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REPORT
OF THE

CONSULTATION PANEL ON THE USE OF MANAGEMENT INFORMATION SYSTEMS (MIS)
FOR RAISING INDUSTRIAL PERFORMANCE

Budapest, 29 November - 3 December 1976

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INTRODUCTION

A Consultation Panel on the Use of Management Information Systems for Raising Industrial Performance was held at Budapest from 29 November to 3 December 1976. The Panel was organized by the United Nations Industrial Development Organization (UNIDO) in co-operation with the Government of the Hungarian People's Republic acting through the Institute for Economy Organization and Computerization in Metallurgy and Engineering Industry.

The purpose of the Panel was to bring together managers and government officials from developing countries responsible for the management of industrial enterprises, manufacturers of computer systems and management consultants to review and evaluate the use of management information systems (MIS) in industry, to exchange information and experience in this field, to illustrate advanced MIS concepts and technologies for the benefit of industries in developing countries, to discuss a possible programme of action and to make recommendations with a view to raising industrial performance by the use of MIS. It was expected that the Panel would help to identify the needs and problems of developing countries relating to the subject, to promote technical assistance to and co-operation among developing countries and to give them examples of experience available in developed countries.

The Panel was attended by 14 participants from 8 developing countries, 8 discussion leaders and 35 observers. The names of the participants are listed in annex I; they represented government industrial development organizations and industrial companies. The titles of the papers presented are given in annex II. The convening of the Panel reflected an awareness that the transfer and development of management technology is a major component of the whole process of the transfer of technology in industrialization.

In the Lima Declaration and Plan of Action reference is made to the need of developing countries for "progressive mastery of the different production and management techniques" (para.55). In this connexion, "the sharing of experience in industrialization and technology by those who have already acquired this know-how" is recommended, and UNIDO is called upon to "implement and expand its programme in this area" (para. 60(k)).

The growing complexity of industrial activities at the company level makes it necessary for managers to apply advanced techniques in running industrial enterprises. The functions remain basically the same, but the volume and complexity of the information required are increasing enormously.

The experience of UNIDO in providing assistance for the design and implementation of MIS has shown that there is a growing need for such activity. This has prompted the idea of exchanging experience among developed and developing countries and of identifying projects or project areas for enhancing MIS development in the latter countries.

RECOMMENDATIONS

The Consultation Panel made the following recommendations:

1. The systems approach should be used to determine the basic needs of an operational unit or industrial enterprise. The organizational structure and work-flow of such operational units or enterprises should be well-defined before an attempt is made to apply MIS concepts, which need not always entail the use of computers.
2. The scope and range of any given MIS must be exactly defined, preferably in collaboration with experienced experts. The closest co-operation among top managers, systems analysts and programmers should be sought to ensure the efficient development of an MIS.
3. If consideration is given to the Lima Declaration (para. 55) and to the increasing importance of computers as aids to management, more attention must be paid to management systems, in particular to MIS.
4. UNIDO should expand at the request of developing countries technical assistance in implementing MIS as a means of increasing the performance of industries. The assistance should help to identify those industrial companies and organizations that need to establish an MIS, to prepare MIS feasibility surveys and projects, to plan and implement an MIS and to train the necessary personnel.
5. UNIDO should assist in establishing close co-operation among developing countries in exchanging experience in the use of MIS.
6. Since MIS is of importance to industries of developing countries UNIDO should carry out surveys and studies designed for practicing managers, on the application of new techniques and technologies in MIS and, in particular, on the use of mini-computers in management systems. Special attention should be paid to exploring possibilities of using mini-computers for management of small companies.
7. In view of the useful experience of this Panel, UNIDO should sponsor a similar consultation meeting for the participation of computer system manufacturers, management consultants and managers from developing countries to examine the prospects of introducing mini-computer-based MIS in industries of developing countries.

8. The introduction of MIS into industries of developing countries should be based on the use of local labour which should be provided with adequate training in problem-solving approaches. UNIDO should assist developing countries in recommending the proper available training facilities.

I. ORGANIZATION OF THE CONSULTATION PANEL

The Panel was opened by I. Litvay, Deputy Minister of the Ministry of Metallurgy and Machine Industry of the Hungarian People's Republic. The Deputy Minister pointed out that the world and national economic inter-relationships, the momentary regulating forces, the micro-environment of economic and commercial activities, the different traditions and customs of countries, the values of the society, the characteristics of technical development, and political and state measures have an effect on the activities and management methods of different organizations. It is known that a well-established management style will contribute greatly to the efficiency of the organization's performance. Management science offers a wide variety of management tools and styles. These may differ but they have one common feature, that is that only systems can be expected to operate successfully and efficiently - in the case of Hungary, manufacturing companies - in which management is capable of evaluating precisely the effect of the variable environmental and internal factors and can harness these factors to the benefit of the national economy and of company objectives. In addition, the availability of sufficient information for reliable decision-making is of prime importance.

The Hungarian People's Republic has recognized the importance of applying up-to-date computer techniques, and as a result, has launched a large-scale programme for their widespread use and development.

J.R. Suocar, Head of the Factory Establishment and Management Section of UNIDO, pointed out that it was generally accepted that management was a strategic factor in economic development which could not be ignored. However, the application of advanced and adequate management systems in developing countries still presented great problems.

He noted that among the functions of UNIDO relating to the Consultation Panel the following were most important: (a) to provide assistance to developing countries, particularly in expanding, modernizing and operating their industries efficiently and (b) to provide a forum and act as an instrument for the developing and industrialized countries in their contacts, consultations and negotiations directed towards the industrialization of the developing countries.

At the opening session the following officers were elected:
J. Kiss Jovák (Hungary), Chairman, Narendra Singh Choudhary (India), Vice-Chairman and Jose Zupan (Yugoslavia), Rapporteur.

II. SUMMARY OF THE DISCUSSION

Computer systems for manufacturing control

The discussion focused on two main questions: (a) under what conditions may computerized systems for manufacturing control be justified, and (b) to what extent can such systems be centralized. As with any project involving a major investment of time and money, the costs and benefits must be accurately estimated and compared prior to processing. In general, the number of transactions and items to be controlled determine the need for computerization. For example, a company producing 20 items from only 10 raw materials would probably not need computerized systems to plan and control production. On the other hand, a tractor manufacturer who must plan and control thousands of items and production operations may benefit from such systems.

Centralized manufacturing control systems are usually feasible only for multiplant companies in which each plant produces either similar products or supplies other plant of the company; an example would be auto manufacturers with multiple assembly plants. Even then, the centralized systems could only carry out reporting functions to do with planning and performance, the functions to do with project execution being undertaken at the local plant level.

The question of whether the system could "optimize" production costs was also raised. By itself, it cannot. The engineers must define the best way to process a product and document the engineering specifications. The system could then compare such "standards" with the actual process and identify deviations requiring management action.

Computers in business management

The approach to the use of computerized integrated planning and control procedures was found useful. A strong need was pointed out for direct support and education. The high investments for designing and implementing computer-based MIS require companies in developing countries to engage in long-range planning, since these investments determine company policies and fix their capital for a long period of time.

The cost and time necessary to implement such systems cannot be determined on a generalized basis, since they depend on a number of factors, such as company structure and organization, available personnel and level of competence, and access to support from outside sources.

It was pointed out that the available computer systems were in many cases developed specifically for the end-user, the non-DP specialist, and that therefore the programming languages for these systems could be learned within a relatively short training period. It was, however, of great importance to acquire experience and know-how in the field of organizing and managing data.

The integrated MIS should be implemented in a modular way and through a step-by-step approach. This would offer the opportunity of evaluating and/or redirecting investments step-by-step without engaging in great initial expenditures. At the same time, benefits could already be realized by implementing a subsystem.

While world-wide efforts are being made to discover increasingly sophisticated techniques, it was felt that for developing countries more research and development should be devoted to the areas of company organization and data organization as basic prerequisites for introducing and using planning and control systems effectively.

The role of computers in production planning and cost accounting

The point was made in the discussion that developing countries often experience difficulties in implementing and using IS because of a certain lack of skills, and owing to management and organizational problems. The Consultation Panel stressed that for implementing integrated MIS, the requirements were: close co-operation between user and data-processing personnel, the involvement of top management, exchange of experiences with companies using computers in developing countries, primary attention to organizational problems, a clear definition of the responsibilities of all functions, and an insistence on setting realistic objectives. Priority should also be given the use of already available software, wherever possible.

Flexibility of MIS, management data systems and financial control systems

The discussion centred on the capability of MIS of supporting the industrial progress in developing countries. A major point of interest was the build-up of the data base, the extent of organizational support required and the manner of entering data into the data base.

As regards centralized versus decentralized data management, it was pointed out that there is now increasing capability by using small or mini computers to handle detailed transactions, to collect and send data in "batch mode" once or several times a day to a central unit to update the central files. Such a system could be superior to a large central system. An exact survey would first have to be made to determine how much data are unique and how much are redundant to a given activity. The volume of transactions from each decentralized spot is also important.

As regards the applicability of MIS to small enterprises, it was thought that the primary steps of MIS could be taken, for example, in small but well-organized co-operative ventures, using small textile producers as a case.

Annex I

LIST OF PARTICIPANTS

Country participants

Algeria

Aissa Kerouchi
Business Applications Manager
EDP Center, Sonatrach
National Petroleum CIE
Centre de Calcul, Sonatrach
80 Ave. A. Chermoul, Algiers

Egypt

Ahmed Esmat Atta
General Director
Information and Documentation Department
General Industrialization Organization
c/o Office of the UNDP Resident Representative
P.O. Box 982
Cairo

Nabil Gweis Mahmood
Director
Information and Documentation Department
General Industrialization Organization
c/o Office of the UNDP Resident Representative
P.O. Box 982
Cairo

Hungary

István Csomós
Project Manager, Ósdi Kohászati Üzemek
3600 Ósdi

Ernő Gara
Department Head, Institute for Economy, Organisation and Computation
of Metallurgy and Engineering Industry
1394 Budapest XIII, Radnóti u. 2

Miklós Orbán
Director, Központi Statisztikai Hivatal
1023 Budapest, Bélyai u. 10

India

Narender Singh Choudhary
Director, Ministry of Industry
Udyog Bhawan, New Delhi

Jordan

Samir Ramadan Sayyed Abu-Ajwah
Director of Director General's Office and Secretary of Planning
Committee, Royal Scientific Society
Amman

Tunisia

Ahmed Cheriff
Project Manager, Centre National Informatique
13 Rue Sidi Boumendil
c/o Office of the UNDP Resident Representative
Tunis

Turkey

Hayrettin Arik
Manager of Electronic Data Processing
Turkish Petroleum Corp.
Midafaa cad. 22
Ankara

Mahmut Ihasan Ayla
Director, Price Control and Standardization Department
c/o Office of the UNDP Resident Representative
Tandogan, Ankara

Ertan Yülek
Deputy Director General, Sumerbank
c/o Office of the UNDP Resident Representative
Ankara

Yugoslavia

Viljem Nemeč
Gospodarska Zbornica Slovenije
President's Adviser, Economic Chamber of SR Slovenia
61 Ljubljana, Titova 19

Jose Zupan
Team Leader, Planning, Manufacturing and Trading Co.
Dvoraskova 11, Ljubljana

UNIDO

Jorge Succar
Head, Factory Establishment and Management Section, UNIDO

Renat Perelet
Factory Establishment and Management Section, UNIDO

Discussion leaders

William G. Stoddard
Arthur Andersen and Co.
Apartado 2585, Mexico City 1 DF, Mexico

Lennie Mc Moffat
Area Manager, Eastern Region, Burroughs Computer Systems Ges.mBH
Moeringgasse 10, 1151 Vienna, Austria

Leonard Luttinger
Account Manager, Eastern Region, Burroughs Computer Systems Ges.mBH
Moeringgasse 10, 1151 Vienna, Austria

Alfred Mirani
Application Programmer, IBM Industrial Centre
Rabl Str. 24, Munich, Federal Republic of Germany

Bernard Dominik Hauser
Managing Director, IBM European Office
149 Ave. Louise, P.O. Box 25
1050 Brussels, Belgium

Nikolaus Gabor
Manufacturing Representative
IBM Boeck
Cobdenstrasse 2, 1010 Vienna, Austria

Peter Abele
Lamontstr. 12
IBM 8, Munich 80, Federal Republic of Germany

Paul E. Martin
Director, Engineering Service
EXEC AG, Executive Counseling Services
Dornacherstr. 210, 4018 Basel, Switzerland

Observers

Austria

F. de Jong
International Institute for Applied Systems Analysis
2361 Laxenburg

Hungary

Tamas Sömjén
Antal Szentülöpi
György Szelecki
János Duzs
Mátyás Arató
Gyula Morányi
Gyula Brunner
Miklós Galambos
Károly Göröncséri
István Gerencsér
János Antal

Sándor Jancsár
József Tarnai
Károly Végvári
Péter Lukács
Imre Spronz
Mihály Solti
Zsuzsanna Orendi
Pál Pál
István Balázs
Dr. György Matók

Zoltán Kiss
Frigyes Lakos
István Meizer
Sándor Gárdonyi
Károly Pogány
Árpád Klatamányi
Gábor Lugosi
Zoltán Ballács
Zoltán Kovács
Ferenc Kovács

Poland

Lechoslaw Kalinowski
Director, Biuro "Promasz"
Warsaw, Barbary 1

Zbigniew Piatek
Institute for Organization of Industry "ORGIMASZ"
Warsaw, Nowogrodzka 56

Leszek Zurowski
Specialist in management
"ORGIMASA"

Annex II

PAPERS PRESENTED AT THE CONSULTATION PANEL

- ID/WG.230/3 The flexibility and capability to develop and improve management information systems
 by Paul E. Martin, EXEC AG, Basel, Switzerland
- ID/WG.230/4 The role of computers in production planning
 by Nikolaus Gabor, IBM Roece, Vienna, Austria
- ID/WG.230/5 The role of computers in business management
 by Alfred Mirani, IBM Industrial Centre, Munich,
 Federal Republic of Germany
- ID/WG.230/6 Computerized cost accounting, a functional control tool
 by Peter Abele, IBM, Munich, Federal Republic of
 Germany
- ID/WG.230/7 Computer systems for manufacturing control
 by William G. Stoddard, Arthur Andersen and Co.,
 Mexico City, Mexico
- ID/WG.230/8 Data base management systems: The data storage and retrieval
 tool of computer-based management information systems
 by Leonard Luttinger, Burroughs Computer Systems Ges.mbH,
 Vienna, Austria
- ID/WG.230/9 The rising cost of solutions - implementation of financial
 control systems
 by Lennie McNoffat, Burroughs Computer Systems Ges.mbH,
 Vienna, Austria
- ID/WG.230/10 Organisational preconditions of the realization of management
 by exception, and its new possibilities by computerization
 by László Lado, Technical University, Budapest, Hungary



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