MACMILLAN SMALL BUSINESS SERIES

Series Editors: Jim Dewhurst and Paul Burns

The books in this series present their subject-matter comprehensively and in a sophisticated manner with more conceptual underpinning than has previously been provided.

The series is designed primarily for students taking courses on small business and other undergraduate and post-experience courses at universities and polytechnics. Many books in the series will also be suitable for those working for professional examinations and for well-informed managers of small and growing businesses.

This series was previously titled the WARWICK SMALL BUSINESS SERIES.

PUBLISHED

Small Business in Europe Paul Burns and Jim Dewhurst (eds)

Small Business: Finance and Control Jim Dewhurst and Paul Burns

Small Business: Production/Operations Management Terry Hill

Marketing for the Small Business Derek Waterworth

FORTHCOMING

Small Business Issues: Text and Cases Paul Burns and Jim Dewhurst (eds)

Small Business: Retail Management David Kirby

Series Standing Order

If you would like to receive future titles in this series as they are published, you can make use of our standing order facility. To place a standing order please contact your bookseller or, in case of difficulty, write to us at the address below with your name and address and the name of the series. Please state with which title you wish to begin your standing order. (If you live outside the United Kingdom we may not have the rights for your area, in which case we will forward your order to the publisher concerned.)

Customer Services Department, Macmillan Distribution Ltd
Houndmills, Basingstoke, Hampshire, RG21 2XS, England.

SMALL BUSINESS

Production/ Operations Management

Terry Hill

M
MACMILLAN
EDUCATION

© Terry Hill 1987

All rights reserved. No reproduction, copy or transmission of this publication may be made without written permission.

No paragraph of this publication may be reproduced, copied or transmitted save with written permission or in accordance with the provisions of the Copyright Act 1956 (as amended), or under the terms of any licence permitting limited copying issued by the Copyright Licensing Agency, 7 Ridgmount Street, London WC1E 7AE.

Any person who does any unauthorised act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

First published 1987

Published by
MACMILLAN EDUCATION LTD
Houndmills, Basingstoke, Hampshire RG21 2XS
and London
Companies and representatives
throughout the world

British Library Cataloguing in Publication Data
Hill, Terry

Small business: production/operations
management.—(Macmillan small business
series)

1. Production management 2. Small business — Management
I. Title

658.5 TS155

ISBN 978-0-333-36403-1

ISBN 978-1-349-18691-4 (eBook)

DOI 10.1007/978-1-349-18691-4

To PM, AJ and JB

Contents

	<i>List of Tables</i>	viii
	<i>List of Figures</i>	ix
	<i>Acknowledgements</i>	xi
PART I	PRINCIPLES OF THE PRODUCTION/OPERATIONS MANAGEMENT TASK	
1	Production/Operations Management in a Small Business	3
2	Analysis of the Production/Operations Process	19
PART II	MAJOR DETERMINANTS OF THE POM TASK	
3	Getting to Know Your Market and Your Business	45
4	Developing and Reviewing Products or Services	55
5	Defining and Determining Capacity	79
PART III	PRODUCTION/OPERATIONS PLANNING AND CONTROL	
6	How to Plan and Control the Production/Operations System	107
7	The Functions of Inventory and its Control in Production/Operations	138
8	How to Study and Analyse Production/Operations Work	150
9	Purchasing	176
10	Payment Systems and Employee Policies	195
	<i>Select Bibliography</i>	209
	<i>Index</i>	216

List of Tables

1.1	Provisional 'births' and 'deaths' by business sector, 1980–2	7
1.2	Lifespan of businesses deregistered for VAT, 1974–82	7
1.3	Reasons for business failure	8
1.4	Small and medium-sized businesses, Companies Act 1981 criteria	9
1.5	Small firms sector, statistical definitions	10
2.1	The choice of process : important implications	27
4.1	Percentage share of sample innovations, by size of firm	62
6.1	Activities to be networked : take out old window and instal new, premeasured one on site	118
7.1	Business balance sheet extracts, seven UK small businesses	139
7.2	Inventory items : representative sample in order of decreasing ARV	145
7.3	Sales to inventory comparisons, 1980–2	149
8.1	Individual's performance: output within a given period	169
8.2	Quality control and process type : siting of responsibility	172
9.1	Ratio of purchases to cost of wages and salaries for manufacturing industries, selected years	177
10.1	Performance scale data	203

List of Figures

1.1	The production/operations function	12
1.2	Product/service mixes	13
1.3	Production management functions in a manufacturing business	14
2.1	Volume increases and process transition	25
2.2	The POM task in a small business	40
3.1	The business plan	49
3.2	Outline for preparing a business plan	50
3.3	Profiling products/services against markets	51
3.4	Order-winning criteria	53
4.1	Product/service life cycle	59
4.2	Transferring technical ideas to a business	64
4.3	Product analysis by annual sales turnover	66
5.1	Load/trip frequency chart	98
5.2	Relationship chart	98
6.1	Forecast demand : level production and inventory build-ups and reductions	112
6.2	Forecast demand : mixed plan – level production with inventory and sub-contract decisions	113
6.3	Forecast demand : mixed plan – inventory build-ups and reductions and variable production levels	114
6.4	Network drawing symbols	115
6.5	Using dummy activities when drawing networks	117
6.6	Activities and their dependencies	117
6.7	Network diagram for the activities and their dependencies given in Figure 6.6	118
6.8	Network diagram of Table 6.1 data	119
6.9	Network diagram : window installation at two sites	120
6.10	Information in event nodes	121
6.11	Bar chart of assignment allocations	124
6.12	Data processing costs	128
7.1	Pareto curve and A,B,C categorisation	146

x *List of Figures*

7.2	A,B,C item control	146
8.1	Process chart symbols	154
8.2	Outline process chart : sales order procedure	155
8.3	Multiple activity chart	156
8.4	Different forms of estimating	162
8.5	Establishing a standard time	164
8.6	Time study sheet	165
8.7	BSI 0–100 rating scale	167
8.8	Daily control sheet for an indirect function	170
9.1	Sample enquiry form	182
9.2	Typical purchase requisition note	184
9.3	Sample purchase order	184
10.1	Straightline proportional incentive scheme	199
10.2	Regressive incentive scheme	200
10.3	Levels of productivity change after move from incentive to fixed wage system	201
10.4	Percentage changes in productivity after move from fixed wage to incentive scheme	201
10.5	Average change in productivity, differing years after the change of scheme	202
10.6	Pressures and interests in a family business	206

Acknowledgements

The author and publishers wish to thank the following who have kindly given permission for the use of copyright material :

Macmillan, for Figures 3.1, 3.2, 3.4 and 4.2.

Prentice-Hall, for Tables 2.1 and 8.1 and Figures 1.1, 1.2, 1.3, 2.1, 5.1, 8.1, 8.5 and 8.8.

Penguin Books, for Figure 2.2.

Pergamon Press for Figure 6.12.

Department of Trade and Industry for Tables 1.1, 1.2 and 1.5.

The Controller of Her Majesty's Stationery Office for Tables 1.3, 1.4, 4.1 and 9.1.

Harvard Business Review for Figure 10.6,

Management Decision for Figures 10.3, 10.4 and 10.5.

Association of Independent Research and Technology Organisations for entries in the appendix 'Research and Technology Organisations'.