysis falls in four categories.

"Historical demand" that have arisen in the past can be analysed to understand the trend of queries that have been addressed to the Ministry of Industry, National Informatics Centre and

administrative ministries of various industrial subjects. Such an analysis would give how "projected demand" can be assessed through judicious extrapolation over the next five to ten years. From the analysis of projects for the five year plan, company plans and R&D plans, we realise "analysed demand". In the assess of information demand, what is going to be very significant in the coming year is the "promoted demand". The availability of remote terminals of NICNET and the online query servicing from all the major cities in the country would in itself increase the demand on such an information system. Demand can be further promoted by subsdisation of costs of online query sevice for the first two or three years until the demand builds up to substantial levels.

6. Assessment of Priority needs:

For the integrated information system through NICNET, highest priority is accorded to information support for government decision making with adequate, accurate and timely information. Next in priority is the information dissemination to industry from Government resources in the form of indicative planning. The archival information system comes next. However, the industries can have their own priorities. Individually they may collect and process their own information and create their own databases. Collectively, they may work through Industries Associations like the Association of Indian Engineering Industries (AIEI). AIEI has a number of committees dealing partially with the industry information. They also bring out periodic reports of relevance to the subject. There are also several commercial information houses like Tata Services Limited, Centre for Monitoring Indian Economy, etc. who take decisions on priority of their own and make available relevant information to the industries and the Governmen t.

7. Information Services Delivery System:

The software library of NIC and its tape archive of industry information is the only major referal service available at present. The query service is being evolved through NICNET query system and NIC databases. Ministry of Industry also disseminate information when queries are addressed to them. There are several extension services in the form of secondary source of information which are available to users on commercial terms.

Current awareness service and information retrieval service is available for bibliographic information through the National Information System for Science & Technology (NISSAT) of the Department of Scientific and Industrial Research. NIC is also running a Patent Informatic.: System with computerised retrieval on the basis of key words. A brief description of the Patent Information System which is a good example of a technology information system is given in Annexure-II.

Industrial Information Intelligence Services are yet to commence in India and there is no significant programmes in this direction at present.

8. Presentation to end-users:

At present most of the presentations to end-users are of passive type and not of a promotional nature. DGTD and Ministry of Industry bring out a number of information documents through DGTD/Department of Industrial Development and Government of India Press. Information is presented to the end users through query systems operated through NICNET apart from conferences, seminars and workshops on the topic.

An important channel of presentation is through the Development Councils under the Ministry of Industry.

9. **Safety and Secrecy of Informtion:**

At present, the various sub-databases of the Industry information system are operating with pass-word keys and locks. Attempts are being made for encrypting information transferred through data communication channels. Electronics Commission set up a Panel of specialists to examine the safety and security of information. The guidelines brought out by the Panel have been published as a report.

10. **Information support to technology acquisition:**

A Sub-database created by NIC for the Ministry of Industry concerns foreign collaboration. This information will assist those industries who are negotiating for technology acquisition. The Department of Scientific and Industrial Research has initiated a programme for the analysis of collaborations in the industrial sector. A technology information exchange system on the pattern of TIES of UNIDO Technology Programme is being planned for the information exchange within the country. This would strengthen the efforts towards the country linking up with the international TIES Programme of UNIDO.

IV. NATIONAL INDUSTRIAL AND TECHNOLOGICAL

INFORMATION NETWORK SYSTEM

The industry information system is superposed on NICNET which is presently confined to Delhi as an intra-city network of 20 computers connected to a Cyber 170/730 host computer. The Udyog Bhavan which houses the Ministry of Industry including SIA, DGTD, Department of Steel, Department of Public Enterprises, etc., a Local Area Network (LAN) is being set up by NIC connecting all the concerned Divisions. This LAN will be connected to the Wide Area Network (WAN) of NICNET. By the end of 1986, NICNET would have four super computers installed in Delhi (already installed), Pune, Bhubaneswar and Hyderabad. These super computers will be connected to 27 State capital midi/mini computers and also to 100 micro computers at the district levels. All these systems will be connected through INSAT-1B and INSAT-1C domestic satellites using micro earth stations and a mother earth station (at Delhi) working on the principle of Spread Spectrum Technology. This will enable queries to be sent to the centralised data banks from any district headquarters considerably assisting district industry centres. It should be mentioned that NICNET is an omnibus information system for a wide variety of subjects like Agriculture, Water, Finance, Energy, Manpower, etc., super-posed in addition to the industry information system. In this sense, it would be a shared network.

V. TRAINING OF INDUSTRIAL INFORMATION SPECIALISTS

Training of industrial information specialists for the central and State Departments of Industry are being carried out by NIC and also CMC Limited at various levels - appreciation courses for personnel at the Management level, courses on query servicing on NICNET to decision makers and on software design to functional level personnel. In general, coordination of training programme at national level is being carried out by NIC.

VI. INTERNATIONAL LINKAGE AND COOPERATION

An external gate-way of NICNET connecting TRANSPACK of France is under design with TRANSPACK acting as a buffer network gate-way to a number of international computer communication networks. This will give access to a number of United Nations Information Systems. There are plans of using external databases like UNINDUST of the Statistical Office, Department of International Economic and Social Affairs, United Nations, New York and INDUS (Industrial Information System) of Vienna International Centre, UNIDO, Vienna, Austria. Of particular interest is INDIS-IDA along with services like SDI, Search on requests, Microfilming and photo-offset of documents.

ANNEXURE-I

INDUSTRIAL INFORMATION SYSTEM DEVELOPMENT AT GOVERNMENT LEVEL

The status with respect to development of information system are outlined below. Details in this regard are incorporated in system descriptions given subsequently.

1. Industrial Licences/Letters of Intent:

Monthly reports on approvals issued under these categories is being entered into the system and reports generated to indicate break-up in terms of States, backward areas, non-industry district etc. Data on approvals of the last five years is being stored on the machine. The basic application form has been totally redesigned to facilitate direct entry of information into the system. Also being planned is a system to monitor the position of various applications under process.

2. Foreign Collaboration Approvals:

Quarterly reports on approvals is being generated after storing the information of details of the approvals. Reports involving country-wise, investment-wise break-ups and other parameters are being generated. Information pertaining to an earlier period will be stored after codification which currently under way. The application form has been designed to be as simple as in consonance with the requirements of the Department and formatted for direct data entry.

3. Monthly Industrial Productions

This is a large and complex project involving as it does monitoring performance of 184 industries under DGTD. Currently, intensive work is under way to streamline collection of data from the field. The Master file of the induistries on all the 184 industries

has been brought fully updated to indicate installed capacities in different segments. Monthly reports incorporating data collected by the Statistical Cell is being generated. Other related data like address file etc., is being updated to facilitate scheme for automatic generation of reminders.

4. **Performance of Public Sector Units:**

Monitoring performance of Public Sector Units under the Department of Industrial Development through reports on monthly production, inventories, sales and other performance criteria had been taken up, following a model earlier developed by the Department. Currently, monthly reports are being generated indicating production in a given month and cumulative production in the given year.

5. **Association with international Data Banks:**

Efforts are under way to obtain information either directly or through periodic updates from international systems like TIPS, TIES and other schemes sponsored by UNIDO and other international agencies. Such a link up will provide valuable information on status of technology, terms of foreign collaboration entered into by other developing countries etc.

6. **Wholesale Price Index:**

The system for weekly reporting on wholesale price index of the office of the Economic Adviser has been computerised. This system currently under testing with sample data will be put into operation shortly.

7. **Training Programmes:**

In order to familiarise officers and staff of the Department with projects being undertaken, and enlist their cooperation, familiarisation courses as well as specialised courses have been

held ona continuous basis for the last five months. It is felt that the courses have mainly served the purpose of familiarisation. Greater interest and involvement of personnel of the concerned departments would be necessary for quick and complete implementation of the projects being undertaken.

DATA BANK AND SUPPORTING SUB-SYSTEMS

Since the range of activities of the Department is extensive, several systems could be developed to assist their functioning. A suggested list is given below.

A. **Principal Systems:**

i) Systems for SIA (licensing, FC and CG database together with operational systems for monitoring issues).

ii) Public sector performance monitoring system.

iii) Industrial Production Database with monthly industrial production reports (DGTD).

iv) Specific systems to assist units of DGTD and Department of Industrial Development in management of products for which they have been assigned responsibility. Since the nature of such activities could be quite different, specific systems have to be tailor-made to cater to the requirements of the concerned units. Systems for two such units - paper and cedment are outlined subsequently.

v) Database of international information of interest to the department together with systems for international information exchange likes TIES, TIPS, etc.

vi) Systems for Office of Economic Adviser, in particular, an operational system for generation of weekly wholesale price index data.

B. **Supporting Systems:**

In order to assist decision making in the concerned departments, several other information modules incorporating information from sources which lie outside the Departments could also be developed. Some such modules could be -

i) Energy Information Module incorporating information on production and availability of electricity, coal, oil and gas and other sources;

ii) Trade information module incorporation (a) import export information; (b) price and availability internationally of various capital goods, raw materials, et. of interest.

iii) Legal information module incorporating texts of statutes, laws etc., relevant to industrial policy and its implementation. Supporting information like lists of MRTP companies, items reserved for different sectors, etc. could be incorporated.

C. **Office Management and Accounting Systems:**

In order to fully utilize computers in the functioning of the Department, several operational systems could be developed as below:

i) File monitoring system, in particular VIP references and other important files for M(I), MS(I) and Secretaries of the Departments.

ii) Accounting systems for pay roll, provident fund, loans and advances, etc.

INFORMATION SYSTEM FOR INDUSTRIAL PRODUCTION

DATABASE

A computerised information system to provide information on production of a large number of industries was set up by DGTD, following a system analysis and development project undertaken by IIM, Calcutta, quite sometime back. The report submitted by IIM may be referred to for details concerning the system. At the present time, the system seems to have become totally ineffective, due to the following reasons:

1. The coverage is very small. In practice, around 30%of the units only supply information in the prescribed format. Around 30% supply information but not in the correct format. Around 40% of the units do not supply the information on production at all.

2. The processing of information is too slow. The existing system of pre-scrutiny, card punching, taping, data validation, generation of defaulter's list, followed by a second stage of collection of forms which would have been received by other concerned units of DGTD followed by a second stage of validation etc. is too time consuming.

As a result of the above two factors, reports are produced with insufficient data with a delay of around six months, rendering the system to all practical purposes useless. After extensive discussions with the senior officers of DGTD and DG himself, several measures were undertaken in order to reorganise, strengthen and improve the Information system. These steps are summarised

below and possible course of action in the near future is indicated.

i) A computer input output room has been separately ear-marked for storing of all the documents. This was done as a large volume of documents has to be properly organised and stored so as to be available for scrutiny, validation etc. In order to fully utilise the input output room, approximately 200 pigeon-holes have to be provided in the room so that forms relating to specific industries could be stored, at specific slots to facilitate repeated retrieval.

ii) A system for automatically generating reminder letters to defaulting units is being implemented. The system will at a given time, say six weeks after the due date, generate letters to remind the defaulting units about the delay in submitting the returns. The programmes to perform this function have been developed, the system however, has so far not been put into operation, as the master file was recently being updated. Corresponding file of addresses is presently in process of updation. After these activities are complete, the automatic reminders system could be made operative.

On examination of the types of errors being committed by the industrial units, it is seen that certain amount of manual correction is needed in the system. Around 200 units submit forms in the correct format, but with mistakes in the forms which necessitate manual checking in the pre-scrutiny stage. It is suggested that these units may be informed of the mistake made by them in filling forms so that mistakes may not continue indifently. Once this is done, the load of pre-scrutiny will reduce considerably.

iii) In order to increase the extent of coverage the information collected in the prescribed format has to be supplemented by collecting information sent through form B, through telex or other modes. For this purpose, it is suggested that concerned unit/Directorate of DGTD may supply minimal information at a fixed time every month in a simple coded form. This would supplement the information collected in the computerised system through form A and would enable production of preliminary report with a coverage of 70 to 80%.

iv) Over a long period, effective functioning of the system could be kept up only through full involvement of the Directorates of DGTD concerned with specific products. For this purpose, one senior officer of each directorate should be identified and be made responsible for interaction with the computerised information system. Similarly, the staff of the Data collection unit may be associated with specific product directorates so that they could establish closer rapport with the concerned directorate.

INFORMATION SYSTEM FOR

SECRETARIAT FOR INDUSTRIAL APPROVALS

The Secretariat for Industrial Approvals (SIA) is primarily concerned with the processing of applications for

i) Industrial licences;
ii) Foreign collaboration; and
iii) Import of capital goods.

Information systems for all the three operations above could be drawn up along similar lines.

Five basic systems could be developed to assist SIA in its functioning. These could be:

1. A system to monitor status of pending applications
2. A system to store and retrieve information of approvals issued currently or in the recent past.
3. A system for monitoring progress of implementation of letters of intent.
4. Interface with industrial production information system and other systems needed to support information requirements for the various approval committees.
5. Exchange of information internationally with systems like TIES (Technology Information Exchange System of UNIDO) and other international systems.

Of these (2) and (4) would constitute the base of SIA for answering Parliament queries and supplying supporting information for decision making. (1) and (3) would be operational systems to assist SIA in its functioning.

Currently, all the basic forms of SIA have been redesigned to assist computerisation. Important data contained in each application form can be entered into the computer. For this purpose, as and when an application is registered in the SIA, a copy of the same should be sent to the ComputerCell. However, to ensure that correct information only is entered, it would be necessary to device a mechanism for verification of various items of information supplied by the applicants in the application forms. Since this examination would involve checking of various technical parameters and details like item-wise capacities, raw material requirements both indigenous and imported, investment involved, additional employment likely to be created, foreign exchange inflow and

outflow etc., this job may have to be entrusted to a technically competent authority. The information entered into the computer would have to be kept updated at each subsequent stage as detailed subsequently. The basic sources of information for the systems as below:

1. Application form filed by parties applying for IL/LI, FC, CG, etc., these forms have been currently redesigned to be suitable for direct data entry (without coding). All information in the application need not be entered into the system as the authenticity of the information has to be verified. The fields for data entry from the form at each stage need be only those needed to monitor status of the processing of applications together with authenticated information upto that stage.

2. The summary card (sheet):

   The summary card has been designed to incorporate details to be entered into the system. A summary will be associated with each file and will incorporate valid and authenticated information only. The summary card has been designed to incorporate historical information also, i.e., when details with respect to any item get modified at different stages, this will be reflected by entries in the summary card of the corresponding file.

3. Approval letters: The approval letter will contain all the items of information for which approval has been granted.

Different items of information will have to be entered at various stages of processing an application. These are set out in detail below:

System to monitor status of pending applications:

Operational work in SIA would be greatly assisted by monitoring system for pending applications. Following would constitute the main items of information to be maintained. Items in (a) would go into the Approvals/Application integrated database. Items in (b) would be specifically necessary to monitor pendency of applications.

(a) Application Stage:

1. Name and address of the applicant/applicant company;

2. Whether private company, state public sector undertaking or a cooperative. If private sector undertaking whether MRTP Co. and if so, the name of the industrial house to which company belongs;

3. If public sector undertaking, whether the project would be implemented in the joint sector and if so, names and status of the joint sector partners;

4. Location : State,District, Teh./Town.

5. Whether the location falls in Category 'A', 'B' or 'C' backward districts/area. If in category 'A', whether it is in the 'No Industry District';

6. Names of items of manufacture alongwith proposed capacities;

7. Whether any of the items are reserved for small scale sector. If so, the names of such items;

8. Whether proposed items of manufacture are governed by any special regulation. If so, the name of the regulatory schedule under which the items are covered;

9. Whether the items are included in Appendix-I;

10. Proposed investment in fixed assets;

11. Extent of loan proposed to be raised from the financial institutions;

12. Additional employment likely to be generated;

13. Year from which the commercial production is likely to be started alongwith phasing of manufacturing programme;

14. Whether capital goods are proposed to be imported. If so, value thereof;

15. Whether foreign collaborfation is proposed. If so, whether technical only, financial or both technical and financial;

16. Whether CG and FC application is/are yet to be submitted alongwith IL application.

B. Monitoring pendency of applications:

1. Re:gistration number and date;

2. Name of the concerned Approval Committee;

3. Name and address of the Administrative Ministry/Section to whom the application is forwarded;

4. Date on which application was forwarded to the administrative Ministry/Section.

5. Date on which comments were received from the Administrative ministry/section.

6. Name of the Technical Authority;

7. Date on which the proposal is considered by the Approval Committee;

8. Whether recommended for approval, rejection, or deferred;

9. If deferred, reason for deferment (to be given in coded form) main grounds on which consideration of proposals is deferred can be broadly coded) and the period for which deferred.

10. If recommended for approval, whether the approval is subject to MRTP or CCEA clearance.

11. If subject to CCEA approval, date on which the case is referred toCCEA.

12. Date on which the case is received back from CCEA.

13. Number and date of issue of disposal letter.

Approvals Data Base:

Following approval, the following information will be entered into the system (from the approval letter - file summary):-

1. Whether letter of intent, industrial licence or amendment in industrial licence/letter of intent issued;

2. Whether the capacity approved is the same as applied for;

3. If same, whether various items of information as given in the application, such as status of the company, sector in which the Project is to be implemented, investment involved, additional employment to be generated, whether the items reserved for small scale sector, whether the items reserved for small scale sector, whether governed by special Regulation and/or

included in Appeendix-I, would remain the same or not.

Information already fed into the computer is required to be corrected for variations, if any;

4. In case the capacity approved is different from the capacity applied for information already fed into the computer on the basis of information given in the application form is required to be corrected especially in respect of investment and employment estimates;

5. Whether the project approved is to be implemented at the same location as given in the application. If approved for a different location, details regarding the changed location are required to be fed into the computer.

6. In case of rejection, the grounds on which the proposal is rejected (in coded form) are required to be fed into the computer;

7. Export obligation or any other special condition included in LI/IL;

<u>System for Monitoring of Progress of Implementation of Letter of Intent:</u>

1. Date on which the initial validity of the letter of intent would expire;

2. Whether the letter of intent is converted into IL within the initial validity period of letter of intent. If not, number of times and the period for which the validity of the letter of intent is extended, suitable mechanism will have to ble involved whereby regular feedback information regarding the progress of implementation of the letter of intent from the administrative ministry is entered;

3. Whether the terms and conditions of the letter of intent been changed after the issue of the letter of intent in question and before its conversion into industrial licence. If so, the changes involved are required to be fed into the computer;

4. In case the letter of intent is treated as lapsed/cancelled, the number and date of the communication sent to the party in this regard;

5. Number and date of the conversion licence issued to the party with the following details:

(a) Whether licence granted in the name of the same company to which the letter of intent was granted;

(b) Status of the Company;

(c) Name of the sector in which the project would be implemented and the names of the implementing parties.

(d) Items of manufacture and capacity

(e) Location;

(f) Investment and employment estimates.

INFORMATION SYSTEM FOR DEVELOPMENT COMMISSIONER FOR SMALL SCALE INDUSTRIES

SAMPLE CUM SURVEY PROJECT:

OBJECTIVE:

A census of small scale units was undertaken for studying the distribution pattern of Production, Employment, Investment in Plant & Machinery and other such related items. The study was further aimed at the contribution of small scale sector to the national income. The census covered all the small scale units registered with the state directorates till 30.11.79 and all the necessary information was collected. In order to update the data collected during the census (73-74) and to provide reliable estimates of the growth of small scale sector on a continuing basis, a sample survey of small scale industrial units was undertaken.

SAMPLE SURVEY

The survey will cover all the small scale units registered with the state directorates as 31.3.81. The total number of units which are covered for the analysis purpose is about 520,000.
In order to ensure complete coverage of all the units, 3 types of lists of all small scale units have been prepared as under:

a) those which were covered in the earlier census
b) those which were not covered and registered later on upto 31.3.81
c) those which were registered as non-SIDO units.

SAMPLING DESIGN

It was proposed to adopt random sampling for the survey to pick sample units from the updated three lists of data. The basic strata was the district itself and all the units in each district were classified on the basis of 2 digit NIC classification. The

units in particular 2 digit industry group were further sub-stratified into four employment slabs namely 1-5, 6-9, 10-19 and 20 and above. The size of the total number of samples to be drawn from each stratum was fixed at 20% to the population size subject to the condition that atleast one unit from each industry group and from each employment slab in a district was selected. The same units were drawn by ensuring random number generation technique.

The approximate size of the total number of samples selected for all States was about 100,000.

The units selected by using the above procedure were tabulated according to product codes and 4 digit NIC codes to see whether all the 'reserved' product codes and mass consumption items were included in the sample list. Subsequently additional samples were drawn wherever the adequacy of the drawn samples were not met. These additional sample units were drawn both at 4 digit NIC and 9 digit product code level. These sample units were tabulated separately for obtaining estimates of production of these products.

All the states have been provided with the preliminary sampling units list, supplementary sampling units list both at 4 digit and 9 digit and the subsequent step of field survey has been initiated. A 'schedule' was designed by NIC to collect the wide information covering many items. The schedule consists of 20 logical records of around 1600 characters.

ANALYSIS:

Many tables on sample survey of small scale industrial units were generated for each state and all India-wise as well. These tables which covered various important items like employment, Investment and number of units helped the DC(SSI) personnel

in having a broad idea at the distribution pattern, locating clustering and "dense" areas. These tables also helped the users to centralise the information and finding out ways for fair allocation of resources. The tables are as follows:

1. Distribution of small scale units and their employment, investment and capacity by 2-digit industry groups.

2. Distribution of units by years of commencement of production.

3. Product-wise classification of small scale units

4. District-wise distribution of small scale units.

ANNEXURE - II

PATENT INFORMATION

Patent documents play an important role in the worldwide transfer of technology. It is in these documents, the actual tecchnological information, the key to future innovations, is found. The technological, industrial and economic development of a country is gauged by the number of patent documents it publishes. Approximately 8,00,000 patent documents are published every year in about 50 countries. A faster and efficient retrieval of such a huge number of patent documents is possible only with the aid of a computer. The International Patent Documentation Centre (INPADOC) which was founded in 1972 with its headquarters at Vienna has built up a data base containing 10 million documents collected from 50 national and regional patent offices. In view of the important role played by patent documents, Government of India has entrusted the job of developing a computerised patent information system in India to National Informatics Centre, Electronics Commission, New Delhi.

The Organisation

National Informatics Centre was set up by the Government of India to function as a catalyst for the improvisation of Governmental productivity through appropriate applications of computers, data base methods, decision optimisation techniques and other informatics methodologies. For this purpose, NIC has developed a computer network based on CDC Cyber 170/730 system. In addition to this hardware, NIC has also created a technical manpower pool to design and develop the necessary hardware and software tools.

Patent Information System (PIS)

The PIS developed by NIC for the on-line retrieval of patent documents employs a novel approach of multi key index directory files which facilitates faster and efficient retrieval of documents. This system is based on documents recorded on magnetic tapes by INPADOC. Several information services provided by INPADOC like Patent Classification Service, Patent Inventor Service and Patent Applicant Service are also available in computer aided retrieval mode from NIC.

The following bibliographic information can be retrieved from patent documents either interactively or in batch mode:

Title of the Document
Country of Publication
Date of Publication
Patent Number
Name of Applicant
Name of Inventor
International Patent Classification (IPC) code

Patents Dissemination service

NIC has a huge repository of foreign patent specifications on micfro-films and micro-fiche. Plain paper copies of patent specifications can be provided at a cost of Rs. 5 per page for R&D and educational institutions and Rs. 8 for others. Patent specifications from the following countries are available:

France (1974 onwards)
Canada (1974 onwards)
United Kingdom (1974 onwards)
United States (1967 onwards)
West Germany (1974 onwards)

Typical Input and Output for
Query Based Computerised Patent Information System

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**********************************************************************
          Welcome to NIC's Patent Information System
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                    TODAY'S DATE :
                    CLOCK TIME :
----------------------------------------------------------------------
This system provides detailed bibliographic information on patent
documents collected by the International Patent Documentation
Centre, Vienna, Austria.
----------------------------------------------------------------------
This query is based on the International Patent Classification
(IPC) code which subdivides technology into more than 54,000
fields consisting of 8 sections, 20 sub-sections, 115 classes and
617 sub-classes.  Each of the 8 sections has a title and symbol.
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Do you know IPC Code? (Y/N)
? n
Do you know subject code of your choice? (Y/N)
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Please select the subject of your interest from the following and
note down codes.
----------------------------------------------------------------------
Code    Subject Title
----------------------------------------------------------------------
A       HUMAN NECESSITIES
B       PERFORMING OPERATIONS AND TRANSPORTATION
C       CHEMISTRY AND METALLURGY
D       TEXTILES AND PAPER
E       FIXED CONSTRUCTIONS
F       MECHANICAL ENGINEERING, LIGHTING, HEATING,
        WEAPONS AND BLASTING
G       PHYSICS
H       ELECTRICITY
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Please give subject code of your choice

? C

CO1 Inorganic Chemistry
CO2 Treatment of Water, Waster Water, Sweage
CO3 Glass, Mineral and Slag Wool
CO4 Cements, Ceramics, Sound Insulating materials
CO5 Manufacture of Fertilizers
CO6 Explosives
CO7 Organic Chemistry

Do you need more information about this section? (Y/N)
? N
Do you need further sub-classification for above details? (Y/N)
? Y
Please enter code selected from this list
? CO7

CO7 Organic Chemistry
CO7B General methods and apparatus for organic chemistry
CO7C Acyclic and carbocyclic compounds
CO7D Heterocyclic compounds

Do you need more information about this group? (Y/N)
? N
Pleasxe indicate IPC of your choice.
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Is it OK? (Y/N)
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Country Code	Country Name	No. of Patent Documents
AT	Austria	21
CA	Canada	36
FR	France	71
IN	India	16
UK	United Kingdom	39

Please type 'A' for all countries or specify desired countries.
Note: Country codes should be given and separated by commas.

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Give 1 for title and Patent Number,

Give 2 for title, Patent Number, Applicant and IPC

Give 3 for title, Patent Number, Applicant, IPC, Inventor and Equivalent Patents.

? 3 Please give Applicant's Name?
(Ex: Miller AK)

? Hoechst AG

Please give Inventor's Name?
(EX: Miller AK)

? Schneider M