Characteristics and Perspectives of Global Industrial Management

Nikolaos Fotopoulos, Ioannis Gionas and Efstathios Tassios

Industrial Applications Department
Advanced Concepts Enterprises
39-41 Ilia Iliou str.
117 43 N. Kosmos, Athens
GREECE

Abstract: The importance of holistic industrial management is outlined in this paper. The new needs that have arisen in industry, due to the fact of general macroeconomic changes, are discussed and the minimal specifications of an organisational model that reflect a solution towards integration ,are presented. The expected benefits by the use of such a model are examined in brief and the concept of a supporting information system is introduced. Finally a schematic diagram of the discussed model, showing the possible functional elements-departments of an industrial enterprise and their interaction, is presented.

Keywords: Holistic Managerial Approach, FSM, MPS, MRPII, CRP

Nikolaos Fotopoulos was born in Athens, Greece in 1963. He obtained his degree in Chemical Engineering with specialisation in Organic Chemical Technology, "Traian Vuia" Polytechnical Institute of Timisoara, Romania (1989). He is now working for obtaining a Ph.D degree at the Division III of Science and Material Technology, Chemical Engineering Department, National Technical University of Greece. Mr Fotopoulos is the manager of the Industrial Applications Department of Advanced Concepts Enterprises, Athens, and his major work fields include production organisation, planning and control, system analysis and design as well as development of managerial tools.

Ioannis Gionas was born in Tripolis, Greece in 1966. He obtained his degree in Electrical Engineering from Patras University, Greece, with specialisation in Electronics and Telecommunications (1989) and completed his MSc in Information Engineering with specialisation in Control Engineering at City University, London (1991). He is currently with the Industrial Applications Department of Advanced Concepts Enterprises, Athens, as an Information Engineering consultant. His major work fields include production organisation, planning and control, control engineering, system identification and optimization.

Efstathios Tassios was born in Athens, Greece in 1967. He obtained his degree in Computer Science with specialisation in Music and Animation from Boston House College, Johannesburg, RSA, 1991. He now works at the Industrial Applications Department of Advanced Concepts Enterprises, Athens, as a Software Engineering consultant and his major work fields include production organisation, planning and control, installation and support of information systems and software engineering applications.

The change of macroeconomic environment over the last decade has imposed important modifications in the structure and functionality of most of the enterprises, in both managerial and technological aspects. With this phenomenon becoming more intense in the production area, one of the most important modules of economy, certain needs as a result of those modifications have arisen :

- A new consistent and holistic managerial approach, resulting from the large amounts of information that originate from different departments and needs gathering and central processing.
- Integration between management and automation in order to allow an easy and fast implementation of management decisions.
- Fast response to external variations at strategic level, concerning the time and cost strategies, resulting from the fast and every day changing of economic environment.
- A mechanism of valid decomposition of strategic plan or top management choices into master production schedule and also into specifying particular departmental targets, due to the increased degree of complexity and bureaucracy found out in different departments and their interactions in an industrial enterprise.
- Training of all involved parts.

In order to accomplish the above an organisational model will be derived according to the following specifications:

- Structure characteristics: the degree of structure is an important concept. The more structured the model is, the easier the enforcement of rules and procedures becomes. In order to achieve a high degree of structure the information flow elements inside as well as outside the model must be normalised. The normalisation also refers to data, procedures and documents such as :

- Company and people information.
- Units of measure and conversions between units of measure, necessary for the definition of parts.
- Classification of parts, necessary for the information interaction and processing between the various departments.
- Currency symbols and exchange rates, necessary for financial information processing.
- Reports concerning production, stocks, purchase and sales information, necessary for the correct and fast tracking of production indices, profitability and departments' results analysis.

This normalisation guarantees the model's self-consistency, self-coherence and reliability.

- Planning capabilities: the model should allow the top management to derive and adjust certain medium- to long-term goals that must be attained. These capabilities are translated into :
  - Company's Strategy/Policy
  - Prediction/Estimation
  - Master Production Plan Scenarios
  - Cash Flow Analysis

- Distribution and Execution functions: the model should allow the decomposition of the top management's choices into short-term and low-level targets and the circulation of those targets in the various departments concerned and also the clear update of the actions taken by those departments in order to keep up with company's expectations.

- Feedback and Control functions: since in industry continuous variations occur and many things can change in a short time period, the model should incorporate the concept of feedback. This way the model becomes dynamic and gives the opportunity to the company to steadily revise its long - term plans and adapt efficiently. In order to achieve such a large scale feedback, it is compulsory to accompany it by two inner feedback loops that stabilise and protect the system from the various fluctuations both at tactical and short-term planning level.

- Human model interface.

The actual Functional/Informational Model Diagram is given in Figure 1 in a condensed form. The basic concept presented in this diagram is that of the departmental structure of an industrial enterprise along with the Functional/Departmental interconnections.

The prospective benefits of such a model can be summarised in the following:

- Production rational time phasing depends upon products demands (sales).

- Investment plans.

- Management of work resources.

- Implementation of stock policies.

- Purchasing strategy.

- Product cost control and amelioration.

- Necessary modifications within the production system in order to meet cost and time targets.

The concept of a supporting information system, that is enhanced in the organisational model presented, is introduced and shown in Figure 1 under the INFORMATION SYSTEM label. The upper case letters represent the dynamic parts of this system, whereas the lower case letters represent the static parts. Typical systems that implement such a general and large scale system integration of strategic long-term planning are encountered in FSM-MPS-MRPII-CRP chain (Financial Strategic Management-Master Production Schedule-Manufacturing Resource Planning-Capacity Resource Planning).

Apart from the above system, the need for time phasing of the functional entities emerging out of the model given in Figure 1 becomes essential. The Functional Entities Logic Diagram given in Figure 2, shows the steps taken by the management in order to maximize the benefits entailed by this model.

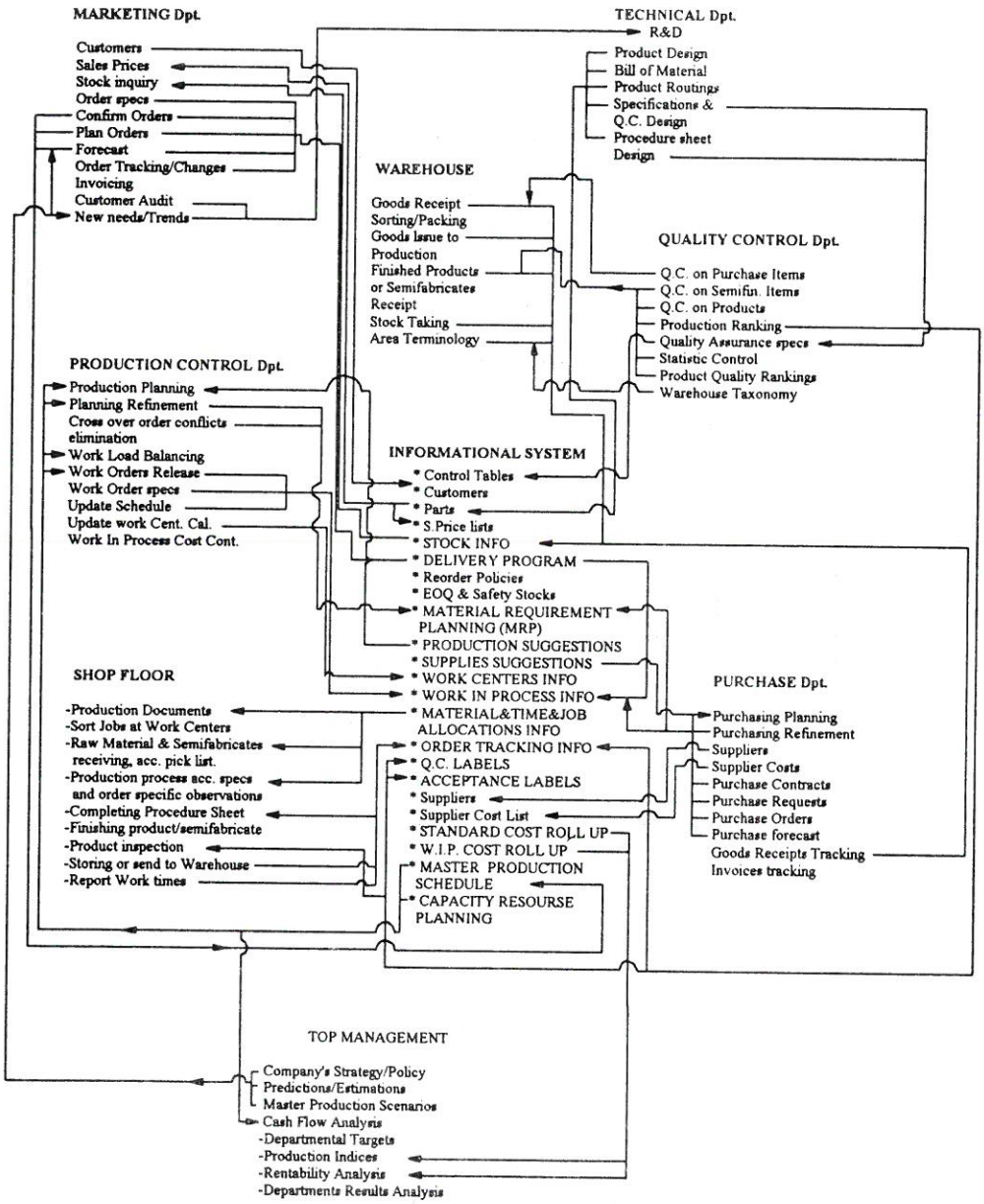

Figure 1. Functional/Informational Model

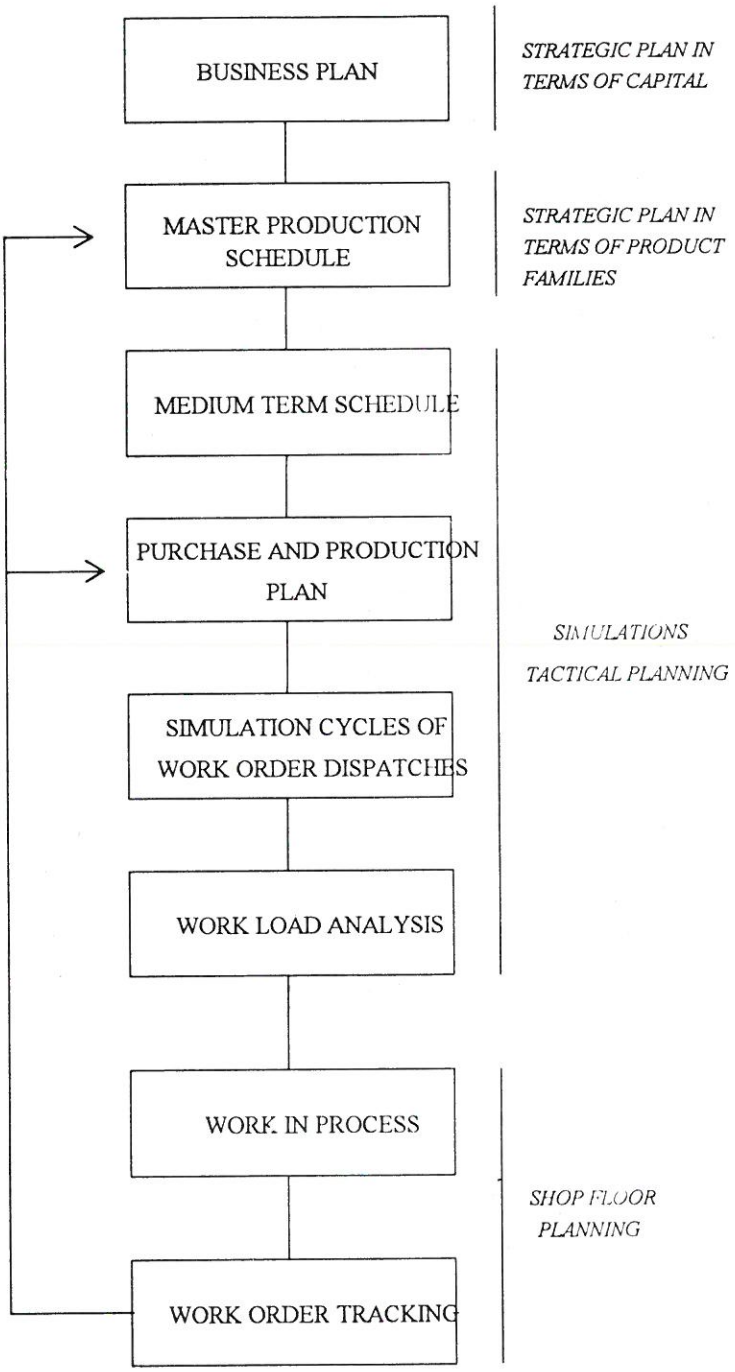

Fig. 2. Functional Entities Logic Diagram of Global Industrial Management

REFERENCES

1. ADVANCED CONCEPT SA, **Study of Reorganization, Development and Automation of Production Process of Mass Fashion SA**, MENTOR EEC Project, December 1993.
2. ALTER, S. , **Information Systems: A Management Perspective**, ADDISON-WESLEY Publishing Company.
3. LUSCOMBE, M. , **"Weathering the Storm" Manufacturing Engineer**, April 1993.
4. LOVE, D. , **"DMRP in the Cell" Manufacturing Engineer**, April 1993.
5. FOTOPOULOS, N. , **Context, Purpose and Perspectives of MRPII Production Control Informational Systems Development in Greek Industry**, Information Systems Applications and Automation, Process Industry Symposium, June 1994.