OCCASION

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

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

Helmut MARSCHETZ

IS/REG Restricted
12 March 1986

15456

Draft Report

DATA PROCESSING REQUIREMENTS FOR COUNTRY INDUSTRIAL DEVELOPMENT REVIEW PROGRAMME

Regional and Country Studies Branch

Division for Industrial Studies

550

Patek

CONTENTS

A. OVERVIEW

A.1 Work assignment:

This report outlines the possibilities for IS/REG, to use data processing facilities for assisting staff and experts in rationalizing the compilation, storage, processing and retrieval of data used in the Country Review Programme.

A.2 Present organizational profiles and proposed targets:

[a] Volume targets of Reviews: From an existing output of an average of 15 Industrial Development Reviews per year, covering 15 different developing countries, an increase of up to an average of 25-30 Review Series per year is a proposed target of the Branch.

[b] Cycle targets of Reviews: This increased volume will reduce the present "cycle" of output from around 6 years to around 3 years with full coverage of nearly worldwide 90 developing countries to be analysed and reported.

[c] Quality targets: In addition, improved quality for each Review s envisaged. This quality target comprises mainly a better structure in tables, in some new formules for calculation, in additional tables, as well as graphical presentation for a better lay out and presentation of each Review.[1/]

[d] Updating targets: The presently used data bases and files from different sources via the mainframe computer of IAEA, are not quite up-to-date. An REG-attributed data bank could be very useful for such updating.

1/ See Data Base of Country Industrial Development Review Series IS/REG (draft), December 1985.

[e] Access targets: A direct access to filed data is proposed and should offer the possibility for "open access" for different kinds of requests by experts as well as by professional staff of REG via a data base management system of the Branch.

[f] Cost reduction targets: The present amount of US$4,000.- (1985) for joint services for using the resources of the mainframe computer system should not increase in the next years. With a view to increase the volume and to reduce the cycles (see [a] and [b]), improve the quality (see [c]), and strengthening the organizational aspects (see [d] and [e]), to be accomplished by an average of only 10 involved economists in REG, the investment in computer hard- & soft- and orgware should help avoid additional costs for joint services and personnel staff increase.

A.3. Analyzed organization of complete Reviews:

As documented in the Progress Report, dated November 20, 1985, all necessary needs of the Branch were analysed from an organizational point of view.

Up to the presentation of this Report and in continuation of the work assignment further analytical work was done.[1/] This allowed a comprehensive analysis of the needs in IS/REG which is summarised in this Report.

B. STARTING POSITION

B.1 Presently used EDP-resources in IS/REG:

Joint services by IAEA Computer Section for IS/REG via the Agency's computer system IBM 3081 with remote job entry from terminals 3270.

1/ Meetings with the Officer of the Branch, with system experts of IBM and DEC, and the analyses of the Report of external consultant Mr. Rastogi, concerning his summary of proposals for data bases used by UNIDO, EDP Section, SSU and REG.

[a] Data base management services comprising the DBMS resources by disciplines:

- National account statistics — Base: WB
- Industrial statistics — Base: SSU
- Foreign trade statistics — Base: UNSO
- Financial statistics — Base: IMF

Statistics and Survey Unit (SSU) of UNIDO supports the updating of data bases. Most of the data are stored in random access memory medias (discs). Some mass data do not have direct access; they are stored on sequential or index-sequential memory medias (tapes), because of the high volume of data.

[b] Computing services for time series analysis comprising computing services for tables for:

- Demographic analysis
- National accounts in time series
- Industrial statistics in sets of time series
- Trade statistics in sets of time series

The upload and requests for such computer programmes by the end-user are operated via the statistical user-language "SLANG" with a terminal. In the present version an expert can execute the requests in a socalled "BATCH MODE" only, to obtain the prinouts of tables from his demanded programme within an hour or day. Printed tables are supported by graphs if requested by the economist.

So neither the softwaretool "SLANG" nor the hardwaretool "TERMINAL" allows the end-user to communicate with the mainframe computer system in a dialogue mode to assist in the creation of a Country Review on-line.

[c] Other joint services: Hard- and software support, programming for individual needs as well as training and eduction. Also announced new services for communication and end-user workstation-support by EDP-Section specialists of IAEA. The demand for these services has grown rapidly.

Computer service costs for [a], [b] and [c] are covering computing time costs and terminal using costs.[1/]

B.2 The changing use of computers:

IS/REG has the responsibility for the Country Review Series and has defined targets in terms of volume, cycle and quality. With a view to achieving these targets, more computer capacity is required.

Focus of this decennium: Up to 1980 usually central organized computer systems served the staff in an office, but most of the staff members still have little access to or knowledge about the computer tools available to help them.

On the other hand, centralized computer resources did not follow the trend towards higher demands and increasing requirements of staff.

New technologies in computer hard- and software as well as new organizational methods in using such resources is the focus of this decenium. These are:

a. the use of Personal Computer (PC) with powerful capacity, configurated as "Expert Systems" on the desk of specialists assisting tasks in nearly each discipline, with integrated random access memory, applied as "stand alone units" or as multiple use unit.

b. the use of Communication Technologies, to link mainframe computer systems with small-scale computer units or PC-units for in-house or gateway communication, and/or to open the possibilities of network services.

c. the Standardization of codes and procedures for better communication compatibility between competitive units, to realize socalled "open systems" with "mixed hardware" and standardized system software and communication protocols.

1/ See IAEA, Computer Resource Rates, No. 145, 85-12-23.

d. a sum of New Tools, applicable to PCs, specially the very popular types of software packages i.e. the Spreadsheet Table Calculator, the intergrated Word-Processing Programmes, the dynamic Window Technique, the Business Graphs, and the integrated Data Base Management.

C. THE PROPOSAL FOR HARDWARE, SOFTWARE AND ORGWARE

Three components are included in this proposal:

- Hardware Configuration Proposals (see C.1)
- Software Application Proposals (see C.2)
- Orgware Needs and Proposals (see C.3)

C.1 THE HARDWARE CONFIGURATION

C.1.1 PC-hardware specification and performance proposed:

The use of Personal Computer (PC) is an essential need in IS/REG, to assist the economist's tasks in creating and generating a complete Review at his own desk. The power and performance of the PC allows this to be undertaken at each working place independently. This technology should be open for economists of IS/REG.

The highlight of the proposed specification of one PC-unit:

- a mass memory on floppy discs (two drives)
- a mass memory on hard disc
- a communication set of software (see C 2)

The floppy disc will file all transactions of data during computing. The hard disc will file all data within a data base as well as completed results of one Review.

PROPOSED SPECIFICATION:

- CPU (Central Processing Unit) with 16-bit processor or 32-bit processor. The 32-bit processor allows the highest speed in computing, however in communication with other hard- & software components only. The user should not insist upon a 32-bit processor, if a tender offers only a 16-bit processor.

- RAM-Memory with a maximum of 512 kilo-bytes capacity. This Random Access Memory (RAM), an integral part of each PC-unit, with the proposed capacity is necessary if a user works with PC-units in a network system. The capacity is also necessary for loading programmes from disc into RAM. If the programmes are too large, too much overheads occur while using the programmes (and this costs computing time). It is also noted that integrated tools (i.e. spreadsheets) are only operating under optimal conditions with this RAM-capacity. It is therefore proposed not to reduce this 512-KB capacity.

- ROM-Memory (Read Only Memory), an integral part of each PC-unit, (i.e. 40 kilo-bytes), is not susceptible by the end-user.

- Keyboard with programming function keys and US-Character-Set and moveable.

- Color-Graphic-Monitor, (25/80). Some tenders are offering colored monitor and graphic monitor on extra costs, IBM i.e. is offering color/graphic monitors in combination only.

- Floppy Disc Unit, with a capacity of 320 kilo-bytes, with double drives (2 D).

- Hard Disc Unit (integral or stand by unit) in Winchester Technology, with a proposed capacity of 10 mega-bytes. PC-expert places are mostly equipped with 10 mb disc capacity. This 10 mb disc is attributed to each PC-unit, and in regard to the REG project (with a proposed high volume of stored base data and of strongly output oriented in text, tables and grahs), is to be judged by an additional data base memory of 50 mega-bytes within the network for common access from each expert place (This additional DBMS is commented under C.1.5).

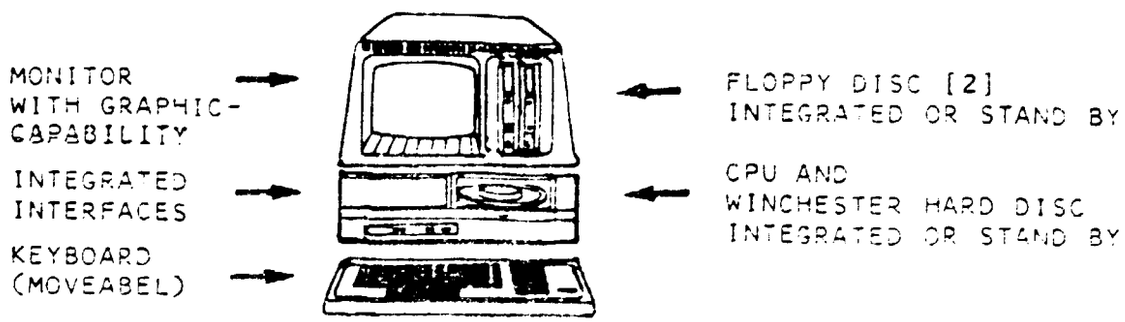
- Adaptor Card for parallel printer unit.

- Adaptor Card for Graph printing mode.

- Adaptor Card for asynchronous ASCII-Character Transfer (RS-232-C Interface, CCITT-V.24-Norm).

- LAN Adaptor Card (Local Area Network).

- 3270 Emulation Card, to emulate transactions from and to the mainframe computer system (Host-System IAEA).



Note: Actual design of shown equipment is variable (i.e. hard disc unit can be configurated as a stand-by unit).

C.1.2 LQ-Printer specification:

Configurated as a stand-by unit on the desk of a working place, combined with a PC-unit, a Letter Quality Printer (LQP) should have following specification:

- printing speed 120 cps, bi-diectional (or higher);
- US-Character Set + graph-characters;
- printing matrix: 9 x 9 points (or higher);
- graph matrix: 480 points per line (or more);
- Centronics Interface;
- changeable image of characters
- adaptor card to PC-unit.

According with the installation of a Laser Printer for final edition of Reviews (see C.1.6), the LQ-Printer could be configurated with lower capacity and with reduced image of typesetting (i.e. a "Near Letter Quality Printer = NLQ-P).

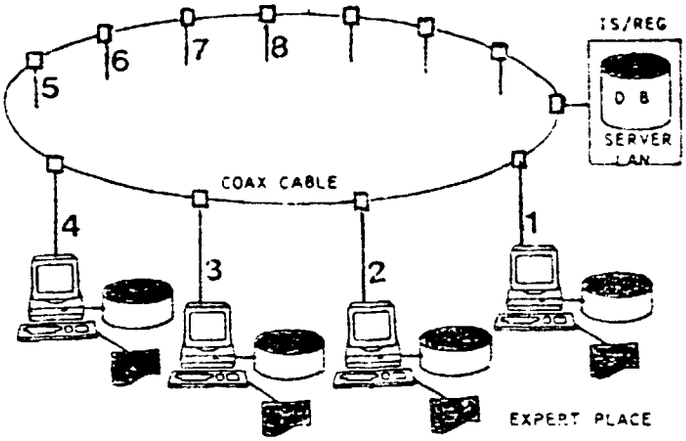
C.1.3 LAN - Specification:

To allow more than one economist involved permanently in Country Review tasks and other assisting staff members as well as responsible managers of REG to work with their PC-units at the same time with common access to the attributed data base, it is necessary to enlarge the architecture of each installed PC-unit from a Single Used PC-Unit to a Multiple Used PC-Unit. This enlargement of architecture can be done in some different ways. One of the most preferable ways is the use of a LAN (Local Area Network) consisting of hard- & software components.

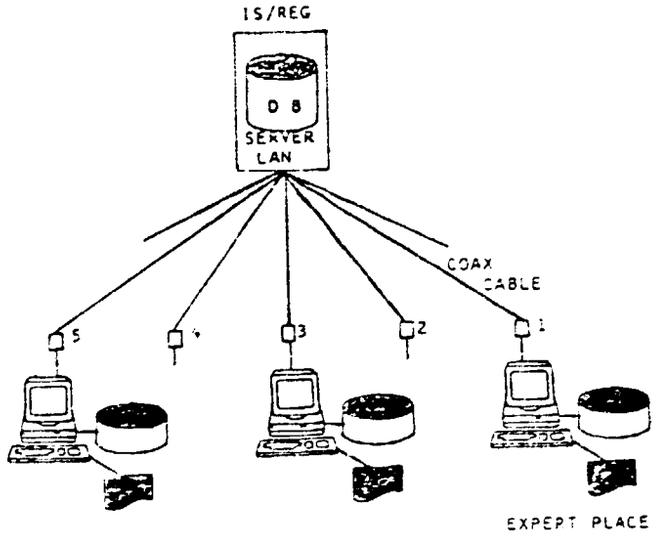
The LAN-Architecture opens this possibility and would be the first step into the world of an in-house and gateway communication system for UNIDO.

Three different LAN-Configurations can be realized:

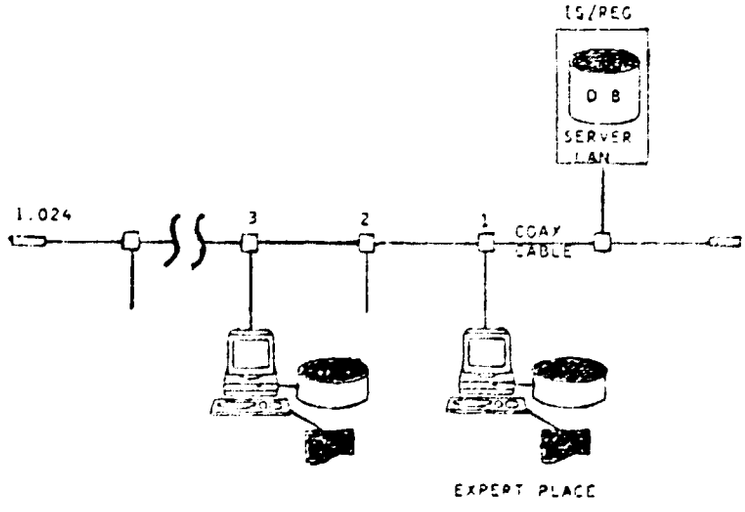
+ the current loop configuration



+ the cascade-configuration



+ the BUS-configuration



LAN-hardware is more or less a calbe (Coaxe) linkage set in combination with LAN-Server-Units supported by Network-software.

Each linkage point (node) occupies in each PC-unit one port (Slot).

The specification follows the normed LAN-Procedures and Protocols (ISO and CCITT-Norm).

The selection of LAN by an end-user is depending on two profiles:

- the quantity (number) of PC-expert places to be linked within the network;
- the transfer rate in kilobytes/time unit from and to the data base unit within the network.

(Example: The S & K - LAN with a maximum of 16 nodes or the ETHERNET with a maximum of 1,024 nodes).

ETHERNET is developed by XEROX, INTEL and DIGITAL EQUIPMENT in association and used by nearly all top 10 of computer dealers and software houses.

LAN-Conception has a great future, because one net can be connected with another or more nets.

The selected hardware dealer and/or the software house must give support to installation of LAN-Equipment and must guarantee the compatibility and standardization of the network system.

C.1.4 Server units specification:

Server units are necessary equipments to handle all data transactions wtihin the network and from and to the host system (mainframe computer). Following boxes/units of servers are necessary:

- communication server;
- print server (if the net includes a laser printer);
- file server.

The primary specification is not of importance for the end-user but the tender has to warrant the function of the server units within the installed network.

C.1.5 The data base unit specification:

In addition to the hard disc unit pertaining to each PC-Place (see C.1.1) with the capacity of 10 mb, it is proposed to configurate a separate hard disc unit used for Data Base Management System (DBMS) with a capacity of 50 megabytes within the network.

This DMBS allows the common access from each expert place. This 50 mb DBMS stores all:

- transferred data (base data) from the host system;
- data banks to compute Basic Indicators;
- data banks to calculate tables, to store mathematical formulas, etc.;
- programmes to be used via PC-Expert Places (tools);
- summarized data of complete Reviews to be kept year by year for different kind of requests.

At the moment a calculation of raw data volume only, covering 20 Country Reviews has been done. The calculated DBMS of 50 mb should offer enough space and there should be the possibility to enlarge this capacity and to upgrade it to twice the volume proposed. That can be done easily.

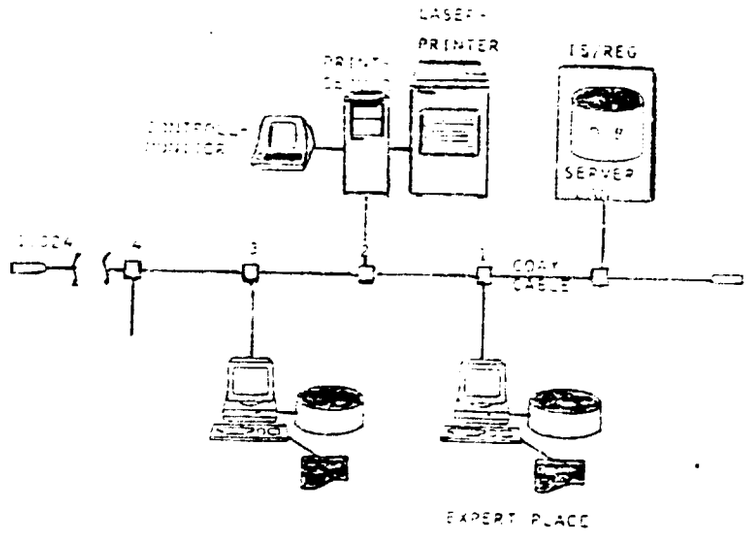
This DBMS attributed to IS/REG, integrated in the LAN will be under the entire responsibility of the Branch. It opens the possibility, to reduce the capacity of each Expert Place (PC-Unit Hard Disc) with its individual stored data and allows a common access to above mentioned data banks and programmes from each Expert Place via the LAN.

C.1.6 Electronic printer (laser printer) specification

It is possible to include a laser printer within the LAN-network system. In this case, an additional Print Server is necessary (see C.1.4).

The Corporate Electronic Publishing System (CEPS) opens the possibility for REG-Branch with relatively low costs to print and to publish (instead of copying) the Country Review Series, thus avoiding the need to have the printing work done by UNIDO or commercial printers.

This in-house publishing gives the Branch greater control and flexibility and reduces the copying costs and production time by a factor of 5 to 10. In this case a laser printer is shown to be the most economic printing method up to around 700 copies of Reviews.



The chart shows, how a printing system could be integrated with the network, served by the PC via the LAN (together with Word-Processing-Software), which enables text and graphs to be integrated electronically and printed by the laser print unit. This would be a powerful combination.

The specification is only depending on quantity of copies of Reviews and quality of typesetting and character image and graphic image, and last but not least the warranty of compatibility within the network-procedures. The tender has to guarantee this specification.

There are some potential producers of laser printers, but mostly they are not identical with well known computer producers. Rank Xerox for instance has such printer units in their programme (type 8010/8030 and 8040). These models are fully compatible within the mentioned ETHERNET.

C.1.7 The streamer tape unit

Depending on the decision of the end-user, a streamer tape unit is the most useful medium for backups.

A streamer tape unit is an integral part of the DBMS-unit in the size of a cassette, available at very low costs.

In the case of REG project, this streamer tape should have a capacity of 50 megabytes and a minimum transfer rating time of 20 mb in 7 minutes.

C.2 THE SOFTWARE APPLICATION PROPOSALS

Distinguish between:

system-software and

user-software;

Distinguish further between:

individual user software

standard user software

user software tools.

C.2.1 The system software

It is recommended to use the D.O.S. System Software. It is worldwide the most preferable system software (engineered by an international software house and offered by computer dealers).

The tender for this DOS-Software has to declare his updated last VERSION[1/] ("Release") and to guarantee:

- PC support ability
- graphic mode ability
- communication mode ability

1/ New system software VERSIONS are services of the computer dealer or of the software house, within a licence contract.

Further specifications: including all necessary UTILITIES (i.e. SORT of data, MERGE, SEARCH, etc.) and a powerful QUERY-LANGUAGE with a small set of commands for the end-user to cover the needs of an expert on each PC-place for special statistical tasks with his attributed files and data.

C.2.2 The 3270 emulation

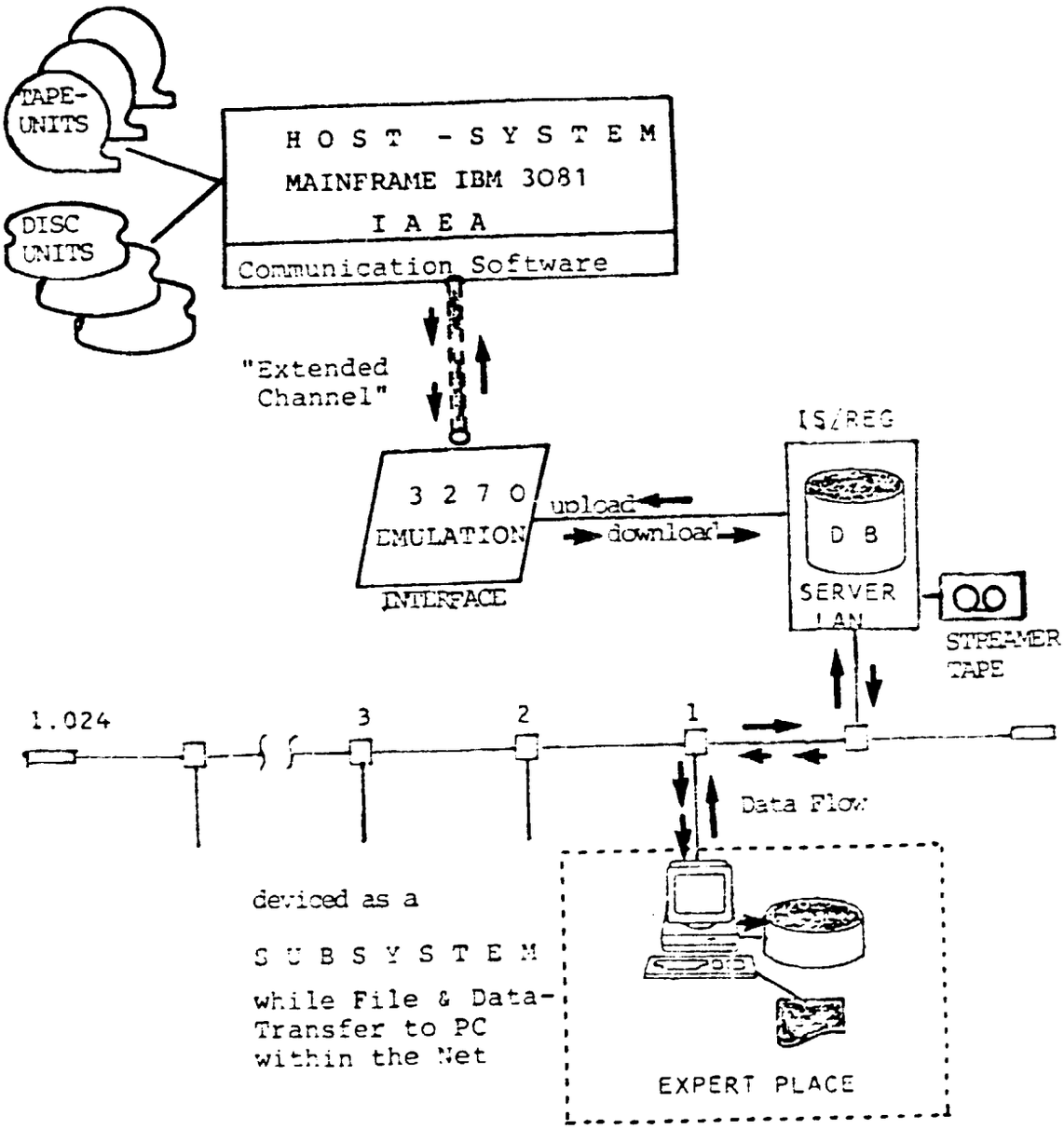
It is proposed to reduce the use of the mainframe computer system IBM 3081.

The joint services should be solely used for transfer of complete files from the mainframe data bases. For this transfer of data and files, each PC-unit must be able to emulate the "3270 - Procedures" (see C.1.1 Emulation Card).

During this procedure the PC-unit will be deviced as a Subsystem and the mainframe computer operates as a Host system.

No further use of computing programmes (as there are table-computing and output, graphic-computing and output, etc.) is necessary anymore from the mainframe system.

To facilitate such data transfers from host system to subsystem via the 3270-emulation, a socalled "Extended Channel" (a hard- & software component) equipped in the mainframe computer, is necessary to allow a data transfer rate speed of 600 kb/sec.



ORGANOGRAMME OF HOSTSYSTEM-SUBSYSTEM with hard- & software components and 3270-Interface and data flow for upload and download procedures.

C.2.3 Back ups

A daily backup should be done for all sensitive data to store, protect and safeguard such data. Backup routines are a part of the system software, operated via a "master terminal" (PC).

A backup could be done via the hardware resources:

- **floppy disc or a**
- **streamer tape unit.**

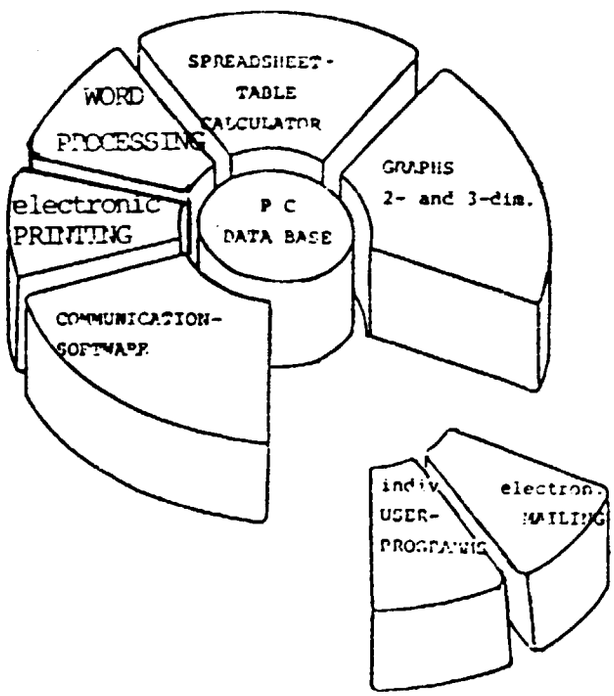
To use such hardware components is just a question of data volume to be protected from destruction.

The backup data, stored on a separate medium (i.e. floppy disc or streamer tape), has to be filed in a separated room of the office.

C.2.4 The user software and tools

The analysis gives the perception that most of the computing needs in IS/REG can be done with so-called Standard Programmes and Tools (see C.2 [d] "The Change of Use of Computers").

The use of such tools by experts and economists in IS/REG gives an entirely independence from EDP-programmers and other EDP-experts (external or internal). Only the knowledge about the use of such tools in the disciplines of economic science, assisted by staff members and managers is necessary. It is comparable with a "driving licence" for automobiles, without being skilled in construction or repair of cars.



This organogramme chart shows the different kind of TOOLS proposed. The application could be enlarged with the model "electronic mailing" later on.

S p e c i f i c a t i o n s:

a/ TOOL: Communication Software

already defined

b/ TOOL: Wor' Processing

- to edit, store and print any kind of texts as there is "standard text" and "individual text" in an alternative mode
- to copy text from other files into currently used files
- to display such text in two different windows
- all functions of changing, shifting and deleting text
- function of automatic taking over of pages
- to insert text with graphs from other files and data from tables via the DBMS
- to number pages automatically
- to set different page formats
- to underline, in bold or italicized

c/ TOOL: Spreadsheet Table Calculator

- minimum of 256 columns and multiple rows
- simultaneous work on the monitor of up to three different tables
- automatic cell formatting, with security protect of data cells
- use of dynamic window technique with a look up into three different files
- to set forward and backward references
- all mathematical, financial and statistical functions, including "goal-seeking methods" to calculate variables from predefined models
- combining tables with text via word-processor
- combining tables with related data bases via DB-Management

d/ TOOL: Two- and Three-Dimensional Graphs

- two-dimensional graphs from raw data for bar-charts, line graphs and pie-charts
- three-dimensional graphs for bar-charts
- display of graphs with window technique
- insert text into the graph, as well as individual editing of text via word-processor
- easy changes over text, titles, axes and dimensions with change of variable parameters
- combined access to DBMS
- output of graphs via LQP

e/ TOOL: Electronic Mailing

New complete software-tools are available.

f/ TOOL: Electronic Printing by LASER

- supported by the print server unit
- xerographic Laserprint quality
- imaging 300 x 300 per square inch (or print pattern 14.400 points per cm^2 after DIN-Norm)
- minimum printing speed: 12 pages per minute
- noiseless printing in typesetting quality

C.3 ORGWARE PROPOSALS

C.3.1 Human aspects[1/]

To realize a project in an organization with HARDWARE EQUIPMENT and SOFTWARE TOOLS it is necessary to consider carefully all impacts of the project.

1/ Following the paper "The changing use of computers in organization of the United Nations system in Geneva" (Joint Inspection Unit) 1985/2.

That means: To control the influence of a computerized system project to human relations in

- changed or new procedures to fulfill the tasks
- new media to assist routine work
- changed or new data flows
- innovating possibilities offered by the "new" system
- learning potentials for all involved members of a department (managers, experts and administrative support staff)

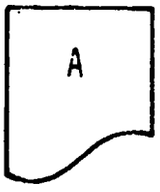
All organizational measures taken for such a project may be summarized in

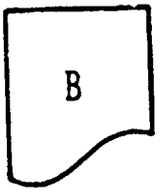
"O R G W A R E"

The Orgware must also include provision of a high-level perspective to ensure that the system fits with and supports overall organizational objectives, re-thinking of old assumptions and methods of operation.

C.3.2 The organizational structure of a review

Each country review shows:

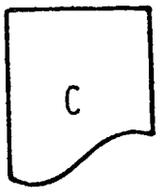
A bloc of data & text	Definition of fixed or variable data & text	Examples:
	The structure of "Standard Text" "f i x e d"	Head-text, footnotes, abbreviation-listings, all table-matrix-texts....



The structure of "individual text"

"v a r i a b l e"

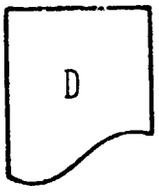
All variable text, to comment upon the analyses of a review....



The structure of different kind of "tables"

"f i x e d" and
"v a r i a b l e"

All computed figures of Basic Indicator-tables, standard tables and appendix tables....



The structure of "graphs"

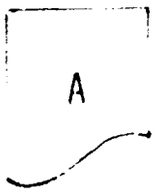
"f i x e d" and
"v a r i a b l e"

All graphs (Line, bar, pie) to highlight the computed table results

Note: To check up, if proposed standard software-tools are suitable to fulfil the targets of new procedures, it was necessary to identify a repeating structure in each Review.

C.3.3 <u>The applicability of hard- and software tools</u>:

(regarding C.1 and C.2)



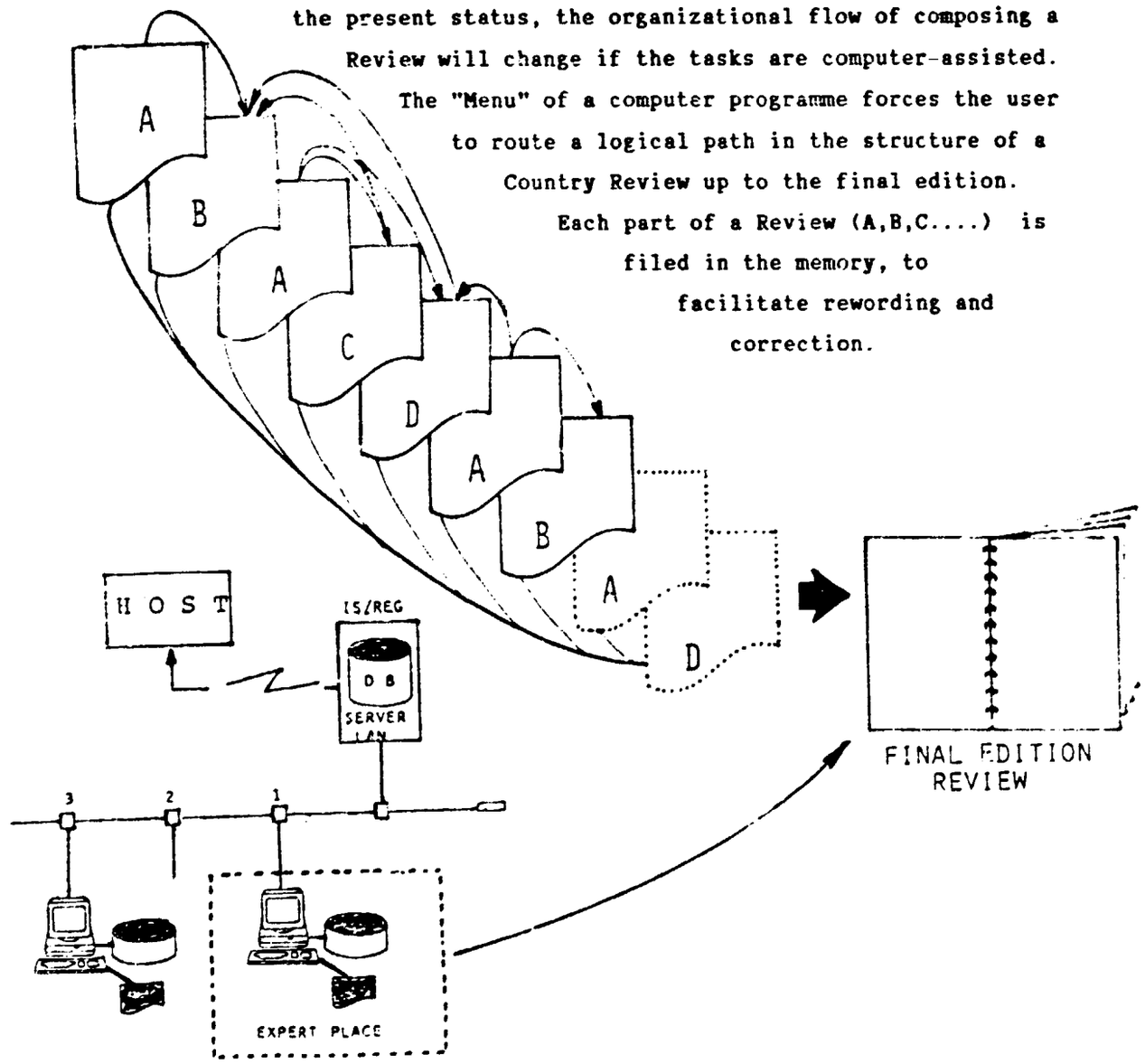
<u>Software tool</u>	<u>Storage medium</u>	<u>Hardware tool</u>
Word-processing-software to insert "standard text" with integrated use of Data Base Management on Expert Place	REG/DB and Expert-DB	PC and peripheral units (laser)

Word-processing-software to key in variable "individual text", with dynamic window technique to "C", with integrated use of DBM and integrated typesetting and electronic printing	Expert-DB	PC and peripheral units (laser)

C	Spreadsheet-table-calculator-software to compute all variable figures, with integrated use of DBM-Expert-Place and DBM-IS/REG in combination with "A" and "B"	REG-DB and Expert-DB and mainframe-host-DB	PC and peripheral units and LAN-Server and mainframe-computer
D	Graph-software with inserted results from "C" in combination with "A" and/or "B" and integrated electronic printing	REG/DB and Expert-DB	PC and peripheral units (laser)

C.3.4 The organizational flow within the structure of a Review:

Various steps are required to produce a Review. Compared with the present status, the organizational flow of composing a Review will change if the tasks are computer-assisted. The "Menu" of a computer programme forces the user to route a logical path in the structure of a Country Review up to the final edition. Each part of a Review (A,B,C....) is filed in the memory, to facilitate rewording and correction.



C.3.5 A changed use of mainframe computer services:

1. Parts "A" and "B" and "D" in the structure of a Review, its editing of text, its calling up and computing of figures inserted in the text or in a graph, can be covered by the mentioned software-tools via the PC-Expert-Place, without using the mainframe computer system (IAEA).

2. Part "C" in the structure of a Review is also an ideal application to create and compute different kinds of tables with the calculating functions available in the software-tool "Spreadsheet Table Calculator" via the PC-Expert-Place, without using the mainframe computer system.

3. Those parts of part "C" in a Review needing files and data from the mentioned data bases, stored in the mainframe computer memory, should be further used via PC-Expert-Place, supported by LAN, by File Server and by 3270 Emulation. These tools allow the expert, to call up and to have a direct access to the DBMS of the mainframe computer and to transfer complete files for his use.

4. The transfer of files should not proceed in the mode of Remote Job Entry via "Slang" and "Terminal", as at present, but in the mode of direct access and transfer of needed files with support of mainframe software.

5. With these transferred files, the expert is able to start his individual computation with relevant functions via his PC and his individual corresponding DB-Memory.

C.3.6 A changed use of typewriters:

It is proposed that no further use should be made of typewriters with word-processing memory for the purpose of typing text from drafts of Reviews. This implies that:

- each expert creates his text ("B" variable part of a Review) by himself and keys in this text as a raw draft via his keyboard of his PC-unit in connection with using the function "Text Editing" with automatic storage on the DB of IS/REG;

- it is possible to display this raw text via the function "Look Up Text" from any PC-Place in the office (can be done with or without password);

- it is possible to add further text or text-blocs, to delete characters, words, sentences, paragraphs or blocs as well as to add or insert "standard text" into the variable text and to set the raw draft in a format on the screeen of the monitor.

- it is possible to print out the draft or the final edition of all stored texts (for further rewording or acceptance by the responsible manager);

- it is possible to repeat this procedure as often as required;

- it is possible to insert the final text in tables and graphs, all to be done via the monitor as well as via printer.

C.3.7 Using the tools without programming knowledge:

a. Creating own formulas with the Spreadsheet Calculator:

This tool needs no programming knowledge, if the end-user operates with the table calculator. The specialist/economist must be able only, to define mathematical formulas in predefined tables (columns, rows, ranks and cells).

A one week training course and a two months experience in using the table calculator is proposed (i.e. to compute GDP, or to compute Basic Indicator 1-5... and all other different kinds of tables).

DIALOG PROGRAMM : _____

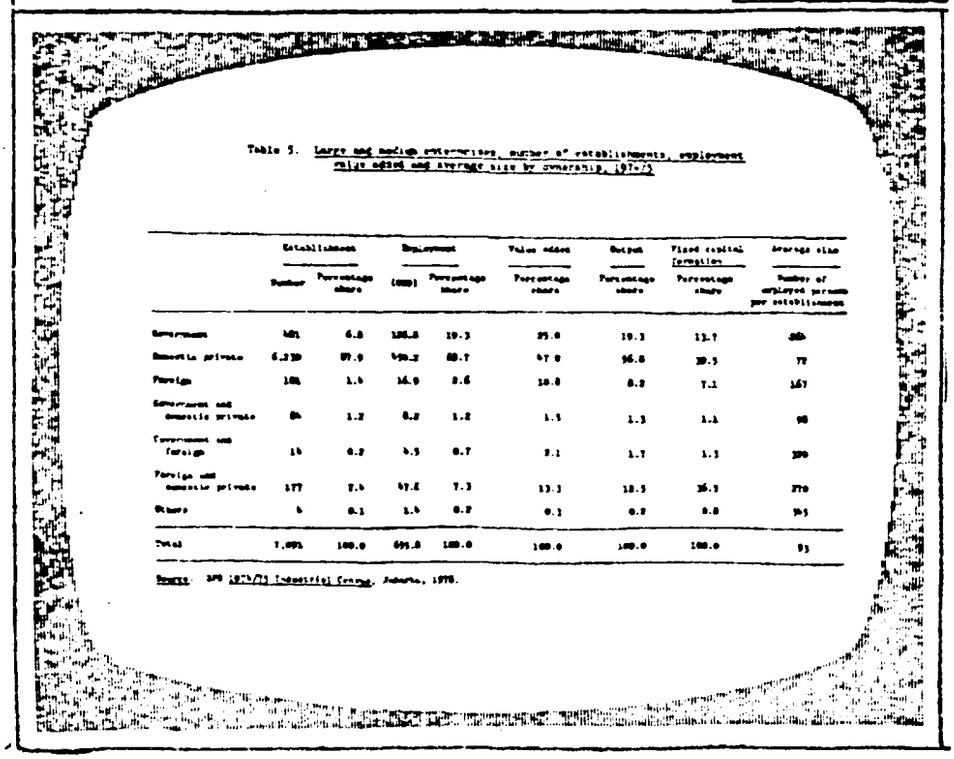


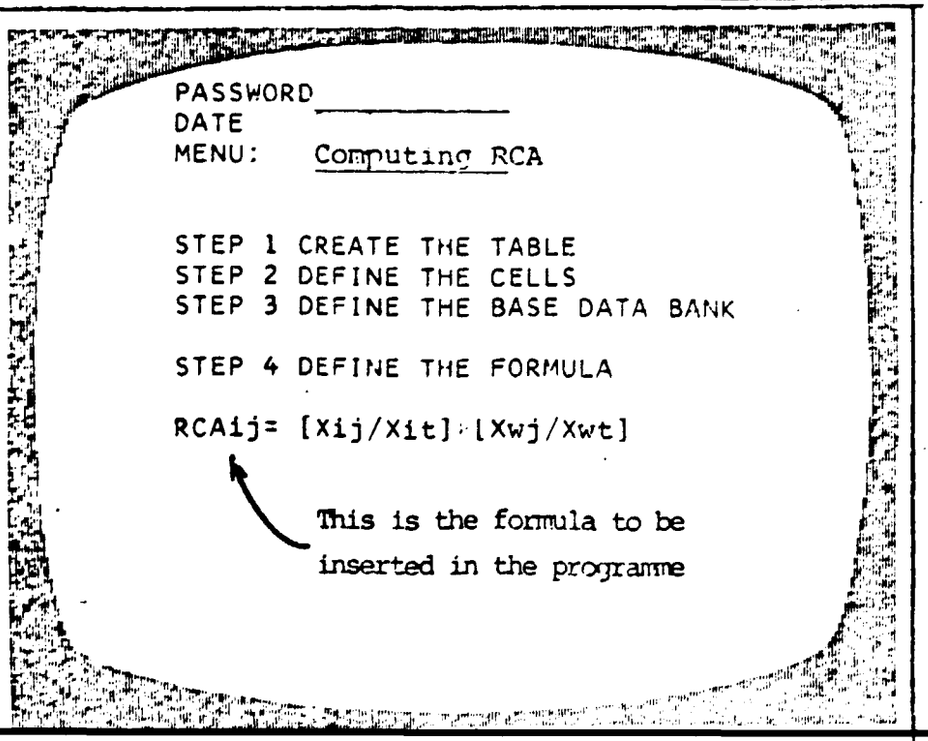
Table 5. Large and medium enterprises, number of establishments, employment, value added and average size by ownership, 1975/6

	Establishments		Employment		Value added	Output	Fixed capital formation	Average size
	Number	Percentage share	(000)	Percentage share	Percentage share	Percentage share	Percentage share	Number of employees per establishment
Government	401	6.0	180.8	19.3	25.0	19.3	12.7	450
Domestic private	6.230	87.9	580.2	60.7	47.0	56.8	30.5	72
Foreign	188	1.4	14.0	2.6	10.8	8.2	7.1	167
Government and domestic private	84	1.2	8.2	1.2	1.5	1.3	1.1	98
Government and foreign	15	0.2	4.5	0.7	2.1	1.7	1.1	300
Foreign and domestic private	177	2.5	97.6	7.3	13.1	12.5	35.9	270
Others	6	0.1	1.5	0.2	0.1	0.2	0.8	341
Total	7.095	100.0	895.8	100.0	100.0	100.0	100.0	93

Source: SSO 1975/76 Industrial Survey, Suburbia, 1978.

Another example, using the data base source SSU/national "compute the index of revealed comparative advantage" (i.e. Table No. 13 R C A).

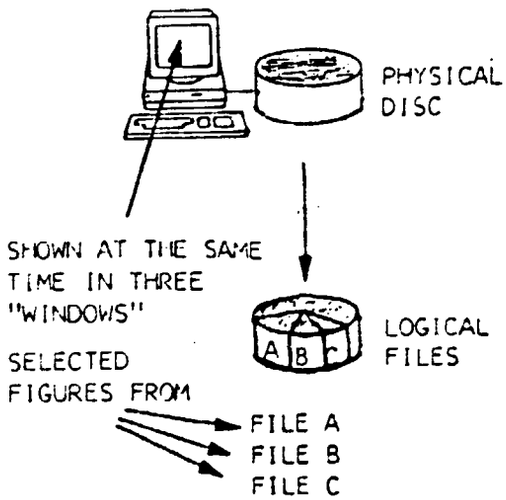
DIALOG PROGRAMM : _____



b. Using dynamic window technique with the Spreadsheet Calculator:

The window technique is a very good organizational help for the user. This technique allows an end-user on his PC to call more than one file from the DBMS, to select figures from these files, to show it in a "window" on the screeen of the monitor and to insert the needed data in the text.

This can be done only with a fingertip:



The next page shows: An opened window, and the insertion of figures from this window in a displayed text. This procedure reduces possible failures to a minimum.

ALOG PROGRAMM : EXAMPLE FOR DYNAMIC WINDOW TECHNIC

Ersatz:			vom:
Kapitel	Abschnitt	Seite	Datum

DVB

CHILE

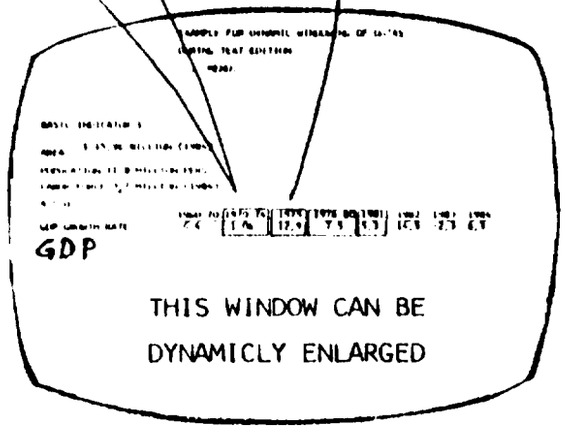
SUBMENUE: STEP; EXECUTIVE SUMMARY

....SINCE [1970] ECONOMIC GROWTH IN CHILE HAS BEEN ERRATIC. REAL GDP GREW BY [1] PER CENT IN [1970], FOLLOWING NEGATIVE GROWTH RATES IN THE PREVIOUS TWO YEARS. IT FELL BY [12,9] PER CENT IN [1975] AND SURGED UPWARD IN [1976], LEADING TO BUOYANT RECOVERY AND SUSTAINED GROWTH UNTIL [1981].....

..... CONTINUATION.....

CREATED TEXT BY ENDUSER

INSERTING



SHOWN DATAS (VARIABLES) BY WINDOW TECHNIC

ABBREVIATED EXAMPLE FOR USING THE TOOL "WINDOWING" FROM DBMS-RESOURCE, WHILE EDTITING OF TEXT

NOTE:

[ ] VARIABLE DATA EX DISPLAYED WINDOW FROM DBMS BASIC INDICATOR 1

C.3.8 Organizational needs to prepare the project:

The project should be divided into the following steps:

1. After decision has been made in principle for the project, nominate the internal (or external) personnel resources. They may consist of:
   an organizational expert with very good knowledge of systems analysis and a good feeling for all organizational needs for complex pojects.
   Estimated time of engagement: minimum 4 months, distributed over a 6 month period.
   an assisting economist of the Branch, familiar with all functions of creating a Country Review (EDP-knowlege not necessary).
   Estimated time of engagement: 2-3 months, distributed over a 6 months period.
   an assisting EDP-expert from IAEA or EDP Section, familiar with the software needs and communication of host systems.
   Estimated time of engagement: partly assisting time of some days, spread over a 6 month period.

   Installation of a project plan, distribution of responsibilities, project controlling, etc.

   Task of the organizational expert (system analyst):
   - to help in the selection of tenders;
   - to check the offers for hard & software;
   - to select the tools, to test the tools;
   - to define the needs for other software components with the selected software house;
   - to select the files from IAEA and to define the needs of file transfer to REG-data bank;
   - to check the created formulas from the economists;
   - to train in the use of tools at the end-user places in seminars;
   - to give help in using all equipments;
   - to watch the installation of the net and of the end-user places, with due consideration to ergonomical needs;
   - to provide help in input and output routines and filing system;

2. Preselection of hardware tenders:
   IBM, DEC, WANG (from the top 10 of micro-producers) and the tenders of "mixed hardware" (laser printer, network components, etc.); and the agreement with a potential software house, if a hardware tender is not able to fulfil the profiles, due to his policy.

3. Define all necessary resources in close connection with the selected tender, define all necessary organizational needs in the Branch.

4. Divide the project into parts, as shown in the project plan:
   - start with one PC-unit, including all cards and interfaces for the network system;
   - install the network and the DBMS within the net;
   - test the net and simulate the 3270-protocol;
   - test the communication services of the host system;
   - create the data bases and start with the test of the first implemented PC-unit;
   - train the use of tools;
   - create test-examples for tools and laser printer.

5. Start the actual work for a selected Country Review and test the results step by step as well as filing methods, back ups and reorganization of DBMS.

6. Installation of the second PC-unit for another Expert Place in the office and organizational training for all involved staff members.