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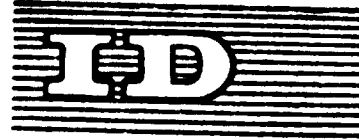
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RECENT TRENDS IN THE DEVELOPMENT OF  
BUSINESS DATA BANKS IN THE UNITED STATES:

With particular reference to  
the requirement for industrial programming ✓

✓ This paper is an extract from the articles prepared for UNIDO by Mr. Jay M. Gould, Jay M. Gould Associates, New York, N.Y. as part of the pre-sessional feasibility study for the International Working Party under consideration. The views and opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

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## I. INTRODUCTION

The term "data bank" has emerged in recent years as an outgrowth of the growing application of computer terminology to the storage and retrieval of information. Yet, data banks in the sense of a body of classified information publicly and inexpensively available to either general or specialized information users are as old as the institution of public and private libraries. The emphasis on the mechanization of information processing techniques embodied in the term data bank is in turn a result of the exponential increase in the volume of information which in modern times has reached awesome proportions. 1/

If the information in a data bank is properly classified and can be key-punched for storage on cards or tape, it is readily apparent that the dissemination of such information can be greatly facilitated by the development of "computer utility" or "information utility" systems. Such systems utilizing telephone and wireless communication links, as well as time and space sharing, can employ great economies of scale in making available a wide range of information processing services directly to customers in their individual offices.

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1/ The magnitude of the paper involved in the "information explosion" can be illustrated by a few statistics: (1) the U.S. Federal Government produces 25 billion pieces of paper per year and has accumulated enough records to fill 7.5 Pentagon buildings, at a total cost of 44 billion per year; (2) military engineering documentation (research reports, manuals, drawings, etc.) now costs 42 billion annually; (3) approximately 15 million checks pass through U.S. banks each year; (4) more than 6 million engineering drawings are made yearly for the military services and more than 50 million drawings are on file; (5) approximately 30,000 technical journals publish more than 2 million articles per year in over 50 languages etc.....

(G. C. P. Bourne; Methods of Information Handling, John Wiley, New York, New York, 1963).

It is generally recognized that data banks will achieve optimum use as shared public files in national and international computer utility systems when available reference sources are integrated into the various information services offered by the system. Data bank development is being actively undertaken in the U.S. today, even in advance of the emergence of national computer utility systems, because computer and transmission technology has already advanced to the point where the efficiencies of operation of publicly shared data banks have become obvious.

Computer utility, while further advanced in the U.S. than elsewhere, particularly in areas under federal administration, is still in a very early stage of development. Many thorny technical, legal, and administrative problems remain to be resolved before data bank information will be available on a "real time" basis by telephone. In the discussions to follow, data banks will be discussed without reference to the probability that future access to them will be greatly facilitated by the establishment of computer utility networks, both within countries and internationally.

The key to the data bank concept is the classification and coding system which must precede any mechanization procedure. The existence of the data on punch cards and tape is important for rapid access, inexpensive reproduction and for mechanical abstracting, indexing, and cataloguing. The latter is of course an extremely important way to provide access to a body of information, and there is much effort now being expended in the U.S. on the development of classification and indexing techniques necessary for the organization of information systems. 2/

The International Standard Industrial Classification and the Standard International Trade Classification or a proper combination of these two seems to offer a key reference for various classification and coding systems for business and economic data banks. In the U.S. the Standard Industrial Classification System

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2/ American Documentation is the U.S. journal of information science which records work in progress in such fields.

is now being widely adapted for the coding and classification of private business reference services, directories, circulation and mailing lists and of many examples of what can be described as incipient data banks of economic information of possible use for industrial development programming.

A brief over-all review of data banks, especially those designed to provide information for corporate planning, is presented in the following section. Then, the major technical aspects of selected business and economic data banks are described; those specific schemes may be particularly interesting from the standpoint of the International Working Party on Industrial Programming Data.

## II. MAJOR CATEGORIES OF BUSINESS DATA BANKS

The following is a listing of various reference services now available in published form which are being converted into data banks by the use of various classification techniques.

### (i) Professional Reference Services

- a. Legal
- b. Medical
- c. Law Enforcement
- d. Scientific
- e. Engineering
- f. Pharmacy
- g. Agriculture

### (ii) Business Reference Services

- a. Credit
- b. Mailing Lists
- c. Directories
- d. Sales Statistics
- e. Marketing Reports
- f. Key Personnel
- g. Job Vacancies
- h. Regulations
- i. Price Schedules

- j. Production Data
- k. Financial Data
- (iii) Consumer Reference Services
  - a. Testing
  - b. Satisfaction
  - c. Product Specifications
  - d. Product Prices
  - e. Sales Figures
  - f. Warranty Information
  - g. Product Availability
  - h. Advertising
- (iv) General Information Reference Services
  - a. Employment Opportunities
  - b. Political Facts
  - c. Sports Statistics
  - d. Historical Data
  - e. Weather Information
  - f. Travel Information
  - g. Repair Information
  - h. Gardening

These various reference services now available in published form are now being converted into data banks. The scientific banks now being developed in the U.S. in the fields of chemistry, physics, biology, etc. are wellknown. In the field of medicine, for example, data banks are evolving as a consequence of the growing use of the computer for hospital accounting, as patient records can be accumulated, analyzed and aggregated with those of other hospitals.

In the finance and business fields, computerized information services are providing a wide range of data required as the basis for executive decisions. These services include: mailing lists, directories, sales statistics, marketing reports, key personnel, job vacancies, business regulations, price schedules, production data, financial data, etc. These information services are now being offered in most large cities in the U.S. as an outgrowth of the private use of computers in their application to internal accounting, sales, and production records. Services are available in the financial areas of investment, insurance, banking, credit,



and taxation. Similar services are offered in retail and wholesale processing, purchasing, production control, and other aspects of the managerial planning and programming functions. For many smaller users that have no private computer installations, such information services are made available by local "service bureaus" with a wider range of data processing facilities than could be otherwise used by any single customer.

A prototype of such a local computer utility is the KEYDATA Corporation, a subsidiary of Charles Adams Associates, which started operations in Boston in 1965 with a Univac 491 computer, serving 100 remote users from a central processing center located in Cambridge, Massachusetts. KEYDATA offers to all users such business services as on-line invoicing, inventory checking and updating, entry of orders, customer credit checking, and the storage and retrieval of information from the user's private files. In addition, numerous off-line services are offered, which can be batch processed during the night when there is little or no on-line demands on the computing center. These off-line services can include the generation of routine and special accounting reports, the preparation of commission statements, price lists, the analysis of customer characteristics, and can also include information taken from national business data banks.

The commercial sale or rental of mailing lists in the United States for direct mail promotion is a very large business in the United States, involving annual volumes of hundreds of millions of dollars. Such mailing lists are generally compiled in many ways; from magazine circulations, mail responses to advertising, credit reports, etc. In recent years it has been recognized that the addition of key information to the lists will facilitate computerized selection procedures that will greatly upgrade the value of each item of information, and in the process the mailing list becomes, in effect, a data bank. The conversion of a mailing list to a data bank requires in addition to the physical transfer of the information from print to card or tape, the inclusion of quantitative information which permits further mechanical processing and linkages with related data banks.

Several economic data banks are now available or under development in the U.S. which are used in corporate planning for sales forecasting, policy determination and selection, market analysis, investment analysis, and plant location. They make use of the U.S. Standard Industrial Classification for ready access and are concerned with alphanumeric information of the kind that lends itself to mechanical data processing.

In the belief that such information systems can be adapted to international use in industrial programming, we shall select several specific schemes and discuss each of them in some detail.

### III. THE PREDICAST SERVICE

Economic Index and Surveys, Inc. in Cleveland is a company which offers, on a subscription basis, a number of information services, several of which are economic data banks of great relevance for industrial management planning. For example, they are responsible for Predicasts, a quarterly publication of abstracts of forward and backward projection data and estimates of current production, shipments, consumption, sales, etc., of as many as 10,000 detailed products of the U.S. economy, arranged both alphabetically and by the U.S. Standard Industrial Classification System. The information abstracted is always quantitative and is taken from articles appearing in over 25 trade journals, business and financial publications, newspapers, government reports, and special studies.

Exhibit A is a sample page indicating that for every product cited, the following information is offered:

a. SIC code to 5 digits. Note that this code is identical with the U.S. SIC system with respect to the first four digits. This means that the product cited is fully identified with respect to the industry of which it is a primary product. The fifth digit, however, sometimes conforms to the SIC product code but in many cases does not and appears to be adapted to the printing

requirements of the publication.

b. Product A. An alphabetic description of the primary product cited.

c. Event. Here the events cited include reports of consumption of other products in the production of product A (which are essentially technical coefficients in an input-output context), plus capacity, consumption, demand, output, sales, exports, imports, usage, revenue, expenditures, shipment, value added, etc.

d. Product B. Here the quantitative information involves a relationship between two products, essentially similar to technical coefficients. Product B, however, carries no SIC code.

e. Years. The quantitative information is generally offered as an estimate for the current or past years or forecast. When relevant, the calendar year for each is identified.

f. Quantities. The quantitative data cited for each of the three years identified in (c).

The remaining information identifies the physical or monetary unit of measure employed, as well as the journal cited, plus date of issue and page reference.

The information cited is considered to offer quick access to data for the following range of management planning functions:

- a. Projection of component information for economic forecasting.
- b. Forecasts of the industrial environment for long range planning.
- c. Growth product forecasts for diversification studies.
- d. Comparative industry growth rates for security analysis.
- e. End use distribution data and projections for market research requirements.
- f. Detailed facts and information sources for market development.
- g. Sales trends for sales analysis.
- h. Data on exogenous variables for operations research.
- i. Detailed product index and information sources for librarians and information and documentation specialists.
- j. Data for rational policy determination by corporate executives.

The Predicast service is one that could readily lend itself to international coverage with the proper resources available for the abstraction and translation of comparable information from comparable data sources published in all countries. As a matter of fact, Economic Index and Surveys is currently offering such subscription services separately for Common Market countries, Scandinavia, other nations of Europe, Canada, Latin America, Africa, Japan, other nations of Asia and Oceania. They also offer subscription services for the outlook summary sheets containing comparative country data for each product, which are referred to as "World-Product-Casts". The subscription options are available for general economic indicators; extractive and soft goods; basic chemicals, polymers, and other chemical products, oil and glass; and metals, electronics and equipment. Published forecasts are abstracted from government planning agencies, journals, bank letters, and international agencies.

The data bank principle underlying the Predicast services has been extended to the coverage of all economic information. Thus, Economic Index and Surveys also publishes an information service which records all such published information, again coded by industry, and available both for the U.S. and internationally.

One of the notable examples of this type of services may be the "Expansion and Capacity Digest". This provides statistical data on producer capacities - domestic and foreign - for companies and for industries. The basic data are the reports of companies on their capacity and expansion plans. This information serves the purpose of computing company market shares by region or by country, estimating corporate product mix, evaluating probable price trends and prospects for equipment sales and construction expenditures, and anticipating (with the aid of Predicast) demand-supply balances. The company data in the Digest is aligned in the following manner:

- (1) Name of producer and plant location
- (2) Major product and current capacity
- (3) Expansion cost and source of information

#### IV. PROFITABILITY AND PERFORMANCE RATIOS

Tax returns analyzed by the U.S. Revenue Service constitute an extremely important statistical data source recording the reported profitability of U.S. enterprises. Properly classified, data taken from tax returns information can constitute a useful data bank of performance ratios, which can serve as a guide to American enterprises seeking yardsticks by which their own performance can be evaluated. Information, such as the data collected by the U.S. Census Bureau, is drawn on heavily by the Input-Output section of the U.S. Office of Business Economics, in constructing the official U.S. input-output tables, but such use involves many technical adjustments of the tax data to conform with input-output methodology.

A useful effort to convert tax data into a data bank has been made by Leo Troy of Rutgers University and has been published by the Prentice-Hall Company of New Jersey under the title of Manual of Performance Ratios for Business Analysis and Profit Evaluation.

This manual makes available, for 266 manufacturing and non-manufacturing industries classified by product, and by industry (according to the U.S. Standard Industrial Classification System), current industry-wide ratios to net sales of: cost of sales; executive salaries; rent; repairs; bad debts; interest payments; taxes (excluding Federal income taxes); contributions; depreciation/depletion/amortization; advertising; pensions and other employee benefits and net profits after Federal income taxes.

The Manual provides answers to questions concerning corporate activity in the United States as reported in 1964 - the most recent year for which authoritative figures derived from tax return data of the Internal Revenue Service are available. It also contains industry sales records at five-year intervals from 1948 through 1963, and also for 1964. Included in the Manual are major (two-digit industries as classified in the Standard Industrial Classification Manual) and minor (three- and four-digit sub-classification) industries. These are subdivided into two general groups - non-manufacturing and manufacturing industries. In

addition to its extensive coverage of industries the Manual introduces several innovations in its presentation of operating and financial characteristics.

The first innovation of the Manual is its classification and definition of all 266 major and minor industries. Any company can easily identify itself with the industry accounting for most of its receipts and be able to compare itself with like enterprises.

The second significant innovation is the index reference of products and services. Thus, anyone analyzing a corporation whose subsidiaries produce a number of products or services can locate the industry producing a given product or service in the Index, and by turning to the page reference, ascertain the industry's average performances. The Index is also divided into non-manufacturing and manufacturing industries.

The tables present 22 operational and financial ratios and percentages classified by size of the total assets in each industry for the year 1964. The asset size classification is yet another important innovation of the Manual. This breakdown makes possible comparison of a company's financial characteristics not only with the appropriate industry but also with other companies similar to it in size. Exhibit B is a sample page from the Manual.

#### V. DUN AND BRADSTREET PLANT FILE

The most ambitious of all business data banks is perhaps the Dun and Bradstreet file of manufacturing establishments; this is a data bank of more than 300,000 industrial plants with information on name, address, telephone number, 4-digit SIC code, employment, sales volume, etc., compiled as a by-product of the extensive credit inquiry business of Dun and Bradstreet. The company is now extending the file to cover all non-manufacturing plants so that, in effect, it will have a complete census of three million

business establishments which, unlike the official counterpart maintained by the U.S. Census Bureau, will be available for public use. The project is expected to be completed in Spring, 1969.

The identification of business enterprises distinguishes the Dun and Bradstreet information from what may be available from U.S. Census tabulations in which the disclosure of information about identified enterprises is withheld by law. Indeed, the U.S. Bureau, in common with most National Statistical Offices, believes that such non-disclosure limitations are essential to the official collection of unbiased data.

Information collected by a private agency such as Dun and Bradstreet is offered either voluntarily by the respondent, with full knowledge that such information will be made public, or else information about the enterprise may be secured from creditors or similar third parties. In either case there may be some question about the accuracy of the facts and figures collected. However, the most significant statistic relating to the magnitude of operations of any single establishment in the Dun and Bradstreet data bank is employment. Checks with comparable Census information indicate that, aside from problems of definition and classification, employment data given to Dun and Bradstreet representatives either by the respondent or by informed third parties (banks, suppliers, customers, etc.) generally conform to similar information collected from respondents by governmental agencies. On the other hand, information on magnitude of sales would rarely be reported objectively by the respondent to non-governmental agencies not operating under non-disclosure prohibitions.

A perhaps more difficult reporting problem is associated with the classification of establishments. Many plant managers frequently do not know the four-digit SIC code under which their establishments are classified by Census enumerators, who are trained to ascertain which of possibly several diverse products produced at a given plant should be considered "primary". Dun and Bradstreet feels, however, that its own reporters are becoming increasingly sophisticated in this respect, and among the information now collected for each plant are all secondary SIC codes for all

products produced at the plant in significant quantities.

This problem would, of course, be eliminated if the Census Bureau would publish the SIC code of all establishments, as has been frequently requested by certain American trade associations, but the U.S. Census Bureau has resisted this as a violation of its non-disclosure rule. 3/

An interesting feature of the Dun and Bradstreet data bank is the use of what is called an exclusive eight-digit numbering system for each establishment, designed eventually to cover as many as ten million possible establishments. The D-U-N-S number (for data universal numbering system) is a unique, random number assigned to an establishment, which can be easily checked by computers for coding errors, and can be used to facilitate intra-company data processing and in inter-company message and data transmission. The maintenance of a complete alphabetic file of business establishments carrying the DUNS numbers greatly facilitates the identification of any given business establishment.

Information in the Dun and Bradstreet data bank is available in eight different formats: magnetic tape, punched cards, pressure-sensitive labels, cheshire labels, direct addressing masters, 3 x 5 cards, tabular listings, and printed tabulating cards. Two of these formats are shown in Exhibit C.

The full data for each establishment includes:

1. Area code and telephone number; name and title of chief executive.
2. Line of business - primary S.I.C.
3. Line of business - up to five secondary S.I.C.'s
4. Number of employees and number of employees in the entire company.
5. Net worth and credit rating (available only to subscribers to Dun and Bradstreet Credit Service)

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3/ It is noteworthy that central statistical offices in both the United Kingdom and in Canada do release standard classification codes for business establishments.



6. Sales volume
7. State - city - country - geographical code.
8. Code to denote whether the establishment is a headquarter; whether no manufacturing is done at the location considered.
9. Code to denote that the establishment is a branch location, together with the D-U-N-S number of headquarters location; code to denote that the establishment is a subsidiary, together with the D-U-N-S number of the parent company.
10. Divisional name or trade style; year in which business started.

Information in this data bank is said to be particularly useful for market researches in determining sales potential and market penetration, and evaluating new products market size and acceptance. Actually Dun and Bradstreet has its own market services division which undertakes contract market research for a diversified clientele. It should be noted that this division's market research services are made possible not only by its direct access to the plant files mentioned above, but also by a nationwide system of branch offices in over 150 principal industrial and commercial markets linked by a wire network for high speed transmission of necessary data. The market research services division also has a field force of several thousand full-time, salaried business interviewers.

#### VI. THE IBI CUSTOM MARKET PROFILE

Initially International Business Machines sold computer-prepared market research reports to companies that sell products and services to manufacturers. Then, in recognition of the growing interest in computerized information systems, IBM contracted with Dun and Bradstreet for a non-exclusive licensing agreement to use the file in marketing information services. The information

offered was in the form of a "custom market profile", a series of five analytical reports, with each profile priced at roughly \$3,500 to \$10,000.

The Custom Market Profile relates the shipments of any industrial producer to the total shipments for four-digit coded industries which it already supplies and to all prospective industrial customers. Preparation of the Custom Market Profile falls into several stages.

First, an analysis of the company's sales records is required that so total annual shipments to each plant can be related to both the SIC code of that plant and its employment. At this stage it is assumed that every plant in that industry is a prospective customer.

The variations in sales performance from plant to plant in an industry are examined in terms of dollar value of shipments-per-employee. The rate of variation is governed by the size of the plant, by employment, and by some optimum consumption ratio-per-employee. The rate is checked by examining how the ratio of dollars-per-employee varies within the size of plant within each industry.

The application of these ratios, as approved by the client, to the Dun and Bradstreet data bank of industrial plants, provides the basis of the Custom Market Profile reports. In these reports, a summary comparison is made between present and potential markets as governed by client-selected parameters. The use of industry coefficients presents an alternate set of broadly-based weights for estimating potential. The industry experience, revealed from such data, is particularly useful for evaluating the markets where the client's own sales experience is unbalanced, or where he is dependent on industrial wholesalers and does not have sufficient direct sales records.

One important function of the industry coefficients is to indicate to the client his share of the market on an industry-by-industry basis. This is done by directly comparing the client's sales to each four-digit industry with the corresponding input/output dollar flow. This aspect of the data bank services will be described later in further details.

Reportedly, IBM has discontinued its industry information service in the above form, because the service did not conform to its long-range corporate goals. Exhibit D illustrates the type of data bank that was made available to customers through this service. An economic consulting firm in New York, Jay H. Gould Associates, announced a new information service in mid-1968 that replaces, in part, certain information offerings that were withdrawn by IBM, including that company's input-output data bank.

## VII. INPUT-OUTPUT DATA BANKS

Input-output research helps focus attention on those technical coefficients that characterize inter-industry transactions undergoing rapid change. It is clear that an expanding input-output data bank which can pool the accumulated experience of changes affecting all buying industries can offer at least first approximations of market demand estimates to all selling industries without requiring the selling industry to develop such information from scratch.

The IBM Input-Output Data Bank, which supported the Custom Market Profile Reports, involves the disaggregation of sectors in the official input-output tables into component 4-digit industries.

If the consumption patterns of a particular material or component were so highly diversified that many industries would report very small quantities, if at all, some allocation procedures have to be established to distribute unreported consumption. This is particularly true with such materials as lubricants, office supplies, rubber belting, rubber hose, replacement tires and tubes, etc. Such allocation procedures, properly applied to and verified by market research, can often be the key to the disaggregation of several industries, thus making available larger bodies of data, at the small cost of a higher-than-average rate of error on a large number of very small transactions.

Private agencies are frequently in a far better position to extend the degree of detail available in input-output grids than are the government statisticians working under non-disclosure limitations. Thus, government statisticians working with Census data would be forced to consolidate 4-digit industries if a single company were to dominate one such industry or an important portion of the market for that industry. For example, the U.S. Flat Glass industry (SIC 3211) would be merged with the Purchased Glass industry (SIC 3231) because the output of a single automotive glass producer has too dominating an influence in both industries to permit disaggregation. Similar considerations concerning the dominance of the largest U.S. nylon producer (DuPont) might require consolidating the Cellulosic Man-Made Fibers Industry (SIC 2823) with the Synthetic Organic Fibers Industry (SIC 2824).

Indeed, the role of central statistical offices in the construction of input-output tables is most important in the establishment of a frame of reference, but only the business enterprises whose activities are recorded in these tables are in a position to evaluate the accuracy of the estimates, to supply the missing data links and to disaggregate the estimates to further detailed levels. Clearly then, the construction of input-output tables can be seen as a joint effort on the part of both private and governmental agencies.

The U.S. organizations engaged in the development of input-output data banks include such research institutions as A.D. Little, Battelle Memorial Institute, and the Stanford Research Institute, McGraw Hill etc. These organizations support the recently established non-profit organization, Institute of Interindustry Data, Inc. (New York) which acts as a clearing house for information on public and private applications of input-output data and seeks to standardize and coordinate such applications and additions to privately developed data banks relating to specialized industrial fields.

The new input-output data bank service offered by IBM-Jay M. Gould Associates can be linked with the Dun and Bradstreet data bank of business establishments. A series of computer printouts are produced that aim at pinpointing the potential demand of the industrial sector for the products of the following particular industry groups: wood, paper, plastics, rubber, glass and metal. Since the coverage of the Dun and Bradstreet file is most complete with respect to the manufacturing sector, the input side (columns) of this input-output data bank is presently confined to the 425 4-digit manufacturing industries. As of mid-1968, the IBM-Gould bank has 85 industrial product groups (4- and 5-digit industries) on the output (rows) side. In the future, the coverage will be extended to as many as 250 product groups.

Exhibit E gives the listing of the 250 row industries whose output goes mainly to other 4-digit manufacturing industries. The asterisked industries in this list are those 85 which have already been covered in the existing IBM-Gould input-output data bank.

It is well known that the construction of input-output tables should proceed at the most detailed level of plant classification possible. In the U.S. the three official input-output tables constructed for the years 1947, 1958, and 1963 were at the 4-digit level of SIC detail but a final consolidation of industries into sectors in the publications greatly reduced the number of 4-digit industries whose separate sales patterns could be traced to 4-digit consuming industries. In order for a data bank to find maximum usefulness in these tables further development is required in the direction of disaggregation even below the 4-digit SIC level. This is particularly important when a variety of product components of a given industry are subject to different patterns of demand. As more and more input-output data are accumulated at various levels of detail, more control totals will be available to increase levels of accuracy and thereby stimulate further private research to seek even greater levels of detail.

It is now clear that the U.S. business community will increasingly favor the employment of input-output research techniques for the analysis of industrial markets because it is the most efficient, most rational tool for understanding the structure of a complex set of interrelated industries. Privately developed extensions of input-output data banks will become increasingly important, particularly with the release this year (1968) of the new 350 sector U.S. input-output tables by the Office of Business Economics. This will offer much new information to form the basis of even further input-output disaggregation.

#### VIII. CONCLUSIONS

Business data bank development in the U.S. is clearly still in an early stage. However, the results to date amply demonstrate that there is no better way to systematize for rapid access the wealth of technological and marketing information necessary for the operation of a complex modern economic system. Such information is currently available, not in data bank form but in the advertising and editorial pages of the U.S. business press.

The Predictast service is but a small example of the wealth of such information which can be systematically abstracted from the business press and retrieved in data bank form. Such information as carried in the various specialized trade publications will be increasingly adapted to conform with the input-output methodology and will be coded according to the Standard Industrial Classification System.

The principle underlying the Dun and Brastreet plant file in particular could be applied on a regional or international basis. Summary characteristics of individual establishments in various countries could be coded and included in a centralized international plant file. The same

principle could also be adapted to cover major industrial projects being considered for implementation in various countries. Systematic co-ordination of industrial development programming activities across national borders would only become possible by having continual access to such international or regional plant and project files. The application of such files can be in innumerable fields.

Of course, the practical usefulness of the files would be enhanced by a simultaneous development of other supporting reference data, especially the kind of data that would help grasp the potential functional relationships among those plants and projects included in the files. The working connexion between the Dun and Bradstreet file and the input-output data bank, as described earlier, should be pointed out in particular in this connexion. Also, the continual up-dating of the plant files obviously requires a well organized field force and a network of communication throughout the participating countries. It is hoped that the proposal being developed by UNIDO for the International Working Party on Industrial Programming Data (referred to as the "Industry File System" in the provisional agenda for its first session 4/) will receive due attention from various national and multi-national organizations concerned with industrial development.

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**"Aide-memoire: purpose, scope, operational framework and provisional agenda for the first session of the Working Party on Industrial Programming Data", ID/WG.23/1, September 1968, Annex III.**

**EXHIBIT A**

**PREDICASTS**

SIC NO	PRODUCT A	EVENT	PRODUCT B	YEARS			QUANTITIES			UNIT OF MEASURE	REL	SOURCE		
				B	S	L	B	S	L			JOURNAL	DATE	PAGE
<b>Ind Organics NEC-Function (Cont)</b>														
28189	Optical brighteners	sales		64	-	70	24.5	-	90.	±	*-M	Textil Bul	7/ /65	48
28189	Optical brighteners	used in	polymers & coatings	64	65	70	750.	900.	2000.	000 \$	*-PP	Mod Plast	9/ /65	105
28189	Plasticizers	consump of	phenol	65	-	70	40.	-	60.	mil lbs	P-P	Hydrocarb	1/ /66	148
28189	Plasticizers	consump of	hydrogen peroxide	65	-	70	7.	-	4.	mil lbs	P-P	OPD Rep	5/23/66	3
28189	Plasticizers, vinyl	consump of	phthal anhyd as % total	65	-	70	40.	-	45.	% of total	P-P	Hydrocarb	3/ /66	152
28189	Preservatives, industrial	sales by	end use	64	-	67	120.	-	-	mil \$	P-	Chem Week	7/24/65	75
28189	Preservatives, wood	consumption		65	66	67	-	+12.5%	-	growth/yr	-P-	Chem Week	8/14/65	117
28189	Refrigerants	consump of	fluorocarbons	65	-	70	135.	19.	175.	mil lbs	P-P	OPD Rep	1/ 3/66	3
28189	Repellent finishes	used in	textile treatment	64	65	70	16.5	19.	23.	mil \$	*-PP	OPD Rep	9/27/65	5
28189	Repellents, non-durable	used in	textile treatment	59	65	70	3.0	2.5	2.0	mil \$	*-PP	Textil Rep	3/ 3/66	55
28189	Repellents, chemical	used in	textile treatment	59	65	70	16.5	19.	23.	mil \$	PPP	C&E News	10/ 4/65	30
28189	Repellents, fluorocarbon	used in	textile treatment	59	65	70	3.	10.	15.	mil \$	PPP	C&E News	10/ 4/65	30
28189	Repellents, fluorochemical	used in	textile treatment	59	65	70	3.	10.	15.	mil \$	*-PP	Textil Rep	3/ 3/66	55
28189	Repellents, fluorochem extend	used in	textile treatment	59	65	70	.5	1.5	2.0	mil \$	*-PP	Textil Rep	3/ 3/66	55
28189	Repellents, pyridinium	used in	textile treatment	59	65	70	2.	1.	1.	mil \$	*-PP	OPD Rep	9/27/65	54
28189	Repellents, resin base	used in	textile treatment	59	65	70	4.	1.	1.	mil \$	*-P	OPD Rep	9/27/65	54
28189	Repellents, silicone	used in	textile treatment	59	65	70	4.	3.	2.	mil \$	*-PP	OPD Rep	9/25/65	54
28189	Repellents, wax base	used in	textile treatment	59	65	70	3.	2.5	2.	mil \$	*-PP	OPD Rep	9/27/65	5
28189	Sequestants, gluconate	consumption		65	66	-	100.	110.	-	index	*-P-	OPD Rep	4/18/66	38
28189	Solvents	consump of	fluorocarbons	65	-	70	25.	-	75.	mil lbs	P-P	OPD Rep	1/ 3/66	3
28189	Ultraviolet absorbers	sales		63	-	68	3.	-	5.	mil \$	*-P	Mod Plast E	9/ /65	434
28189	Ultraviolet absorbers	consump by	end use	63	64	68	590.	690.	1200.	000 lbs	*-P	Mod Plast E	9/ /65	434
28189	Ultraviolet absorbers	used in	polyvinyl chloride	63	-	68	130.	-	285.	000 lbs	*-P	Mod Plast E	9/ /65	434
28189	Ultraviolet absorbers	used in	polyolefins	63	-	68	95.	-	285.	000 lbs	*-P	Mod Plast E	9/ /65	434
28189	Ultraviolet absorbers	used in	polyester resins	63	-	68	90.	-	220.	000 lbs	*-P	Mod Plast E	9/ /65	434
2819	<b>IND ORGANIC CHEM NEC</b>													
<b>Nitrogen Compounds</b>														
28191	Nitrogen compounds, world	production		65	to	70	-	+9.5%	-	growth/yr	-P-	E&M Jour	11/ /65	99
<b>Ammonia</b>														
28191	Ammonia, N America	capacity		-	-	70	-	-	13.	mil m tons	-P	OPD Rep	5/30/66	7
28191	Ammonia, N America	consumption		-	-	70	-	-	9.	mil m tons	-P	OPD Rep	5/30/66	7
28191	Ammonia	capacity		65	66	-	100.	200.	-	index	*-P-	Chem Eng	11/22/65	124
28191	Ammonia	capacity		65	66	-	11.2	15.	-	mil tons	PP-	C&E News	5/30/66	29
28191	Ammonia	capacity		-	-	68	-	15.	-	mil tons	-P-	Jrl Comm	11/ 8/65	2
28191	Ammonia	capacity		-	-	67	-	-	13.3	mil tons	-P	Chem Week	9/11/65	52
28191	Ammonia	capacity		65	66	67	10.7	13.4	17.	mil tons	PPP	O&G Jour	8/ 9/65	49
28191	Ammonia	capacity		64	-	67	8.5	-	17.	mil tons	PPP	Chem Week	9/11/65	51
28191	Ammonia	capacity		64	-	67	9.0	-	17.2	mil tons	P-P	Farm Chem	11/ /65	30
28191	Ammonia	capacity	(nitrogen content)	64	-	68	7.	-	13.5	mil tons	*-P	OPD Rep	11/29/65	37
28191	Ammonia	capacity		65	-	68	11.	-	17.9	mil tons	P-P	C&E News	5/ 9/66	36
28191	Ammonia	capacity		-	-	68	-	-	18.	mil tons	-P	Wall St JI	8/ 3/65	28
28191	Ammonia	consump of	hydrogen	-	-	80	-	-	2100.	mil cu ft	-P	C&E News	3/26/66	30
28191	Ammonia	production		63	66	-	6.2	9.4	-	mil tons	PP-	C&E News	5/ 9/66	36
28191	Ammonia	production		65	-	67	9.	-	13.	mil tons	P-P	NY Times	1/23/66	17



## IRON ORES (SIC 101)

## Sales Volume Record of Total Industry

YEAR	DOLLAR SALES	INDEX
1948	300,755,000	100.0
1953	562,505,000	187.0
1958	560,551,000	186.4
1963	771,760,000	256.6
1964	753,275,000	250.5

Ratios or Percentages as indicated below (1961)	By Size of Assets (in thousands of \$)					FOR THE TOTAL INDUSTRY
	A Under 500	B 500 to 2,499	C 2,500 to 9,999	D 10,000 to 49,999	E 50,000 and over	
<b>Selected Operating Factors (in per cent of Net Sales)</b>						
1. Cost of Sales	(b)	91.7	64.2	47.8	58.2	60.4
2. Executive Salaries	(b)	1.8	.5	.1	.3	.5
3. Rent	(b)	.1	.1	(a)	.4	.4
4. Repairs	(b)	(a)	3.1	5.4	3.5	3.3
5. Bad Debts	(b)	(b)	(b)	(b)	.1	.1
6. Interest	(b)	.1	(a)	.5	3.6	2.7
7. Taxes (Excl Fed Inc Tax)	(b)	3.6	4.9	3.6	2.3	3.0
8. Contributions	(b)	(b)	.1	(a)	(a)	(a)
9. Depr/Depl/Amortiz	(b)	2.3	14.2	16.7	22.0	18.8
10. Advertising	(b)	(a)	(a)	(b)	(a)	(a)
11. Pensions & Benefits	(b)	(a)	1.9	.9	1.2	1.1
12. Net Profit after Inc Tax	(b)	1.4	5.1	14.5	10.6	9.8
<b>Selected Financial Ratios (number of times ratio is to 1)</b>						
13. Current Ratio	(b)	2.7	1.9	1.4	3.8	3.1
14. Quick Ratio	(b)	2.5	1.7	1.1	3.3	2.8
15. Net Sls to Net Wkg Cptl	(b)	5.7	3.4	6.5	1.8	2.2
16. Net Sls to Net Worth	(b)	2.6	1.3	.9	.6	.8
17. Inventory Turnover	(b)	(b)	(b)	(b)	(b)	(b)
18. Tot Liab to Net Worth	(b)	.4	.7	.6	.7	.7
<b>Selected Financial Factors (in per cent)</b>						
19. Curr Liab to Net Worth	(b)	27.7	41.9	33.1	13.2	16.6
20. Inv to Curr Assets	(b)	6.7	9.8	20.2	27.5	11.9
21. Net Inc to Net Worth	(b)	3.6	6.7	13.7	6.9	7.6
22. Ret Earnings to Net Inc	(b)	100.0	(b)	61.7	58.0	52.6

\*Depreciation largest factor







EXHIBIT D - 3



Industry Information Cards

CUSTOM MARKET PROFILE  
BY TERRITORY

DEC 19, 1966

Territory	Number of Customers		Sales		Revenue		Profit		Assets		Liabilities		Equity	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
1 MD NEW ENGLAND	973	4.00	42	0.40	2,700.0	3.07	143.0	3.77	5.1	3.4	3.4			
2 NY & N J	2,944	14.51	74	14.00	12,000.0	16.21	642.0	17.04	3.4	3.4	3.4			
3 SO CAN & WPC	998	4.07	41	8.20	5,404.0	6.02	150.0	6.38	2.9	2.9	2.9			
4 PEEN & NJ	2,604	13.23	67	13.40	11,192.0	13.97	338.0	13.64	3.0	3.0	3.0			
5 MID ATLANTIC	1,179	5.81	35	7.00	4,895.0	6.11	117.0	4.72	2.4	2.4	2.4			
6 SOUTHEAST	828	4.08	8	1.60	2,011.0	2.51	17.0	.69	.0	.0	.0			
7 OHIO & MICHIGAN	2,425	11.95	46	9.20	9,918.0	12.38	257.0	10.37	2.6	2.6	2.6			
8 ILL & IND	1,907	9.79	47	9.40	9,549.0	11.92	496.0	20.02	5.2	5.2	5.2			
9 MD CENTRAL	1,264	6.23	30	6.00	4,118.0	5.14	74.0	2.97	1.0	1.0	1.0			
10 MID CENTRAL	956	6.71	23	4.00	2,636.8	3.29	3.0	1.25	1.2	1.2	1.2			
11 MOUNTAIN	310	1.57	3	.60	304.0	.36	2.0	.00	.7	.7	.7			
12 MOUNTAIN WEST	923	4.55	21	4.20	2,652.0	3.31	55.0	2.22	2.1	2.1	2.1			
13 CALIFORNIA	2,022	13.91	63	12.00	11,000.0	14.49	348.0	14.04	3.0	3.0	3.0			
<b>TOTAL</b>	<b>20,291</b>	<b>100.00</b>	<b>500</b>	<b>100.00</b>	<b>60,113.0</b>	<b>100.00</b>	<b>2,470.0</b>	<b>100.00</b>	<b>3.1</b>	<b>3.1</b>	<b>3.1</b>			

Industry Summary

EXHIBIT D-1

SIC	Industry	Customer Market Profile by Industry										Market Area Totals
		1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	
2691	PAPERS & PRINTING	1,909	9.00	23	6.00	1.2	27,401.0	34.26	491.0	19.01	1.0	21.3
2679	MISC PLASTIC PRODUCTS	5,017	24.72	104	20.00	2.1	14,617.0	18.25	522.0	21.07	3.6	5.0
2821	PLASTICS & RUBBER	1,304	6.72	21	4.20	1.5	11,325.0	14.14	213.0	0.00	1.9	10.1
3732	BOAT BUILDING & REPAIRING	1,613	7.95	19	3.00	1.2	6,946.0	8.67	76.0	3.07	1.1	6.0
2643	BAGS, EXCEPT TEXTILE	500	2.06	24	4.00	6.1	6,109.0	7.73	293.0	11.02	6.7	12.2
3993	SIGNS & DISPLAYS	3,523	17.36	101	20.20	2.9	5,499.0	6.00	310.0	12.51	5.6	3.1
3941	TOYS & GAMES	859	4.23	80	17.60	10.2	2,659.0	3.32	417.0	16.03	15.7	6.7
3652	PHOTOGRAPH RECORDS	36	1.79	14	2.00	3.0	1,647.0	2.04	40.0	1.94	2.9	3.0
3669	FAB RUBBER PRODUCTS, NEC	1,744	7.01	23	6.00	1.5	1,549.0	1.93	10.0	.73	1.2	.0
2641	PAPER COATING & GLAZING	431	2.12	14	2.00	3.2	1,104.0	1.36	32.0	1.29	2.9	2.3
3357	NONFERROUS WIRE	200	1.20	17	3.40	6.1	663.0	.79	40.0	1.01	6.3	2.0
3679	ELECTRONIC COMPONENTS NEC	2,727	13.44	52	10.40	1.9	545.0	.60	10.0	.73	3.3	.3
	MARKET AREA TOTALS	20,291	100.00	500	100.00	2.9	60,113.0	100.00	2,470.0	100.00	3.1	5.0



Industry Information Center

DEC 19, 1980 0972

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EXHIBIT E.

A LISTING OF 250 (4-DIGIT) INDUSTRIES WHOSE OUTPUT  
GOES MAINLY TO OTHER 4-DIGIT MANUFACTURING INDUSTRIES

(SIC code)

Foods:

- 2041 Flour and meal
- 2045 Blended and prepared flour
- 2046 Wet corn milling
- 2061 Raw cane sugar
- 2062 Cane sugar refining
- 2063 Beet sugar
- 2087 Flavorings
- 2091 Cottonseed oil mills
- 2092 Soybean oil mills
- 2093 Vegetable oil mills, nec.
- 2094 Grease and tallow
- 2096 Shortening and cooking oils

Textiles:

- 2211 Weaving mills, cotton
- 2221 Weaving mills, synthetics
- 2231 Weaving, finishing mills, wool
- 2241 Narrow fabrics mills
- 2253 Knit outerwear mills
- 2254 Knit underwear mills
- 2256 Knit fabric mills
- 2259 Knitting mills, nec.
- 2261 Finishing plants, cotton
- 2262 Finishing plants, synthetics
- 2269 Finishing plants, nec.

- 2281 Yarn mills, except wool
- 2282 Throwing and winding mills
- 2283 Wool yarn mills
- 2284 Thread mills
- 2291 Felt goods, nec.
- 2293 Padding and upholstery filling
- 2294 Processed textile waste
- 2295 Coated fabric, not rubberized
- 2296 Tire cord and fabric
- 2297 Scouring and combing plants
- 2298 Cordage and twine
- 2299 Textile goods, nec.
- 2328 Work clothing
- 2381 Fabric dress and work gloves
- 2393 Textile bags
- 2394 Canvas products
- 2396 Apparel findings
- 2399 Textile products, nec.



Wood products:

- 2411 Logging camps and contractors
- \* 2421 Sawmills and planing mills
- \* 242121 Rough and dressed hardwood lumber
- \* 242128 Rough and dressed softwood lumber
- 2426 Hardwood dimension and flooring
- 2431 Millwork plants
- 2432 Veneer and plywood plants
- 2433 Prefabricated wood products
- 2441 Nailed wooden boxes and shooks
- 2442 Wirebound boxes and crates
- 2443 Veneer and plywood containers
- 2445 Cooperage
- 2491 Wood preserving
- 2499 Wood products, nec.
- 2541 Wood partitions and store fixtures
- 2542 Metal partitions and store fixtures

Paper products and printing:

- \* 2611 Pulp mills
- \* 2621 Paper mills, except building
- \* 26211 Newsprint
- \* 26212 Uncoated groundwood paper
- \* 26213 Coated printing and converting paper
- \* 26214 Book paper, uncoated
- \* 26215 Fine paper
- \* 26216 Coarse paper
- \* 26217 Special industrial paper
- \* 26218 Sanitary tissue

- \* 262186-7 Industrial and packaging tissue
- \* 2631 Paperboard mills
- \* 26311 Container board
- \* 26312 Special food board
- \* 26313 Folding boxboard
- \* 26314 Set-up boxboard
- \* 26315 Special paperboard
- \* 26316 Wet machine board
- \* 2641 Paper coating and glazing
- \* 2642 Envelopes
- \* 2643 Bags except textile bags
- \* 26431 Grocers', variety and shopping bags
- \* 26432 Specialty bags and liners
- \* 26433 Shipping sacks, multiwall bags
- \* 2645 Die cut paperboard and paper
- \* 2647 Sanitary paper products
- \* 2649 Converted paperboard products
- \* 2651 Folding paperboard boxes
- \* 2652 Set-up paperboard boxes
- \* 2653 Corrugated and solid fiber boxes
- \* 2654 Sanitary food containers
- \* 2655 Fiber cans, tubes, drums, etc.
- \* 26551 Fiber drums
- \* 26558 Fiber cans
- \* 26559 Fiber cores, tubes, cones, reels, spools, etc.
- \* 2661 Building paper and building paper mills
- 2751 Printing: letterpress
- 2752 Printing: lithographic
- 2753 Engraving and plate printing
- 2761 Manifold business forms
- 2789 Bookbinding and related work
- 2791 Typesetting
- 2793 Photoengraving
- 2794 Electrotyping and stereotyping

Chemicals:

- 2812 Alkalies and chlorine
- 2813 Industrial gases
- 2814 Cyclic (coal tar) crudes
- 2815 Intermediate coal tar products
- 2816 Inorganic pigments
- 2818 Organic chemicals, nec.
- 2819 Inorganic chemicals, nec.
- \* 2821 Plastics materials and synthetic resins
- \* 2822 Synthetic rubber
- \* 2823 Cellulosic man-made fibers
- \* 2824 Organic synthetic fibers, noncellulosic
- 2831 Biological products
- 2843 Surface active agents
- 2851 Paints and varnishes
- 2861 Gum and wood chemicals
- 2871 Fertilizers
- 2872 Fertilizers, mixing only
- 2873 Agricultural pesticides
- 2879 Agricultural chemicals, nec.
- 2891 Glue and gelatin
- 2892 Explosives
- \* 2893 Printing ink
- 2894 Fatty acids
- 2895 Carbon black
- 2899 Chemical preparations, nec.

Petroleum products:

- 2911 Petroleum refining
- 2951 Paving mixtures and blocks
- 2952 Asphalt felts and coatings
- 2992 Lubricating oils and greases
- 2999 Petroleum and coal products, nec.

Rubber and plastics:

- \* 3011 Tires and inner tubes
- \* 3031 Reclaimed rubber
- \* 3069 Fabricated rubber products, nec.
- \* 30691 Rubber belting
- \* 39692 Rubber hose
- \* 30693 Sponge and foam
- \* 30694 Rubber floor and wall covering
- \* 30695 Mechanical rubber goods
- \* 30696 Rubber heels and soles
- \* 30699 Other industrial rubber goods
- \* 3079 Plastics products, nec.
- 3111 Leather tanning and finishing
- 3121 Industrial leather belting
- 3131 Footwear cut stock

Glass, clay products:

- \* 3211 Flat glass
- \* 3221 Glass containers
- \* 3229 Pressed and blown glass, nec.
- \* 32292 Lighting and electronic glassware
- \* 32293 Textile type glass fiber
- \* 32294 All other pressed and blown glassware
- 3231 Products of purchased glass
- 3241 Cement, hydraulic
- 3253 Ceramic wall and floor tile
- 3255 Clay refractories
- 3259 Structural clay products, nec.
- 3264 Porcelain electrical supplies
- 3271 Concrete block and brick
- 3272 Concrete products
- 3273 Ready-mixed concrete
- 3274 Lime
- 3275 Gypsum products
- 3281 Cut stone and stone products

- 3291 Abrasive products
- 3292 Asbestos products
- 3293 Gaskets and insulations
- 3295 Minerals: Ground or treated
- 3296 Mineral wool
- 3297 Nonclay refractories
- 3299 Nonmetallic minerals, nec.

Ferrous and nonferrous products:

- \* 3312 Blast furnaces and steel mills
- \* 33122 Steel ingots, bars and shapes
- \* 33123 Steel strip, sheet and plate
- 3313 Electrometallurgical products
- \* 3315 Steel wire drawing
- \* 33151 Ferrous wire and wire products
- 3316 Cold finishing of steel shapes
- 3317 Steel pipe and tubes
- 3321 Gray iron foundries
- 3322 Malleable iron foundries
- 3323 Steel foundries
- 3331 Primary copper
- 3332 Primary lead
- 3333 Primary zinc
- 3334 Primary aluminium
- 3339 Primary nonferrous metals, nec.
- 3341 **Secondary** nonferrous metals
- \* 3351 Copper rolling and drawing
- \* 33515 Copper rod bar and mechanical wire
- \* 33516 Copper plate sheet and strip
- \* 33517 Copper pipe and tube
- \* 3352 Aluminium rolling and drawing
- \* 33522 Aluminium sheet plate and foil
- \* 33525 Aluminium extruded shapes
- \* 33526 Aluminium pipe and tube
- 3356 Rolling and drawing, nec.
- \* 3357 Nonferrous wire drawing, etc.

- \* 3361 Aluminium castings
- 3362 Brass, bronze, copper castings
- 3369 Nonferrous castings, nec.
- 3391 Iron and steel forgings
- 3392 Nonferrous forgings
- 3399 Primary metal industries, nec.

Fabricated metal products:

- 3411 Metal cans
- 3429 Hardware, nec.
- 3431 Plumbing fixtures
- 3432 Plumbing fittings, brass goods
- 3433 Nonelectric heating equipment
- 3441 Fabricated structural steel
- 3442 Metal doors, sash, and trim
- 3443 Boiler shop products
- 3444 Sheet metal work
- 3449 Miscellaneous metal work, nec.
- 3451 Screw machine products
- \* 3452 Bolts, nuts, washers, and rivets
- 3461 Metal stampings
- 3471 Plating and polishing
- 3479 Metal coating, engraving, etc.
- 3481 Fabricated wire products, nec.
- 3491 Metal barrels, drums and pails
- 3493 Steel springs
- 3494 Valves and pipe fittings
- 3496 Collapsible tubes
- 3497 Metal foil and leaf
- 3498 Fabricated pipe and fittings
- 3499 Fabricated metal products, nec.

**Machinery and components:**

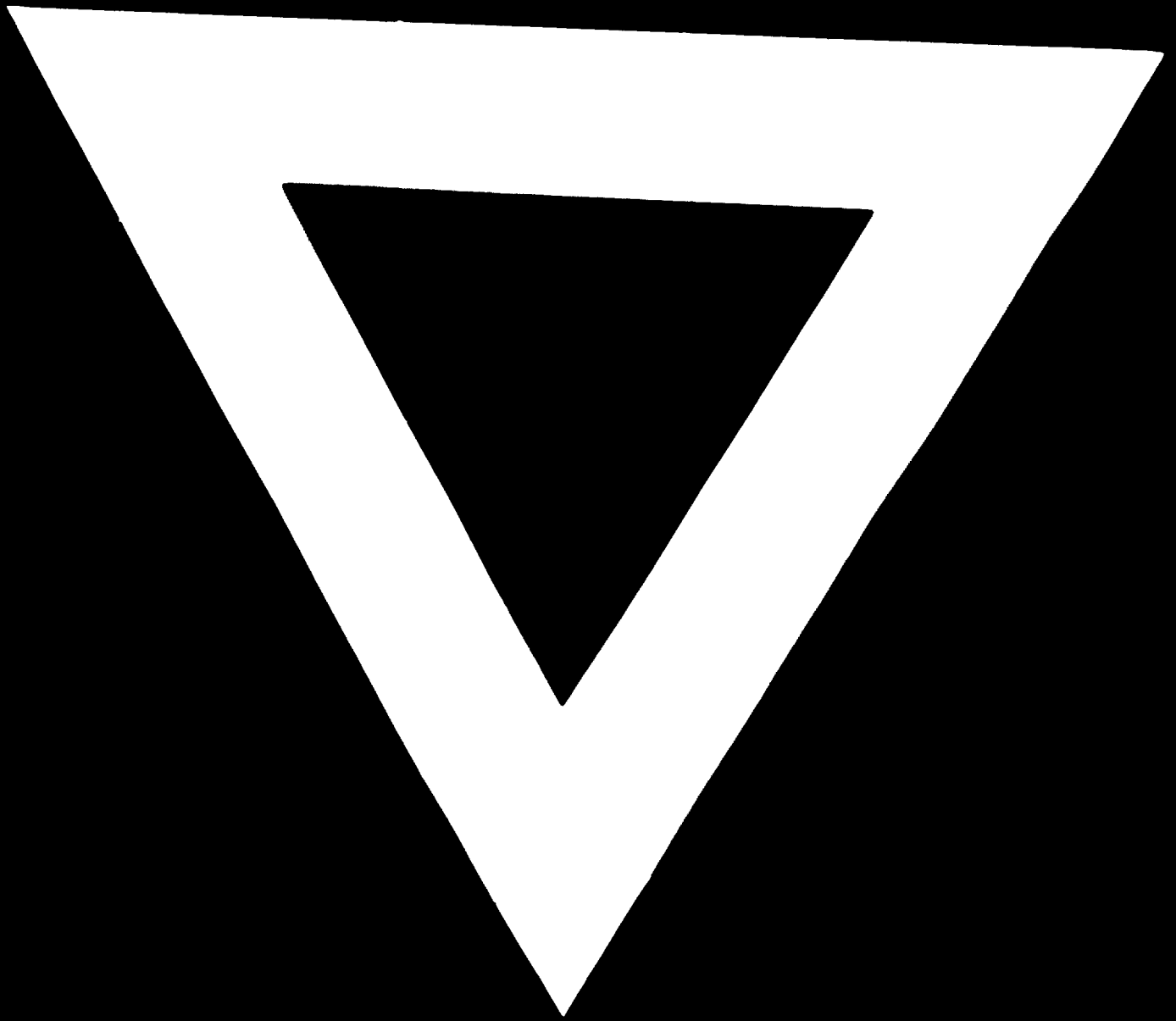
- 3511 Steam engines and turbines
- 3519 Internal combustion engines
- 3522 Farm machinery and equipment
- 3531 Construction machinery
- 3532 Mining machinery and equipment
- 3533 Oil field machines and equipment
- 3534 Elevators and moving stairways
- 3535 Conveyors
- 3536 Hoists, cranes, and monorails
- 3537 Industrial trucks and tractors
- 3541 Metal-cutting machine tools
- 3542 Metal-forming machine tools
- 3544 Special dies and tools
- 3545 Machine tool accessories
- 3548 Metalworking machinery, nec.
- 3551 Food products machinery
- 3552 Textile machinery
- 3553 Woodworking machinery
- 3554 Paper industries machinery
- 3555 Printing trades machinery
- 3559 Special industry machinery, nec.
- 3561 Pumps and compressors
- \* 3562 Ball and roller bearings
- \* 35621 Ball bearings
- \* 35622 Roller bearings
- 3564 Blowers and fans
- 3565 Industrial patterns
- 3566 Power transmission equipment
- 3567 Industrial furnaces and ovens
- 3569 General industry machinery, nec.
- 3576 Scales and balances
- 3582 Commercial laundry equipment
- 3584 Vacuum cleaners, industrial
- 3585 Refrigeration machinery

- 3586 Measuring and dispensing pumps
- 3589 Service industry machines, nec.
- 3591 Machine shops
- 3599 Machinery, nec.
- 3611 Electric measuring instruments
- 3612 Transformers
- 3613 Switchgear and switchboards
- 3619 Electric transmission and distribution equipment
- \* 3621 Motors and generators
- \* 36211 Fractional horsepower motors
- \* 36213 Integral horsepower motors and generators
- 3622 Industrial controls
- 3623 Welding apparatus
- 3624 Carbon and graphite products
- 3629 Electric industrial goods, nec.
- 3643 Current carrying devices
- 3644 Noncurrent carrying devices
- 3671 Electron tubes, receiving type
- 3672 Cathode ray picture tubes
- 3673 Electron tubes, transmitting
- 3679 Electronic components, nec.
- 3691 Storage batteries
- 3692 Primary batteries, dry and wet
- 3694 Engine electrical equipment
- 3699 Electrical products, nec.
- 3715 Truck trailers
- 3811 Scientific instruments
- 3821 Mechanical measuring devices
- 3822 Automatic temperature controls
- 3831 Optical instruments and lenses
- 3861 Photographic equipment

Miscellaneous Products:

- 3955 Carbon paper and inked ribbons
- 3964 Needles, pins, and fasteners
- 3981 Brooms and brushes





**74.10.17**