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United Nations Industrial Development Organization

Expert Group Meeting on the Industry Files
System and other Data Bank Techniques for
Industrial Programming

Vienna, Austria, 16 - 20 November 1970

DATA BANK FOR INDUSTRIAL PLANNING:

Report on the Expert Group Meeting on
the Industry Files System and other
Data Bank Techniques for Industrial Programming 1/

1/ This document has been reproduced without formal editing.

TABLE OF CONTENTS

INTRODUCTION

1. The meeting of the Expert Group on the Industry Files System and other data bank techniques for industrial programming was held at the UNIDO headquarters during the period 16 - 20 November 1970. The Group was formed by ten experts nominated by the UNIDO Executive Director and assisted by the Industrial Programming Section of the Industrial Policies and Programming Division of UNIDO, which acted as the technical secretary. The list of participants is given in Annex I of this report.

2. Problems of planning for development, formulation and assessment of programmes and policies, have led many developing countries to seek solutions in the form of "data banks". In November 1969, UNIDO took steps to draw up basic guidelines by convening the East African Working Party on Industrial Programming Data in Nairobi.[2] While the principles expressed in the form of "Industry Files System" seem to have been well received by most experts and officials concerned with the problem of data in developing countries, they are yet to be buttressed by various prototypes and corollaries, taking account of activities in progress in various parts of the world.

3. The Expert Group was thus requested to re-examine the existing version of the Industry Files System proposal and work out the necessary amplifications and modifications in order to complete it as a practical guide for interested authorities in developing countries. The Aide-mémoire[3] given to the Group to that effect included further an indication of the specific objectives of the five-day meeting. Namely, in regard to the "use" aspect of the data bank of the suggested type, attention was drawn to the desirability of gathering and sorting out the relevant prototypes of industrial programming task for which a data-bank approach would be essential. In regard to the "supply" aspect, the Group was requested to examine practical problems relating to the register-of-businesses approach in particular and the record-linkage possibilities offered under this approach.

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[2] "THE INDUSTRY FILES SYSTEM" - Report of the East African Working Party on Industrial Programming Data, has been produced as a UNIDO working document for internal circulation only, but has been read by a number of experts and officials associated with UNIDO's technical assistance activities.

[3] "AIDE-MEMOIRE" (ID/WG.84/1)

4.   The Group received at its opening session further clarification and
background information regarding the tasks assigned to it.   At this session,
the Director of the Industrial Policies and Programming Division of UNIDO
referred to the fact that data gathering had traditionally been handled by
specialists institutionally separated from the development planning process.
He stressed the need for planners to activate the basic data supply, thus
strengthening their links back to the information system on which they
depended.

5.   It was also made clear that the notion of "data bank for industrial
planning" would differ in many respects from that of an "Industry Division of
a Central Statistical Office".   In general, the former should be conceived
as an operation a few steps closer to the development cadres concerned with
industrial planning and policy matters, than the conventional activities
under the regular statistical programme.   Flexible and versatile utilisation
of "micro-data" might be regarded as an additional distinctive feature of
the data bank proposal.   Elements that might tend to overlap between a data
bank proposal and the Statistical Office would be duly reflected in the final
structuring of the data bank itself, which should, by its very intention, be
supplemental to any existing statistical operations.

6.   It was emphatically noted that a "data bank", per se, ought not imply
building a sophisticated and expensive system, but the starting point could
be very simple.   As indicated in one of the papers contributed by partici-
pants,[4] all administrative actions provide data and every country has an
administration.   Thus, there will be no particular threshold, in terms of
level of economic development, for building a data bank in a developing
country.

7.   The earlier part of the five-day sessions was devoted to the discussion
on the problem areas of common relevance to both the use and the supply
aspects of data bank.   The plenary session was followed by the parallel
sessions of two sub-groups: Group I concentrated on reviewing various
programming and analytical tasks to be linked to data bank activities, and
Group II on an examination of critical elements in the structure of data
banks for industrial planning.   Toward the concluding stage of the meeting,

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[4]   "MAIN STEPS FOR BUILDING A DATA BANK FOR PLANNING PURPOSES"
        by Jean V. Salmona   (ID/WG.84/2)

both Groups exchanged the results of their debates and put forward a general recommendation regarding future UNIDO action, along with summary notes relating to the major technical issues considered during the parallel sessions.

8.   The following report is composed of three parts: I. - General debates and recommendations; II. - Models for industrial programming and data requirements (report of Group I); and III. - Towards the revision of the draft Industry Files System (report of Group II).   The working documents used at the sessions are listed in Annex II.

I.   GENERAL DEBATES AND RECOMMENDATIONS

9.   This part of the report presents the gist of the discussions held at
the plenary sessions.   These touch upon a range of strategic questions
envisaged in establishing and operating a truly useful data bank as an
integral part of the process of industrial development planning and admini-
stration.   These include such topics as: (a) approach to the analysis of
data needs - planning sectors and data sectors;   (b) the information
hierarchy - from data sources to decisions;   (c) primary data and secondary
data;   (d) inter-agency co-ordination of statistical estimates - a precursory
step towards the inception of an active data bank;   (e) industrial process
flow analysis as a point of departure for data gathering;   (f) aggregate data
system versus micro-data system;   and (g) an industry analysis and programming
department within the data bank.   "Concluding remarks" refer to the desired
approach to the future work, particularly for the back-stopping of UNIDO
technical assistance experts and the step-by-step deepening of a desk manual
which should keep abreast with the new experiences evolving in developing
countries.

Inventory of potential users and their needs

10.   Emphasis was laid on the importance of conducting a fully-fledged study
on potential users and their data requirements, before determining the scope
of data collection and organization.   The general guideline for such a
study was already clearly stated in one of the working documents submitted
to the meeting.[5/]   The same author produced also an additional note
describing the results of such a pre-project study applied to several specific
institutions for which a given data bank proposal was intended.   The parti-
cipants were of the opinion that this note should preferably be amplified as
a chapter of the manual to be compiled in the future, including an over-all
assessment of the complete set of case studies undertaken and a clear
indication of their impact on the specific design of the information systems
adopted by the data bank considered.

11.   While each potential user-organization was analyzed in these examples
in terms of a typical decision problem facing it and major models used by
its analysts to examine alternative solutions, a few participants felt that

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5/   "MAIN STEPS FOR BUILDING A DATA BANK FOR PLANNING PURPOSES" (ID/WG.84/2),
     pp. 10 - 12.

the "decision models" in the examples were no more than a cursory description
of the main chain of thoughts applicable to a given problem; the resulting
identification of "data needed" thus seems to have suffered some ambiguity
or somewhat excessive selectivity. (For example, loose specifications such
as "input-output table", "age structure of population", "regional distribution
of income" would not be very informative for the purpose of defining the
desired scope of elementary data files, as distinguished from pre-aggregated
data files.)

A data sectors/planning sectors matrix

12. In this connexion, a participant drew attention to the kind of matrix
analysis which is often employed in the programming of national statistical
operations: indicate in rows available data sectors (or categories) such as
population, traffic, agricultural crops, industrial production, etc., and
specify column sectors such as school planning, industrial planning, traffic
control, agricultural planning, etc. Statisticians may tend to check the
use of given data categories by various planning sectors and thus evaluate
the relative priorities to be accorded to different data sectors in the entire
statistical programme. This type of check, however, often runs at the
expense of the real interests of specific planning sectors, since the latter
may call for other data sectors than those readily installed and/or various
specialized sub-sectors not explicitly entered in the matrix. Application
of a pre-fixed set of data sectors (with ambiguous specification of the
product-mix of each sector) to an analysis of users' needs will be bound to
commit serious aggregation errors. It would be essential that a data bank
proposal should start with the identification of these needs with the least
possible prejudice to be associated with what the users have so far been
allowed to use.

The information hierarchy

13. The term "data" is by itself just something as shapeless as the atmos-
phere expanse. When its "use" possibilities are to be identified in relation
to a given decision-making task, a certain hierarchical figuration should be
assigned to it in order to define a few distinctive steps needed for its
processing. A participant offered one version of such "information hierarchy"

on which his company's function as an information industry was modelled.[6]
This concept, when adapted for the type of data bank being considered at this
meeting, may be represented by something like the following chart.

```
                    /\
                   /  \
                  /    \
                 /Decision\
                /----------\
               / Advisory   \
              /   report      \
             /------------------\
            / Analytical studies \
           /----------------------\
          /    Composites of        \
         /     information bits       \
        /------------------------------\
       /        Information bits         \
      /------------------------------------\
     / Regular          | Irregular          \
    /  (primary)        | (secondary)         \
   /   sources:         | sources:             \
  /                     |                       \
 /   - Census Bureau    | - Trade journals,      \
/    - Administrative   |   technical articles,   \
     records of         |   etc.
     development
     institutions
```
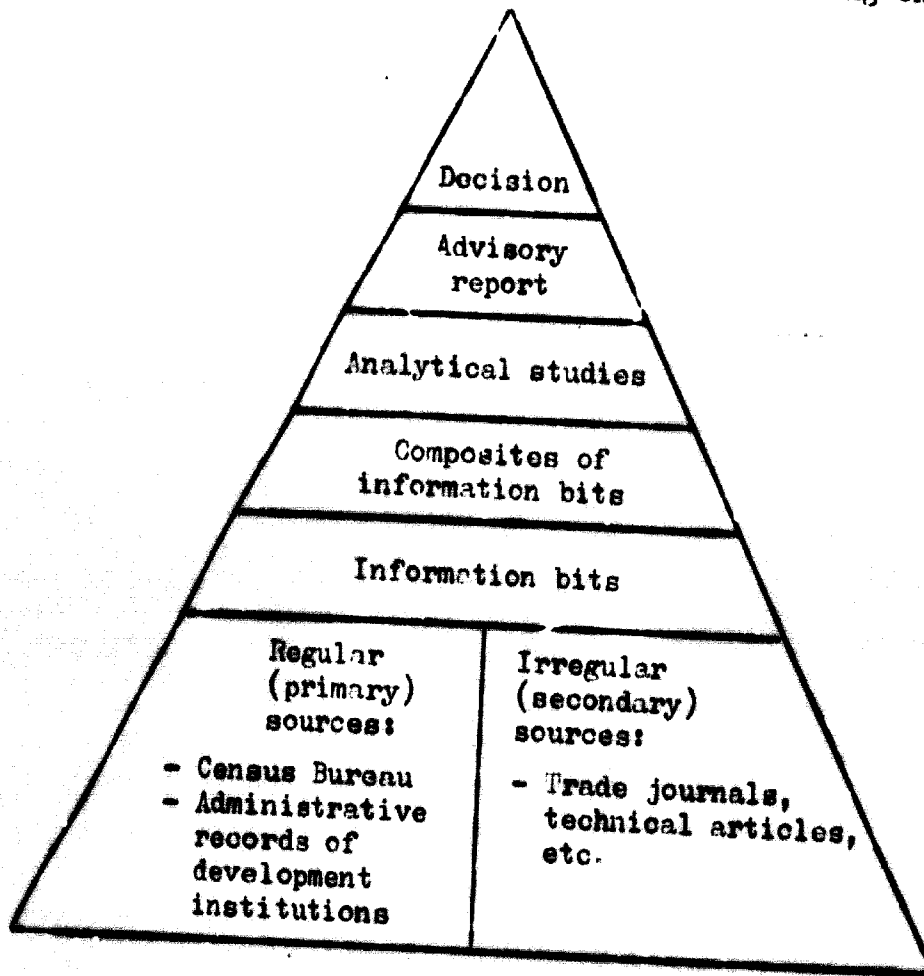
14. Obviously, the lower one goes down in the hierarchy, the less selective
the concept of information and hence it is increasingly of multi-purpose
utility (but is decreasingly serviceful for given decision purposes).   The
analysis of users starts from the top while the analysis of data sources
starts from the bottom.   The level of "information bits" may be regarded as
more or less corresponding to what the data bank is to hold as "elementary
data files".   But the "composites" level, which may generally involve a
greater degree of aggregation or summarization, is even more dependent on the
nature of the analytical studies to be carried out and the advisory support
to be derived thereof for the decision maker.

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[6]   Predicasts, Inc., Ohio, USA, operates with the information hierarchy
      which has "documents" or "library division" at its bottom. cf. "MANUAL"
      for the Predicasts, Inc. Tape Service (for internal use only).

Secondary data and data bank

15. The "secondary" data may be so distinguished from the primary data in that the former refers to what results from an application of a given set of basic information bits to some specific decision-analysis problems. Data given in journals and articles by way of evidence or illustration of any particular study, indexes derived from a trend analysis or forecasts, etc. may be considered as secondary data. Re-use in one context of the data once processed in another context can often be rewarding; with some proper assumption of parallelism, the information sought on one issue may often be "represented" by information once used and processed on other issues. The availability of meaningful secondary data for given recurrent decision purposes will be in nature less regular or less controllable than primary data. However, when desired sources of primary data are yet to be secured at the expense of time and money, it can be rewarding to attempt at extracting semi-primary information from readily available library documents.

16. In this connexion, the attention of the Group was invited to the special coding system being employed by a certain information industry in digesting innumerable source documents in the world. In addition to the more or less familar coding systems for products, enterprises, geography, units of measure, etc., the company employs a three-digit "Event-Coding" system. This provides a rather comprehensive set of descriptors for those kinds of semi-primary information which are most frequently sought for the company's information services, such as institutional structure, management procedures, new products and technology, nature and existence of resources, utilisation of resources, production and distribution, unit costs, wages and prices, etc. This approach permits computerization and versatile uses of an enormous expanse of important information bits obtainable from secondary sources. Particularly for technological and institutional information, such an event-coding system might be utilized extensively to support the model-building for the processing of data and even to supplement the primary data files in a data bank.

17. The operations with secondary data sources would be recommendable on both the national and the international levels. However, since information on technologies, markets, etc. draws heavily upon foreign sources, the desired secondary source operations would be subject to considerable economies of scale. A regional (inter-country) data bank might thus be the most economical approach to such operations.

Co-ordination and unification of statistics currently in use among different planning organs

18. There is no particular threshold for a data bank action. In many developing countries where the existing statistical system is quite rudimentary, there seems to exist the tendency of different planning and executing agencies for industrial development using different statistics, often mutually contradictory as among different users. Under such circumstances, a very modest, but immediately rewarding start towards a fully-fledged data bank could be offered by organizing something like an Inter-Agency Committee on Industrial Data Bank to examine and improve the substance of statistical information as currently utilized by different agencies. The on-going project in the Republic of the Philippines was cited as an example along this line.

19. The main characteristics of the Philippines project are:

    (a) As Phase 1, the Committee concentrates on the verification of existing statistics in use, unification of the definitions, interpretations and correlations for each series, development of a central storage and retrieval facility for co-operative use. This phase is to be followed at a later stage by Phase 2 in which steps will be taken to affect the data base itself and improve the primary data sources, and much later by Phase 3 where a detailed framework of input-output data to be developed as a tool for practical programming tasks and linear programming and other model-building work will be included in the software to facilitate studies on development strategies;

    (b) The Committee is composed of the "analysts" (and not the administrators) of the major development institutions in the country, including the governmental planning and policy-making organs, Central Bank and public and private development banks, private associations of industrial investors, business consultant firms and universities, as well as foreign financial agencies located in the country;

    (c) The technical work of the Committee starts with an analysis of national industrial plans and identification of the underlying industrial process flows to be linked to various products of the country's extractive industries of strategic importance. This facilitates priority-setting for the Committee both in terms of different industrial activities and products to be considered and in relation to data specifications desired by the analysts of different organs.

Process flow charts to guide data gathering

20. The Group appraised highly the attempt being made by the project in the Philippines, particularly to adopt the identification of the major process flows of strategic importance for present and future industrialization of the nation. Particularly in the case of developing economies, it is quite an unfortunate convention that first the Census Bureau collects data and then an input-output table is compiled like a ritual. The relatively sparcely-filled industry base of a developing country tends to be subject to quite radical technological changes relative to its size, and thus aggregation errors easily nullify the practical utility of the traditional input-output table. Data organization ought to be initiated after the economy is properly inspected under a microscope and the destination of individual commodities and the processing technology of an individual industry have been studied in depth. This point received treatment at length in one of the working documents at hand[1] and received further attention during the sessions of Group I, the report of which is given in Part II of this document.

Aggregate data files

21. The Philippines project in Phase 1 will include, reportedly, a modest data bank modelled on an approach similar to CANSIM (the Canadian Socio-economic Information Management System).[8] This system is known to contain mainly time series of aggregate data and radically contrasts to the micro-data approach geared to the register of businesses. The data bank for industrial planning as proposed for the consideration of the Group is characteristically a micro-data approach. It was agreed, however, that the UNIDO proposal ought not neglect the supplementary role to be played by aggregate data files, since certain categories of data might not become available in non-aggregate form. A degree of eclecticism has thus been proposed in favour of increased flexibility in system design.

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[1] "DATA BANKS AS A BASIS OF CAUSATIVE MODELS", by S.P. Noble.

[8] A brief description of this system is available in CANADIAN STATISTICAL REVIEW, March 1970.

22. A great part of the analytical operations in a data bank would involve an extrapolation of information relating to the past to future dates. The manipulation of macro-data for macro-projection purposes would not be a primary role of the proposed approach to a data bank, but a flexible composition and estimation of macro concepts as suitable for given planning and policy problems should rather be considered as the gist of the proposal. In fact, however, much of the work at the level of individual industrial projects (such as demand analysis) needs to be guided at one stage or another by macro-level expectations. The data bank should preferably be equipped, therefore, with some sort of macro-data operations in order to meet likely needs of users on a broad front.

Concluding remarks: advice for future work

23. Most of the discussions summarized above took place before the participants formed two sub-groups, and some during the occasional meetings of both groups. After the final exchange of conclusions from the parallel sessions of the two groups, which are reported below, the following remarks were made by way of a general recommendation.

24. In the matter of "data bank", the novelty of the tasks at hand in a way contrasts with the lack of evidence of their effectiveness in actual life, particularly when one refers to the developing countries. It will be necessary to review and assess continually future development in this field. However, the major problem areas having been outlined, it would be advisable to convene from time to time a small working group of only a few experts to elaborate in detail solutions to specific problems as they arise. One of such working groups may be convened in the not-too-distant future in order to assist UNIDO in compiling a first "Manual on the establishment and operation of data banks for industrial planning in developing countries", the need for which has been evident from the lately growing concern of many developing countries about possibilities open for initiating action in this field.

25. Another opportunity for expert group consultation will arise in back-stopping UNIDO experts working in developing countries and substantiating their technical expertise in handling problems they would have to face with little relevant experience. Funds for such ad hoc expert groups should be

provided for in each technical assistance project to be considered.   The experience with these field projects could then be fed back into the Manual

26.   The Manual in its entirety would thus develop only gradually.   It would consist of a growing set of documents, some of them being amended as field experience broadens.   The meeting recommended that attention be concentrated meanwhile on the following problem areas:

    (a) techniques of record linkage;

    (b) techniques of process analysis and collapsed input-output models.

27.   Techniques of record linkage deserve a thorough elaboration by means of a detailed description of specific examples.   Well-described examples of record linkage would throw light not only on technical solutions of linkage problems, but also on the possible scope and uses of the entire data bank concept under study.

28.   As regards the techniques of industrial programming, practical and consistent procedures of linking micro-level feasibilities to macro-level considerations deserve further exploration.   While input-output techniques offer a generally useful framework for data assembly and consistency check, facts and possibilities gripped by technical process flow analysis need to be properly absorbed into this general framework.   The UNIDO Manual should give continued attention to this need.

II.   MODELS FOR INDUSTRIAL PROGRAMMING AND DATA REQUIREMENTS: Report of Group I

29.   Group I was composed of Messrs. S.B. Noble, S. Shishido, L. Unčovský and W.M. Weiss.   Mr. S. Schleicher participated occasionally as a supporting member.   Mr. Shishido was elected as the chairman and the UNIDO substantive officers served as technical secretaries.

30.   The Group had before it three working papers written specifically for the purpose of this meeting:

   (a)   "Description of some formal operational models of planning" by the UNIDO secretariat;

   (b)   "Typology of industrial model-building" by S. Schleicher; and

   (c)   "Data banks as a basis of causative models" by S.B. Noble.

31.   The Secretariat for the Economic Commission for Europe, particularly the Projections and Programming Division, contributed several items of its publications dealing with models for economic planning and policy-making as a background reference for this Group.$\underline{2}/$

Industrial programming models: a compendium of prototypes

32.   Initially the Group's discussion centred round those case studies which had been submitted in the UNIDO secretariat paper.   The planning models summarized in that paper contained some 30 actually operational "formal" models, mainly drawn from the experience in a number of developed countries. These models were classified in terms of: (a) forecasting models and impact

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$\underline{2}/$ The main items are:

   -   MACRO-ECONOMIC MODELS FOR PLANNING AND POLICY-MAKING,   E/ECE/665, Sales No. E.67.II.E.3;

   -   CONFERENCE OF EUROPEAN STATISTICIANS: STATISTICAL STANDARDS AND STUDIES - No. 11, "Statistical Requirements for planning Economic and Social Development - Report of the United Nations European Regional Seminar, Prague, 18 - 29 September 1967", Vols. I and II, ST/CES/11, Sales No. E.68.II.E/Mim.30;

   -   ASPECTS NOUVEAUX DE L'EMPLOI DES MODELES MACRO-ECONOMIQUES EN EUROPE, ME/GER/68/D1, ECE, Geneva, 1968;

   -   REPORTS ON CURRENT RESEARCH DURING THE YEAR 1969 ON THE USE OF MATHEMATICAL METHODS IN ECONOMIC ANALYSIS, ME/GER/70/D.24;

   -   Various papers presented at the First Seminar on Mathematical Methods and Computer Techniques, Varna, 28 September - 10 October 1970 (MATHECO 1970/S-1/VAR series).

study models; (b) structural balance models; (c) unit-decision models of
the programming type; and (d) multi-unit or decentralized decision models.

33.   As an alternative classification, the Group distinguished between the
demand-oriented and the supply-oriented types, and considered various models
under each type, referring to the various levels of aggregation involved in
them: (a) Macro-economic, (b) Semi-macro (with the ISIC one-digit or even
broader sectors), (c) Sectoral (multi-sectoral, detailed input-output and
other general-system models) and (d) Partial-sectoral (models for individual
branches of industry).

34.   It was noted that "industrial planning" in its broadest sense ranges
all the way from the highly aggregated activity concepts associated with
over-all planning and sectoral programming on the one hand, down to the
specific technical aspects of project preparation, evaluation and implemen-
tation.   While relatively heavy emphasis is laid on the latter extreme,
project planning, the positive role of a formal model in industrial planning
should evolve in such a way as to ensure consistent linkage between the
macro-level constraints and the micro(project)-level feasibilities.

35.   In this connexion, particular attention was paid to the two-level
programming models for industrial branches which have recently been made
operational in Hungary.   They were designed to interlock the optimization
of resource allocation at the level of an individual industrial enterprise
and at the level of a national economy or its sector, and thus to formalize
the programming process underlying the so-called "transfer price" system.
As to the real "operation" status of these models, however, the Group was
informed that they did not gain so much support as to replace the traditional
programming procedures practised through the hierarchy of development
administration.

36.   The discussion thus orbited for a while around the fact that it was
extremely difficult to define the operational utility of formal programming
models strictly in terms of their interactions with those sophisticated
elements of bureaucracy embedded in the actual system of industrial develop-
ment planning and programme administration.

37.   The Group shared the view that actual decision-making on complex economic
and social issues and policies could not solely be dependent on formal
(usually mathematical) models, except certain decision routines at the middle

or lower management levels, such as inventory control within an enterprise.
This ought not be meant to disclaim the merits of formal models or "systems
analysis" as applied to the macro-level or the sector-level planning routines.
However, in view of the limited time available for the group sessions, the
Group felt rather unprepared to arrive at any finite package of modelling
techniques that might be recommended as a typical component of the "data bank
for industrial planning".

Data requirements for industrial programming

38. The reviewing of various types of planning models helped extract a
somewhat generalized framework of data assembly that would be more or less
commonly associated with the techniques of model building.   To prepare an
exhaustive list of planning data requirements was certainly not a task
suitable for this Group.   The ECE document on "Statistical Requirements for
Planning Economic and Social Development"[10] was recalled as one of the
examples attempting at an extensive construction of basic statistical systems
for planning purposes.   Within the UNIDO work, attention was drawn to its
earlier study, "Data Requirements for Industry Analysis and Programming",[11]
which gave a comprehensive account of the information requirements and
sources for the tasks of diagnosis, plan formulation and choice of policy
instruments.

39. The Group attempted, therefore, only to provide a recapitulation, in a
highly condensed form, of the broad range of data requirements well explored
on many other occasions, for the purpose of assisting in the discussion of
Group II.   The results are summarized as follows:

40. A. Planning data at the economy-wide level: Three alternative ways to
organize data were suggested.   In terms of their data intensiveness, they
appear in the following order:

   (a) For simple macro-analysis:- Quick and rough national accounts
        estimates and industrial production index by collecting the
        output data for selected commodities in physical terms. These

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10/   See footnote 9/ on page 14.

11/   ID/WG.23/4, 15 February 1968: Contribution by Prof. Thomas Vietorisz
      for the International Working Party on Industrial Programming Data,
      Vienna, 18 - 27 November 1968.

data should be available on a bi-monthly basis at the level of two-digit commodity classification, at least.

(b) For national income analysis:- This requires extension of the analytical coverages to include consumption, investment, government expenditure, exports and imports. The data requirements therefore consist of the traditional national income series with their supporting statistics, preferably on a bi-monthly basis.

(c) For disaggregated I - O type analysis:- A formal input-output accounting balance should be established, such as:

$$\sum_j a_{ij} X_j + Y_i + \triangle S_i + E_i = X_i + M_i$$

where Y_i = domestic final demand, excluding changes in stocks

$\triangle S_i$ = changes in stocks

E_i = exports

M_i = imports

The a_{ij}'s should be annually up-dated at least for key sectors, in both value and physical terms. The size of basic table for this purpose should be at least 100 x 100.

41. In addition to the usual commodity flow data, information relating to labour and capital stock should be available at least for major industrial sectors:

$$L_i = L_{wi} + L_{oi} \qquad (i = 1 \ldots 20)$$
$$K_i = I_i - R_i + K_{i, -1} \qquad (i = 1 \ldots 20)$$
$$K_i^n = I_i - D_i + K_{i, -1}^n$$

L_w = employed worker

L_o = self-employed and family worker

K_i = gross capital (undepreciated)

I_i = gross investment

R_i = replacement

K^n = net capital stock

D = depreciation

42. There should also be some price data enough to check the accounting balances:

Column: $P_i \sum_i a_{ij} X_j + W_j L_{wj} + P_j = P_{xj} X_j$

Row: $P_i \sum_j a_{ij} X_j + P_i Y_i + P_{ei} E_i = P_{xi} X_i + P_{mi} M_i$

and to establish the average input price,

$$P_i = (P_{xi}X_i + P_{mi}M_i)/(X_i + M_i)$$

P_i = input price

P_{xi} = output price

P_{mi} = import price

W = wage earnings

P = profit

43. <u>B. Programming at the project level</u>: The economic data extracted from detailed project engineering studies would constitute an additional genre of statistics that is of crucial importance for national project evaluation. This should include:

X (= plant output), X^c (= capacity output), I, L_w, L_o, a_iX (= major inputs P_xX, wL_w (wages and salaries), P, V(= value added, E, and M, for each project.

Some sub-classification of the information relating to the detail of these items is, of course, desirable.

44. In order to assess the potential contribution of a project to the economy, it would be desirable to have an explicit expression of the national desiderata and a set of shadow prices of key primary inputs. The data required to compute these "national parameters for project evaluation" ought to be systematically derived from an economy-wide analysis and regularly up-dated to reflect major changes in the basic socio-economic conditions.

45. <u>C. Regional analysis</u>: This calls for a regional breakdown of some of the key variables:

$$X_{ri}, \quad K_{ri}, \quad L_{ri}, \quad Y_r \qquad (r = 1 \dots)$$

and if possible, the interregional flow information:

$X_{rs,m}$ (= interregional flow, $r \rightarrow s$, by type of transportation mode, m)

should be compiled.

Commodity flow model: a flexible solution for the input-output model

46. The Group was of the opinion that an I - O table provides still the best framework for the assembly and control of data collected from otherwise unrelated sources. The Group was, however, aware of the limitations of the I - O analysis especially in dealing with developing economies. The necessary

assumption of constant input coefficients would generally be much less
tenable in a developing economy than in a mature economy; the changes in
the structural relationships of the economy aimed at in the context of
planning would be more radical in a developing economy, and these need to be
more immediately related to the details of factory- or project-level
programming. The "aggregation errors" likely to be committed in a formal
input-output table should therefore receive as serious attention as when the
input-output data is used to guide market research and related studies on
the level of an individual firm.

47. While disaggregation is the solution, it is not physically feasible,
nor necessary, to attempt the maximum degree of disaggregation in all sectors.
Instead, an attempt to build complex production functions in technologically
identifiable terms should be limited to only certain key strategic industrial
sectors.

48. It was noted that the industrial programming in a developing country
would have to rely more extensively on detailed engineering studies of
individual plants, than on time series data. Most of the aggregation errors
result from an arbitrary output classification which disregards the
similarities in input structure. To avoid the difficulty, the orthodox
square matrix should either be replaced by, or somehow combined with, a
collapsed rectangular process-analysis type of table. This would imply
modifying the balance equations of the original I - O table into:

$$X_i - \sum_j t_{ij} + M_i = E_i + Y_i + \Delta S_i$$

where t_{ij} is the amount of i-th commodity input for plant j (rather than
sector j). Since a developing country usually has only a limited number of
major industrial plants (establishments), tracking down the flow of i-th
commodity input would not be too demanding a job.

49. Such a "flow"-form of the input-output model consists of tracing, for a
given specific industry or commodity, successive sequences of sales and
transformation. Associate an input/output coefficient with each of the
sales and multiply coefficients that occur along the identified sequence,
and we will have an approximation to the row of the inverse matrix for the
particular industry or commodity considered. If the sequence does not end,
we can connect any dangling edges to the inverse of the conventional input-
output matrix and this inverse will define all of the remaining indirect flow.

The entire input-output matrix can thus be partitioned, for each specific industry or commodity under study, into:

$$\begin{bmatrix} S & T \\ \text{zero} & (I - A) \end{bmatrix}$$

Where S is a set of sequences as identified above, T is a matrix that converts the categories of S into the categories of the conventional input-output model. The inverse of such a partitioned matrix is given by:

$$\begin{bmatrix} S^{-1} & S^{-1}T(I - A)^{-1} \\ \text{zero} & (I - A)^{-1} \end{bmatrix}$$

where S^{-1} is readily obtained in the process of constructing S, and $(I - A)^{-1}$ obtained from the conventional input-output matrix.

50. The partial disaggregation method suggested as above would prove fruitful as a technique of consolidating the individual project-level studies with the over-all inter-sectoral models. It also assigns a new genre of data to the concept of data banks for industrial planning: i.e. well-organized, continually replenished sets of techno-engineering information relating to the specific uses of specific commodities. The method considered would find particularly useful applications in the treatment of basic metals and some metal-working industries. Chemical -based industries should be treated in a similar way. Industries producing end-products for final use hardly require a specific flow-form of model since most of their sales go directly to final demand.

Use of techno-economic data from secondary sources

51. Apart from the task of identifying the basic primary data (= techno-economic variables and parameters) and their inter-relationships, the Group took note of the importance of secondary data that are available in a variety of pre-processed forms in trade journals, professional articles, etc. For data-bank purposes, a one-step deeper operation than the conventional work of librarians would be desired. Namely, a proper coding system should be employed to re-generate semi-primary information on production, investments,

capacities, markets, etc. from various secondary sources. The huge stock of business information being utilized by an information industry such as Predicasts, Inc. is in fact supported by such an operation based on secondary data. This company's three-digit "event-coding" system, which represents the results of trials and errors over many years, caught the attention of the Group as a notable prototype of general utility

52. Judicious use of secondary data will not only improve the scope of the data bank but also will save time and effort when the existing primary data sources are yet to be worked out to secure the needed information. In this connexion, attention was drawn also to the relative merits of "informal" models for projections, forecasting, etc. For example, a forecast may be made by means of an analysis of relevant time series statistics. This will then be checked against the forecasts made by other people of similar or related variables using more or less different sources of information and perhaps different "models". An eclecticism may come to order in one way or another before arriving at a sensible judgement. Also, in the process of putting together information to form an opinion, arbitrary assumptions, interpolations and extrapolations may be resorted to in a flexible, if not formally consistent, manner.

53. One may argue that an informal model, lacking in consistency in explicit terms, tends to be incapable of uncovering sources of its own errors. A formal model permits analysis of errors with respect to specific variables and equations as well as the system as a whole, but the element of inflexibility may often contribute to the loss of perspective. The Group noted, however, that the contrast of formal versus informal models is not a pertinent issue of model-building; but a rigorous model on economic matter is meant normally only to offer an orderly perspective for decision making and not immediately to mould a judgement on the available perspectives.

III   TOWARDS THE REVISION OF THE DRAFT INDUSTRY FILES SYSTEM: Report of Group II

54.   The objective of Group II was to "gather, as concrete reference material, specific examples of inter-record linkage representing actually tested cases, with due attention to institutional problems and effective ways of solving them, as well as technical de-bugging problems'.   By gathering specific examples of record linkages and by learning from practical experiences in this field, it was intended to up-date the existing version of the Industry Files System and particularly to focus on the essential elements of the system.

55.   The Group had a set of documents$\underline{12/}$ for consideration including the "Industry Files System - Draft Report on the East African Working Party on Industrial Programming Data" (referred to as the IFS proposal).   The agenda did not follow precisely the structure of the IFS proposal since some aspects were found more desirable for elaboration than others;   it is for the reader's convenience that the discussion and findings are presented in a lay-out corresponding to the structure of the IFS proposal.   The issues are, therefore, presented as follows:

		(Corresponding section in the IFS proposal)
(i)	Basic considerations	Summary Description of the Proposal
(ii)	Register of businesses and record linkages	The Structure of the IFS
(iii)	Uses	The Uses of the IFS
(iv)	Institutional context	The Institutional Context
(v)	Implementation	An Implementation Proposal for the IFS

The bulk of this report is focussed, however, on discussions on the second item, i.e. technical problems and possibilities concerning the register of businesses and record linkages.

Basic considerations

56.   The main theme of the Industry Files System proposal was found acceptabl; by the Group, but some amendments were introduced in its structural features. Namely, the linkage of records with scattered elementary and aggregate data to a central register of businesses should represent the major structure of data supply for industrial planning and decision-making.   The data base of the system will consist of a set of related data files.   These files may differ in terms of frequency of up-dating, coverage and degree of aggregation.

12/   See Annex II.

While the original proposal assumed that only elementary data will be stored in the data base files, it was recommended that the statistically processed data also be included in the data base. Consequently, <u>the data base would store both elementary and aggregate data.</u>

57. The IFS was originally proposed to be partial, covering the industrial sector only. The Group reconsidered this approach and noted that this had been meant simply to indicate an action priority at the outset of data bank building for industrial planning. In fact, however, the planning and policy activities in the industrial sector necessarily call for data not only from the industrial sector itself, but from other sectors as well (manpower, natural resources, transport, public utilities, etc.). Therefore, the IFS should be conceptually defined from the outset as <u>an integral part of an over-all information system</u>, which should be recognized particularly when establishing registers of businesses. This approach does not exclude the possibility that the establishing of an over-all information system, which in any case can only be built in stages, starts with the industry sector.

58. As a consequence of the above change in understanding the ultimate goals, the title "Industry Files System" was subjected to critical discussion. It was argued that ultimately the "Files System" would go beyond the "industry" field. Besides, "Files System" was felt to be an exaggerated description of a rather modest undertaking. It was therefore recommended that the title be changed to "<u>Data Bank for Industrial Planning</u>". It is this title which is applied further on in this report.

59. The concept of the data bank should be broadened also in the sense that the "<u>reference programming data</u>" should receive greater attention than envisaged in the original IFS proposal. It was emphasized by some participants that the exogenous data (data on technology, production, trade, prices, etc. in other countries) play an important role in industrial planning and decision-making and should, therefore, be given first priority along with indogenous data on existing industrial firms and plants. Realizing the unlimited amount of these data and the rather limited needs and resources in a small developing country, it was felt that fully-fledged information centres should be built up preferably on a regional basis as indicated in the original proposal. The exogenous data section of the Data Bank for Industrial Planning should provide for the linking of local (or national) information systems to that of a regional centre.

60   The "confidentiality" problem is one of the basic factors affecting many aspects of the data bank.   Though confidentiality of data may sometimes be a pretended notion, purporting only to avoid possible abuse of data which by themselves are not confidential, the protection of personal and business secrecy is the legitimate claim in many societies.   Data banks have to live with this problem.   It could be solved by:

(a) exluding any possibility of free physical access to data stored in the computer;

(b) classification of the users of data and installation of appropriate keys for controlling their access to data;

(c) sufficient aggregation of elementary data when processed for general dissemination.

61.   As far as <u>physical access</u> to data stored in the data bank is concerned, there are several ways of protection.   Since paper files could be easily copied, security can best be achieved by denying to unauthorised personnel access to data retrieval equipment.   In the case of data storage on magnetic tapes, the computer system documentation can be treated as confidential and accessible to authorized personnel only.

62.   The controlling of access to confidential data will require attaching proper <u>security codes</u> to different users.   If a computer is used in the data bank, it can be programmed to allow only certain data to be routed to certain users.   Security codes can be built in the retrieval instructions to the computer; if the code is unknown to the user, the computer will deny access to the data.

63.   Protection of confidentiality of the information to be disseminated in the public is accomplished by a sufficient <u>degree of aggregation</u>.   Laws and regulations usually stipulate that confidential data should not be released unless aggregated from three or four sources, and if the share of one source of data constitutes more than a certain percentage (e.g. 70 percent) of the aggregate.

64.   While the security within computer systems is to be solved by the data processing expert in the course of establishing the data processing unit, the desire or necessity to plug into the data bank confidential data will in itself influence the institutional concept of the data bank.   Some participants felt that the necessity to cope with the confidentiality problem might favour <u>the location of a data bank within the Statistical Office</u>, at least at the outset.

Register of businesses and record linkages

65. The IFS proposal envisaged that the complete system would consist of the following files:

- Identifier File
- Core File
- Sample File
- Plan Data File
- Reference Programming Data File

The Group's discussion of the register of businesses and record linkage problems was intended to cover mainly issues related to the Identifier File and the Core File.

66. It was agreed that the most typical structure of a Data Bank for Industrial Planning would be represented by a register of businesses (to serve as a tool of record linkage and as a "mini data bank") to which various data files and records would be linked.

67. The register of businesses should contain only data of relatively long validity. While some experts consider employment size measured in class categories as sufficiently stable, some recommend a <u>size code</u> based on some other characteristic, such as fixed investment. Employment figures are prone to change from year to year; with an employment size code of 50 - 100 workers, a unit employing 45 workers in 1968, 55 in 1969 and 48 in 1970, will slip from one size to another year after year. There would be many such marginal cases for each size. Fixed investments are a relatively non-variable characteristic and may prove to be a more reliable size indicator of productive capacity.[13/] However, one should not neglect the fact that data on fixed capital are generally less easily available than employment data. Besides, it would not be possible to secure absolute stability of the file; there are always changes in the activities of an individual establishment as well as the emerging of a new establishment and submerging of one establishment into another. The point is that if changes occur in the data, the old data should be stored within the system so that the changes can be easily followed.

13/ See "COMMENTARY ON THE UNIDO INDUSTRY FILE SYSTEM" by G.R. Mohnot, (ID/WG.84/3), page 11, paragraph 24.

68. Attention was then drawn to the distinction between the __situation file__ and the __historical file__, as practised in Norway. The situation file gives the actual situation as has been registered, while the historical file is mainly furnished with all the changes noted in the situation file when it is up-dated. By combining the situation and the historical file, one can reconstruct a situation for any chosen point of time in the past.

69. In compliance with the basic policy regarding coverage of the data bank, the Group felt that a register of businesses should not be confined to the industrial sector only, but should include establishments in all sectors. However, the subsistence economy of rural villages would pose insurmountable obstacles to complete registering of agricultural farms. The __agricultural sector__ may therefore be considered as an exception under normal circumstances.

70. Similarly, a certain limitation in regard to __size coverage__ has to be exercised by the creator of the register. The option of the lower size limit shall be made with due regard to the stipulations of licensing regulations.

71. In practice, the coverage of the register would differ from one country to another depending on availability of data and possibility of locating establishments. When establishing the register, all available __sources identifying establishments__ should be utilized. Among others, the following sources can be consulted:

(a) Records of tax-collecting offices. They do not have complete lists of establishments since the establishments not paying taxes (either those operating at a loss or non-profit-making organizations) are not recorded by them. Besides, income taxes paid to the central government are usually levied from enterprises, and not from establishments. It is only the property taxes that are collected in some countries from establishments and paid to local authorities.

(b) Records of insurance companies. Usually only establishments/ enterprises employing labour are recorded.

(c) Records of public utilities (electricity, water, telephone, etc.). These records are also incomplete and scattered.

(d) Street surveys and other statistical surveys. Their coverage is considerably high, but they have the disadvantage of not being up-dated frequently.

72. There may be other sources identifying establishments, e.g. import and export statistics, applications for licenses, etc. The register may be incomplete even after use has been made of all available sources, but this imperfection should not discourage establishment of the register; the purpose

is to achieve the highest possible coverage   What remains can be handled
by means of sample statistics

73. The gradual establishment of a register of businesses in a developing
country may adopt a <u>selective approach</u> that explicitly takes into account
the existing and potential major production lines in the country. Namely,
for each major raw material being (or to be) produced in the country,
construct the relevant <u>process flow</u> from one branch of industry to another.
Particular branches of major interest for industrial planning and policy-
making purposes will be identified from such a process flow reflecting the
techno-engineering possibilities associated with the given raw material.
These branches will be classified into two groups:

  (a) Branches having establishments with wide spatial distribution;
       and

  (b) Branches having establishments with limited spatial distribution.

The second group is suitable for registering each establishment individually.
For the first group, however, completing the register in a similar way would
be an expensive operation and could be covered for the time being by
aggregate estimates to be derived from area samples, population census, etc.
This approach would be easily applicable to a relatively small developing
country with more or less mono-cultural economic structure.   Its merit
would consist in developing the statistical basis for industrial planning in
a form readily susceptible to the input-output type analysis.

74. In establishing and up-dating the register, existing administrative
records of, for example, <u>social securities</u> and <u>internal revenues offices</u>
would play an important role.   In this connexion, attention was drawn to
the experience of the Central Enterprise Register in Sweden.<u>14/</u>   The enter-
prise register in Sweden is given the status of an official source for basic
enterprise information, which has an effect of rationalization in business
administration as well as in the development of statistics for planning
purposes.   Data are collected at both the enterprise and the establishment
levels, and enterprises are sub-divided into those with and without employed
manpower.   Data on the enterprises with employed manpower are taken from

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14/ Owe Salomonsson, "A STUDY OF SOME PROBLEMS AND EXPERIENCES RELATED TO
     THE SWEDISH CENTRAL ENTERPRISE REGISTER" (Submitted as a background
     paper for the meeting.)

the National Insurance Board, while data on those with no employed manpower are derived from business supplements to income tax reports. The latter are rather out-dated, so up-dated data exist only on enterprises with employed manpower. At present, the following data are kept in the register on each enterprise with employed manpower:

 (a) enterprise identification number;
 (b) name;
 (c) address (head office);
 (d) codes for branch (maximum three different codes in ISIC);
 (e) code for region;
 (f) code for community;
 (g) code for taxation district;
 (h) hours worked (converted to man-year equivalents);
 (i) indication if activity in more than one address;
 (j) indication of any change in the status of the enterprise;
 (k) addresses of local units if located other than in head office.

75. The **Swedish enterprise register** has been in operation since 1963. The major critical observations now being taken into account to effect due improvements are as follows:

 (a) Incomplete coverage. However, there does not seem to exist any possibility of covering fully all enterprises without employed manpower.

 (b) Out-datedness. The Board of Insurance releases data only after they have been stored for at least 18 months.

 (c) Confidentiality. While information collected for statistical purposes is restricted, some administrative records are open to the public. The register aims at storing only open data.

76. In order to improve the structure and functioning of the register, the Bureau of Statistics proposes, _inter alia_, the following amendments:

 (a) The register should be divided into historical and situation files and be up-dated continuously.

 (b) The scope of the register should be increased to cover:
  - public government
  - non-financial enterprises
  - financial enterprises
  - households

 (c) The register should have three units: enterprise unit, local unit and establishment.

(d) New identification number (seven digits and a check digit) shall be designed so that the number need not be changed should the status or activity change.

(e) The data content will be extended to include data on turnover, output-homogenity index, status of implementation, etc.

(f) The register should be designed in such a way that integration can easily be achieved as mong the Register of Enterprises, Register of Population and Register of Real Estates. To each of the basic three registers, several special registers will be attached (taxation, insurance, services, wealth, students, occupation, health, agricultural estates, apartments, etc.). Gradually, the most frequently used (open) data should be taken out from the special registers and stored in the basic registers. In other words, the basic registers would function as pivots of records (specific files) linked to them.

77. The problems of _record linkage_ were among the major issues of the meeting. The Group recognized the fact that there are not too many practical examples of record linkage available in the world as yet. Besides the above-mentioned project of an integrated information system in Sweden, the examples described in Mr. Osipov's paper[15] proved useful for demonstration purposes, since they represented actual experience. One of the salient features of the record linkages described in the paper is that all of them were performed upon the request of planning and administrative bodies. The linkage of records made it possible to find out certain correlations that would help estimate the behaviour of economic variables.

78. The illustrated techniques of record linkage consisted of _matching data from statistical censuses with those from administrative records;_ the Register of Businesses served as the pivot of the operation. Since the statistical census applies the same classification and the same identification numbers as the Register (in this particular case the Register was administered by the Statistical Office), it was rather easy to match the data from the census to the Register. It was more difficult to match administrative records with the Register, and several preparatory steps were necessary (assigning of identification numbers, selection of a representative sample, punching cards, etc.).

15/ "SOME EXAMPLES OF RECORD LINKAGE IN A CENTRAL BUREAU OF STATISTICS" (contribution to the meeting of this expert group).

79. For illustration purposes, several examples are briefly described below:

   (a) Data on fixed assets (collected by a special questionnaire)
   to be linked with data on employment, gross output, etc.
   (extracted from the annual survey of industry and crafts).
   Capital/output and capital/employment ratios by branches,
   size groups, etc. derived from the linkage exercise were
   used for estimating the demand for capital and manpower.

   (b) Data on research and development expenditures (collected
   originally by a National Council for Research and Develop-
   ment) linked with data on economic performances of
   establishments (extracted from the annual survey on
   industry). Ratios were established indicating correlation
   between research and development expenditures and the
   performance parameters of industries.

   (c) Data on land used by business enterprises (taken from
   administrative records of municipal authorities) linked with
   data on economic activities of enterprises. The resulting
   ratios (total area per output, storage area per output, floor
   area per employee, etc.) were used for town planning purposes.

   (d) Data on exports (taken from customs records) linked with data
   on the economic activities of exporting enterprises (a list
   of exporters had to be established). It makes it possible
   to identify export orientation by branches, by size categories,
   etc., and to compare economic performances of enterprises
   according to their degree of export orientation.

   (e) Data on imports (taken from customs records) linked with data
   on importers (identified in the register) for the purpose of
   finding out the destination of imports by branches and final
   use.

   (f) Data on loans and grants (taken from administrative records
   of the Development Bank) with data on the economic activities
   of the enterprises which were granted loans (derived from
   periodical reports submitted to the bank and/or from the
   Register). This linkage can show the distribution of loans
   by branches, size, categories, etc., and the difference in
   economic performances between enterprises with and without
   loans.

   (g) Data on water and electricity consumption in industry (taken
   from the records of a water authority and an electricity
   company) linked with data on the economic activities of the
   major industrial consumers of water and electricity (taken
   from the Register). The resulting ratios, if followed for
   several years, can be used for estimating future consumption
   of water and electricity.

80. Some other examples of record linkage were mentioned at the meeting
(linkage of balance sheets and of sales tax reports to the register files,
etc.), but it was emphasized that such examples can be cumulated only as the
experience develops. It was also agreed that currently available examples

should be documented referring to technical details of each linkage operation in order to facilitate the exchange of experience in this field.

81. It was also emphasized that while the collection of record linkage examples could inspire and assist the promoters of Data Banks for Industrial Planning, actual work would depend very much on local conditions (that is, on specific needs and conditions governing the structure of existing data sources). Since <u>analysis of data sources</u> would be decisive for outlining possible operations of the Data Bank, the Group made an effort to draw up a checklist to help an <u>analysis of existing data sources</u>. A generally applicable "questionnaire" might consist of the following items:

A. <u>Contents of the record</u>

- Employment
- Production capacity
- Outputs (specified)
- Inputs (specified)
- Capital engaged (in value)
- Economic and financial indicators

B. <u>Coverage</u>

- Size category
- Sector
- Region

C. <u>Reliability</u>

D. <u>Availability</u>

- Confidentiality
- Cost of processing

E. <u>Integration possibility</u>

- Modification
- Expansion
- Up-dating

82. Analysis of data sources along the above lines ought to be accompanied by an <u>analysis of data needs</u> of potential users. The steps to be followed for the latter purpose are outlined in one of the papers submitted to the meeting [16] and were briefly discussed at the beginning plenary sessions.

16/ Jean Salmona, "BUILDING A DATA BANK FOR PLANNING AND PRIVATE DECISION MAKING PURPOSES" (Notes on the OTM examples).

Uses

83. Group II did not devote much time to discussion of possible uses of the data bank, partly because examples of uses were implied in the examples of record linkages and partly because it was Group I which was dealing more extensively with data requirements for industrial planning. It was understood by Group II that the Data Bank for Industrial Planning should support planning, financing and implementation activities of economic agents in the field of industry. Of these, planning activities (formulation of objectives, structural analysis, formulation and analysis of resource allocation programmes, identification of investment opportunities, evaluation of projects, etc.) were recognized to be the most data-intensive.

84. Attention was drawn occasionally to the problem of how to measure technological changes, both in the past and in the future. The economic indicators are traditionally designed to deal with technological factors only in indirect terms or in terms of their economic impact. The Group was referred to the on-going UNIDO project, "Industry Profiles", which attempts to deepen the interaction between economic data and engineering data in the context of diagnosis and programming of industrial activities on the enterprise and project level. The Group felt that the "Reference Programming Data" section of the data bank ought to receive further serious consideration and that the possible structure of data files in this section and techniques of digesting technological information should be elaborated in due course.

Institutional context

85. The participants were hesitant to propose any unique locational policy for the data bank. Examples were given showing that even within one country a data bank changed its administrator from one institution to another. (In one example, the transfer from the National Statistical Office to the Prime Minister's Office was under consideration.) Although in most cases the registers of businesses are administered by Central Statistical Offices, it does not follow that this should be the rule. Many participants felt that it might be generally convenient to start operations of the register within the Statistical Office and consider removing it from there after operations had reached a certain scale.

Implementation

86. A data bank can not be established as a fully-fledged body at once; it has to develop gradually. The first step should consist of establishing a register of businesses. However, conditions for establishing a register may not be favourable in all countries. In principle, it is possible to start with registering relatively large establishments for which there are records either in the Statistical Office or in administrative departments. The selective approach mentioned in paragraph 73 above would deserve particular attention in further elaborating guidelines in this respect.

87. Linking of records should also be developed gradually. The recommended approach is to work on individual users' needs and accumulate the gained results and experience into a sustained routine. This will have a positive impact on the formulation of the programme of work for the data bank which should be geared to users' needs at every stage.

88. As far as computing and data-processing programmes are concerned, they can be defined only after the volume of data, frequency of request, types of exhibit required, lead-time of request to response, etc. are known. No effort should be made to pre-determine these programmes at the very outset of the data bank.

89. It should be emphasised that an intensive training of data users in regard to techniques of data processing and analysis be undertaken by those associated with the data bank. Very often institutions gathering data remain indifferent to those using them and *vice versa*. This leads to a situation where much of the information produced proves either of poor relevance to on-going planning and policy matters or simply unrecognised. Therefore, the using agencies themselves have to develop competence to handle data and to specify their needs precisely.

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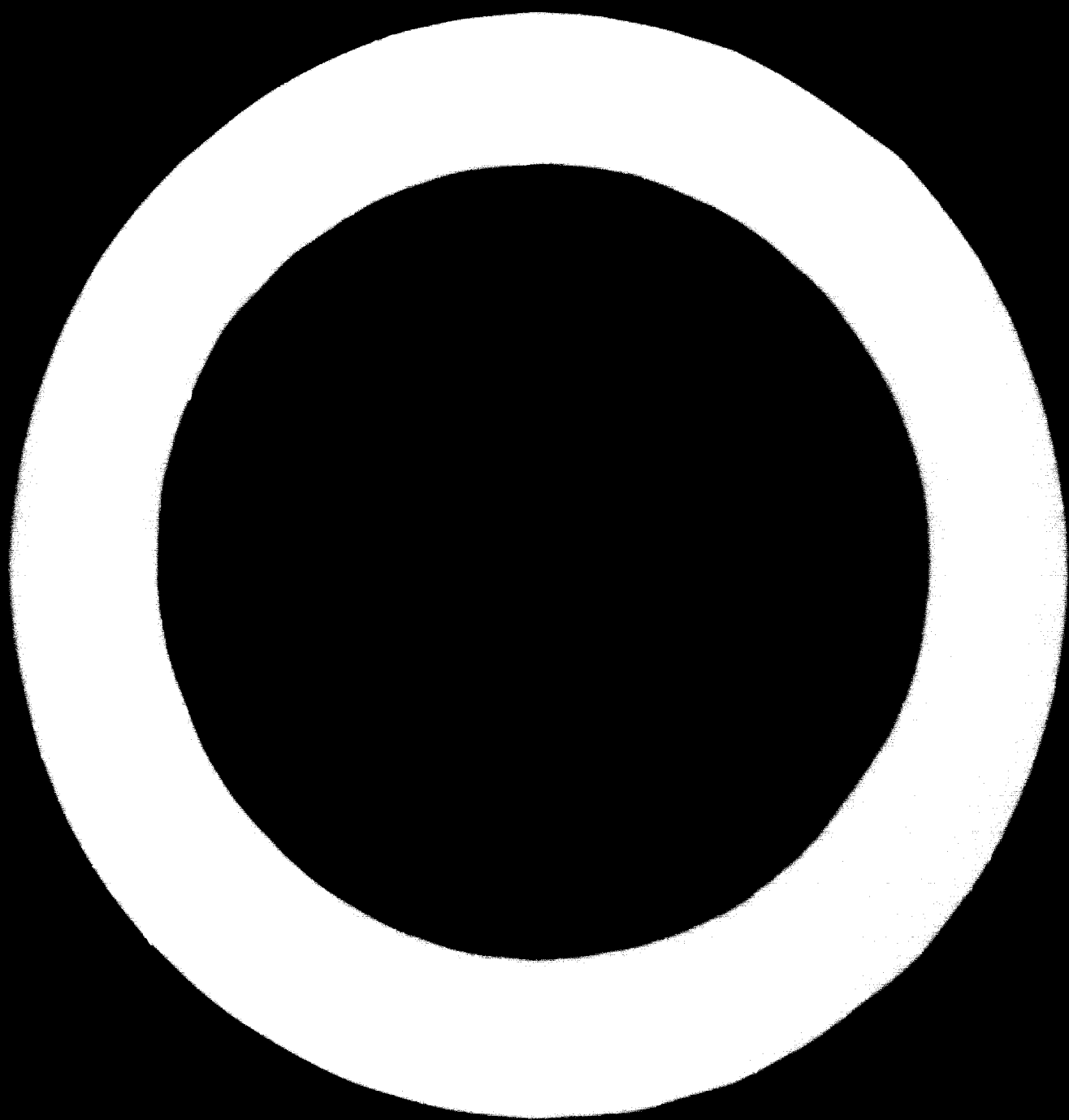
Annex I

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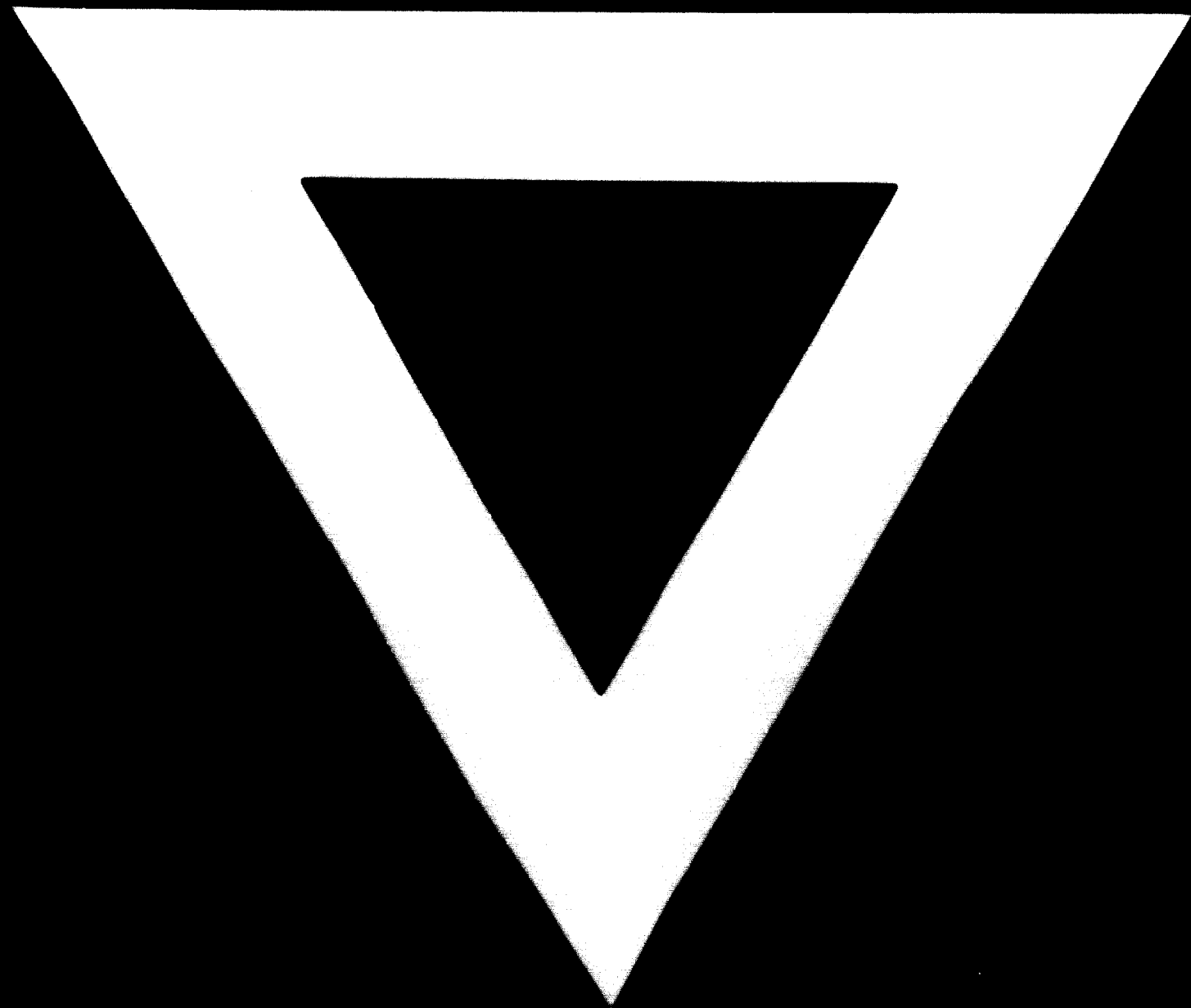|	
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Annex II

LIST OF DOCUMENTS

1.	UNIDO	Aide-mémoire (ID/WG.84/1)
2.	UNIDO	Main Steps for Building a Data Bank for Planning Purposes by Jean V. Salmona (ID/WG.84/2)
3.	UNIDO	Commentary on the UNIDO Industry File System by S.R. Mohnot (ID/WG.84/3)
4.	UNIDO	The Industry File System: Draft Report on the East African Working Party on Industrial Programming Data (Secretariat paper)
5.	Owe Salomonsson	A Study of Some Problems and Experiences related to the Swedish Central Enterprise Register
6.	Isaac Osipov	Some Examples of Record Linkage in a Central Bureau of Statistics: a preliminary paper
7.	UNIDO	Description of Some Formal Operational Models of Planning (Secretariat paper)
8.	UNIDO	Typology of Industrial Model Building by Stefan Schleicher
9.	Stedman B. Noble	Data Banks as a Basis of Causative Models
10.	Jean V. Salmona	Building a Data Bank for Planning and Private Decision Making Purposes: Notes on the Observatoire Economique Méditerranéen Case Studies
11.	William N. Veiss	Excerpts from the Manual for the Predicasts, Inc. Tape Service

(See Part II of this report, page 14,
for the ECE publications referred to
at the meeting.)

29. 5. 72