

Evidence-Based Productivity Improvement

A Practical Guide to the Productivity
Measurement and Enhancement System
(ProMES)



Robert D. Pritchard
Sallie J. Weaver
Elissa L. Ashwood

Evidence-Based Productivity Improvement

A Practical Guide to the Productivity
Measurement and Enhancement System
(ProMES)

Robert D. Pritchard

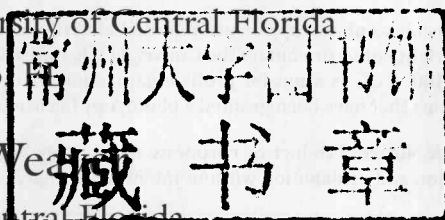
Professor Emeritus, University of Central Florida
Orlando, FL

Sallie J. Weathers

University of Central Florida
Orlando, FL

Elissa L. Ashwood

Founder and Chief Strategist, Truly Accomplished
Pittsburgh, PA



Permission granted for nonexclusive world rights of material from Pritchard, R.D., *Measuring and Improving Organizational Productivity: A Practical Guide*, Praeger Press, New York, 1990.

Routledge
Taylor & Francis Group
711 Third Avenue
New York, NY 10017

Routledge
Taylor & Francis Group
27 Church Road
Hove, East Sussex BN3 2FA

© 2012 by Taylor & Francis Group, LLC
Routledge is an imprint of Taylor & Francis Group, an Informa business

Printed in the United States of America on acid-free paper
Version Date: 20111102

International Standard Book Number: 978-1-84872-967-4 (Hardback) 978-1-84872-968-1 (Paperback)

For permission to photocopy or use material electronically from this work, please access www.copyright.com (<http://www.copyright.com/>) or contact the Copyright Clearance Center, Inc. (CCC), 222 Rosewood Drive, Danvers, MA 01923, 978-750-8400. CCC is a not-for-profit organization that provides licenses and registration for a variety of users. For organizations that have been granted a photocopy license by the CCC, a separate system of payment has been arranged.

Trademark Notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

Library of Congress Cataloging-in-Publication Data

Pritchard, Robert D.

Evidence-based productivity improvement / Robert D. Pritchard, Sallie J. Weaver, Elissa L. Ashwood.

p. cm. -- (Series in applied psychology)

Includes bibliographical references and index.

ISBN 978-1-84872-968-1 (pbk. : alk. paper) -- ISBN 978-1-84872-967-4 (hardcover : alk. paper)

1. Industrial productivity--Measurement. 2. Performance--Measurement. 3. Organizational effectiveness--Measurement. I. Weaver, Sallie J. II. Ashwood, Elissa L. III. Title.

HD56.25.P75 2012

658.5'15--dc23

2011044425

Visit the Taylor & Francis Web site at
<http://www.taylorandfrancis.com>

and the Psychology Press Web site at
<http://www.psypress.com>

Evidence-Based Productivity Improvement

A Practical Guide to the Productivity
Measurement and Enhancement System
(ProMES)

SERIES IN APPLIED PSYCHOLOGY

Jeanette N. Cleveland, Pennsylvania State University

Kevin R. Murphy, Pennsylvania State University

Series Editors

Edwin A. Fleishman, founding series editor (1987–2010)

Gregory Bedny and David Meister

The Russian Theory of Activity: Current Applications to Design and Learning

Winston Bennett, David Woehr, and Charles Lance

Performance Measurement: Current Perspectives and Future Challenges

Michael T. Brannick, Eduardo Salas, and Carolyn Prince

Team Performance Assessment and Measurement: Theory, Research, and Applications

Jeanette N. Cleveland, Margaret Stockdale, and Kevin R. Murphy

Women and Men in Organizations: Sex and Gender Issues at Work

Aaron Cohen

Multiple Commitments in the Workplace: An Integrative Approach

Russell Cropanzano

Justice in the Workplace: Approaching Fairness in Human Resource Management, Volume 1

Russell Cropanzano

Justice in the Workplace: From Theory to Practice, Volume 2

David V. Day, Stephen Zaccaro, Stanley M. Halpin

Leader Development for Transforming Organizations: Growing Leaders for Tomorrow's Teams and Organizations

Stewart I. Donaldson, Mihaly Csikszentmihalyi, and Jeanne Nakamura

Applied Positive Psychology: Improving Everyday Life, Health, Schools, Work, and Safety

James E. Driskell and Eduardo Salas

Stress and Human Performance

Sidney A. Fine and Steven F. Cronshaw

Functional Job Analysis: A Foundation for Human Resources Management

Sidney A. Fine and Maury Getkate

Benchmark Tasks for Job Analysis: A Guide for Functional Job Analysis (FJA) Scales

J. Kevin Ford, Steve W. J. Kozlowski, Kurt Kraiger, Eduardo Salas, and Mark S. Teachout

Improving Training Effectiveness in Work Organizations

Jerald Greenberg

Organizational Behavior: The State of the Science, Second Edition

Jerald Greenberg

Insidious Workplace Behavior

Edwin Hollander

Inclusive Leadership: The Essential Leader-Follower Relationship

Jack Kitaeff

Handbook of Police Psychology

Uwe E. Kleinbeck, Hans-Henning Quast, Henk Thierry, and Hartmut Häcker

Work Motivation

Laura L. Koppes

Historical Perspectives in Industrial and Organizational Psychology

Ellen Kossek and Susan Lambert

Work and Life Integration: Organizational, Cultural, and Individual Perspectives

Martin I. Kurke and Ellen M. Scrivner

Police Psychology Into the 21st Century

Joel Lefkowitz

Ethics and Values in Industrial and Organizational Psychology

Manuel London

Job Feedback: Giving, Seeking, and Using Feedback for Performance Improvement, Second Edition

Manuel London

How People Evaluate Others in Organizations

Manuel London

Leadership Development: Paths to Self-Insight and Professional Growth

Robert F. Morrison and Jerome Adams

Contemporary Career Development Issues

Michael D. Mumford, Garnett Stokes, and William A. Owens

Patterns of Life History: The Ecology of Human Individuality

Michael D. Mumford

Pathways to Outstanding Leadership: A Comparative Analysis of Charismatic, Ideological, and Pragmatic Leaders

Kevin R. Murphy

Validity Generalization: A Critical Review

Kevin R. Murphy and Frank E. Saal

Psychology in Organizations: Integrating Science and Practice

Kevin Murphy

A Critique of Emotional Intelligence: What Are the Problems and How Can They Be Fixed?

Susan E. Murphy and Ronald E. Riggio

The Future of Leadership Development

Susan E. Murphy and Rebecca J. Reichard

Early Development and Leadership: Building the Next Generation of Leaders

Margaret A. Neal and Leslie Brett Hammer

Working Couples Caring for Children and Aging Parents: Effects on Work and Well-Being

Robert E. Ployhart, Benjamin Schneider, and Neal Schmitt

Staffing Organizations: Contemporary Practice and Theory, Third Edition

Steven A.Y. Poelmans

Work and Family: An International Research Perspective

Erich P. Prien, Jeffery S. Schippmann, and Kristin O. Prien

Individual Assessment: As Practiced in Industry and Consulting

Robert D. Pritchard, Sallie J. Weaver, and Elissa L. Ashwood

Evidence-Based Productivity Improvement: A Practical Guide to the Productivity Measurement and Enhancement System

Ned Rosen

Teamwork and the Bottom Line: Groups Make a Difference

Heinz Schuler, James L. Farr, and Mike Smith

Personnel Selection and Assessment: Individual and Organizational Perspectives

Kenneth S. Shultz and Gary A. Adams

Aging and Work in the 21st Century

John W. Senders and Neville P. Moray

Human Error: Cause, Prediction, and Reduction

Frank J. Smith

Organizational Surveys: The Diagnosis and Betterment of Organizations Through Their Members

Dianna Stone and Eugene F. Stone-Romero

The Influence of Culture on Human Resource Processes and Practices

Kecia M. Thomas

Diversity Resistance in Organizations

George C. Thornton III and Rose Mueller-Hanson

Developing Organizational Simulations: A Guide for Practitioners and Students

George C. Thornton III and Deborah Rupp

Assessment Centers in Human Resource Management: Strategies for Prediction, Diagnosis, and Development

Yoav Vardi and Ely Weitz

Misbehavior in Organizations: Theory, Research, and Management

Patricia Voydanoff

Work, Family, and Community

To Sandy

Series Foreword

The goal of the Applied Psychology series is to create books that exemplify the use of scientific research, theory, and findings to help solve real problems in organizations and society. Pritchard, Weaver, and Ashwood's *Evidence-Based Productivity Improvement: A Practical Guide to the Productivity Measurement and Enhancement System* exemplifies this goal. Pritchard and his colleagues have brought together a decades-long program of research on the Productivity Measurement and Enhancement System (ProMES) and have integrated their findings and experiences into a scientifically solid and eminently practical guide to developing, implementing, and evaluating the ProMES system.

This book starts with a well-grounded discussion of what the term *productivity* really means in organizations and how a system for measuring productivity and providing feedback to individuals and organizational units can have a dramatic impact on the effectiveness and performance of organizations. A step-by-step description of the design of the ProMES systems and the scientific theory that underlies these systems follows. Unlike some "how-to" books, Pritchard and colleagues provide a detailed overview of *why* ProMES works and *how* to assess its effects.

The second section of this book shows a deep appreciation of the constraints and opportunities that are presented in work organizations. It lays out the conditions necessary to implement ProMES and the types of decisions that organizations must face in employing this method of productivity enhancement.

The third and fourth sections of this book lay out commonly asked questions and methods for overcoming the barriers to effective productivity measurement and feedback. They compare ProMES to other interventions designed to produce similar effects (e.g., Six Sigma) and fairly describe the relative advantages of alternative approaches.

Evidence-Based Productivity Improvement: A Practical Guide to the Productivity Measurement and Enhancement System illustrates the effective marriage of science and practice. It is well-grounded in research on measurement and motivation but at the same time recognizes the practical issues faced when applying science to organizations. This book will appeal to scientists and practitioners alike. It has useful hints for managers, consultants, and students, and it can serve as a model for putting social and behavioral science to work in organizations. We are very proud to add *Evidence-Based Productivity Improvement: A Practical Guide to the Productivity Measurement and Enhancement System* to the Applied Psychology series.

Kevin R. Murphy
Jeanette N. Cleveland

Preface

Productivity lies at the heart of important issues such as global competitive position, industrial success, organizational survival, and individual quality of life. Productivity growth has been tied to the prosperity of national economies, decreased inflation, success of individual organizations, increases in our quality of life, and better use of natural and human resources.

For the individual organization, productivity improvement is a critical mechanism underlying organizational adaptability and effectiveness—facilitating the sustainment of highly reliable outcomes in the face of dynamic environmental and industrial forces. To make these improvements, however, tools are needed to help organizational personnel improve the productivity of their organizations. This book is intended as an information source for implementing a tool that should help in that process.

The book describes the use of the Productivity Measurement and Enhancement System (ProMES) developed by my associates and I (Pritchard, Jones, Roth, Stuebing, & Ekeberg, 1988, 1989). ProMES is an intervention designed to produce a quality measurement of performance and to use this measurement system as feedback in a way that will maximize performance improvements. A design team composed of people doing the work, a supervisor, and a facilitator first identify the objectives of the unit. They then develop objective measures that will validly and completely measure how well those objectives are being met. Next, they form what is called “contingencies,” a type of graphic utility function relating how performance on each measure contributes to the organization. These contingencies allow for the formulation of an overall performance score, capture the differential importance of the different measures, and identify the priorities for making improvements. Data from this measurement system are then fed back to members of the unit, and they use this information to make improvements in the way the work is done. This feedback and innovation planning then continue over time in a continuous improvement model.

Since those initial publications, there have been several books on ProMES. A book describing the intervention and how to do it was published in 1990 (Pritchard, 1990a), followed by a German version (Pritchard, Kleinbeck, & Schmidt, 1993). Since then there have been four books reporting ProMES studies (Pritchard, 1995d; Holling, Lammers, & Pritchard, 1998; Pritchard, Watson, Kelly, & Paquin, 1998; and Pritchard, Holling, Lammers, & Clark, 2002).

The ProMES research program is an example of the concept of evidence-based management (Pfeffer & Sutton, 2006; Rousseau, 2006a, 2006b, 2007; Walshe & Rundall, 2001). The idea behind evidence-based management is that managers should use interventions based on evidence of their success rather than other factors such as what other organizations do. Rousseau and McCarthy (2007) argue that evidence-based management facilitates better outcomes from management decisions, continued learning by managers, and closer ties among scholars, educators,

and practitioners. Because ProMES is based on sound theory and there is clear evidence of its effectiveness in organizations, ProMES is an example of an intervention that is evidence based.

The book is intended for several audiences. It should be useful to behavioral science professionals who wish to learn more about practical methods of measuring and improving organizational productivity. In addition, managers who want to learn more about ways to improve productivity in organizations should find it a source of helpful information. It will also be of benefit in teaching. It can be used as a source book in classes stressing practical methods of productivity improvement and for workshops on productivity.

The book is divided into four major parts. Section I presents background on productivity and a description of ProMES, including the criteria for a good productivity measurement system and how ProMES meets these criteria. For those interested in theory and research, it also includes the theory behind ProMES and a major chapter on research done on ProMES. Section II describes in detail how to develop ProMES in an organization in very concrete terms. This is the section for those wanting to learn enough about it to implement the system. It presents information on what to do before starting a system and gives very specific guidelines on how to do each step of the intervention. Section III covers more issues of how to implement a ProMES system and discusses questions and answers users sometimes have about the system. Section IV covers using the system with other productivity improvement systems and describes other applications of ProMES. ProMES is compared with other techniques of feedback, goal setting, and incentives and specifically compared to the Balanced Scorecard and Six Sigma. ProMES can be used in many other situations in addition to productivity improvement, and these applications are discussed in the final chapter.

A book describing the results of a 30-year research program is a product of many forces and the influence of many people. The original research to evaluate the productivity measurement system (ProMES) was funded by what was then called the Air Force Human Resources Laboratory, which is now part of the Human Effectiveness Directorate of the Air Force Research Laboratory. I want to acknowledge all my colleagues over the years who have put their valuable energies into accumulating knowledge about ProMES. This research program could never have happened without you. I also want to thank Praeger Publishing for permission to use materials from my 1990 ProMES book that they published, *Measuring and Improving Organizational Productivity: A Practical Guide*. Special thanks also goes to Raquel Hodge, who was a great help in finalizing the manuscript.

Robert D. Pritchard
Orlando, Florida

Authors

Robert D. Pritchard received his bachelor's degree in psychology from the University of California–Los Angeles (UCLA) in 1966 and his PhD in 1969 from the University of Minnesota, specializing in industrial–organizational psychology. He was an assistant and later an associate professor of psychology at Purdue University from 1969 to 1977, and a professor of psychology at the University of Houston from 1977 to 1988, where he also served as director of the industrial and organizational psychology program. He was professor of psychology and management at Texas A&M University from 1988 to 2003, and was director of its industrial and organizational psychology program there from 1988 to 1997. From the fall of 2003 to the present, he has been a professor of psychology and management at the University of Central Florida. Dr. Pritchard has received several research awards such as the Society for Industrial and Organizational Psychology (SIOP) dissertation award and the SIOP Distinguished Scientific Contribution Award. He is a fellow of SIOP, the American Psychological Association, and the American Psychological Society; he also has been chairman of the Society of Organizational Behavior, and president of the Houston Association of Industrial and Organizational Psychologists. He has been on the editorial boards of professional journals and was the editor of the SIOP Organizational Frontiers book series. Dr. Pritchard was a member of the Commission on Incentives and Productivity for the State of Texas for 5 years and has been appointed to the board of directors of the International Foundation for Research in Performance Management Systems. His primary interests are measuring and improving organizational effectiveness and understanding and assessing motivation. He has worked on enhancing productivity and effectiveness with organizations in the United States and abroad. He was a member of a National Research Council panel reporting on organizational productivity and has published in the areas of motivation and productivity, including numerous articles and nine books. He has given workshops, symposia, and other presentations on his productivity work in the United States, Canada, England, the Netherlands, Germany, Switzerland, Finland, Mexico, Puerto Rico, Spain, the Czech Republic, Sweden, New Zealand, and Russia.

Sallie J. Weaver completed this work as a doctoral candidate in the industrial and organizational psychology program at the University of Central Florida (UCF). She earned a BS degree in psychology with a certificate in performance management from Florida State University and an MS degree in industrial/organizational psychology from UCF. Weaver is a senior graduate research associate at the Institute for Simulation and Training where her stream of research focuses on team performance processes, team effectiveness, and performance measurement, with an emphasis on healthcare and patient safety. Weaver is also the recipient of the 2009 Thayer & Joyce

Graduate Fellowship awarded by the Society for Industrial and Organizational Psychology and the 2009 Doctoral Scholarship awarded by the National Training and Simulation Association via the Interservice/Industry Training, Simulation, and Education Conference. Weaver is currently an assistant professor in the Department of Anesthesiology and Critical Care Medicine at the Johns Hopkins School of Medicine. She also holds an appointment with the Armstrong Institute for Patient Safety and Quality.

Elissa L. Ashwood is president and chief strategist of Strategy 42, a private practice specializing in personal and management strategy. Named as the ultimate answer to the ultimate question of life, the universe, and everything in Douglas Adams's *Hitchhiker's Guide to the Galaxy*, 42 is short for the unique mix of things that really matter to her clients. Her combination of award-winning performance research, structured problem solving, and operational design expertise-with-a-heart helps individuals and organizations identify and achieve their priorities. Ashwood's breadth of leadership experience includes roles as a finance and HR executive at Citibank, American Express, and AIG, as a McKinsey & Co. consultant, and as a published author. She is often described as a role model of work–family balance. Her success in developing leaders and improving some of the best organizations in the world makes her a valued career and management advisor.

Contents

Series Forewordxix

Preface.....xxi

Authors..... xxiii

**SECTION I: THE PRODUCTIVITY MEASUREMENT
AND ENHANCEMENT SYSTEM (ProMES):
AN INTRODUCTION AND BACKGROUND**

1 The Value of Productivity Measurement3

Productivity: Why So Important?..... 3

The Effects of Productivity Growth 4

The Importance of Measuring Productivity 5

 General Reasons for the Importance of Productivity Measurement 6

 Advantages Occurring Through the Process of Developing Productivity Measures.... 6

 Beneficial Uses of the Resulting Productivity Measurement 6

2 Organizational Productivity: A Definition and Description7

Purposes in Measuring Productivity 8

The Purpose Influences the Measurement System..... 9

The Intent of ProMES.....10

3 Criteria for an Optimal Productivity Measurement and Feedback System..... 11

4 The ProMES Approach: An Overview17

Steps in the Development of ProMES.....18

 Step 1: Form the Design Team19

 Step 2: Identify Objectives.....19

 Step 3: Develop Indicators.....19

 Step 4: Develop Contingencies 20

 Step 5: Develop Feedback Reports..... 24

 Step 6: Conduct Feedback Meetings.....25

 Step 7: Monitoring the Project Over Time.....25

5	Theoretical Background Behind ProMES.....	27
	Theory	27
	Connections	28
	Motivational Force and Behavioral Intentions	31
	The Theory and Organizational Systems.....	32
	Implications From the Theory and How ProMES Incorporates Them	33
	Other Conceptual Foundations of ProMES.....	39
	Feedback.....	39
	Participation in Decision Making.....	40
	Roles, Role Ambiguity, and Role Conflict	40
	Goal Setting and Task Strategy	41
	Teams	41
6	Comparison of ProMES to the Desirable Characteristics	43
7	Research Evidence Supporting ProMES	49
	The Initial ProMES Study	49
	Productivity Results.....	49
	Attitude Results.....	50
	Hawthorne Effects.....	50
	Later ProMES Research Questions	50
	Can ProMES Be Developed in Different Settings?	52
	Does ProMES Improve Productivity?	52
	Magnitude of ProMES Effects.....	57
	Effects of Removing ProMES	57
	Cost–Benefits of ProMES	57
	Effects During ProMES Development.....	58
	Comparison Groups	58
	Do Improvements Last Over Time?.....	58
	What Factors Are Important in Making ProMES Successful?	59
	Other Research on ProMES Success Factors.....	61
	What Are Other Effects of ProMES?	67
	Effects on Attitudes	67
	Negative Reactions	68
	Conflict	69
	Interdependencies	69
	Effects on Financial Outcomes	70
	What Have We Learned About Why ProMES Works?	70
	Other Motivational Issues.....	73
	ProMES Improvement Priorities.....	73
	The Effects of Participation.....	74
	ProMES and Team Climate.....	74
	Contingencies and Policy.....	75
	Indicator Types.....	76
	How Long Does It Take to Do ProMES?	77
	Calendar Time to Do ProMES.....	78

What Improvements in the ProMES Process Have Been Developed?	79
Introduction of the System	79
Seeing ProMES as a Continuous Process	81
Using Graphics in Feedback	81
Improvements in Developing Contingencies.....	81
Conjoint Analysis and Contingencies	84
What Do We Still Need to Know: Future Research on ProMES	86
Psychological Processes in ProMES	86
Effects on Financial Outcomes	86
Streamlining ProMES Development	87
ProMES Throughout the Organization	87
8 Why ProMES Works.....	91
Structural Features.....	91
Motivational Features	93
Informational Features.....	94

SECTION II: HOW TO DO ProMES IN YOUR ORGANIZATION

9 Laying the Foundation: Conditions Necessary for ProMES	97
Conditions Prior to Implementation	97
Necessary Background Knowledge	97
Important Organizational Conditions	97
Important Organizational Attitudes	98
The Importance of Management Support	100
Major Implementation Principles.....	100
10 Key Decision Points When Starting System Development	105
Preliminary Decisions.....	105
The Design Team.....	105
The Target Unit(s).....	107
Needed Organizational Resources	108
The Development Process: General Considerations.....	109
The Importance of Participation	109
Participation Versus Control.....	109
The Importance of Time.....	110
Meeting Schedule	110
Interaction Among the Design Team.....	110
Preparing the Unit.....	111
11 Developing Objectives and Indicators.....	115
Developing Objectives	115
Objective Identification Process.....	116
Criteria for Good Objectives.....	117
Developing Indicators.....	118
Process of Identifying Indicators.....	118
Criteria for Good Indicators	119