



TP274  
F4

8362279

# Managing the Data Center

**ALLAN F. FROEHLICH**



E8362279



**Lifetime Learning Publications**  
Belmont, California

A division of Wadsworth, Inc.  
London    Singapore    Sydney    Toronto    Mexico City

Jacket Designer: Diana Ciardella  
Designer: Nancy Benedict  
Editor: Nancy Palmer Jones  
Illustrator: Carl Brown  
Composition: Computer Typesetting Services, Inc.

©1982 by Wadsworth, Inc. All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transcribed, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher, Lifetime Learning Publications, Belmont, California 94002, a division of Wadsworth, Inc.

Printed in the United States of America  
1 2 3 4 5 6 7 8 9 10—86 85 84 83 82

**Library of Congress Cataloging in Publication Data**

Froehlich, Allan F.

Managing the data center.

Bibliography: p.

Includes index.

1. Electronic data processing departments—  
Management. I. Title.

HF5548.2.F76 1982

658'.054

82-4622

ISBN 0-534-97942-4

# ***Managing the Data Center***

## Preface

---

As a data center manager (DCM), you must keep a complex set of resources (namely, hardware, software, and people) in balance and justify the cost and performance of these resources to your organization's top management. At the same time, as the organization's dependence on its information resources increases, the users themselves become more aware of and more interested in data processing. These factors combine to make the DCM's job more visible within the organization; in fact, they require that you truly *manage* the center. *This book describes how to manage (rather than simply "operate") a data center, and it defines the tasks that every DCM must accomplish in order to manage well.*

Experienced data center managers know that there is rarely a single, right answer to a data center dilemma. Rather, what's usually needed is an ability to make a sound decision from among a group of alternatives. *The theme of this book is that the data center should be viewed as a business enterprise and that you should make decisions much as a rational businessperson—a type of entrepreneur—would make decisions about a business.*

This book is written for the data center manager, for the manager of the data center manager, or for the person who is in line for appointment as a data center manager. In other words, the book looks at the DCM's job from the perspective of data processing *management* rather than from a *technical* data processing point of view. Thus, the focus is on such concerns as cost/benefit relationships and the effective use of the resources that have been allocated to the DCM. You will also find here several variations on data center "models," and the various parts of these models are discussed in order to understand

why a data center works the way it does and to anticipate the parts of the model that are most likely to change over time.

Although this book contains a number of sample documents and forms, it is more than a simple "handbook." Rather, it provides a wide variety of recommendations and lists of specific things to do that will help you manage the data center better. The author's aim is to give you new insights into how the DCM's job can best be performed on a day-to-day basis and, in the larger sense, into what the DCM's responsibility is as a planner and leader of the data processing future of an organization.

# *Introduction*

---

Defining the scope of the data center manager's job is an awesome task. Look, for example, at the following data processing trends that have emerged in recent years:

- Central processor capacity and power is increasing and increasing rapidly, even in what would have been considered a "small" installation just a few years ago.
- More on-line applications are being put into production.
- Distributed data processing is still a "young" concept, but the uncertainties surrounding it have not kept people from trying to implement it.
- Capacity allocation between central sites and distributed sites remains unsettled for the near term, but the trend toward distributed data processing will probably result in functional specialization among various processing locations.
- Data entry workloads are diminishing as a percentage of the total data center workload.

Each of these trends brings with it a set of changes with which a data center manager (DCM) must learn to deal.

In a recent conversation with a data center manager, the manager identified the following as areas that will change in the near future:

- Security and integrity of data will be improved.

- Production scheduling will be improved with the use of a job scheduler.
- Current CPUs will be replaced with larger, faster equipment since the growth of the company will create a larger volume of work than current CPU cycles can process effectively.
- Staffing characteristics will change (there will be less clerical effort, more emphasis on monitoring and control).
- The data center will be relocated because of insufficient space.

The startling thing about this list is not whether or not these changes will take place (they probably will), but the diversity of the events a data center manager is expected to manage.

If we reword the items in the above list to match terms traditionally used when a manufacturing process is revamped, the list would read something like this:

- Review personality profiles of all personnel; tighten access and availability to all facilities (local and remote).
- Study all work center loadings to determine optimum use of machine resources.
- Install totally new production line equipment.
- Retrain existing staff in needed new skills; hire specialists as needed.
- Move into a new production facility.
- Build additional plants, tying them into the main plant for operational purposes.

This is a formidable list of "things to do!" To deal with these tasks, the DCM must be a combination personnel director, industrial engineer, building services manager, production control manager, and computer guru. In other words, to be successful, a data center manager must tackle the job as though he or she were an entrepreneur striving to build a small company into an ever more efficient and cost-effective operation.

The major sections of this book are designed to help you develop this entrepreneurial attitude. Part I, "Managing," describes the dif-



ference between “managing” and “operating” a data center, defines the “total computer resource,” and lays the groundwork for effective planning and measuring of the data center’s growth.

Part II, “Organizing,” describes the functions of every job in the data center and shows the relationship among these jobs. This section covers the importance of matching your employees’ skills, backgrounds, and personalities to their positions and of providing realistic feedback on their performance.

Part III, “Getting Results—Managing the Information Factory,” looks at the data center as a “factory” in order to show how to achieve the highest performance ratings from your “customers” (the users). The basic issues of production and inventory control, customer service, and optimal workflow are addressed in this section.

Part IV, “Handling the Business Details of Data Processing,” gives specific practical advice on how to present the data center’s budget, how to price data center services, and how to account for data center expenditures—all topics that must be handled well in order to obtain the support of upper management for the data center’s activities.

Part V, “Living with Change,” provides an overview of the issues that are becoming more and more important both as your own data center grows and as the industry as a whole becomes more complex. The concluding chapter (Chapter 22) provides a case study against which you can test your entrepreneurial skills, and the Summary provides a glimpse of the future from this author’s point of view.

Throughout this book, the terms “data center” and “data center manager” are used as a matter of convenience to avoid ponderous lists of synonyms. These terms are meant to embrace all similar titles and designations, such as “operations center,” “EDP center,” “operations manager,” “computer center manager,” and the like. Likewise, terms such as “company” or “organization” are used in the generic sense and are intended to apply to a wide variety of business situations even though entities such as banks, hospitals, and nonprofit organizations may not usually refer to themselves as “companies.”

The Selected Bibliography at the end of this book includes all the references cited in the text as well as books and articles related to data center management.

8362279

## Short Contents

---

### Part I Managing 1

- Chapter 1 Managing Versus Operating a Data Center 3
- Chapter 2 Managing the Total Computer Resource 13
- Chapter 3 Managing the Data Center as a Business 23
- Chapter 4 Measuring the Data Center's Current Status 33
- Chapter 5 Defining the Data Center's Future 43
- Chapter 6 Managing the Changes in Data Processing 51
- Chapter 7 Building an Effective Management Style 61
- Chapter 8 Preparing the Data Center Annual Report 77

### Part II Organizing 97

- Chapter 9 Mapping the Organization of the Data Center 99
- Chapter 10 Matching People and Positions 119
- Chapter 11 Measuring Professional Performance 135

### Part III Getting Results—Managing the Information Factory 145

- Chapter 12 Controlling Production and Inventory 147
- Chapter 13 Providing the Best Possible Customer Service 173
- Chapter 14 Using Industrial Engineering to Manage the Information Factory 183

### Part IV Handling the Business Details of Data Processing 205

- Chapter 15 Budgeting for the Data Center 207
- Chapter 16 Accounting for Data Center Services 217
- Chapter 17 Pricing Data Center Services 225
- Chapter 18 Analyzing the Data Center's Major Expenditures 235

### Part V Living With Change 243

- Chapter 19 Developing Procedures for Security and Disaster Planning 245
- Chapter 20 Upgrading and Converting 261
- Chapter 21 Preparing Data Center Contracts 269
- Chapter 22 Managing the Data Center in the Face of Change—A Case Study 277

# Contents

---

<b>Preface</b>	<b>xvii</b>
<b>Introduction</b>	<b>xix</b>

## **Part I Managing 1**

<b>Chapter 1</b>	<b>Managing Versus Operating a Data Center 3</b>
	Operating the "Primitive" Center 4
	"Managing" the Hardware 4
	Managing the "Well-balanced" Data Center 4
	The Operating Loop 5
	The Planning Loop 6
	The Job of the Data Center Manager 8
	Applying This Information to Your Data Center 9
	Summary 10
<b>Chapter 2</b>	<b>Managing the Total Computer Resource 13</b>
	Managing People 14
	Managing Your Staff 14
	Delegating 14
	Managing Your Users 16
	Managing Your Boss 18
	Managing Hardware and Software 19
	Applying this Information to Your Data Center 21
	Summary 21
<b>Chapter 3</b>	<b>Managing the Data Center as a Business 23</b>
	Controlling Rising Costs 24
	Handling the Rapidly Changing Technology 24

	Competing for Qualified People to Do the Job	25
	Meeting the Increasing Demand for Services	26
	Competing with Data Processing Alternatives	26
	The Personality of the Entrepreneurial Manager	27
	Finding Out How to Run a Business	28
	Applying This Information to Your Data Center	29
	Summary	30
<b>Chapter</b>	<b>4 Measuring the Data Center's Current Status</b>	<b>33</b>
	Quantifying the Center's Cost/Benefits	34
	Measuring Benefits	34
	Measuring Cost Avoidance	34
	Measuring Cost Reductions	34
	Measuring the Level of DP Expenditures	35
	Measuring How Others See You	36
	Measuring Your Participation in the Corporate Plan	39
	Applying This Information to Your Data Center	40
	Summary	40
<b>Chapter</b>	<b>5 Defining the Data Center's Future</b>	<b>43</b>
	Analyzing Functional Strategies	44
	Steps to Take for Adjusting Functional Strategies	44
	Looking at the Data Center's History and Its Prospects	45
	Gauging the Economic Health of the Company	47
	Applying This Information to Your Data Center	49
	Summary	49
<b>Chapter</b>	<b>6 Managing the Changes in Data Processing</b>	<b>51</b>
	Managing the Changes in Technology	52
	Assessing Corporate Policy on Technology	53
	Communicating the Risks of Using New Technology	54
	Communicating with Upper Management	56
	Managing the Changes in Terminology	57
	Managing the Changes in the Role of Data Processing	58
	Applying This Information to Your Data Center	59
	Summary	59

<b>Chapter 7</b>	<b>Building an Effective Management Style 61</b>
	Presenting the Changing Data Center "Product" 62
	The Switch to On-line Applications 62
	The Need for Data Custody Procedures 63
	Changing Management's View of Data Processing 64
	Creating an Ongoing Dialogue with Users 66
	Formal Meetings 66
	Informal Meetings 68
	Task Forces 69
	Conversations and Lunches 70
	Tours 70
	Newsletters 71
	Creating and Guiding the Steering Committee 72
	Applying This Information to Your Data Center 75
	Summary 76
<b>Chapter 8</b>	<b>Preparing the Data Center Annual Report 77</b>
	The Purposes of the Annual Report 78
	The General Format of the Annual Report 78
	Using the Annual Report as a Measurement Tool 83
	Expenditures 83
	Staffing 84
	Service Load 85
	Productivity Highlights 86
	Cost Per Available Hour 86
	Average Cost Per Job 86
	Average Hours Per Job 86
	Cost Effectiveness Versus Efficiency 88
	Cost Per Data Entry Keystroke 89
	Interactive Availability 90
	Batch Rerun Percentage 90
	Summing Up the Performance Analysis 90
	Compiling the Operations Worksheet Calculations 91
	Compiling the Data Entry Worksheet Calculations 94
	Applying This Information to Your Data Center 95
	Summary 95

**Part II   Organizing   97**

<b>Chapter   9</b>	<b>Mapping the Organization of the Data Center   99</b>
	Organizing the Data Center Staff by Function   100
	The Preparation and Review Functions   100
	The Execution Function   101
	The Support Function   102
	The Control Function   102
	Placing the Data Center on the Corporate
	Organization Chart   102
	When Data Processing Is Dedicated to a Single
	User   103
	When DP Expands to Serve Several Users   104
	When DP Becomes the Information Utility
	Within the Company   105
	Organizing the Information Utility   107
	The Technical Support Group   109
	The Systems and Programming Area   109
	The Data Center   110
	Shift Control   110
	Operations Control   111
	Expected Variations   113
	Applying This Information to Your Data Center   116
	Summary   116
<b>Chapter   10</b>	<b>Matching People and Positions   119</b>
	Assessing the Turnover Rate   120
	Pinpointing Why Turnover Occurs   120
	Turning a High Turnover Rate Around (or
	Avoiding It Altogether)   122
	Creating an Action Plan   122
	Rotating Assignments   123
	Ensuring Effective Supervision   123
	Creating Accurate Job Descriptions   124
	Transferring Employees from Within Your
	Organization   126
	Hiring People from Outside the Company   127
	Interviewing Job Candidates   128
	Establishing an Effective Training Plan   129
	Choosing Training Tools   130
	Assessing the Cost/Benefits of Your Training
	Plan   132

	Applying This Information to Your Data Center	134
	Summary	134
<b>Chapter 11</b>	<b>Measuring Professional Performance</b>	<b>135</b>
	Using Objective Measurement Tools	136
	Stating Measurement Objectives	136
	Determining Types of Objectives	137
	Motivating Employees to Perform Well	138
	Money	139
	Job Recognition	139
	Sense of Participation	140
	Use of Talents	141
	Career Opportunities	141
	Preparing the Performance Review	142
	Applying This Information to Your Data Center	143
	Summary	143
 <b>Part III</b>	 <b>Getting Results—Managing the Information Factory</b>	 <b>145</b>
<b>Chapter 12</b>	<b>Controlling Production and Inventory</b>	<b>147</b>
	The Growing Complexity of Elements to Be Controlled	148
	Controlling Production	151
	Scheduling Shifts	151
	Shortening the Work Week	151
	Rotating Shifts	153
	Allowing Flex-time	154
	Establishing Good Production Documentation	154
	Documentation Checklist	155
	Documenting Data Center Procedures	160
	Shift Reports	160
	Operational Problem Reports	161
	Scheduling the Operations Workload	162
	Defining the Workload	162
	Analyzing Resource Availability and Utilization	162
	Involving the User in Scheduling	164
	Summing Up Work Scheduling	165
	Controlling Inventory	167
	Control Procedures for the Tape Library	168

	Controlling Paper Supplies	170
	Applying This Information to Your Data Center	170
	Summary	171
<b>Chapter 13</b>	<b>Providing the Best Possible Customer Service</b>	<b>173</b>
	Providing Quality Assurance	174
	Setting Standards	174
	Making an Application Resource Estimate	175
	Ensuring Reliability and High Performance	177
	Writing the Data Center Service Agreement	178
	Using Problem Reports to Improve Customer Relations	180
	Applying This Information to Your Data Center	182
	Summary	182
<b>Chapter 14</b>	<b>Using Industrial Engineering to Manage the Information Factory</b>	<b>183</b>
	Optimizing the Workflow	184
	Reducing Wait Time	185
	Eliminating Bottlenecks	185
	Educating Users about Turnaround Time	186
	Identifying Control Points in the Workflow	187
	The Job Input Control Point	187
	The Data Entry Control Point	188
	The Mainframe Control Point	190
	Patch Software	190
	Interact with Programs	191
	Set Up Jobs	192
	Report Status; Report Trouble	192
	Adhere to Schedules; Emphasize Throughput; Emphasize Availability	193
	Troubleshoot; Analyze Problems	193
	Repair Hardware	194
	The Control Points at Peripherals and Terminals	195
	Compiling the Total Resource Review	196
	Measuring the Resources	197
	Evaluating the Measurements	198
	Assessing Various Measurement Tools	203
	Applying This Information to Your Data Center	204
	Summary	204



## **Part IV   Handling the Business Details of Data Processing   205**

- Chapter 15   Budgeting for the Data Center   207**  
     Preparing the Budget   208  
         Defining Two Types of Budgets   208  
         Identifying Budget Components   208  
     Presenting the Budget   211  
         Justifying the Budget   212  
         Zero-Base Budgeting   213  
         Quantifying the Benefits from the Data Center   213  
     Applying This Information to Your Data Center   214  
     Summary   216
- Chapter 16   Accounting for Data Center Services   217**  
     Exception Reporting   218  
     The Allocation Method of Accounting   219  
     The Chargeback Method of Accounting   221  
     Applying This Information to Your Data Center   223  
     Summary   223
- Chapter 17   Pricing Data Center Services   225**  
     Thinking in Terms of Application Rates   226  
     Setting Rates   226  
         Categorizing and Measuring Data Center Expenses   227  
         Charging by Application   227  
     Developing the Chargeback Algorithm   231  
     Applying This Information to Your Data Center   233  
     Summary   233
- Chapter 18   Analyzing the Data Center's Major Expenditures   235**  
     Using the Payback Period to Evaluate an Expenditure   236  
     Evaluating an Expenditure on Net Present Value   238  
     Comparing Alternatives Using Net Present Value   239  
     Applying this Information to Your Data Center   242  
     Summary   242