MANAGEMENT INFORMATION SYSTEMS

Planning, Developing, Managing

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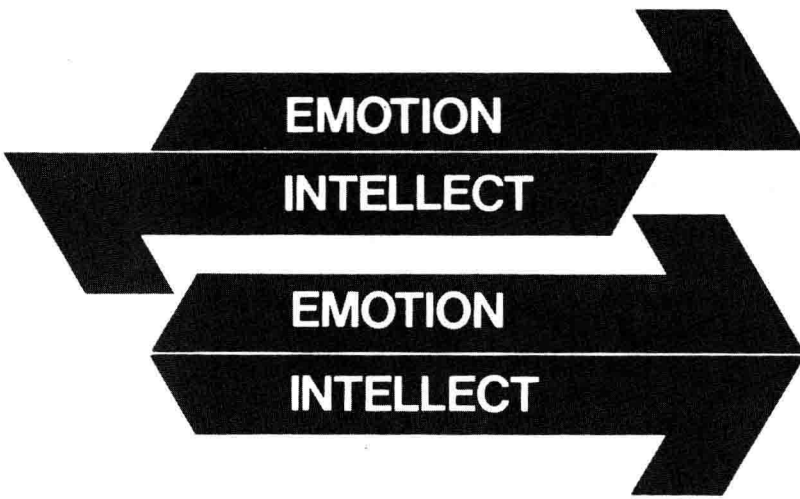
ACKNOWLEDGMENTS

When a book takes 10 years to develop and finish, the trail of acknowledgments grows very long, but all the more necessary. In treating these by groups for purpose of easy identification, I recognize the difficulty in dealing with the relative support, and hope that those affected understand.

The Cover

This single visual concept has had a great impact upon me and upon my consulting style and further strengthened my support of the blending of the behavioral sciences and management technology. All too frequently the emotional attachments to divisional or functional prestige or prerogatives have been counter to the intellectual needs of good interfunctional and EDP interface. Progress proceeds at a snail's pace until this is overcome. When intellect shows the managers that they all gain tremendously by helping with the joint MIS development, and an understanding of their emotional problems (usually fears) is achieved—*progress zooms!*



This visual was supplied by *Fred Zweig, President of Waymaker Institute,* St. Louis, Mo., during a consulting assignment at Rath & Strong on our corporate mission.

Colleagues at Rath & Strong

Almost everyone in a small consulting company contributes to its image in some way—but in the preparation of this book I particularly appreciated:

- The editorial review performed by *Robert Cronan*
- The explication of concepts and rewriting of the behavioral sections by *Dan Ciampa*
- The help of *Woodrow Chamberlain* and *Robert Cronan* in preparing the Nordberg Machinery Group MRP case study
- The assistance of the Task Force on the Mapping case study, including *Romeyn Everdell, E. Robert Barlow, Gerald Dorman, William Leitch, Dan Ciampa,* and others.

Many of the above participated with me in a variety of assignments over the 10 years during which the data was collected; others in Rath & Strong include *LeRoy Lindgren, J. Nicholas Edwards, Dan Murray, Wood Sutton, John Noon, Clint Jones,* and *Tom Woods*. I cannot go on without thanking *Sylvia Poster* and *Mim Karhumaa* for much editing and keeping the additions, deletions, and other changes under good control.

Clients' Personnel

The most demanding of the systems installations over the 10 years were those Material Requirements Planning Systems, and Shop Floor and Production Control Systems in complex jobs shops, though some of the multiwarehouse distribution systems, were very demanding.

The greatest contribution came from the installation of MRP and Master Scheduling Controls at Nordberg Machinery Group of Rexnord, Milwaukee.* The people who made it happen are *Robert Schoner,* President, Process Machinery Division; *Eugene Schloesser,* EDP Systems Manager; *Frank Strang,* the General Manager; and *Don Taylor,* President of the Machinery Group. I should also mention *Ron Borowski,* Systems Development, and *Frank Monfre,* Inventory Control Manager, who worked very closely with the Rath & Strong staff previously mentioned.

Probably the smoothest MRP Shop Floor Production Control Program was at the Jones & Lamson Division of Waterbury Farrel—a Textron Company. Three factors contributed to this:

- Jones & Lamson Management, including *Robert Jones,* General Manager, *Ray Streeter,* Factory Manager, *Paul Van Dusen,* Materials

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* See Case Study Appendix 2.

Control Manager, and *Don Richmond,* a key system analyst and programmer. This group are about as straightforward "let's get on with the job guys" as you could expect.

- Jones & Lamson did not have a lot of other computerized systems with which the MRP and Shop-Floor Control System had to interface.
- Excellent client–consultant relationship based on substantial past history.

The installation most dependent on the contributions of our Organization and Management Dynamics Group (OMD–behavioral scientists) was the distribution system at Leviton. In fact, most of the systems work had been completed, but inaccuracies and user noninvolvement factors prevented its successful use. The Leviton personnel who were instrumental in its success were Don Hendler, Distribution Vice President; Steve Sokolow, EDP Systems Vice President; Tom Blumberg, Marketing Vice President; Harold Leviton, President; Ralph DeBiasi, Financial Vice President; Harvey Kramm, Operations Vice President—Jack Amsterdam, Chairman; and many warehouse managers and task force members.

Another program involving OMD was the Mapping Case Study (See Appendix 1) carried out with Ray Howland, Sr., Chairman, and Roger Howland, President of Eastern Tool and Stamping Co.

At the Hesston Corporation we were involved in a number of successful multidisciplinary (Behavioral Sciences, plus Management Technology) programs, one of which included Data Accuracy and W-I-P Control. Key people were Richard Huxman, Factory Manager; Howard Brenneman, President; Frank Depew, Vice President, Farm Equipment Division (now with Jacobson Manufacturing Co.); Glen Otte, Materials Manager, and many others.

Others include Robert Pash, Vice President, Finance, Newell Companies; Ed Puth, Financial Vice President, and Jim Osborne of EAI; George L.N. Meyer, Jr., then President of the Meyer Group of ATO; Brooke Reeve, President, Harvey Granger, Vice President, Manufacturing, and Vic Johnson, Vice President, Materials, Great Dane Trailers, Inc.; Harreld DeMunbrun, of Casco (now with Echlin), and Stuart Mason, Vice President, Manufacturing; Arthur Williams, formerly EDP Manager of B.F. Goodrich; James Brown, EDP Systems Manager, United Carr Fastener; at Computer Sciences, Infonet Division, Maury Pratt and Marty DeFranco; at Joy Manufacturing Company, Bill Campbell, Distribution Manager, Louis Helmick, President; Larry Greenhouse, Division Manager and Bill Calder, Plant Manager; at Moog, Bill Godin and Bob Brady; and George Raymond, President of Raymond Corporation.

Closer to home, my son, Tim Putnam, did some of the early editing and rearranging that was most helpful, and Dot, my wife, put up with a great deal of "book work"—some even on vacations.

Contents

Introduction

This is a book about the successful management of Management Information Systems covering:

- The management requirements, from the Chief Executive to the Systems Programmer.
- The time period from predesign through development, installation, and operation, on to future considerations.

Other books have covered quite thoroughly the technical requirements for Management Information Systems (MIS) in the various functional areas. A few have dealt with some of the key managerial factors for success that are included here. To my knowledge, however, no previous work has tried to compile the managerial factors for successful MIS application as done in this book, i.e., from top-to-bottom of the management and from start-to-finish of the application, based upon more than two dozen case experiences. Yet most professionals correlate the degree of success with MIS more to managerial and human factors than to technical ones.

In the '73 and '74 National APICS Conferences, the author asked several hundred attendees about the biggest cause of poor MIS performance with this response:

	Yes	No
Are you satisfied with the total progress of your MIS system?	20%	80%
Do you consider the most significant determinant to your progress is systems or technical expertise?	20%	80%
Or communications, understanding and human problems?	80%	20%

This test elicited similar responses when asked of several local groups. It remains a mystery as to why this quandary exists: 80% of the problems lie on the human side, yet 95% of the time and money has been spent on further *technical* improvements.

One of the reasons is that the communications and human-resource problems are multifunctional, and the support and planning required have to come from top management. Another reason is the lack of understanding of the type of participation and training required. The routine "lay it on" approach should be replaced by the participative, workshop, "own-my-share-of-the-problem" style. This can best be accomplished with guidance from management development professionals.

The early chapters of the book,

- Getting Started,
- Preparing Top Management for a Key Role in MIS, and
- Creating a Positive Environment for Change,

are directed especially toward top management because this is the crucial stage for its involvement. That which is done or left undone at this stage seriously affects the potential for full success downstream. The latter chapters:

- Designing the System,
- Implementing an MIS System, and
- Living with an MIS System,

are pointed more toward members of middle and lower management, since they have major responsibilities during these stages. The final chapter, "In the Future," has both top management and operating management implications.

Thus, the audience for the book includes:

- Chief executives;
- Functional executives—finance, production, marketing distribution, engineering;
- Departmental managers;
- Production and inventory control managers;
- Materials managers;
- MIS managers;
- EDP managers;
- Systems and programming personnel;
- College students.

The book also deals with the important factor of managing the operation while implementing a Management Information System. Many companies have found the transition period exceedingly difficult and often very costly.

Outline

The first chapter opens with a statement on MIS philosophy. This is followed by a brief historical development of some of the key issues.

The second chapter, "Preparing Top Management for a Key Role in MIS," emphasizes that more is needed than superficial support or

acceptance of a program to "keep up with the Joneses." Methods of surveying potential costs and benefits are outlined, together with the commitments that are needed from top management in order to achieve the established goals. The need for a comprehensive master plan and adequate macro designs is outlined. Top management has to provide the active support that overcomes functional barriers and facilitates the achievement of common objectives.

The third chapter, "Creating a Positive Environment for Change," deals with management from top to bottom. Acceptance of change and acceptance of the risk of being wrong must be actively promoted at the top, or progress will be slow and commitment low all the way to the bottom. "Mapping" of Organization Effectiveness and Resource Efficiency is explained in this chapter and a case example is presented in the Appendix.

The human side of MIS and the use of participative training groups to deal with resistance to change is explained. Such methods replace resistance with involvement and goal-setting. At the functional executive level, we need commitment to coordinate with other functions on the program, as well as wholehearted support within each function. In the major "user" departments, such as production and inventory control, sales, distribution, etc., the manager has to play the *full* user role, setting the specifications, checking on progress, clearing up input data, and using the results. Finally, in the EDP and systems area, we need a competent staff that can work effectively with a variety of functional users and encourage their active participation.

The next chapter, "Designing the System," deals with the fundamentals for long-term success rather than with short-term objectives. While the latter may be vital for current support of the application, lack of a long-term view has resulted in perpetual and wasteful rework in many installations. The development of a master plan and macro designing are key steps. The cost of redoing and replacing a badly segmented system can exceed the initial cost, and may create difficult transitional problems as well. Such items as these are explained:

- Integrated data base,
- Management by exception,
- Data edit and check,
- Documentation,
- Modular design,
- Software, including application packages, and
- Systems sensitivity.

The emphasis is still on management, however. At this level of the organization, a task force oriented toward the user, with participative methods of problem solving, is essential if we are to obtain full commitment to the program.

From systems design, the book moves to a chapter on implementation. We attempt to explain top management's role in pushing for progress to schedule and insisting on high quality of results. The user has the role of debugging and achieving reliance on the new system with a minimum of parallel operation. Proper stress is given to the user's responsibility for and support of data cleanup and the maintenance of data audit reports. We recommend directing implementation toward the areas of larger payoff, since achieving positive results develops increased future support.

The next chapter, on "Living with an MIS System," covers performance in the installation and use of the MIS as well as the overall management of the business in achieving projected profit goals. The best managers get the desired results through the use of the system combined with the "gut-feel" decisions when necessary. It is important to recognize that:

- Too frequently top management does not push for the highest success levels with MIS;
- Too frequently catastrophes have been attributed to living with MIS where, in fact, management, and not the system, is at fault;
- Too frequently results have fallen short of expectations and users have been content to allow them to remain there.

Most of all, management should make the change to MIS exciting and not threatening. This requires the support of people through a period of change, along with praise and reward when the transition has been successfully accomplished.

In the final chapter, I take a look into the future and discuss the impact of success with MIS on all levels of management and labor. We will see great emphasis on central staff work versus separate functional staff; line managers will monitor operations, and assume greater responsibility for expensive equipment. At the same time, we must adjust to a reduction in day-to-day planning by lower levels of management.

The book concludes on a hopeful note—that MIS will increase in both success and impact, that the challenge and benefits will be greater than in the past, and, with participative programs, we can improve "humanism" in business operations.

This book is designed as a training manual as well as a read-through treatise for the professional. The next pages describe the type of

participative training recommended. The questions supporting the training practice are placed at the back of each chapter.

Team Development For MIS Support

This book presents a general picture of common (and some not-so-common) problems encountered during the conception, design, and implementation of major industry systems.

From a technical point of view, it includes such issues as:

- Integrating systems across functions,
- Need for realistic accounting systems,
- Considerations in data-base selection and development,
- Data editing and accuracy control,
- Development of a sound master plan, including policy determination, estimation of benefits, and manpower and planning needs over the time space.

It also presents its picture from *a people and a management* point of view. Included here are people being able to work together to solve problems and to plan, managers motivating their subordinates, and people being committed to making the system work.

The reason for this two-part treatment is very simply that *both* areas can cause systems to fail; they can fail because of technical flaws, inadequate designs, or low level of technical skills; they can also fail because the people who should have been prime movers were not involved in the initial phases of the design, and because groups of people from Production Control cannot work with their counterparts in Production because of deep-seated animosities that have never been resolved. As expressed in the design on the cover, their emotions are going in an opposite direction to what is being presented to the intellect. The point is that, since problems that make systems fail can emanate from either the "technical" or the "people" side of organizations (or both), it is important to deal with both when discussing how to recognize and solve systems problems.

In order to enhance the usefulness of this book, we have designed a three-to-five-day workshop for use within companies that have installed, or are about to install, manufacturing systems. The objective of these participative workshops is to enable teams of key people from each functional group involved in the management information system (including, of course, the MIS group itself) to work together in assessing system strengths and weaknesses and in planning for improvement. Typical teams are shown in the table below.

Typical Teams

	Marketing – Sales		Manufacturing – Purchasing				
	Order Entry	Distri-bution	MRP	Shop-floor control	Purch.	Finance & Cost	Engin-eering
Systems rep.	X	X	X	X	X	X	X
Sales adm.	X	X	X			X	X
Distribution rep.	X	X	X			Optional	
Manufacturing			X	X	X	X	X
Inventory control	X	X	X	X	X	X	X
Production control			X	X	X	X	Optional
Purchasing	X		X		X	X	X
Cost–Finance	X	X	X	X	X	X	X
Engineering	X		X	Optional	X	X	X

General Process

1. All workshop participants should be furnished copies of this book at least three weeks before the first meeting so that they can read the first two chapters and individually score their company on the score sheet for those chapters. These sheets are specially designed to identify strengths and weaknesses in system logic and performance. These sheets are returned to the consultants and are scored; the important data they provide will be fed back at the beginning of the first workshop, described below.

Prework

- First 2 chapters
- Score company, with questionnaire for first two chapters

Ranking

Depending on the number of factors, the chairperson may wish to compute the average "score" for each—or have the "A's" (most important items) singled out of the list—

- Those closest to 1.0 are facilitators.
- Those closest to 5.0 are hindering.

Meeting I

Day One:

- Introduction
  - Expectations
  - Objectives
  - Agenda

- Feedback—Review of information from individual responses to the questionnaire:

  Strengths, Weaknesses;

  Areas of agreement, areas of disagreement;

  FF, Facilitating factors

  HF, Hindering factors

- Reactions/discussion

Divide into small groups to address problem areas identified in data:

a) Each group should address itself to each category of problem;
b) Objectives of each are to expand each category and gain agreement on major hindering and facilitating factors;
c) Dinner and distribution of prework for Day Two.

Day Two:

- This day will be spent learning the concepts behind and the skills of creative problem solving and teamwork.
- The day (including lectures, exercises, and discussion) will end with each team defining specific action steps to resolve problems identified in Day One.

2. The first meeting lasts two full days and includes all of the team members in a general session with two consultants. The general objectives for this meeting are:

a) To appraise and reach consensus on the relative ranking of major *facilitating* and *hindering* factors in successful systems (including both those outlined in the book and others that the teams can add on their own).
b) To recognize, those factors where consensus cannot be reached and either take steps to resolve the differences or reduce the severity of potential impact on progress.
c) To recognize, within departments and individuals, certain attitudes or management styles that affect cross-functional relationships. Understanding these and, where possible, changing them, will be a significant step toward assuring an excellent system.
d) To develop and gain commitment to carrying out action steps to improve the major hindering factors.

This meeting is also used to help improve the way in which people work together on the job. Some techniques here include: