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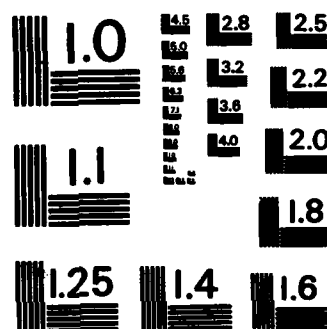
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FOREIGN TECHNOLOGY DIVISION



TELEINFORMATION AND MANAGEMENT

by

Elzbieta Siwak-Szczepek



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TELEINFORMATION AND MANAGEMENT

Elzbieta Siwak-Szczepek

INTRODUCTION

Celebrations of the Day of the Communicator in 1978 were dedicated the presentation of the start of the linkage department in planning and initiation of specialized systems of teleinformation. The Ministry of Communication and the Head Department of the Polish Electricians Association supported it.

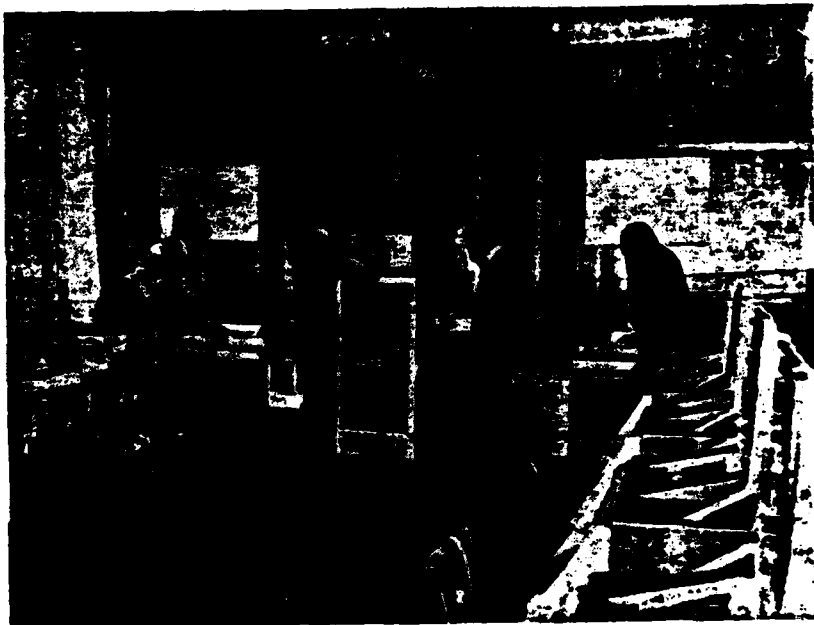
The celebrated technical study session took place in the building of the Head Department of Technical Organization. The subject was: "Organizational and Technical Means of Telex Communication for Automated Processing Needs of Management". There was an exhibit organized in the Building of the Directorate of Post and Telecommunications in Warsaw. Its motto: "Telex in Management Service" was motivated by the character of the exhibits relating to the usage of several systems.

Studies in this area are under the educational direction and patronage of the Minister of Communications — Professor Edward Kowalczyk — through the Centre of Technical Information and Data Processing in Warsaw, under the direction of Engineer Czeslaw Syca. The character of these studies will predetermine solutions introduced to the miscellaneous areas of management.

An additional, exceedingly economic premise for the propagation of the mentioned systems of teleinformation throughout the nation, is the achievement of national production of mini-computer equipment. It is generally available, relatively inexpensive and easily serviced. The telex network functions within

them as the basic information hookup and due to its structure it guarantees nationwide coverage.

Above all, this aspect gives the teleinformation system a higher ranking compared with traditional information systems. The flexibility and universality of programming the terminals contributes to the multiplicity of applications and in consequence compels the perfecting of methods and techniques of management. This approach to the problems of management is fully justified, because by proposing one available network for data transmission with unanimously determined methods and techniques of sending information, a standardized form of reception and interpretation of this information may be obtained. This is a sensible move. It aids in the automation of informational processes in management.



Photograph 1. Shows a general view of the exhibit room.

The exhibited teletypes on the right, connected to the network compile in the system BIST (Basic Information System Telex) the role of terminals allowing for broadcasting and reception of information. As a particular kind of terminal, they can be connected

with any telex subscriber in the nation. Information sent through the telex net is subordinate to certain changes imposed by the BIST system.

CHARACTERIZATION OF TELEINFORMATIONAL SYSTEMS

Minicomputers (computers) complete the role of terminals in the teleinformation systems. In other cases, these terminals can be made up of teletypes, televisions or telephones. The telex network is an informational hookup for them, the apparatus responsible for the transmission of data and the factor having the real influence on the structure of the system.

The computers mentioned are a particular type of mechanism of secondary importance in the system.

The universality of the traditional system of information, apart from using the modern methodical programming apparatus, depends largely upon the amount and quality of the secondary mechanisms mentioned. It is they that determine the usage of the system. These secondary mechanisms such as disc and tape memories, reader, perforator or printer are solely appropriate for local processing.

Developing the system according to the transmission of data, dependent on the national telex network, with terminals in the form of teletypes, mini-computers or computers, enables processing by remote control. Inasmuch as the first case deals with a simple process of data transmission on the level of memorizing information on the outer memory hookups, this process is based on the telex network for the teleinformation systems. Programming the system for this case must take into account the network principles of sending information (data and reports).

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Accordingly, the programming of the system (software type) often implies the need for defined constructional changes in the adapting mechanisms (hardware type), or simply the need for change in equipment shape. It obliges the system's designer to make an alternative and better choice between the programming and the equipmental parts of the system. This in turn guarantees the possibility of adapting the system to a variety of conditions of usage, which gives the teleinformation system universal and multi-duplicating qualities of utilization.

They are economical and guarantee standardization of information sent, uniformly and systematic method of interpreting computer processing and the sending of reports (data) by the telex network.

Depending on the intended use and achievement plan of a given system of teleinformation, the minicomputers can perform various functions. Among others, they fit the role of:

- multiplexer
- news accumulation
- processors for large ciphering machines (of defined sphere of activity)
- intelligence terminals, that is, mechanisms having a defined capacity for calculation and storage of information (used for collaboration with large computers even with different secondary mechanisms)
- independent mechanisms in information system (this, among others, will make them useful in the way of specialized stations for automatic arrangement and introductory treatment of data, called DATATELEX)

- mechanisms working with large computers and, apart from the stations, fulfilling the roles of arranging data, the function of local banks (this is important relating to scattered processing of data).

The goal of the displays shown at the exhibition, was to suggest, in the framework of system BIST, a defined method for optimal improvement of the work of communication services, using modern minicomputer equipment with specialized programming. Connecting the telex network with minicomputers was achieved by using a telegraph adaptor. This network delivers entering data to the system; the minicomputer processes it and sends it out again through the telex.

The intelligent terminal project in system BIST was based on minicomputer type MERA-300.

Depending on the role of the intelligent terminal in the system (defined by type of programming and equipment), it can be used in two ways:

- as a DATATELEX station - local processing
- as a helping mechanism, used as an intermediary in preparing and sending information in the form of finished reports, or delivering information for processing to a central computer - remote control processing (transmission can be directed both ways).

Entered data can be delivered "on line" to system, that is, directly from the telex network; or "off line" - indirectly, e.g. on the magnetic hookup, in the form of univocally given deposits, of a defined structure of records assigned repository and meaning, a defined code and record density.

The type of outlet with BIST depends on the shape of the equipment, enables connections with the receiver, one on one (broadcaster-receiver), in closed circuit type — one to N, where N is the natural count which defines the number of receivers. Simultaneously, reports of the same format and content are sent to them.

USEFULNESS IN MANAGEMENT PROCESSES

The basis of most effective decisions in management procedure is the regulated and punctual flow of reports between the management and the worker level. Information plays an indispensable role in this matter, in the area of programming as well as in construction on computer equipment and help mechanisms.

Specialized systems of information, based on achieving the most modern methodical apparatus, were undoubtedly a boon in delivering correct results. They caused the elimination of the human factor from the process of traditional transformation of information, shifting the responsibility of introductory data preparation onto computer processing. This deals with matters as: formal control of data, arrangement, interchangeability, relocation, etc. Certain decisions can be made resulting from analyzing data produced this way. To favorable conditions they are a premise for the effective planning in management. The ability to have them reach a given place in a given time should be guaranteed. These premises are one of the most realistic factors, having an influence on the origin of teleinformation systems; that is, the kind in which information processing can be connected with data transmission. The national telex network is the data hookup for the mentioned systems; and since it is a ciphered network, it can easily be adapted to fit the needs of the previously mentioned systems (handled by line modulators, modems).

System BIST fulfills all the mentioned demands.



Photograph 2. Shows a part of the computer set, working in framework of BIST with the line modulator as the mechanism guaranteeing data transmission.

The basic information system telex completely satisfies all of the stated requirements.

Cassette memories serve to prepare direct and archival collectors. They can determine the product for further processing, though they are the final form of reports prepared for sending. /109

Processing and storage of large amounts of information which is done when using a teleinformation system with a wide range, demands the guaranteeing of equipment, besides guaranteeing the programming.

Guaranteeing software must include the following aspects:

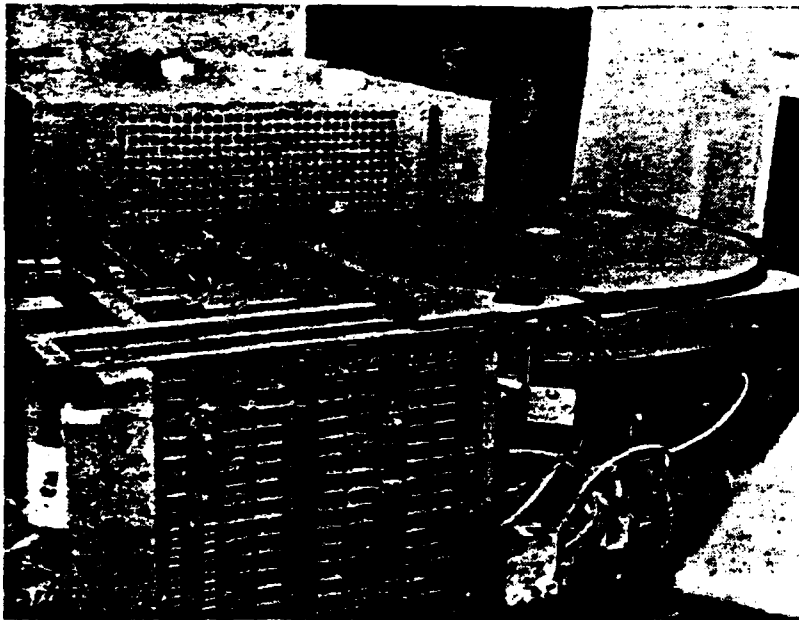
- creation and interchangeability of local data bases.
- possibility of integrating local data bases into one central bank.
- ensuring communications between a central bank and local data bases (two-way)
- guarantee of securing availability of data banks against the wrong people.
- specificity of scattered processing.
- possibility of interchange and verification of information of "on line" type.

They strongly influence the structure of the system, affecting evidently quantitative and qualitative aspects of programming. Photograph 3 shows a disc memory [MERA-9425] in system BIST, fulfilling the role of hookup for storage of large collections of information. This form of gathering information is quite authentic on the level of achieving and verifying data (considering the time element).

Developing the system, in the perspective of functional programming, and guaranteeing appropriate hardware connection of terminals with minicomputer, and minicomputer with the telex net, collaboration of computers can be initiated on the principles of coordination or subordination. In this variant of collaboration, the computer fulfills the role of a specialized terminal (intelligent), and the network fulfills the role of an information hookup.

This way national telex resources can be used and this is a
le quality of BIST.

The method of programming is similar to the method of designing
leinformation system, keeping optimal usage in mind. The
ism speeding up the programming process and easing the way /110
ting mistakes in particularly hard cases, is LOCAN-21,
alyzer of the logic processes; it is shown in Photo 4,
(also presented at the exhibition).



Photograph 3. Shows the memory disc - 9425, in BIST.

Besides being an aid in setting programs in motion by the
ig of instructional codes, addresses, contents of worker
and so on, LOCAN-21 creates the possibility of checking
ures of synchronism and asynchronism, giving it a special



Photograph 4. Part of computer equipment in BIST system;
top: analyser of procedures of logic: LOCAN-21; directly
under: clock for actual time.

value. It can be of aid in settling eventual reasons for equipment failure, shortening the time of troubleshooting, directly after the stage of its examination. Furthermore, it can be used in the primary initiating and starting of the system. On this same photo, over the central processor is a clock showing actual time. It enables reading of actual time while the system is in use, and additionally it creates the possibility of controlling user disconnection (programmed and serviced) in tune with the demands of the system, in time allotments set by the programmer.

CONCLUSIONS

The usage of the teleinformation systems in management procedures is very effective and consequential. Depending on the type of problem, which is based on computerization, and depending also on managemental procedure outreach and its structure determined by a defined organizational schematic (related to the level of national economy, hierarchy in organizational structure — department, branch, etc.), the adaptation and exploitation of the teleinformation system take place in various conditions.

Also, on the planning level which gives the final programming shape, these alternatives are taken into consideration:

- speed of searching for information, as opposed to telecommunication needs.
- storing large amounts of information along with optimal search ability (time sense).
- advisability of creating local data bases and securing of programming apparatus for eventual relocation.
- advisability of creating one central data bank and insuring its contents.

- Modernizing interfaces resulting from a change of usage conditions. This modernizing is integrally tied in with the need of creating local data banks (as an alternative solution).

These give the system a final form and should be achieved proportionally to real economic factors considered on global levels.

For the direct receiver, the user of the system, other aspects are also important. Measuring the system for its usefulness in a defined purpose, the function of gradually specifying communication is achieved.

With regard to BIST, these are:

- organized collecting of data
- automation of sending and receiving of data (relating to sender-receiver and closed circuit)
- automatic arrangement and reorganization of data
- possibility of data storage.

These give the system qualities of universal usage. BIST on the one side, establishes a concrete method enabling multi-directional use of minicomputer equipment; on the other, using the elements of data transmission, it enables the user who does not possess these resources to remotely avail himself of them.