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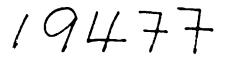
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A SYSTEM FOR BALANCED DEVELOPMENT AND RESOURCE MANAGEMENT
OF INDUSTRIAL ENTERPRISES AND ORGANIZATIONS

DP/BUL/87/003

REPUBLIC OF BULGARIA

Technical report: Mission to Sofia 6-10 January 1992*

Prepared for the Government of the 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 Brian Dangerfield
UNIDO consultant in systems modelling

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Institutional Infrastructure Branch

United 'ations Industrial Development Organization
Vienna

* This document has not been edited.

Contents

ABSTRACT

This report details work carried out, meetings held and recommendations arising out of a visit to the Industry Development Institute (IDI), Sofia, Bulgaria under UNIDO project DP/BUL/87/003, "A System of Balanced Development and Resource Management of Industrial Enterprises and Organisations".

The author acted as a consultant in systems modelling (job description ref. DP/BUL/87/003/11-53/J12106) and visited Sofia from 6-10 January 1992 inclusive (working days only) with briefing/de-briefing stops in Vienna before and after the trip.

The job description was to prepare teaching materials, deliver lectures and present case studies applying system dynamics. Also, the use of the DYSMAP2 software for system dynamics simulation modelling was to be demonstrated. This software had been purchased by the IDI expressly for this purpose.

The report describes the situation as revealed at the initial meeting at IDI, some detail of the focus of training and finally a set of recommendations and conclusions of the author following his visit. These are divided into three sections: that involving action by UNIDO, which is dependent upon continued funding; a comment on the proposal to use networking and database specialists in Bulgaria and finally suggestions addressed directly to IDI who must be more proactive in marketing their expertise.

INTRODUCTION

This report describes the work carried out by the author during his visit to the Industry Development Institute (IDI), Sofia, Bulgaria, from 6-10 January 1992. Briefing was held at UNIDO, Vienna, on 3 January 1992 and de-briefing on 13 January 1992.

The author was acting as consultant in systems modelling. The IDI had purchased DYSMAP2, a system dynamics software program, and needed assistance in its use and an insight into its capabilities for their purposes in the light of the changing political and economic circumstances prevailing in Bulgaria.

The IDI had already purchased an IBM PS/2 personal computer system and the software was implemented on this system. A Token Ring local area network was in the process of being installed.

The implementation of system dynamics software in part derived from the earlier mission to Sofia of Graham Winch, expert on strategy management and planning. He visited the IDI in November 1989 and reported on his mission in a document dated 19 January 1990.

I ACTIVITIES

The activities in the week comprised formal meetings, informal discussions and classroom presentations.

A. Initial Meeting

On arrival at IDI a meeting was convened with Dr. Tsanyo Tsvetkov (Director), Mr Haralambi Ch.Haralambiev (Deputy Director), Mr S S Tomov (DP Manager) and two of the specialists. We were later joined by Dr. Valentin Parvanov who is the link man for the project at IDI. Dr. Tsvetkov outlined the history of IDI and the changes which had taken place since 1989. In particular, the numbers of IDI personnel had reduced somewhat -- from a peak of 800 specialists down to just under 300 now. Dr. Tsvetkov had taken over as Director General only in June 1991. The IDI is managed by a Board of five members and monitored by a Control Group.

Financing of the IDI has shifted. Now only 10% comes from the State, the rest is from private industry. IDI need to earn their income by marketing their expertise, but the current economic situation militates against this. Their professed objective currently is just to survive; many other similar organisations have folded.

One important point relates to the mention of a Macro-economic Modelling Laboratory as being part of IDI. This is stated in the background to the job description. In fact, this unit no longer exists. Formerly under the control of Dr. Parvanov, the specialist team in economic modelling have all left IDI now and the majority are working in a commercial software house.

The first meeting at their Head Office was followed by informal discussions with Dr. Parvanov. A demonstration was given of two software packages they have implemented already on a PC. One of these was an econometrics package, the other a market analysis package for the evaluation, by a firm, of its competitors' products. Both packages had been developed with outside help. The Technical University of Vienna was mentioned as was one in Prague.

The address of IDI at 12A Ho Shi Min Blvd, 1040 Sofia is their Head Office. Work with the software and in the teaching situation took place at their Computer Centre: 151, Komunisticheski manifest Blvd, 1330 Sofia (Tel: 231128). A short wind-up meeting took place at Head Office again on the Friday.

B. Training

As stated earlier, this was held at their Computer Centre. The author implemented the software on the PS/2 system and checked that hardcopy output was working prior to commencing formal class sessions with an audience of 8-10 specialists. In addition, a number of specimen models were copied to the PS/2's hard disk along with PCPLOT, a graph-plotting program provided free, but unsupported.

The detailed list of training topics is included as Appendix A. Those marked with an asterisk were covered during the four training days. Time constraints prevented all topics being dealt with but packs of photocopied teaching material (5 copies in all) were left for the trainees, along with single copies of three of the author's academic papers, two of which concerned case studies of system dynamics applications.

Of particular importance was the stress laid on where to use system dynamics models. For the IDI this is at three levels: macro economy; industry; and corporate levels. For the first, and possibly also the second, the government itself would be the client.

System dynamics is used to check out managers' own planning thinking. Models help put structure on what can be ill-defined issues. They assist in strategic debate but they are not forecasting models. Because it separates resource flows from information flows, the method can also be used in the cost-effective design of information systems. It can show which particular information is necessary for an organisation to be piloted successfully, in a strategic sense, and, by implication, it can test out which information is worthless for this task.

Obviously IDI staff have, as yet, no direct experience of applying system dynamics methods. It was stressed that the material left behind should be thoroughly digested; any queries on it would be handled by the author following mailed or faxed requests. Individual specialists were urged to help one another in the hope that, say, two or three might become competent enough to handle a modelling project. It is important that the momentum instigated by the author's visit is not allowed to dissipate.

RECOMMENDATIONS

UNIDO Matters

The following will involve UNIDO funding and are dependent on unused budgets being carried forward into 1992.

1. A Cyrillic text driver should be implemented in DYSMAP2 so that it appears more user-friendly to Bulgarians with little or no knowledge of English.

2. The following English-language texts should be obtained to augment tne training materials handed over by the author.

E F WOLSTENHOLME   "System Enquiry"   John Wiley, 1990   (UK)

N ROBERTS, D F ANDERSEN   et al. "An Introduction to Computer Simulation"
                            Addison-Wesley, 1983   (USA)

3. The Token Ring should be fully implemented. To abandon it now would be to waste the money spent on it to date.

4. Two or three specialists should come to Salford University for further training, provided they have mastered most of the material left behind by the author.

Networking and Database specialists

The following concern the database and networking specialists referred to in the report by Graham Winch (January 1990). It appears that these specialists were required to help build a vast database of information to be provided by 5000+ firms. To this author this venture is hardly merited. It smacks of an electronic version of state planning which was rejected by the people in 1989.

It would be sensible for the IDI to have some expertise in local area networks on PCs. This would put them in a good position to advise individual firms contemplating the installation of such a network. Being able to offer advice in this area is an obvious source of revenue for IDI. By the same token, expertise in PC-based database software (eg DBASE or FOXPRO) would give IDI an edge in advising firms grappling with the creation of databases. (At the moment IDI are advising Balkan Airways on the creation of an aircraft maintenance database, apparently based on a mainframe.) But specialists such as these are not, for the immediate benefit of IDI, best employed working on grandiose schemes to network a large part of the industrial economy.

Self-help Activities by IDI

Finally, and perhaps most importantly, the following recommendations relate to actions which the IDI can undertake on its own part. They must be proactive in the realisation that they are now (or soon will be) in competition with other firms offering managerial expertise.

1. They must devote some resources to advertising their services eg simple leaflets.

2. Be prepared to offer a number of days free consulting in order to induce business.

3. In conjunction with 2. persuade the Bulgarian government to offer subsidised fees to those private sector firms which use IDI to improve their managerial techniques and systems or which attend courses at IDI. (This is the exact reverse of the old system whereby the government gave grants directly to IDI.)

4. Persuade the Bulgarian government to use the services of IDI directly eg for macro-economic or industry modelling.

5. Offer cheap courses on strategic planning.

All the above is circumscribed by the need to retain skilled staff. The economic conditions currently prevailing in Bulgaria are such that staff are experiencing virtually static salaries at a time of very high inflation. Motivation might be enhanced if they are able to claim a personal 'reward' for any business they bring in or are particularly successful at.

Motivation and morale can also be maintained by ensuring that staff each have the opportunity to use modern computer techniques and/or have a chance of attending further training courses, possibly outside of their own country.

Finally, it is worth mentioning that this current project (which has run for four years) has been the vision of one man, Dr. Parvanov, at IDI. It might be prudent, if the project continues, to request IDI to nominate one or two deputies who can ensure its continuance in Dr. Parvanov's absence or if he left IDI.

APPENDIX A   DETAIL OF TRAINING COURSE

COURSE: SYSTEM DYNAMICS AND DYSMAP2

INDUSTRY DEVELOPMENT INSTITUTE, SOFIA, BULGARIA

January 1992

TOPICS TO BE COVERED:

(*) The philosophy of System Dynamics (SD) and its conceptual under-
    pinnings

(*) The role of SD models in the process of policy making: Group
    Decision Support Systems and Boardroom Systems

(*) Dynamic behaviour modes, information feedback and feedback loops

(*) Influence diagrams

(*) Model conceptualisation and flow diagrams

(*) From flow diagrams to equation writing; DYSMAP2 syntax and
    functions, especially table functions

(*) Formulating and running a very simple model using DYSMAP2
    (The product life-cycle of a fashion item)

(*) Delays in SD models

(*) Building a model incorporating delays (Production planning)

(*) More on equation writing; dimensional analysis

    Loop analysis; gain and delay

(*) Errors in model development and model debugging

    Validation and testing of SD models

(*) Exercise: the marketing of consumer durable goods

    Revision on the role of SD models in policy support

    Optimisation in SD models; fitting models to data for
    parameter estimation; the DYSMOD/386 software; examples

    CASE STUDY 1: The Rise and Fall of Laker Airways

    CASE STUDY 2: Economies of scale in the Steel industry

CASE STUDY 3: Market Growth and Capital Investment

(*) Indicates topics covered during the training sessions

APPENDIX B   LIST OF CONTACTS MADE AT IDI

Dr T Tsvetkov   Director General   Tel: 790004 Fax: 799134 (*)

Dr I P Ivanov   Deputy Director General Tel: 230128 (*)

Mr H Ch.Haralambiev   Deputy Director General   Tel: 791041   (*)

Dr V Parvanov   Project Manager

Mr S S Tomov DP Manager   Tel: 231128

Mr D Cvetkov   President, Management Board of IDI   Tel: 883081 (*)

(*) = Spoke little or no English