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POSSIBILITIES OF THE HUNGARIAN PARTICIPATION IN THE CO- OPERATION WITH THE DEVELOPING COUNTRIES IN THE COMPUTER FIELD*

by

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This paper endeavours to outline in which fields and in which forms can our country most adequately promote the development of the computer techniques in the developing countries. This paper presents one possible approach to the problem, without going into the details of the particular application areas. The actual realization, the feasibility of the possibilities to be mentioned below, depends on the circumstances of the issues in question.

Let us see the main groups of cooperation possibilities and the comments may be added to them.

Elaboration of overall development policies for the computer field

Computerization has very far-reaching economic and social effects. Recognizing this fact, even the developed countries, having no central planning economic system in the strict sense of the word, endeavoure to excercise some kind of state control over both the development of the computer industry and the application of computers. So, this may be the right way for the developing countries too, as shown by the example of several countries e.g.: Algeria, Irak, India.

Why are we able to support the developing countries in this field?

The computerization in Hungary is based on a centrally controlled and managed development program. In the framework of this program an attempt has been made to plan and synchronize the research and development, production, application, marketing, servicing, education etc. policies of the computer field. Thus we have experi-

ence in the elaboration of complex plans for computerization and naturally we also know the difficulties occurring in the practical realization of these plans.

Computer oriented education

Hungary has outstanding educational organizations in many fields of science and technology. Computer science education is supported by the Hungarian mathematical "schools" of traditionally high level. As a result - in the framework of the centralized development program mentioned earlier - several organizations offer good educational possibilities in computer field. One of the most important is SzÁMOK[x], having been established with the support of UNDP. This modern educational centre is organizing basic and advanced courses in different computer oriented topics for both Hungarian and foreign students.

Design and production of computers and peripherals; planning and organization of factories producing computers or peripherals

Production of computers and peripherals in bigger volume began in our country 8-10 years ago. However, the electrical industry, instrument industry and electronics which constitute the foundation of computer industry have century-old valuable traditions. In these worldwide acknowledged industrial branches Hungary has a history of outstanding innovations and products. Nowadays also several competitive companies as GANZ ELECTRIC WORKS, TUNGSRAM, MEDICOR WORKS, etc. are operating in these fields. It is very significant from the viewpoint of the present considerations, that these companies have established good trade connections with the developing countries for a long time.

At present, significant percentage of the products of our computer industry is exported. The end-products may be divided into the following groups:

- computers /small, mini and microcomputers/,
- peripherals /displays, printers, disk drives, data entry systems, etc./ and
- teleprocessing equipments.

It is worth to mention, that developing countries establishing their own computer industries, probably might be forced by technico-econ-

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omical considerations to think of similar categories of devices. So, they can favourably utilize our knowledge and experience acquired in the course of building up the production capacities of our computer industry, as well as in planning and continuous updating of the range of our products.

Software development

This field certainly is interdependent with that discussed in the previous point, however, because of its growing importance it needs special emphasis.

Our software experts have a considerable amount of knowledge and experience both in the software production for Hungarian-made computers and in the utilization and sometimes development of software components for imported computers of different types. This makes possible for our firms, e.g.: SzKI[x] to perform software development works for leading Western companies, too.

These Hungarian intellectual capacities are at disposal for the developing countries, too.

Attachment of different types of peripherals

When we have to make large configurations and connect different computers to each other, it often becomes necessary to investigate and solve compatibility and interfacing problems between different types of computers and peripherals, so among others to develop control or attachment units and software products for conversion, and to solve other tasks necessary to the joint operation.

Such a knowledge is very important for the experts of the developing countries. That is especially the case, considering that significant percentage of the Hungarian computer and peripheral park consists of types generally occurring in their countries, as well.

Planning, organization and operation of the computer centre

In the frame of our national program for computerization a lot of new computer centres have been established. Experience in planning, organization, establishment and operation of them can also be profitably utilized in the developing countries. This is justified by the fact, that the formerly mentioned institute SzKI[x] has organized several successful courses for the experts of developing countries, among others, just in the theme of computer centre operation.

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Computer applications, design of application systems

In the following, some possible fields of cooperation are listed, classified by economical branches. At some items application tasks are also mentioned solved mainly by using Hungarian-made computers. It has to be remarked, that during this consultation, in separate lectures, detailed reports are given by the colleauges of the firms and institutes, respectively VIDEOTON*, KFKI** and VILATI*** about some computer applications.

Energy industry
- measuring data acquisition and process control systems for electric power stations,
- oil and gas industry
  - data logging and data processing systems,
  - process control systems of checking tank fields,
  - computerized control of pipeline systems;

Applications in the aluminium industry;
Engineering industry
- numerical control of machine-tools and integrated groups of machines,
- measuring data acquisition and evaluation system e.g.: final checkout of Diesel engines,
- automatic laboratory equipments and other instruments,
- computer aided medical diagnostic systems;

Applications in the silicate industry;
Applications in agriculture and food industry;
Transport
- management system for marshalling yards,
- scheduling problems,
- traffic control;

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* VIDEOTON Computer Factory

** Central Research Institute for Physics of the Hungarian Academy of Sciences

*** Institute of Electric Automation

Commercial and business applications;
Water management systems;
Applications in different other fields
- public health
- education
- technical-scientific calculations.

The enclosed table, titled "Proposed fields and forms of cooperation" gives the summarized result. The "forms of cooperation" may be divided into two main groups. In the first case the representatives of a given developing country are at home and they get the technical assistance, the personal consultation, the printed matter or other support on the spot. In the second case the representatives of the developing country may acquire the knowledge necessary for them in Hungary. Naturally, these forms and the sub-groups of them can be combined in a versatile manner from time to time, considering the benefits and the possible problems of each form of cooperation from the point of view of a given developing country.

Finally, we must mention that this paper outlined the personal intellectual forms of cooperation, possibilities of the transfer of knowledge in the computer field, because of their basic importance from the point of view of developing countries. Of course, there are different other possible forms of cooperation - for example exchange of goods etc. But just because of the great variety and characteristic features of such forms of cooperation we do not deal with them now.

Table

Proposed fields and forms of cooperation

Definition of field, theme	Form of cooperation x
Elaboration of overall development policies for the computer field	1-4
Computer oriented education	2-5
Design of computers and peripherals	1-4
Production of computers and peripherals	2-4
Planning and organization of factories producing computers or peripherals	1-2
Software development	2-4
Attachment of different types of peripherals	1-4
Planning and organization of computer centre	1-5
Operation of computer centre	1-5
Computer applications, design of application systems	1-5

x
Number and definition of the form of cooperation:

Sending technical assistance to the developing country:

1 - make a study of the given theme /by Hungarians/
2 - delegation of Hungarian experts, consulting services

Reception of foreign experts in Hungary:

3 - individual study-tour, exchange of experience
4 - collective study-tour, exchange of experience
5 - organization of a course or symposium.

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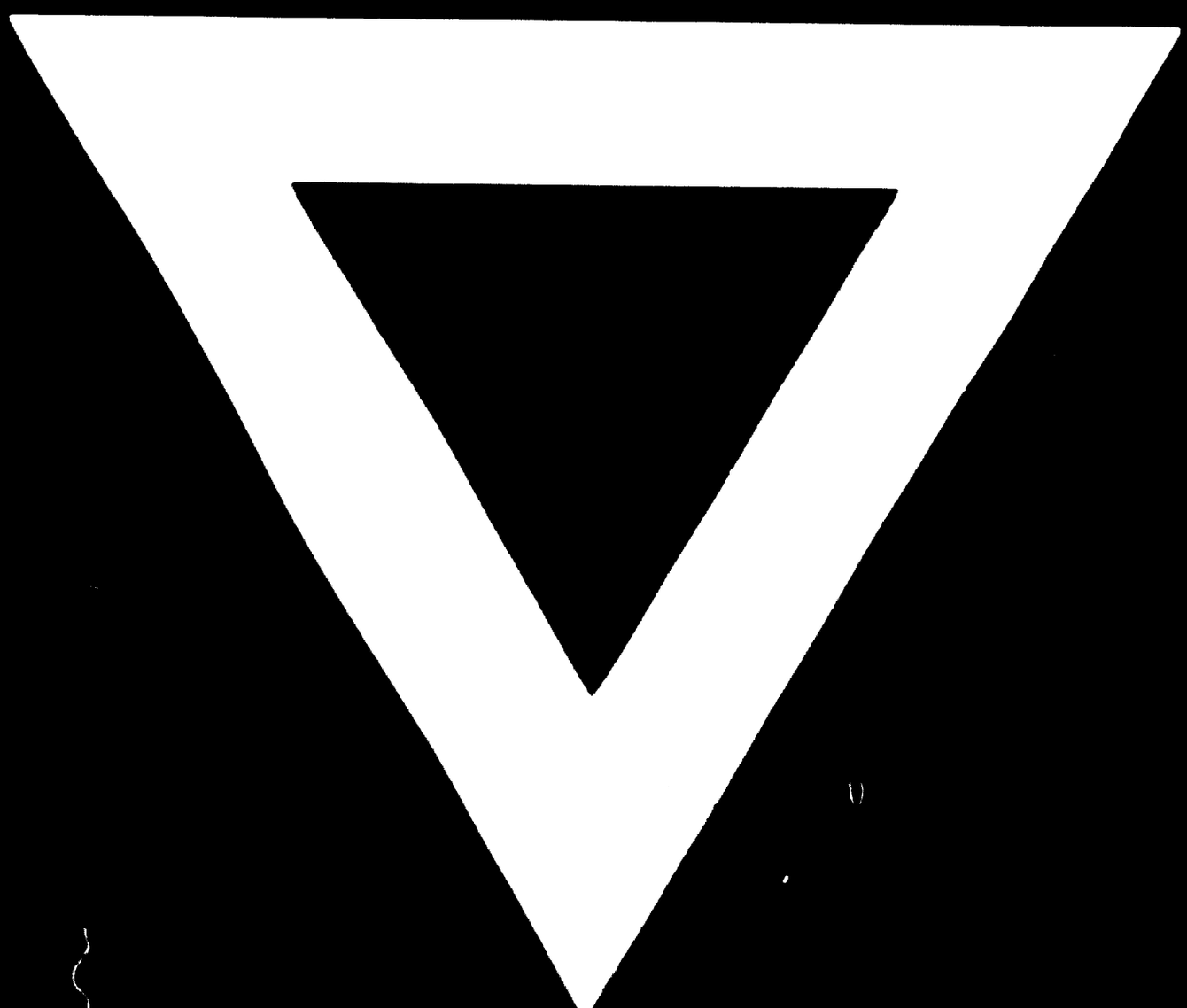

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