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AUTOMATIC CONTROL SYSTEM OF THE COMPANY MARS.(U)
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FOREIGN TECHNOLOGY DIVISION

AUTOMATIC CONTROL SYSTEM OF THE COMPANY MARS

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AUTOMATIC CONTROL SYSTEM OF THE COMPANY MARS

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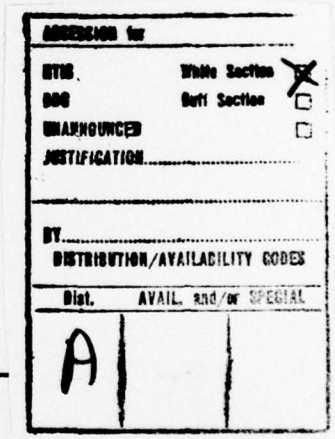

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AUTOMATIC CONTROL SYSTEM OF THE COMPANY MARS

The communal company "Kancelarijske masine" (Bureau Machine) (CSSR) (Czechoslovakia) during 1972-1973 has developed the first variant ASU (Automatizovoni System Uprovljanja) (Automatic Control System) ACS for the machine manufacturing company using the computor JS-1021[1]. ACS has four subsystems: 1) control of the technical preparation of the manufacturing, 2) operational control of the manufacturing, 3) control of the material-technical stocks, and 4) control of the personnel resources. The perfection of these subsystems and the development of the new subsystems are being planned during 1976-1977: control of the auxiliary manufacturing, marketing and bookeeping. The possibility of using the system as the JS-1030 will be checked. After the end of the studies (about 1980) the system MARS will be included in the general state-owned ASU.

The basis for ASUP which will be in the process of creation until 1975, will be the computer "Minsk 32." After that period, Minsk 32 will be completely replaced with the computer of JS and ASVT series with the microelectronics component circuitry. The possibility of the application of a new component base, the principle of the cascading (agregating), the standard control commands and the adaptability of the JS and ASVT computers make possible further perfection of the automatic control system. For machines of the unified system, a complex system of programming supplies is created, including the complex program of the technical services with many algorithmic languages and the sub-routine of the applied programs. Some of the computers with the same data handling capabilities as Minsk 32 are many times more expensive. Manufacturing

1) Trajbold, Jan: MARS: the current state of operation and the prospects for its development. Mech automat. admin. 1974, 14, br. 2, 46-47.

needs the third generation of the computer. Until the price of the third generation of the computer stabilize and are comparable with the prices of the second generation of the computer, it is obvious that the second generation of computers will be used. Therefore, it is necessary to insure their use at the level of data acquisition devices.

At the present time hundreds of companies are introducing ASUP and that means the creation of the information banks based on the use of the computor "Minsk 32." In very short time there will be a large scale manufacturing of the series JS. In order to have a smooth transition to the new technical basis it is necessary to respect the principle of the information sequencing. This can be done, first, by the information standardization used in ASU. Secondly, it is necessary to standardize the information display of the machines. In the third place, in the case of the impossibility of organizing the informations exchange in ASU in accordance with the standards of the machine display, for example, in the case of connection of the new devices to the existing ASU, it is necessary to provide an adequate technical system and the mathematical logic with the devices that will eleminate the existing differences in the information display.

It is necessary to resolve the problem of the technical service of ASU. It is not economically feasible to have a group of technical personnel for service and repair for every system. It is time to create a territorial organization for central service of the computing devices. In addition to this, in the existing practice the expenses for computer service are not taken into account. The computers need service during thier lifetime. The amortization rate for the computers is not satisfactory and is now only 2%. It is known that the payment terms for computers are very short.

But with the "amortization rate" of 2% the computer should work for 50 years.

It is necessary to pay special attention to the problem of the personnel fluctuation, especially the programmers and the people developing the problems. First, in many companies, there is no precisely defined policy concerning ASUP, making worse the condition for the specialist's activities. Secondly, there is a significant discrepency between the complexity and importance of the jobs and the salary of the people performing the jobs in company computer centers. This means that many qualified specialists, prepared to do the jobs during the development process of ASUP will not stay to do them.

In addition to this, many companies have a strict policy concerning computer personnel. For example, in the case of a special research study in metallurgy, it was found that in almost all metalurgical companies computer personnel are not complete because of salary savings. Many companies consider that buying a computer will have an immediate effect and cause cuts in administrative personnel within a year or two. If that is not realized, the company starts the reduction of personnel in the computer center. In order to prevent that, the company management can arbitrarily determine the number of personnel necessary for development of a standard structure for the company computer center personnel, introduce some rules for the number of personnel and the salaries in accordance with the company category of personnel.

On the basis of the presented material, it is possible to accept a principle that the large scale use of automatic planning and company control is possible only as based on

the use of typical ASU, because preparations and other activities are extensive and require a large amount of work. Without the typical solution this will require important personnel and material costs. Such an approach to the applications of the ASU make possible the development and manufacture of computers with the given mathematical structure; i.e., with the complete set of standard programs used for the solutions of many economical problems.

At the present time computer manufacture and application are rapidly increasing. The problem of computer personnel cannot be resolved using the traditional methods of extensive personnel increase based on the traditional method. It is necessary to apply new techniques: creation of typical mathematical structure, use of modular principles for development of machine programs, creation of the central system of the technical service (prevention, repairs, modifications).

Regardless of general estimates, formed by the domestic and foreign practices, that the use of the computer is economical and efficient, it is still necessary to analyze computer costs systematically and to develop efficient methods and calculations to find out how to decrease computer costs. These are indispensible conditions for large scale application in the communal economy. In conclusion, we would like to say that, under today's conditions, with the directions for further manufacturing concentration and creation of the powerful manufacturing and industrial companies, the importance of the technical base of the control, automatic control systems and the newest computing and organization methods, are of paramount importance. On time solutions of these problems will accelerate the introduction of ASU in the communal economy.

Part of the mathematical structure of the ASU is the response of its operating system to the performed functions. But the "Minsk 32" operating system cannot be applied to ASU without significant modifications. That is now being done. In order to avoid error repetition in the creation of the operating system of the JS computer, it is necessary to take into acocunt all requirements of the designers concerning the operating system. A second important task of the operating system is control of the technical complex of ASU. The complexity of its solution is caused by the different technical base set, which is different for the same type of ASU and the composition of the technical devices is different depending on the peripheral terminals. Because of this, it is necessary sometimes to adapt the operating system to the technical base many times. In order to make it easy it is necessary to realize a generator of the operating system. The generator, after receiving the initial information (the list of devices of the technical base) will generate the indispensable operating system. As a perspective problem in the area of the operating system we have a problem of realization of the standard interface system of the mathematical structure and the computer, capable of generating the programs, not only applicable to the structure of the computing complex, but also as a function of the controls of the systems.

It is also necessary to enlarge the special courses for study and for acquiring the practical knowledge for the use of the algorithmic languages COBOL and FORTRAN and to do more mathematical modeling of the thermochemical, thermal, physical and mechanical process of the black metallurgy. The insufficient knowledge of all these processes makes the algorithmization of the control system and the process control difficult.

It is often considered that the computer will generate the information that management will easily apply to make efficient decisions. The practice shows that even experienced and highly qualified managers, generally do not use the computer information because the interpretation of the computer information is a complex problem. Development of the method for such an analysis is necessary.

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