Management Science

Publication details, including instructions for authors and subscription information:
http://pubsonline.informs.org

Book Reviews

To cite this article:
(1962) Book Reviews. Management Science 9(1):162-169. https://doi.org/10.1287/mnsc.9.1.162

BOOK REVIEWS

LIKERT, RENSIS. *New patterns of management.* New York: McGraw-Hill Book Company, Inc., 1961.

One set of views about organizational behavior has now reached a more sophisticated level of application than most other recent views. To my mind, the set is characterized by two major attributes: first, it is people-oriented, viewing organizations primarily as human phenomena. Second, with this humanistic perspective, it is a "power-equalization" set. By the latter I mean that it specifies more or less explicitly an ideal organizational model in which power is distributed much more equally among the members of an organization than is characteristically the case in present-day industrial hierarchies.

Likert's book is one of two recent major expositions of this people-oriented, power-equalization approach to organizations. The other is McGregor's *The Human Side of Enterprise.* Likert and McGregor have a great deal in common; both expounding a body of beliefs and findings deriving largely out of twenty or more years of research and practice on live organizations. Likert's view, and McGregor's, are closely related to Mayo and the Western Electric studies, to Kurt Lewin and the development of group dynamics, and to Rogerian nondirective therapy for the individual.

Both McGregor and Likert have done excellent jobs of presenting this human relations perspective on organizations and management. But while McGregor's was a think-type exposition, Likert's is based deeply in empirical data accumulated at his Survey Research Center at the University of Michigan. And the presence of data adds considerable impressiveness to his arguments. He builds his special theory of management largely out of his group's findings relating (1) supervisory behavior to productivity, (2) group processes to communication, and (3) influence processes to organizational performance.

In almost every case, of course, his data are survey data; results of attitude questionnaires administered to members of large organizations. But he does lean heavily on one field experimental study, first reported by Morse and Reimer in 1956, carried out in one of the large insurance companies. He does this in part because he recognizes that survey data often leave large unanswered questions about causality. Expecially in Likert's area, many of us have raised questions about the causal relationship, if any, between morale and productivity. But by moving over into field experimental work—difficult as it may be to carry out nicely controlled experiments in the field—we at least get some better feeling for causality.

In the interesting field experiment in question, Likert's group compared four divisions of a large economy. A high producing and low producing division were given an experimental treatment aimed at lowering decision points and increasing participation. Two other comparable divisions, engaged in essentially the same activities, were turned toward closer supervision and toward high-level decision-making. Unfortunately the outcomes were ambiguous. In overall productivity

the more "hierarchical" groups were, in fact, superior by a slight margin, although the participative groups increased in productivity too.

It is at this point that Likert rings in the idea of "intervening variables," a set of factors which clearly moved in an adverse direction in the hierarchical program and in a positive direction in the participative program. For example "feelings of responsibility" increased in the participative program, but decreased in the hierarchical one. Employee attitudes toward high producers were more positive after the participative program than in the other case. Satisfaction with superiors increased considerably in the participative program and decreased in the hierarchical program, and so on.

But here Likert begins to leave his data to extrapolate; and his position grows weaker! He argues that if the program had continued longer (it was stopped at the end of a year by management) then indeed the differences in favor of the participative program would have been manifest even in productivity, for these intervening variables would by then have had their full impact. Thus Likert argues, "The attitudes, loyalties and motivations which improved the most in the participative program and deteriorated the most in the hierarchically controlled program are those which these studies have consistently shown to be most closely related in the long run to employee motivation and productivity. . . . Apparently the hierarchically controlled program at the end of one year was in a state of unstable equilibrium. Although productivity was then high, forces were being created, as the measures of the intervening variables and turnover indicated, which subsequently would adversely affect the high level of productivity" (p. 68).

Though there is a ring of truth to these arguments, the data do not directly support them. Moreover, it seems to this reviewer that Likert makes the unwarranted assumption that his hierarchical managers are static creatures, insensitive to their own failings. He may be grossly underestimating the number and kind of compensatory moves that management might make to counter any developing loss of morale and loyalty, or at least to counter their adverse economic consequences. Managers could, for example, conceivably maintain high productivity despite developing human resistance by the expedient of removing human beings altogether from large areas of operation. Since these were clerical jobs, and since they were occurring contemporaneously with the development of EDP, this alternative does not seem a fantastic one.

Likert spends the last portion of his book outlining his "link pin" theory of management. He proposes an organization of overlapping groups with some persons in the organization serving as link pin members of more than one group. He calls it an "interaction-influence" system of management, not unlike McGregor's Theory Y. It is characterized by a leveling of the power distribution, by efforts to develop more mutual influence than authoritative influence, and so on. Thus, "hypothetically at least, . . . each member of the organization would be loyal to his own work group, to its leader, and to the organization as a whole. The members of each work group would be skilled in their respective roles. Every member of the organization would feel that the overlapping groups which

link the organization together enable him satisfactorily to exert influence in all parts of the total organization" (pp. 181–182).

This ideal model seems a reasonable distillation from much of the research on organizations and groups conducted at Michigan, at the Harvard Business School, at M.I.T. and elsewhere over the last couple of decades. It also seems to have two major shortcomings. The first is its tendency to equate effective management solely with effective use of people. There is, even within the social sciences, increasing evidence that while it is true that people change the world, it is also true that the world changes people. If our hypothetical organization can best be made more productive by increasing the motivation and morale of its members, then Likert's model of organization to accomplish this end seems a sensible one. If, however, larger jumps in effectiveness can perhaps be obtained by investments in other realms (e.g., in technology), managements may on occasion move in directions quite different from the directions suggested by Likert, and still be, by my standards, good managers.

The second weakness is the scientific one I have already raised. Likert has compared apples and oranges; he has considered the dynamics of his own model, and compared it with static skeletons of the alternative models. He has pointed out the dynamic impact of changes consequent to his interaction-influence system, but he has somehow implicitly assumed that the alternative hierarchical approach to management is both the only viable alternative, and a static one at that, devoid of any self-corrective mechanism. Given that kind of an imaginary enemy, how can one's own army lose?

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MAASS, ARTHUR, HOFSHMIDT, MAYNARD M., DORFMAN, ROBERT, THOMAS, HAROLD A. JR., MARGLIN, STEPHAN A. AND FAIR, GORDON M. *Design of water resource systems*. Cambridge, Massachusetts: Harvard University Press, 1962.

After a first reading one wonders if the title should have been "Design of *A* Water Resource System" rather than ".... Systems". After a second reading this reviewer is convinced that it really doesn't matter. The one system studied is examined in such detail that application of many of the techniques to other systems presents no real problems. The need for a work of this type is so great that one hesitates to criticize those few sections which are not up to the general standard of excellence. There will be enough criticism from those who are overly concerned with vested interests and the political aspects of water resource planning and management. The authors have taken great care in their definition of the "benefits" of water resource programs, not only from the viewpoint of statute and common law, but also in the interpretation of benefits in a democratic society. Their presentation of competing political and economic factors in the design and operation of water resource systems might well serve as a standard for other mathematical studies of projects concerned with "... the public welfare", and for those O. R. workers engaged in studies of under-developed countries.

The book is a result of a five year "Harvard Water Program" (1955–1960). In addition to the authors, many others (from Federal and State agencies) contributed to both the program and the book, both of which were "team efforts". Thus the work avoids the lack of reality often associated (at least in the folklore) with academic research. The single problem discussed in detail (and covering more than half of the book) is not a "real" one, but one simple enough to be studied in detail yet complete enough to demonstrate most of the difficulties of large scale studies. The data for the basic input is real enough, a fifty year history of the Clearwater River (Montana) and its tributaries. As might be expected, the data on benefits is relatively "soft" and has a judgmental bias but the authors are well aware of the difficulties and have pointed out the need for intensive studies in this area.

The study is presented in three parts: 1) Objectives and Concepts, 2) Methods and Techniques, and 3) Governmental Factors. The first part consists of four chapters of a general nature treating objectives, basic economic and technologic factors, economic factors affecting system design and application of basic concepts. One important feature is the demonstration of the income-redistribution objective as well as the objective of efficiency of economic growth. In this part, too, the authors demonstrate the role of operating and capital costs and the influence of budgetary constraints. Much of the detail on mathematical techniques appears elsewhere and might have been omitted without affecting the value of the book to economists and O. R. workers. The book is addressed to engineers and others engaged in water resource development and hence an introduction to the concepts and techniques in the language of water resource development is not out of place.

The second part of the book is a demonstration of the general considerations by means of a sample problem. In this part the sample river system is presented in full detail, possible analytic and simulation techniques are discussed, and a large scale simulation study carried out and examined for response characteristics. In addition there are several chapters which treat mathematical models, the synthesis of streamflow sequences and the role of operating procedures. This part is, in a sense, the meat of the study, and most of it is good, firm and solid meat. There may be too much emphasis on the computer program itself; but the program indicates that larger systems can be studied in even more complete detail on existing computing equipment. Therefore, there are few technological obstacles to the future of analysis of water resource systems.

Many who feel that a mass attack by simulation methods can solve such complex problems might consider the small amount of computer time available (less than 10 hours on an IBM 704) as unfortunate. Indeed, one may question the results from the viewpoint of replications and confidence intervals. Considering the limitations of computer time and resources, the results achieved are quite remarkable. If anything, it indicates that simulation experiments need not be exhaustive and that good experimental design and knowledge of the physical system can conserve resources.

The last part, which consists of a single chapter, can be taken as a plea for

real planning and systems analysis by government agencies, or as a general statement of the responsibility of government agencies in the field of water resource development. Just as the technical parts demonstrate that water resource problems are systems problems, this part demonstrates that water resource development has far reaching economic and social consequences and, hence, deserves the full attention of the legislative, judical and administrative branches of government.

Summing up: A book which is at once a history of a project, a case study, an introduction to water resource development for O. R. workers, and an introduction to the techniques of O. R. for water resource engineers. It has meat for all management scientists, particularly those engaged in water resource studies, economic planning and aid to under-developed countries.

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RIORDAN, JOHN. *Stochastic service systems.* New York: John Wiley & Sons, Inc., 1962, $6.75.

This book is primarily intended as a comprehensive summary of developments in recent years in the study of stochastic service systems. It goes beyond mere summarization, however, containing several new results. The author is careful throughout to distinguish between his new results and those attributable to others.

As stated in the preface, the book is addressed to the applied mathematician. It makes extensive use of Laplace and Laplace-Stieltjes transforms as well as generating functions. The management scientist who does not have these tools at his fingertips will encounter serious difficulties in reading the material. The mathematical development is considerably more difficult than that in D. R. Cox and W. L. Smith's *Queues*, reviewed in this journal, April 1962.

The principal new results are the derivation of the delay distribution function for last-come-first-served queue discipline, Poisson inputs, and arbitrary service time distribution, new derivations for combined loss and delay systems, and a detailed working out of the relations of moments implied by Laplace transform relations.

The first chapter describes the underlying physical aspects of service systems which are described in probabilistic terms in Chapter 2. The next three chapters are concerned with the infinite server, the single server, and the finite number of server cases, respectively. The final chapter discusses theoretical studies of traffic measurements. The systems analyzed are, in general, more complicated than those discussed in the usual queuing literature although not as complex as some studies in the literature on stochastic processes.

For those with the prerequisite mathematical background, the book is recommended reading.

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MANNE, ALAN, S. *Economic analysis for business decisions.* New York: McGraw-Hill Book Company, Inc., 1961, $6.95, 177 pp.

This is a well-written, unpretentious book which fulfills its stated purpose as a survey and introduction to the areas between the disciplines of economics and industrial administration. It appears to be better suited to the needs of first year graduate students in industrial administration than to graduate students in economics. Except for an excellent treatment of the role of shadow or implicit prices, the economic discussion is somewhat sparse.

A nice use is made of worked-out examples, and by means of these and the exercises at the end of each chapter, a clear understanding of the principles of linear programming, integer and dynamic programming and their applications, is conveyed to the reader.

On page vii, Professor Manne refers to the IBM Research Center as one of a number of "purely fictitious organizations". This (possibly fictitious) reviewer has observed that at least one copy of this fine book has been allocated to this fictitious consumption activity. The reader is left with a moot question concerning shadow prices.

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BOOKS RECEIVED

(Inclusion of books in this list does not preclude their subsequent review.)

ACKOFF, R. L. *Scientific method.* New York: John Wiley & Sons, Inc., 1962, $10.25, 464 pp.

ARGYRIS, CHRIS. *Interpersonal competence and organizational effectiveness.* Homewood, Illinois: Richard D. Irwin, Inc., 1962, $6.50, 292 pp.

ARROW, KENNETH J., KARLIN, S. AND SCARF, H. (eds.). *Studies in applied probability and management science.* Stanford, California: Stanford University Press, 1962, $8.50, 287 pp.

BARISH, NORMAN N. *Economic analysis.* New York: McGraw-Hill Book Company, Inc., 1962, $9.75, 729 pp.

BELLMAN, RICHARD E. AND DREYFUS, STUART E. *Applied dynamic programming.* Princeton, New Jersey: Princeton University Press, 1962, $8.50, 363 pp.

CRUICKSHANK, HENRY M. AND DAVIS, KEITH. *Cases in management.* Homewood, Illinois: Richard D. Irwin, Inc., 1962, $7.35, 285 pp.

DAVIS, KEITH. *Human relations at work.* New York: McGraw-Hill Book Company, Inc., 1962, $7.95, 642 pp.

EILON, SAMUEL. *Elements of production planning and control.* New York: The Macmillan Company, 1962, $9.75, 587 pp.

EILON, SAMUEL. *Industrial engineering tables.* London: D. Van Nostrand Company Ltd., 1962, $7.50, 232 pp.

GALLAGHER, JAMES D. *Management information systems and the computer.* New York: American Management Association, Inc., 1961, $6.00, 191 pp.

GORDON, MYRON J. *The investment, financing and valuation of the corporation.* Homewood, Illinois: Richard D. Irwin, Inc., 1962, $6.50, 256 pp.

GREENBERGER, MARTIN (ed.). *Management and the computer of the future.* New York: John Wiley & Sons, Inc. 1962, $6.00, 340 pp.

HAIRE, MASON. *Organization theory in industrial practice.* New York: John Wiley & Sons, Inc., 1962, 173 pp.

KEITH, LYMAN A. AND GUBELLINI, CARLO E. *Introduction to business enterprise.* New York: McGraw-Hill Book Company, Inc., 1962, $6.95, 438 pp.

LLOYD, DAVID K. AND LIPOW, MYRON. *Reliability: management, methods & mathematics.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1962, $11.25.

MCCRACKEN, DANIEL D. *A guide to IBM 1401 programming.* New York: John Wiley & Sons, Inc., 1962, 199 pp.

MILWARD, G. E. *Launching and managing O and M.* New York: St. Martin's Press, Inc., 1961, $3.50, 94 pp.

NATIONAL BUREAU OF ECONOMIC RESEARCH, NEW YORK. *The rate and direction of inventive activity: economic and social factors.* Princeton, New Jersey: Princeton University Press, 1962, $12.50, 635 pp.

NEMMERS, ERWIN ESSER. *Managerial economics.* New York: John Wiley & Sons, Inc., 1962, $10.25, 498 pp.

ORCUTT, GUY H., GREENBERGER, MARTIN, KORBEL, JOHN AND RIVLIN, ALICE M. *Microanalysis of socioeconomic systems (a simulation study)*. New York: Harper & Brothers, 1961, $8.00, 425 pp.

PECK, MERTON J. AND SCHERER, FREDERIC M. *The weapons acquisition process: an economic analysis*. Boston, Massachusetts: Harvard Business School, Division of Research, 1962, $10.00, 736 pp.

RUCKER, ALLEN W. *Gearing wages to productivity*. Harvard Square, Cambridge, Massachusetts: The Eddy-Rucker-Nickels Company, 1962, $2.00, 52 pp.

SCHNEIDER, DIETER. *Die wirtschaftliche nutzungsdauer von anlagegutern als bestimmungsgrund der abschreibungen*. 1961, XII, 172 pp.

SCOTT, WILLIAM G. *Human relations in management: a behavioral science approach*. Homewood, Illinois: Richard D. Irwin, Inc., 1962, $7.50, 442 pp.

SHISTER, ARRON AND SUMMERS (eds.). *Public policy and collective bargaining*. New York: Harper & Row, 1962, $4.50, 248 pp.

SIEGEL, LAURENCE. *Industrial psychology*. Homewood, Illinois: Richard D. Irwin, Inc., 1962, $6.95, 414 pp.

TERRY, GEORGE R. *Office management control. The actions of administrative management*. Homewood, Illinois: Richard D. Irwin, Inc., 1962, $7.95, 744 pp.

THOMPSON, STEWARD. *How companies plan*. AMA Research Study 54. New York: American Management Association, Inc., 1962, 215 pp.

TIMMS, HOWARD L. *The production function in business: fundamentals and analysis for management*. Homewood, Illinois: Richard D. Irwin, Inc., 1962, $7.50, 546 pp.

UNITED NATIONS. *Economic bulletin for Africa*. Vol. 1, No. 1 (January 1961), $.75, 103 pp.

UNITED NATIONS. *Economic and social consequences of disarmament*. 1962, $.75, 66 pp.

WESTON, J. FRED. *Managerial finance*. New York: Holt, Rinehart & Winston, Inc., 1962, $8.50, 660 pp.

ZIEGLER, RAYMOND J. *Casebook in production management*. New York: John Wiley & Sons, Inc., 1962, $5.50 (paper $3.95), 150 pp.