

Effective Management for Engineers and Scientists

Leon A. Wortman, D.B.A.

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JOHN WILEY & SONS

New York • Chichester • Brisbane • Toronto • Singapore

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Library of Congress Cataloging in Publication Data:

Wortman, Leon A

Effective management for engineers and scientists.

"A Ronald Press publication."

Includes index.

1. Engineering—Management. 2. Psychology, Industrial. I. Title.

TA190.W58 658'.001'9 80-19665

ISBN 0-471-05523-9

Printed in the United States of America

10 9 8 7 6 5 4 3

Preface

Not everybody wants to be a *manager*. But practically everyone wants to understand what a manager is and does. Is the manager merely a person who has been elevated to an exalted position in his company, division, department, section, or group? Is he in this “exalted position” because of *what* he knows, or because of *who* he knows? Does he have to marry the boss’s daughter, or be related directly through blood or marriage to become a manager?

The answer to the last question is really very simple: being part of the boss’s family doesn’t hurt one bit if all you care about is being called “manager.” But whether you became a manager because of *whom* you know or through coincidences of birth and luck, it is *what* you know that will determine whether you are effective as a manager. By effective, I mean *able to achieve desired results*.

The *effective manager* is one who is able to achieve positive, productive results through the fulfillment of his role as the supervisor or leader of people who are responsible for performing technical work. The trick—but it isn’t really a “trick”—in performing as an effective manager is in practicing the “arts” of interpersonal communication and of understanding the interlocking needs of the subordinates who are necessarily responding to demands coming at them from multiple directions. These demands include the needs of the group to which the subordinates belong within the organizational hierarchy, the demands or needs of their peers, their supervisors, the leaders and managers throughout the hierarchy, and the company taken as an entity with an image and a series of plans and objectives the subordinates must support.

An “art” is a skill acquired through experience, study, and observation. “Communication” is any process by which information is

exchanged between individuals and groups. However, communication is much more than people talking to one another. It is people *working together* toward the attainment of common objectives. It means commitments to the plans, to the group, and to the company and its goals.

The work of the *effective manager of engineers and scientists* is not easy. It cannot be done in a casual or intuitive manner. The “arts” of management must be highly developed and the skills must be prudently practiced. At no time in this book do I ever indicate that a manager’s work is easy. Being an effective manager just isn’t easy. It is much easier to *become* a manager than it is to *remain* a manager. Some of you reading this book may already be managers. Others may one day become managers. Not everyone will be an *effective manager*.

The manager is *accountable* for people who are *responsible* for technical work. The manager is a person who must skillfully balance his concern for his people with his concern for the task. He must learn to be effective in the development of morale and attitudes that motivate his people to achieve. In this area he has a strong concern for his people. The hard data that define the series of actions for which his people are responsible also define the task for which he has concern.

Being an effective manager of engineers and scientists, I repeat, is not easy and is never simple. It is not my intention in writing this book to make the job of the manager *easy*. I don’t think any book can do this. This book is intended to help the new and the veteran manager become more effective managers. I think a book can do that.

Throughout the book I have tried to be consistent in my use of the male pronouns: he, him, his. However, this is done solely as a matter of convenience and to eliminate the awkwardness of having to use expressions like “he/she,” “him/her,” and “his/hers.” I do hope you will not think that my use of the male pronouns to the exclusion of the female or dual pronouns is sexism or discrimination on my part. As have so many other authors, I am sure, I have unsuccessfully struggled with this modern language problem. Effectiveness as a manager, of course, has nothing whatsoever to do with gender.

LEON A. WORTMAN

Palo Alto, California
August 1980

Acknowledgment

I am grateful to many of my co-workers, who contributed in important ways to the knowledge, expertise, and insights that have enhanced my career and enabled me to write this book. Several of the managers to whom I reported directly had particularly positive influences on my development. They have earned and deserve special mention.

Harry Daniels, my first engineering manager, taught me the value of honesty in dealing with subordinates. Paul W. Fuelling, chief engineer of radio station WHN and WHNF in New York, taught me the importance of flexibility in style. William A. MacDonough, retired president of the Kudner Agency, ranks as one of the most effective managers I have known. Indeed, he is my role model for the *effective manager*.

Leonard J. Smith, executive director of Training Services, Inc., Rutherford, New Jersey, encouraged me to combine my academic education and "hands on" experiences in management and organization development into a series of "Effective Management" seminar/workshops. He has taught me a great deal more about two-way communications techniques than he may realize.

Michael J. Hamilton, my editor, earns special acknowledgment for the encouragement and enthusiasm he shared with me in putting my concepts and practices into book form.

L.A.W.

Contents

| | |
|--|-----------|
| Introduction | 1 |
| 1 What makes them tick? | 8 |
| Physical and human resources, 9 | |
| The soft data bank • Interactions • People orientation | |
| • First the theory • Predicting group behavior | |
| Theory as a basis for action, 13 | |
| Personality theory, 14 | |
| <i>Freud • Jung • Adler • Horney • Sullivan • Fromm</i> | |
| Learning theory, 21 | |
| <i>Pavlov • Watson • Skinner</i> | |
| Tabular description: Personality and learning theories, 23 | |
| 2 The search for satisfaction | 27 |
| People have needs, 28 | |
| Behavioral sciences, 28 | |
| <i>Herzberg • Maslow • McGregor • McClelland</i> | |
| How do the theories correlate? | |

| | | |
|----------|---|-----------|
| 3 | Who am I? | 43 |
| | You and McGregor, 45 | |
| | <i>Self-test: Do your assumptions lean toward theory X or Theory Y?</i> 45 | |
| | <i>Theory Y consistency • Theory X consistency</i> | |
| | What are your needs?, 49 | |
| | <i>Evaluate yourself, then evaluate others</i> | |
| | <i>• Determining the nature of your needs • Rate your supervisor, your peers, and your subordinates</i> | |
| 4 | Managing the creative mind | 60 |
| | Creativity? Ingenuity? Productivity?, 62 | |
| | <i>Managing the creative engineer and scientist • How creative are you?</i> | |
| | <i>Self-Test: Measuring your similarity to other creative individuals,</i> 75 | |
| 5 | Building positive interpersonal relationships | 79 |
| | Desirable leadership characteristics, 80 | |
| | Coping with a negative personality, 83 | |
| | <i>Solving the problem</i> | |
| | <i>Self-test: Measuring your abrasiveness,</i> 88 | |
| | Conflict management—an opportunity to excel, 89 | |
| | What is “conflict”? • Win-Lose? Lose-Lose? | |
| | No-Lose? • No-Lose is Win-Win • Does it always work? • Back to square one • Benefits are derived | |

| | | |
|----------|---|------------|
| 6 | Constructing two-way communications | 95 |
| | Are your downward communications correct?, 95 | |
| | Twelve "do not's" in communication, 101 | |
| | Nine clues to successful group meetings, 103 | |
| | Brainstorming . . . the creative meeting, 110 | |
| 7 | Building team activity | 113 |
| | Psychodynamism—human intercommunications, 114 | |
| | <i>The communiscope • Report-command theory</i> | |
| | <i>of communications • Self-perception and the team</i> | |
| | <i>• Feelings of adequacy and the team</i> | |
| | Formation of the group, 123 | |
| | <i>Goals must be relevant to needs • The open door</i> | |
| | <i>• The informal leader emerges</i> | |
| | Hawthorne experiments—practice evolves into theory, 127 | |
| 8 | Analyzing verbal transactions (TA for the engineering manager) | 130 |
| | According to TA theory, 132 | |
| | <i>The parent • The adult • The child</i> | |
| | Direct and crossed communications, 138 | |
| | Strokes, 140 | |
| | What is your dominant ego state?, 143 | |
| | <i>Self-test: What is your dominant ego state?, 144</i> | |
| | <i>How to evaluate the scores</i> | |

| | | |
|-----------|---|------------|
| 9 | Expectations and management styles | 154 |
| | The Wheel of Interaction revisited • Leadership and management • The power of expectations | |
| | A catalog of management styles, 162 | |
| | Conservative • Captain • Avoider • Ambivalent • Structured • Motivator • Empathetic • Driver • Laissez-Faire • Achiever • Dictator • Supporter • Characteristics of management styles | |
| 10 | Effective use of management styles | 176 |
| | Vector analysis of style, 179 | |
| | Style must match need, 187 | |
| 11 | Twelve management problems and how to solve them | 191 |
| | Joe Cool, 194 | |
| | Superstar, 198 | |
| | Mister Miserable, 203 | |
| | Answerman, 207 | |
| | Sprinter, 210 | |
| | Writer's Cramp, 214 | |
| | Panic Man, 218 | |
| | Obfuscator, 223 | |
| | Day-at-a-time, 227 | |
| | Mind-set, 231 | |
| | The Strangler, 234 | |

Contents

xv

Granite Man, 236

You have just practiced problem solving
at the manager level, 240

12 Moving up

242

The “look” of a manager, 243

The sound of a manager, 250

Effective use of time, 252

The manager and red tape, 255

Moving out of management, 256

Are heavy readers high achievers?, 260

A call to action, 265

Index

269

Introduction

Many organizations use a rather simplistic definition of the word "manager." It is not unusual to read in a policy manual or a collection of rules referred to as S.O.P. (Stand Operations and Procedures) that a "manager is an individual with at least two other individuals reporting directly to him." Not much more is offered beyond the description of the channels of communication that must be observed and the documents that must be completed in order to (a) make a proposal, (b) obtain an authorization, or (c) put some other documents into the storage files.

Not much more is given in the way of guidance on how to be a manager, what is expected of him, or how his effectiveness will be evaluated. A "manager" is simply that, a *manager*. I recall quite clearly the time I tried to find out more about the significance of the title "manager."

My boss, a top executive in a Fortune-500 company, called me into his office and with a beneficent smile told me he was promoting me to department-level manager. Until then, as an employee with that company, not a single person had been reporting to me. My position had been purely *staff* to a staff executive, senior level. Suddenly I was designated a "manager" and would have more than 100 people reporting to me through a hierarchal structure of professional staff, group, and section leaders. I asked what seemed to be an important question: "What's a 'manager'?" I really was quite serious. My employer seemed to be equally serious when he said, "You'll learn!"

Now, many years later in my career development, my heart and thoughts go out to those poor souls who were accountable to me. The only guidance I had been given was "You'll learn!" I did learn, by trial and error. My errors were trials to my subordinates! If only we could

redo history. If only we were born smart. But we cannot. And we are not.

For the most part, we are products of our childhood environments. We learn by imitation, sometimes unwittingly imitating those things we despise and people we disavow. This imitative learning is carried into adulthood—chronological “adulthood”—and forms our behavioral patterns and, when we become *managers*, it distinguishes our *management styles*. Without instruction or guidance from a respected and omniscient teacher, we tend to replicate the imprint of those styles that made their deep impressions on us during our formative years, the impressionable stages of growth.

Perhaps the strongest imprint is made by our relationships with our parents, many of whom seem to have an unfortunate inability to cope with their own children and, as though attempting to survive a traumatic experience, take a position of total authority over their offspring. The parent is expected by the social community (and spurred by his own ego needs) to “cope” effectively. The style or technique for coping—probably handed down from grandparent to parent—is quite simple: “I am your father (or mother) and you will do as I say!” The message is clear: “I may not be right all the time, but I am your parent all the time! Honor me. Do as I say—or else!”

There are no quantifiable standards for performance as a parent, no specific measure that determines the effectiveness or success of parenthood. If there were published standards, who would implement them? There are books and seminars on “how to be a parent.” Many contain theories and suggestions for practice. But there is no way to impose, insist that the books be read or the seminars be attended by any parent, or that the concepts that are offered be practiced. The parent is the ultimate authority figure who shapes the patterns of growth in the child that emerge later as dominant life styles. The parent may appoint surrogates, such as schoolteachers who spend at least as much time with the child as the parent does each day. Thus, the child grows up surrounded by authority figures. And when the child exits the family and enters society as an *adult*, thinking he is at last free and on his own, he is often traumatized by the discovery that in place of his *parent* who used to tell him what to do all day he now has a *boss* who tells him.

If we view the parent as a *manager*, we view an organizational unit, the family. From whom have the parents learned to be “managers”? Of course, from their own parents who learned from theirs, and from theirs,

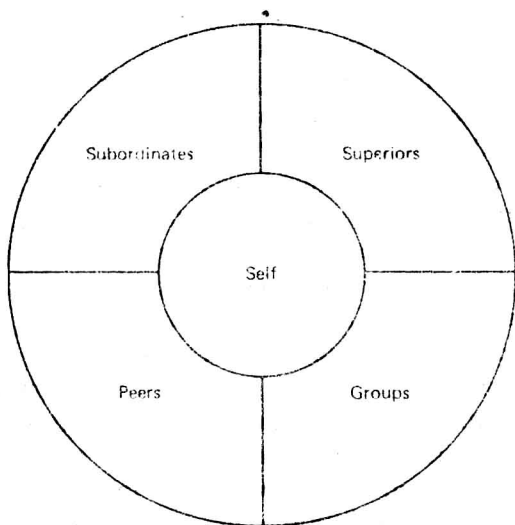
and so on. The pattern tends to repeat itself over and over again through each generation of the organization. One day a member of the family unit becomes a *manager* of an external unit, a unit whose productivity will be measured quantitatively in very specific and explicit terms.

This *manager* must now interact with a new series of human organisms, each an individual in his own right. The new manager takes control and applies his authority. He mandates. Issues orders. Commands, with a pointing finger, that his subordinates shall "perform." He demands obeisance; "respect my rank, if not me!" Without conscious thought, he behaves as though the members of his work unit, group, section, department, division, or company are his own "children." He is usually totally unaware that, in effect, he is treating his subordinates in a parent-child relationship, "coping" as did his parents in an effort to satisfy his own needs. Without awareness, he is imitating his parents and their surrogates, using authority born of rank as opposed to authority that is born of knowledge, skill, and expertness.

We have depicted the *manager* as a dominant, unreasonable, demanding person, wielding huge power, yielding to no one other than his own supervisor (his "parent"?). The manager is not always in this mode. However, although many preach democracy, given an opportunity they practice dictatorship. But the objective for the manager is to be *effective*—to achieve desired, positive results that are beneficial to all people and entities involved with the company or organization to which they belong or with which they identify.

The *effective manager of engineers and scientists* has an especially difficult set of challenges. He is coping, generally, with people who are skilled in their professions, knowledgeable, creative, ingenious, independent, and who are always asking questions that cannot be ignored, evaded, or avoided by the manager. Each individual in the technical work unit has a unique set of needs that must not be ignored. The manager, in order to be *effective*, must know how to deal with the intense dynamics of interpersonal and intergroup relationships. An inability to achieve the desired results will certainly be noted by his subordinates, peers, and superiors as *managerial* failure. He will be considered *ineffective*. His career or his job may be in jeopardy. The effective manager of engineers and scientists makes judicious use of the human and physical resources that have been placed under his control in order to accomplish the objectives of the work group as a part of the whole organization.

In order to lead and control the engineering and scientific activity effectively, the manager must identify, evaluate, and accommodate five distinct sets of needs and interactions—his own plus those of his superiors, subordinates, peers, and the separate groups or units of activity within the total organization. The manager must be effective in these relationships, which are diagrammed as the *Wheel of Interaction*.



Within each quadrant of the outer circle that surrounds the inner circle, "Self," are the specific needs and characteristics of others with whom the manager ("Self") must interact. Without successful interactions, the manager, the "Self," cannot perform, cannot gain the level of productivity for which he is accountable.

It is not enough to become totally familiar with "Self" and "Subordinates." It is vital to be able to accurately identify, define, and accommodate the needs and characteristics of the "Superiors" (the *managers* of "Self"), the "Peers" or colleagues, and those of the "Groups" or work units. Only then is the manager, "Self," able to begin to satisfy that which ties together individual engineers or scientists, project work units, and activities that represent the needs of the organization as a holistic society. This "society" of human and physical resources contains the objectives and goals toward which all efforts are in reality dedicated, and toward which attainment all contributions of the manager will be noted, measured, and sometimes appropriately rewarded.

A move upward in the organization, from member of the professional staff to the managerial level, demands modifications in appearance and behavior, use of new language, new modes of self-presentation, and adjustments in perspectives. Although such elements may appear to be superficial, they are, nonetheless, influencers and imprinters of the ability to recognize that roles have a new significance when the word "manager" is prefixed or suffixed to the job title. If the manager is to succeed, he must recognize the new focus, adjust to, accept, and learn everything conceivable about the new environments and the expectations of all those with whom he must interface. He must learn to deal effectively with conflict and to nurture the communications processes.

In many interactions there are winners and losers. Everybody admires a winner. Although we may feel great empathy for the underdog-loser, nobody wants to be a loser. The *effective manager* uses techniques that result in *no-lose* interactions.

Every manager is constantly confronted with potential and actual conflicts. Ideas, concepts, innovations and people—especially those who are creative—are often in conflict, in the sense of disagreeing with one another's beliefs. The *effective manager* manages conflict. Conflict does not manage the *manager*. He has learned the theory and knows how to practice the *no-lose* principles. Those who have not learned to manage conflict constructively may have learned how to suppress or evade conflict. Suppression or evasion—as opposed to managing—may extend the tenure of the manager. The prognosis, however, is for eventual failure as an *effective manager*.

The suppression technique will probably remove from the scene—voluntarily or involuntarily—those engineers and scientists who have innovative ideas, unusual concepts, and approaches to technical work that tend to generate conflict. These people often do not conform to the group's perception of itself, or to a strong-willed individual's or manager's directions. It is not often recognized that people who cause conflict may be the truly creative members of the staff. And the manager who does not encourage creativity, ingenuity, and innovation for fear of the potential for conflict may, in the long run, destroy the group for which he is accountable. Although it is certainly not his intent to do so, this manager may find himself surrounded with subordinate engineering and scientific personnel who may be, at best, mediocre in aspiration and performance levels. Free from conflict—but where have the good people gone?

Inadvertently, communications may be discouraged by the *ineffective*

manager. In so many ways, it is possible to destroy the openness of communications, to make it a one-way process instead of the desired and essential two-way superior-to-subordinate/subordinate-to-superior flow. Once the two-way channel has been interrupted, and it is a fragile "channel," special skills and time-consuming efforts are required to reconnect it.

It is the intent of this book to fully detail the theories, the means, and techniques by which an incumbent *manager* of an engineering and scientific professional staff can improve his effectiveness. The new or future manager may learn how to avoid the "error" inherent in a trial-and-error approach, get off to the right start, minimize the time and energies expended in patching things together and, because he is *effective*, thoroughly enjoy and find great satisfaction in the manager's role.

This book will develop the *Wheel of Interaction* as an important basis for defining the interpersonal relationships that surround the manager of the professional staff so that he may be enabled to continue on his way to growth and opportunity by demonstrating his unique skills in the optimum utilization of human resources. This book will discuss and describe the optional management styles available to the manager and how and when to apply them to the job. The styles recognize that people are the vital elements in meeting technical work objectives.

Practice is based on theory. This is known as fact to the communities of engineers and scientists. Before one can become a productive professional, one must have a firm foundation in theory. The *effective manager* must have a firm foundation in the theories of human behavior and needs. The view is not from that of the clinical psychologist but is from that of the pragmatist, the working *manager* who, in dealing with his people, must comprehend the inferences that have been drawn from observed behavior and from the experiments with the laws and theories that have evolved and that have found general acceptance. Thus, without pretending that in order to be effective the manager must acquire credentials as a psychologist, we will understand the practical significance and applicability of the most commonly accepted theories of the behavioral scientists. Most important, the *manager* will become involved with how to put these theories to use in communication, conflict prevention and resolution, motivation and productivity, in interpersonal, intergroup, and intragroup relationships.

The reader will learn how to identify his own management styles and