MANAGEMENT INFORMATION SYSTEMS AND PRODUCTION MANAGEMENT A LOOK AT THE SEVENTIES

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I. Introduction

The areas of production and inventory control were among the first to experience the impact of computers. Today we find that most large organizations have computerized some facets of their production and inventory control cycle. The sophistication of these systems varies, but even the best are not addressed to the problem the manager faces in his efforts to improve his decision-making process.

The first use of the computers at the production level has been invariably addressed to the processing of accounting data. Efforts to process more disaggregated data and to do it faster, have resulted in systems which clutter the desks of managers with a lot of data but little if any information. In our estimation this is an unfortunate development; because the production manager not only is unable to obtain help from the information system in his attempts to structure and control his problems, but, what is more, he is hampered by the ever increasing quantity of data the computerized system generates. No wonder he mainly resorts to his intuition despite our exhortations to use models and rational analysis.

We believe that the greatest obstacle toward the realization of effective

information systems for production management is not technical but conceptual. We have hardware and software to satisfy our needs economically, if we just knew what to do with them. This is our main problem in the general area of management information systems, lack of articulation.

The purpose of our presentation is to shed some light on the issue of what type of systems we should be looking for in the seventies. To do this we will:

(a) Discuss the ingredients of control of production processes, and at the same time bring to the forefront some of the general characteristics of the major problems production managers face in their efforts to carry out their functions

(b) Outline a framework for general management information system design and specify the dimensions along which such systems may vary, and

(c) Evaluate existing systems across the dimensions discussed under (b) and speculate about the future.

II. The Control of Production Processes

As with any other control situation, there are certain elements which are necessary for managing production operations effectively. The information system, if it is to be useful to management, must provide aid, across each one of the following dimensions all of which are necessary for the operation of a planning and control system.[1]

1. Objectives: The objectives of the production activities of an organization are the result of a whole series of transformations which bring

[1] We view the information system as the set of relationships or links between the various components of the control process. The assemblage of the control process and the management information system we will call management planning and control system.

the overall objectives of the organization to bear on production plans and operations. It is through the transformation or translation of the strategic plans into hierarchical subplans, operations and suboperations, that top level assumptions and subjective value judgments of managers are converted into information. The latter in turn constrains lower-level operations because it is perceived as a set of "facts".

There are several consequences for the information system which emanate out of the hierarchical structuring of plans and operations, and the conversion, in the process, of value judgments into "facts". For the purposes of this paper we will concentrate only on two.

(a) The objectives that filter down to the production level are multidimensional. The Management Information Systems (MIS), therefore, must provide managers with information not only regarding the constraints, but also aid in perceiving changes in priorities and in trading off between conflicting alternatives.

(b) If, in addition to the usual feedback, the assumptions which underlie the constraints and relate value judgments to operating plans were to be monitored, the M.I.S. would be more useful to managers. It can provide signals and dictate actions which could prevent problems from arising. Furthermore, it can help reinforce or point out the necessity for changing held beliefs concerning the relationships between assumptions, objectives, plans, resources, technology and operations. That is to say help the manager test the latter relationships (his model of the world as he sees it), and learn from experience.

Unfortunately, very few if any information systems today provide feedback