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**A SYSTEM FOR BALANCED DEVELOPMENT AND RESOURCE  
MANAGEMENT OF THE INDUSTRIAL ENTERPRISES  
AND ORGANIZATIONS**

DP/BUL/87/003

**BULGARIA**

Technical report: Advisory mission on a system for balanced  
development and resource management of industrial  
enterprises and organizations\*

Prepared for the Government of the People's Republic of Bulgaria  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

Based on the work of Graham W. Winch,  
expert in strategy management and planning of  
development of industrial enterprises and organizations

Backstopping officer: C. Antonio/V. Gregor,  
Institutional Infrastructure Branch

United Nations Industrial Development Organization  
Vienna

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\* This document has not been edited.

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This document reports the activity and conclusions of the author on the first leg of a split mission in connection with UN project DP/Bul/87/003 - "A System for Balanced Development and Resource Management of the Industrial Enterprises and Organisations". The mission comprised one week, of which one day was spent in a briefing at UNIDO in Vienna, and four days in Sofia (week of 20-25th November 1989).

The role of the author, as expert, was to assist and advise the team at the Industry Development Institute to achieve the project's objectives, and specifically for this initial element of the split mission the author's objectives were:

- To familiarise himself with the project from both the UNIDO briefing and discussions with the team at the IDI.
- In particular, to review the scope of the project, how the objectives of the project relate to changing systems in Bulgaria, and how the "outputs" from the project are to be implemented.
- After this familiarisation, to review with the team relevant approaches and methods for the management of industrial enterprises.
- To advise on required features, and implementation of a new system for balanced development and resource management, including training requirements.
- To discuss the specifications for supporting software for improved systems in Bulgaria, including capabilities and appropriateness of existing available packages.

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## ABSTRACT

This document reports on the first leg of a split mission in connection with UNIDO project Bul/87/003: "A System for Balanced Development and Resource Management of the Industrial Enterprises and Organisations". The mission to Sofia by the author as expert in strategic management (Job description ref DP/87/003/11-01/J12106) took place during week 20th - 25th November 1989. Objectives for the brief mission were to familiarise the author with the objectives and scope of the project and for him to provide advice and support to the team at the Industrial Development Institute, particularly in the areas of strategic management, strategic modelling and training needs.

The following preliminary or interim recommendations (in summary form) were drawn:

1. Liaison should continue between the author and team in Bulgaria in accordance with an agreed programme.
2. Database system development should continue in line with specifications.
3. Capabilities and features of commercially available Decision Support System Software should be reviewed.
4. Additional expert assistance in areas of Database Systems and Networks should be obtained.
5. The team should develop competence and procure software in System Dynamics.
6. Second leg of the author's split mission should be in April/May 1990 timeframe with specified objectives.

## I INTRODUCTION

This document reports the activity and conclusions of the author on the first leg of a split mission in connection with UN project DP/Bul/87/003 - "A System for Balanced Development and Resource Management of the Industrial Enterprises and Organisations". The mission comprised one week, of which one day was spent in a briefing at UNIDO in Vienna, and four days in Sofia (week of 20-25th November 1989).

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- In particular, to review the scope of the project, how the objectives of the project relate to changing systems in Bulgaria, and how the "outputs" from the project are to be implemented.
- After this familiarisation, to review with the team relevant approaches and methods for the management of industrial enterprises.
- To advise on required features, and implementation of a new system for balanced development and resource management, including training requirements.
- To discuss the specifications for supporting software for improved systems in Bulgaria, including capabilities and appropriateness of existing available packages.

Time was inevitably extremely short on this first element of the split mission, but the initial objectives were achieved. The

author was able to familiarise himself with the objectives and status of the project, and to advise the team on aspects of future work that will raise the effectiveness of the new systems and supporting hardware. Interim recommendations arising from this initial phase are detailed in this report.

## II RECOMMENDATIONS

This initial mission has lead to the following preliminary or interim recommendations:

- (1) Liaison should continue between the author and the team in Bulgaria, in accordance with the programme agreed before departure from Sofia (see Annex ).
- (2) The database system development should be continued in line with specifications being drawn up by the Sofia team. The software should have the capability to consolidate information (including forecasts) from different enterprises across various dimensions.
- (3) The team in Sofia should review the capabilities of commercially available Decision Support Systems and include the best design features within their specifications.
- (4) Additional expert assistance should be obtained at appropriate times during the project, to co-ordinate with system development and hardware delivery. Recommended experts are:  
  
Database Systems : Mr A Skinnard  
Networking : Mr A McMullin
- (5) As a tool for strategic modelling and as an aid to understanding the dynamics of new developing economic and business processes, the team should develop competences in the System Dynamics approach, including purchase of software - PD DYNAMO or STELLA.
- (6) The second leg of the author's split mission should be in the April/May 1990 time-frame. The objectives of the second visit should be, briefly:



- Review further development and proposed implementation of software system(s).
- Assure integration of system developments within overall plans to enhance strategic management within industrial enterprises.
- Determine training needs of IDI staff in areas of:
  - Strategic Management
  - Strategic Modelling & System Dynamics
  - Decision support systems as or to be implemented.

(this activity geared to personal development of IDI staff and also to their potential role as trainers of industrial managers.)

- Consider design of training programmes for managers.

### III ACTIVITIES

The activity carried out as the basis for this report was undertaken by the author in the role of expert in strategic management and planning of the development of industrial enterprises and organisations. The full specification and objectives are defined in Job description DP/Bul/87/003/11-01/J12106. The activity was geared to these objectives without significant deviation. It comprised a mission of 4 days duration to Sofia during the period November 21st to 25th 1989, following a short briefing at the UNIDO offices in Vienna on November 20th. All time in Sofia was spent at the IDI offices in Sofia where the principal contacts were Dr Valentin Parvanov, Director of Division, and Mr Atanas Minchev. Review sessions were also held with the Director General of the Institute, Dr Alexander Alexandrov, and a useful dialogue was held with Prof. Dr Zdravka Kovacheva, Professor of Strategic Planning at the Karl Marx Economics Institute in Sofia.

The activity comprised three basic elements:

- briefings for the author on the work of the Industrial Development Institute in the context of strategic management and planning, including demonstration of IDI developed software, and specifically the basis, objectives and status of this UNIDO sponsored project.
- detailed discussions concerning various aspects of the project, including:
  - specification for software and systems
  - general issues of strategic management, particularly the balance between resource utilization and development of new markets

- relationship between strategic management at individual enterprise level and planning at industry and national economy levels.
- strategic modelling, including role for the system dynamics approach.
- training needs for IDI staff and managers in industrial enterprises and organisations.

(these issues will be addressed individually in the next chapter - Issues).

- A seminar was given for invited senior staff in the Institute on Strategic Planning Processes, including a comparison of a resource utilization perspective versus a market-orientated perspective, and general issues concerning the possible implications of the "single market" in the EC in 1992.

#### IV ISSUES

##### A. Specifications for Software and Systems

Discussions on this issue comprised mainly a review of detailed specifications already under development at IJDI.

The specifications appear to be comprehensive, detailed and ambitious (formal documents are in Bulgarian script and because of this could not be read directly by the author). It is understood that the intention is to provide a data/information framework relating to all significant industrial enterprises and organisations, this could ultimately represent 5000+ firms. Such databases would be networked together with appropriate consolidations to enable balanced development of Bulgarian industries. This would form the basis of a decision-support system to assist and improve decision making and resource allocation at corporate and business levels. It was agreed that additional expert advice and support would be invaluable in the two areas:

- Database design : data organisation, user interface, consolidation between databases, and linking to forecasting modules.
- Networks : protocols, software & hardware, location of nodes, system management.

##### B. Resource Utilization & Market-Orientated Focuses

Consideration was given to the differences in precepts in strategic management and planning in centrally managed economies typical of the Eastern Block, and market-orientated economics of the West. Of particular concern were the performance measures to be included within the system. For current purposes efficiency in the utilization of resources is still the principal focus. In the

longer term, if Bulgaria moves to a more market-orientated focus and seeks to expand its exports, then the system must be flexible enough to enable appropriate additional measures to be generated. These would be typical market and competitive measures such as relative cost positions, total market and market shares, marketing parameters and impact.

Further to this is the danger that as the new systems become successfully implemented and part of the decision making system process they will restrict or point decision making to using only resource efficiency as the choice criterion. The broadening of definitions of enterprise success, if new economic priorities emerge, must be reflected in both the general strategic management processes and in the systems that support them. This points to a need to ensure that training programmes in strategic management do reflect that performance appraisal is based on enterprise objectives (and mission) and that as the objectives change so must the performance measures.

### C. Enterprise/Economy Integration

Under the premise that central economy planning will remain a feature to ensure balanced development and resource management among industrial enterprises, information and planning systems implemented at enterprise level are envisaged as part of a network to supply aggregate information centrally. Some commercially available software, in the top-end decision-support system category is specifically designed to facilitate consolidation of many data-bases or spreadsheets. They may employ the data-cube concept enabling sections of the aggregate data-base to be viewed from a number of perspectives. In this context, viewpoints may be required at central level across industry sectors, market sectors (eg internal vs various hard-currency markets), regional production/employment. The needs for such differing perspectives should be reviewed, and the capabilities of typical commercial software examined to determine how the network could be best utilised to gather and consolidate information.

#### D. Strategic Modelling & System Dynamics

Strategic modelling and forecasting is a key feature of the proposed new systems. Extrapolation models based on the strategic data-bases can be readily developed, probably using a spreadsheet approach, econometric/regression models of the Bulgarian economy are also available at IDI. However these approaches are limited, particularly where new systems are emerging, in which case historic time-series will relate to different structures. Also within such a dynamic situation, decision making processes and behavioural factors are key. An approach called System Dynamics is able to integrate structural relationships with such decision processes and behavioural aspects to produce full causal models. This approach would be particularly valuable as an element of this project both as a tool for predicting dynamic system behaviour and also as a training/learning aid to understanding new decision making processes and priorities for Bulgarian industry. The software package PD DYNAMO runs on PC-computers and is purpose designed for the system dynamics approach. STELLA is an alternative product, better for learning purposes, but requires Apple MacIntosh computers.

#### E. Training Needs

Preliminary consideration only was given to the area of training needs and training programmes. It was agreed that initially training programmes should be provided for IDI staff, they in turn should be developed so that they would be able to provide the training programmes for managers in industrial enterprises and organisations. Specifications for training courses would be agreed as the project progresses.

Three areas were identified as requiring the development of training courses and the associated materials:

- Use of the database and networking systems
  - by industrial managers
  - by central planners
  
- Strategic Management, including organisational objectives encompassing resource utilization and market-orientated emphasis
  
- Strategic Modelling and System Dynamics, including the use of the DYNAMO package.

### CONCLUSIONS

The mission to Sofia was very short and the major activities involved briefings and reviews of the progress to date and "brainstorming" discussions concerning a number of aspects of the project. The recommendations emerging from these discussions have been listed earlier.

This is a large and ambitious project which will depend crucially on hardware, software and telecommunication systems coming together. The project seems to have been progressing steadily but has had to be paced by hardware procurements in which delays in obtaining the specified IBM PS2 equipment have been experienced.

Training in the use of the new systems, possibly coupled with professional development for Bulgarian managers in line new economic priorities and a more market-orientated focus will also be key features of success.

With different emphasis and priorities emerging over time, the systems that are implemented must be flexible so that they can support and enhance strategic decision-making in line with corporate and business objectives.



ANNEX

WORK PLAN OF ACTIVITIES AND FURTHER EXPERT SUPPORT TO ENSURE  
SUCCESSFUL COMPLETION OF PROJECT DP/BUL/87/003

1. To receive

- outline of database and indicators
- structure of system

December 1989, Graham Winch

2. To send papers and references for System Dynamics and Dynamo

asap, Graham Winch

3. IDI to familiarize itself with this documentation

January 1990

4. To review additional expert support:

Networks

Database Design

(To coordinate with delivery of hardware)

Mid-January 1990, Graham Winch

5. Review in March/April:

- Final specification for database/Decision Support System

- Role of System Dynamics and Dynamo in Decision Support System
- Training needs for IDI staff
- Consider the design for training programmes for managers

March-April 1990

6. Course for Managers:

- Use of database/Decision Support System
- Strategic Management
- System Dynamics/Dynamo