I. Văduva, V. Baltac, V. Florescu, I. Floricica.

STRUCTURED PROGRAMMING

Editura tehnică

Specialists are aware of the overwhelming role of the programming activity in the use with an ever increasing efficiency of electronic technics in the cybernetized scheduling of production processes, production programming and the rationalization of recording and computation work. The reviewed study is aimed at improving the programming activity, providing electronic computer users with new technics for elaborating efficient and reliable programmes-the structured programming technics.

By its methodological and practical content, the study is intended for both practicians by putting at their disposal an instrument of rationalizing and unifying the activity of design, implementation, documentation and maintenance of the programme products and for the teaching staff and students concerned with finding the most adequate forms for a thorough knowledge of electronic computer programming.

The first chapter entitled "Particularities and Limits of Classical Programming" presents the essential aspects of classical programming and underlines the fact that the present way of programming, with an artisan's character, based rather on intuition and experience no longer succeeds to meet with the ever greater requirements for new software products for various economic applications.

The absence of an efficient coordination, the difficult control of the advance in a design work, the impossibility of programme planning, the difficulty of programme communication, the difficulty of appling methods of labour organization, a.s.o. are mentioned as limits of classical programming.

In the second chapter, the authors tackle the problem of design and modular implementation of the programme systems.

The stages of the decomposition of a complex programme or informatic system into relatively independent units (modules) easy to handle and test, are analysed. It is specified that modularization should be applied both at the level of action and data description. The advantages of modular programming as regards the quality and flexibility of the programme, of programming standardization by the creation of module libraries characteristic of several types of applications, collective programming, a.s.o. are discussed in conclusion.

The method of structured programming is approached in detail in the third chapter. The "top-down" approach of conceiving programmes is described and the new method of graphic representation of both the programme structure and the stages of their conception — *the programming tree* — is presented. As regards the organigram which continues to remain the traditional method of programme representation, the way of its structuring by the method of code duplication, of the state variable or the introduction of auxiliary Boolean variable is exemplified. This chapter also analyses the problem of programme validation and it is pointed out that structured programming leads to the obtain-

ing of reliable programmes and the demonstration of their correctitude is muh facilitated. It is pointed out in conclusion that structured programming is an important step along the rationalization of the *programming* activity, its advantages in comparison with classical programming being analysed.

To amplify the utility of the study, the fourth chapter approaches the problem of elaborating data processing algorithms organized in file structures. Thus, a first step is made along the standardization of the activity of conceiving and implementing programmes operating with file structures.

The algorithms presented on types of operations achieve the finalization of the main operations to which files are subject during processing.

The next two chapters present the way of implementing the structured programmes in the conditions of using the COBOL and FORTRAN languages. The authors' option had in view in the first place the wide area of spreading and implicitely the use of these languages.

Worth mentioning in particular is that in connection with the problems of interdependences between the control standard structures and COBOL and respectively FORTRAN directions of use, the authors make references and proposals on improving their performances. These proposals are materialized in COBOL and respectively FORTRAN macro-directions which by post-valuation are expressed in programming directions specific to each language.

The propositions and theoretical demonstrations are upheld by many examples of programming in economic practice.

These two chapters also represent through the modality of structuring and presentation a valuable guide for programmers.

The main aspects of the organization and improvement of the programming activity by using modern methods among which we mention the "chief programmer's team", the "HIPO method", etc. are presented in the final part of the work.

Special attention is given to the integration of quality check into the technology of programming activity. The statistical indices quantifying the effects of the use of the new methods of programming organization and unfolding are presented in this respect.

Generally, the work is characterized by a clear presentation of the approached technics, by a logical succession of the chapters and of the problems.

The work attains at least two objectives: the formation of habits and of a new way of thinking in programming; the materialization of a scientifically substantiated methodology, able to govern to programming activity.

Answering in an original way the present concerns as regards the standardization and industrialization of the activity of working out programme-products, the authors' study is at the same time a pioneering work in the programming theory and practice in our contry.

Prof. dr. L. Tövissi