

Second  
Edition

# Essentials of Operations Management

Nigel Slack  
Alistair Brandon-Jones

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**Nigel Slack**  
**Alistair Brandon-Jones**



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# Brief contents

**1** Operations management and performance 2

---

**2** Operations strategy 38

---

**3** Product and service innovation 70

---

**4** Process design – resources 100

---

**5** Process design – analysis 130

---

**6** Supply chain management 162

---

**7** Capacity management 198

---

**8** Inventory management 234

---

**9** Resource planning and control 274

---

**10** Lean operations 308

---

**11** Operations improvement 342

---

**12** Quality management 376

---

**13** Project management 408

---



# Contents

Guide to 'Operations in practice'  
examples **xv**

Preface **xix**

To the instructor **xxii**

To the student **xxiii**

Ten steps to getting a better grade in  
operations management **xxiv**

About the authors **xxvi**

Acknowledgements **xxviii**

Publisher's acknowledgements **xxx**

Notes **440**

Index **444**



## Operations management and performance

Introduction **3**

Key questions **3**

### What is operations management? **4**

Operations can produce both services and products **6**

Operations management in not-for-profit organizations **9**

### What is the input–transformation–output process? **10**

Inputs to the process **11**

### Why is operations management important to an organization's performance? **13**

Performance at three levels **14**

### What is the processes hierarchy? **20**

Operations management is relevant to all parts of the business **21**

Business processes **22**

### How do operations and processes differ? **23**

The volume dimension **24**

The variety dimension **24**

The variation dimension **24**

The visibility dimension **25**

The implications of the four Vs of operations processes **26**

### What do operations managers do? **27**

The model of operations management **31**

Summary answers to key questions **32**

Problems and applications **34**

Want to know more? **36**





2

## Operations strategy

Introduction 39  
Key questions 39

### What is strategy and what is operations strategy? 40

Operations strategy 42  
Hayes and Wheelwright's four stages of operations contribution 42  
Perspectives on operations strategy 43

### What is the difference between a 'top-down' and 'bottom-up' view of operations strategy? 44

'Top-down' strategies 44  
'Bottom-up' strategies 45

### What is the difference between a market requirements and operations resources view of operations strategy? 47

Market requirements-based strategies 47  
The operations resources perspective 52

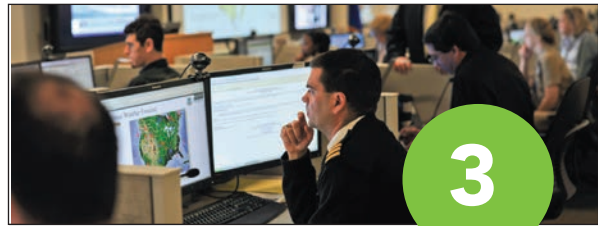
### How can operations strategy form the basis for operations improvement? 58

The 'line of fit' between market requirements and operations capabilities 58

### What is the 'process' of operations strategy? 60

Operation strategy formulation 61  
Operations strategy implementation 62  
Operations strategy monitoring 62  
Operations strategy control 63

Summary answers to key questions 64  
Problems and applications 66  
Want to know more? 68



3

## Product and service innovation

Introduction 71  
Key questions 71

### What is product and service innovation? 72

Innovation, creativity and design 72  
Incremental or radical innovation 73

### What is the strategic role of product and service innovation? 75

The process of design 76  
Design process objectives 76

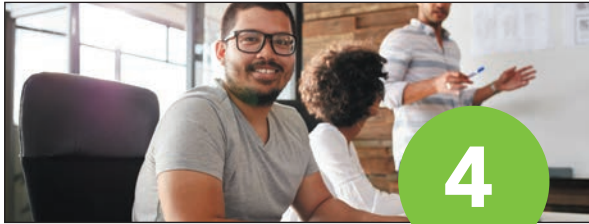
### What are the stages of product and service innovation? 81

Concept generation 82  
Concept screening 83  
Preliminary design 85  
Reducing design complexity 86  
Design evaluation and improvement 87  
Prototyping and final design 89

### What are the benefits of interactive product and service innovation? 90

Simultaneous development 90  
Early conflict resolution 91  
Project-based organizational structures 92

Summary answers to key questions 95  
Problems and applications 97  
Want to know more? 98



## Process design – resources

Introduction 101  
Key questions 101

### Why is choosing the right resources important? 102

Process design and product/service design are interrelated 102

### Do processes match volume–variety requirements? 103

The ‘product–process’ matrix 104  
Process types 105  
Moving off the natural diagonal 108

### Are process layouts appropriate? 110

Layout should reflect volume and variety 110  
Layout selection 113  
Advantages and disadvantages of layout types 114  
Layout and ‘servicescapes’ 114

### Are process technologies appropriate? 115

Process technology should reflect volume and variety 116

### Are job designs appropriate? 119

Job design should reflect volume and variety 119  
To what degree should jobs be defined? 121  
How should job commitment be encouraged? 123

Summary answers to key questions 125  
Problems and applications 127  
Want to know more? 128



## Process design – analysis

Introduction 131  
Key questions 131

### Why is it important to get the details of process design correct? 132

### What should be the objectives of process design? 134

‘Micro’ objectives 134  
Standardization of processes 136  
Environmentally sensitive process design 137

### How are processes currently designed? 138

Process mapping 139

### Are process tasks and capacity configured appropriately? 143

Throughput time, cycle time and work in progress 143  
Workflow 147  
Process bottlenecks 148  
Arranging the stages 149

### Is process variability recognized? 152

Summary answers to key questions 157  
Problems and applications 159  
Want to know more? 161



## Supply chain management

Introduction 163  
Key questions 163

### What is supply chain management? 164

Internal and external supply chains 167  
Tangible and intangible supply chains 167

### How do supply chains compete? 167

Performance objectives for supply networks 169  
Lean versus agile supply networks 171

### How should you manage supply chain relationships? 173

Contracting and relationships 173  
Which type of relationship? 176

### How should the supply side be managed? 177

Sourcing strategy 177  
Global sourcing 180  
Supplier selection 180  
Managing on-going supply 182  
Improving supplier capabilities 184

### How should the demand side be managed? 184

Logistics services 185  
Customer relationship management (CRM) 186  
Customer development 187

### What are the dynamics of supply chains? 188

Controlling supply chain dynamics 190

Summary answers to key questions 192  
Problems and applications 194  
Want to know more? 196



## Capacity management

Introduction 199  
Key questions 199

### What is capacity management? 200

Long-, medium- and short-term capacity management 201

### What are the main long-term capacity decisions? 201

Economies of scale and the 'optimum' capacity level 201  
The timing of capacity change 203

### What are the main medium-term capacity decisions? 205

The objectives of capacity management 206  
Understanding medium-term demand 206  
Understanding medium-term capacity 207  
Both demand and capacity can vary 210  
Predictable and unpredictable variation 211

### What are the ways of coping with mismatches between medium-term demand and capacity? 213

Level capacity plan 213  
Chase demand plan 214  
Demand management plan 216  
Yield management 218

### How can operations understand the consequences of their medium-term capacity decisions? 218

Considering capacity decisions using cumulative representations 219

Considering capacity decisions using queuing principles **220**  
 Considering capacity decisions over time **225**  
 Summary answers to key questions **227**  
 Problems and applications **229**  
 Want to know more? **232**



## Inventory management

Introduction **235**  
 Key questions **235**

### What is inventory? **236**

All processes, operations and supply networks have inventories **237**

### Why do you need inventory? **239**

So why have inventory? **240**  
 Reducing physical inventory **243**  
 Day-to-day inventory decisions **244**

### How much should you order? (The volume decision) **245**

The economic order quantity (EOQ) formula **247**  
 Gradual replacement – the economic batch quantity (EBQ) model **251**  
 Criticisms of EOQ models **252**

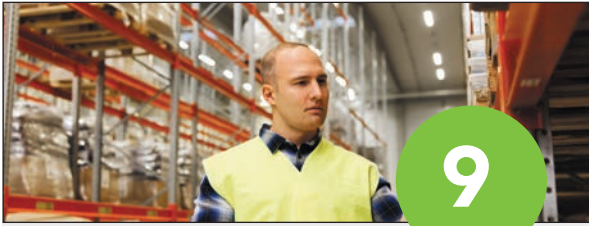
### When should you order? (The timing decision) **254**

Continuous and periodic review **258**

### How can you control inventory? **260**

Using the ABC system to prioritize inventories **261**  
 Measuring inventory **263**  
 Inventory information systems **263**  
 Common problems with inventory systems **267**

Summary answers to key questions **269**  
 Problems and applications **271**  
 Want to know more? **272**



## Resource planning and control

Introduction 275  
Key questions 275

**What is resource planning and control? 276**

**What is the difference between planning and control? 278**

Long-, medium- and short-term resource planning and control 278

**How do supply and demand affect planning and control? 280**

Uncertainty in supply and demand 280  
Dependent and independent demand 280  
Responding to demand 281  
P:D ratios 284

**What are the activities of planning and control? 285**

Loading 285  
Sequencing 287  
Scheduling 291  
Monitoring and controlling the operation 297  
Drum, buffer, rope 298

**What is enterprise resource planning (ERP)? 299**

How did ERP develop? 301

Summary answers to key questions 303  
Problems and applications 304  
Want to know more? 306



## Lean operations

Introduction 309  
Key questions 309

**What is lean? 310**

Three perspectives of lean 312  
How lean operations consider flow 312  
How lean operations consider inventory 314  
How lean operations consider capacity utilization 315  
How lean operations consider the role of people 315  
How lean operations consider improvement 318

**How does lean eliminate waste? 318**

Causes of waste – *muda, mura, muri* 319  
Types of waste 319  
Looking for waste (and *kaizen* opportunities) – the ‘*gemba walk*’ 321  
Eliminating waste through streamlined flow 321  
Eliminating waste through matching demand and supply exactly 326  
Eliminating waste through flexible processes 328  
Eliminating waste through minimizing variability 331  
Keeping things simple – the 5S method 334

**How does lean apply throughout the supply network? 334**

Summary answers to key questions 337  
Problems and applications 338  
Want to know more? 340



## Operations improvement

Introduction 343  
Key questions 343

### Why is improvement so important in operations management? 344

Radical, or breakthrough, change 346  
Continuous, or incremental, improvement 347  
Exploitation or exploration 347  
The structure of improvement ideas 348

### Why is failure management also improvement? 349

Assessing the potential causes and consequences of failure 349  
How can failure be prevented? 350  
How can operations mitigate the effects of failure? 351  
How can operations recover from the effects of failure? 351

### What are the key elements of operations improvement? 352

Improvement cycles 352  
A process perspective 353  
End-to-end processes 353  
Evidence-based problem solving 353  
Customer-centricity 354  
Systems and procedures 354  
Reduce process variation 355  
Synchronized flow 356  
Emphasize education/training 356  
Perfection is the goal 356  
Waste identification 356  
Include everybody 356  
Develop internal customer–supplier relationships 357

### What are the broad approaches to improvement? 357

Total quality management as an improvement approach 357  
Lean as an improvement approach 358  
Business process re-engineering (BPR) 358  
Six Sigma 361  
Differences and similarities 362

### What techniques can be used for improvement? 364

Scatter diagrams 364  
Process maps (flow charts) 365  
Cause–effect diagrams 367  
Pareto diagrams 367  
Why–why analysis 368  
Benchmarking 370

Summary answers to key questions 371  
Problems and applications 373  
Want to know more? 375



## Quality management

Introduction 377  
Key questions 377

### What is quality and why is it so important? 378

The operation's view of quality 378  
Customers' view of quality 379  
Reconciling the operation's and the customer's views of quality 380  
How can quality problems be diagnosed? 383

### What steps lead towards conformance to specification? 384

Step 1 – define the quality characteristics 385  
Step 2 – decide how to measure each characteristic 386  
Step 3 – set quality standards 386  
Step 4 – control quality against those standards 387  
Steps 5 and 6 – find and correct causes of poor quality and continue to make improvements 393

### What is total quality management (TQM)? 394

TQM as an extension of previous practice 394  
The principles of TQM 395  
TQM means meeting the needs and expectations of customers 396  
TQM means covering all parts of the organization 396  
TQM means including every person in the organization 397  
TQM means all costs of quality are considered 398  
TQM means developing the systems and procedures that support quality and improvement 401

Summary answers to key questions 404  
Problems and applications 406  
Want to know more? 407



## Project management

Introduction 409  
Key questions 409

### What is project management? 410

What do projects have in common? 410  
What is project management exactly? 412  
Not all projects are the same 412  
The stages of project management 415

### What is a project's 'environment'? 416

The role of stakeholders in projects 416  
Project definition 418

### How can projects be planned? 420

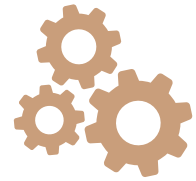
Identify activities – the work breakdown structure 420  
Estimate times and resources 421  
Identify relationships and dependencies 422  
Identify schedule constraints 426  
Fix the schedule 427  
Network analysis 428  
Program evaluation and review technique (PERT) 429

### How can projects be controlled? 432

Project monitoring 432  
Assessing project performance 433  
Intervening to change the project 433  
Managing matrix tensions 434

Summary answers to key questions 435  
Problems and applications 437  
Want to know more? 439

# Guide to 'Operations in practice' examples



Chapter	Location	Company/ example	Region	Sector/ activity	Company size
Chapter 1 Operations management	p.5	Prêt A Manger	Global	Retail	Medium
	p.8	Torchbox	UK	Web designers	Small
	p.9	MSF	Global	Charity	Medium
	p.19	LEGO	Global	Manufacturing	Large
	p.26	Ski Verbier	Europe	Hospitality	Large
	p.27	Formule 1	Switzerland	Hospitality	Small
Chapter 2 Operations strategy	p.41	SSTL	UK	Aerospace	Medium
	p.48	Apple retail	Global	Retail	Large
	p.55	Contrasting strategies: ARM versus Intel	Global	Microchips	Large
	p.57	Apple's supply operations strategy	Global	Technology	Large
	p.63	Sometimes any plan is better than no plan	Europe	Military	Large
Chapter 3 Product and service innovation	p.74	How iPhone disrupted the smartphone market	Global	Technology/ retail	Large
	p.79	IKEA's slow development process	Global	Retail	Large
	p.81	Product innovation in circular economy	UK	Entertainment	Small
	p.87	Art Attack!	Europe	Media	Medium
Chapter 4 Process design – resources	p.109	Space4 housing	UK	Construction	Medium
	p.112	'Factory flow' helps surgery productivity	UK	Healthcare	Medium
	p.118	Technology or people?	General	All	N/A
	p.122	High customer- contact jobs	General	Airline	Large



Chapter	Location	Company/ example	Region	Sector/ activity	Company size
Chapter 5 Process design – analysis	p.133	Changi Airport	Singapore	Air travel	Large
	p.137	Fast food	General	Restaurants	Large
	p.143	Sainsbury's line of visibility	UK	Retail	Large
	p.155	Shouldice Hospital	Canada	Healthcare	Small
Chapter 6 Supply chain management	p.166	Ocado	UK	Retail	Medium
	p.168	Managing Apple's supply network	Global	Technology	Large
	p.170	The North Face of sustainable purchasing	Global	Retail	Medium
	p.181	The tsunami effect	Global	All	N/A
Chapter 7 Capacity management	p.203	Heart surgery and shipping	India/ global	Healthcare/ transport	Large
	p.209	Panettone	Italy	Food production	Large
	p.217	Annualized hours at Lowaters	UK	Retail	Small
Chapter 8 Inventory management	p.237	An inventory of energy	Global	Energy	Large
	p.244	Treasury Wine's hangover	Australasia	Retail	Large
	p.254	Inventory management at Flame Electrical	South Africa	Wholesale	Medium
	p.261	Amazon's 'anticipatory shipping'	Global	Retail	Large
Chapter 9 Resource planning and control	p.277	BMW scheduling	UK	Motor service	Medium
	p.288	Can airline passengers be sequenced?	General	Air transport	N/A
	p.294	The life and times of a chicken sandwich	General	Food production	N/A

Chapter	Location	Company/ example	Region	Sector/ activity	Company size
Chapter 10 Lean operations	p.311	Jamie's 'lean' meals	UK	Retail	Medium
	p.317	Toyota's lean DNA	Global	Manufacturing	Large
	p.324	Waste reduction in airline maintenance	Global	Air travel	N/A
	p.329	<i>Kanban</i> control at Torchbox web designers	UK	Web design	Small
	p.330	All change at Boeing	Global	Air travel	Large
Chapter 11 Operations improvement	p.345	Sonae Corporation	Portugal	Retail	Large
	p.355	Heineken	Netherlands	Brewing	Large
	p.370	Learning from Formula One	UK	Sport/transport	Medium
Chapter 12 Quality management	p.380	Victorinox/ Four Seasons	Switzerland Global	Manufacturing Hospitality	Medium Large
	p.383	Quality at Magic Moments	UK	Personal service	Small
	p.388	Ryanair reforms its view of service quality	Europe	Airline	Large
	p.397	Fat finger syndrome	General	Financial services	N/A
Chapter 13 Project management	p.411	Imagineering projects at Disney	Global	Entertainment	Large
	p.413	Halting the growth of malaria	Global	Healthcare	Large
	p.424	The Scottish Parliament Building	Scotland	Government	Medium

## Supporting resources

Visit [www.pearsoned.co.uk/slack](http://www.pearsoned.co.uk/slack) to find valuable online resources

### MyLab Operations Management

#### For students

- Interactive tutorial exercises with immediate feedback
- A personalized study plan with a range of self-assessment questions
- Excel spreadsheets designed to help support your understanding of key concepts
- An online glossary to explain key terms
- Flashcards to test your understanding of key terms

#### For instructors

- Operations management simulations allow students to apply key theory to real business scenarios
- A homework and assignment manager, allowing you to assign exercises for your students
- A Gradebook which tracks students' performance on sample tests as well as assessments of your own design

The **Companion Website** provides suggested model answers to the first question in the 'problems and applications' section of each chapter.

For more information please contact your local Pearson Education sales representative or visit [www.pearsoned.co.uk/slack](http://www.pearsoned.co.uk/slack)

# Preface

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## INTRODUCTION – OPERATIONS MAY NOT RUN THE WORLD, BUT IT MAKES THE WORLD RUN.

Operations management is *important*. It is concerned with creating the services and products upon which we all depend. All organizations produce some mixture of services and products, whether that organization is large or small, manufacturing or service, for profit or not for profit, public or private. Thankfully, most companies have now come to understand the importance of operations. This is because they have realized that effective operations management gives the potential to improve both customer service and efficiency simultaneously. But more than this, operations management is *everywhere*; it is not confined to the operations function. All managers, whether they are called Operations or Marketing or Human Resources or Finance, or whatever, manage processes and serve customers (internal or external). This makes at least part of their activities 'operations'.

Operations management is also *exciting*. It is at the centre of so many of the changes affecting the business world – changes in customer preference, changes in supply networks brought about by internet-based technologies, changes in what we want to do at work, how we want to work, where we want to work and so on. There has rarely been a time when operations management was more topical or more at the heart of business and cultural shifts.

Operations management is also *challenging*. Promoting the creativity that will allow organizations to respond to so many changes is becoming the prime task of operations managers. It is they who must find the solutions to technological and environmental challenges, the pressures to be socially responsible, the increasing globalization of markets and the difficult-to-define areas of knowledge management.

---

## THE AIM OF THIS BOOK

This book provides a clear, authoritative, well-structured and interesting treatment of operations management as it applies to a variety of businesses and organizations. The text provides both a logical path through the activities of operations management and an understanding of their strategic context.

More specifically, this text is:

- ★ **strategic** in its perspective – it is unambiguous in treating the operations function as being central to competitiveness
- ★ **conceptual** in the way it explains the reasons why operations managers need to take decisions
- ★ **comprehensive** in its coverage of the significant ideas and issues that are relevant to most types of operation
- ★ **practical** in that the issues and challenges of making operations management decisions in practice are discussed (the 'Operations in practice' examples that feature in every chapter explore the approaches taken by operations managers in practice)
- ★ **global** in the examples that are used, with descriptions of operations practice from all over the world, and in the treatment of core OM ideas
- ★ **balanced** in its treatment, in that it accurately reflects the balance of economic activity between service and manufacturing operations.

---

### WHO SHOULD USE THIS BOOK?

This book is for anyone who is interested in how services and products are created:

- ★ **Undergraduates** on business studies, technical or joint degrees should find it sufficiently structured to provide an understandable route through the subject (no prior knowledge of the area is assumed).
- ★ **MBA students** should find that its practical discussions of operations management activities enhance their own experiences.
- ★ **Postgraduate students** on other specialist Master's degrees should find that it provides them with a well-grounded and, at times, critical approach to the subject.

---

### DISTINCTIVE FEATURES

#### Clear structure

The structure of the book uses the '4 Ds' model of operations management that distinguishes between the strategic decisions that govern the *direction* of the operation, the *design* of the processes and operations that create products and services, planning and control of the *delivery* of products and services, and the *development*, or improvement, of operations.

**Illustrations-based**

Operations management is a practical subject and cannot be taught satisfactorily in a purely theoretical manner. Because of this we have used examples and short 'operations in practice' examples that explain some of the issues faced by real operations.

**Summary answers to key questions**

Each chapter is summarized in the form of a list of bullet points. These extract the essential points that answer the key questions posed at the beginning of each chapter.

**Problems and applications**

Every chapter includes a set of problem-type exercises. These can be used to check your understanding of the concepts illustrated in the worked examples. There are also activities that support the learning objectives of the chapter, which can be undertaken individually or in groups.

**Want to know more?**

Every chapter ends with a short list of further reading that takes the topics covered in the chapter further, or treats some important, related issues. The nature of each further reading is also explained.

# To the instructor

---

## THE ESSENTIALS SECOND EDITION

When we created the first edition of *Essentials* we hoped that we were keeping up with the requirements and preferences of our book users. We were responding to what we thought was a demand from both lecturers and students for a text aimed at shorter, more introductory courses in operations management. We believed that there was a demand for an authoritative but not necessarily fully comprehensive text. It appears we were right. The first edition of *Essentials*, based on the approach that has made both *Operations Management* and *Operations and Process Management* market-leading texts, was particularly well received – hence this second edition.

- ★ We have retained the concept of a text that is shorter than its companion texts, with coverage focused on what extensive research indicates are key topics. In some cases, this has involved incorporating content from more than one chapter of our longer texts. For example, in this edition we have combined operations management and operations performance content to free up space for an additional chapter on project management that wasn't in the first edition.
- ★ We have also retained many learning features, including 'Operations in practice' examples, 'Key questions', 'Worked examples', 'Test your knowledge', 'Problems and applications', and the 'Want to know more?' features.
- ★ What is new to this edition, in addition to many new examples and increased coverage of some topics, is that for the first time we offer model answers to the 'Problems and applications' exercises at the end of each chapter. Answers to the first question are included in the companion student website to this text. Answers to the other questions are available to bona fide lecturers and tutors in order to support their teaching.

# To the student

---

## MAKING THE MOST OF THIS TEXT

All academic texts in business management are, to some extent, simplifications of the messy reality that is actual organizational life. Any book has to separate topics in order to study them, which in reality are closely related. For example, operations strategy impacts on process design, which in turn impacts on approach to quality management; yet, for simplicity, we are obliged to treat these topics individually. The first hint, therefore, in using this text effectively is to look out for all the links between the individual topics. Similarly, with the sequence of topics, although the chapters follow a logical structure, they need not be studied in this order. Every chapter is, more or less, self-contained. Therefore, study the chapters in whatever sequence is appropriate to your course or your individual interests. The same applies to revision – study the introductory passages and ‘Test your knowledge’ sections.

The text makes full use of the many practical examples and illustrations that can be found in all operations. Many of these were provided by our contacts in companies, but many also come from journals, magazines and newspapers. So, if you want to understand the importance of operations management in everyday business life, look for examples and illustrations of operations management decisions and activities in newspapers and magazines. There are also examples that you can observe every day. Whenever you use a shop, eat a meal in a restaurant, access music via your phone or ride on public transport, consider the operations management issues of all the operations for which you are a customer.

The ‘Problems and applications’ exercises are there to provide an opportunity for you to think further about the ideas discussed in the chapters. They can be used to test out your understanding of the specific points and issues discussed in the chapter and to discuss them as a group, if you choose. If you cannot answer these you should revisit the relevant parts of the chapter. When you have done this individually, try to discuss your analysis with other course members. Most important of all, every time you analyze one of the case exercises (or any other case or example in operations management), start off your analysis with these two fundamental questions:

- ★ How is this organization trying to compete (or satisfy its strategic objectives if a not-for-profit organization)?
- ★ What can the operation do to help the organization compete more effectively?



# Ten steps to getting a better grade in operations management

We could say that the best rule for getting a better grade is to be good. We mean really, really good! But, there are plenty of us who, while fairly good, don't get as good a grade as we really deserve. So, if you are studying operations management, and you want a really good grade, try following these simple steps:

1

➔ **Practice, practice, practice.** Use the 'Test your knowledge' and the 'Problems and applications' features to check your understanding. Use the 'Study plan' feature in MyLabOM and practice to master the topics that you find difficult.

2

➔ Remember a few **key models**, and apply them wherever you can. Use the diagrams and models to describe some of the examples that are contained within each chapter. You can also use the revision podcasts on MyLabOM.

3

➔ Remember to use both **quantitative and qualitative** analysis. You'll get more credit for mixing your methods appropriately: use a quantitative model to answer a quantitative question and vice versa, but qualify this with a few well-chosen sentences. Both the chapters of the text and the exercises on MyLabOM incorporate qualitative and quantitative material.

4

➔ There's always a strategic **objective** behind any operational issue. Ask yourself, 'Would a similar operation with a different strategy do things differently?'. Look at the 'Operations in practice' pieces in the text.

5

➔ **Research** widely around the topic. Use websites that you trust – we've listed some good websites in the 'Notes' section at the end of the text and on MyOMLab. You'll get more credit for using references that come from genuine academic sources.

6

➔ **Use your own experience.** Every day, you're experiencing an opportunity to apply the principles of operations management. Why is the queue at the airport

check-in desk so long? What goes on 'behind the scenes' to deliver you the latest tech gadget? Use the clips on MyLabOM to look further at operations in practice.

7

➔ **Always answer the question.** Think 'what is really being asked here?'. 'What topic or topics does this question cover?' Find the relevant chapter or chapters, and search the 'Key questions' at the beginning of each chapter and the 'Test your knowledge' at the end of each chapter to get you started.

8

➔ Take account of the **three tiers of accumulating marks** for your answers:

- a) First, demonstrate your knowledge and understanding. Make full use of the text and MyLabOM to find out where you need to improve.
- b) Second, show that you know how to illustrate and apply the topic. The 'Operations in practice' sections, combined with those on MyLabOM, give you hundreds of different examples.
- c) Third, show that you can discuss and analyze the issues critically. Where appropriate, consider alternative viewpoints.

Generally, if you can do (a) you will pass; if you can do (a) and (b) you will pass well; and if you can do all three, you will pass with flying colours!

9

➔ Remember not only **what** the issue is about, but also understand **why!** Read the text and apply your knowledge until you really understand why the concepts and techniques of operations management are important, and what they contribute to an organization's success. Your new-found knowledge will stick in your memory, allow you to develop ideas and enable you to get better grades.

10

➔ **Start now!** Don't wait until two weeks before an assignment is due or an exam is about to take place. Read on, log on ([www.myomlab.com](http://www.myomlab.com)) and GOOD LUCK!

*Nigel Slack and Alistair Brandon-Jones*

# About the authors

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## Nigel Slack

Nigel Slack is an Emeritus Professor of Operations Management and Strategy at Warwick University, an Honorary Professor at Bath University and an Associate Fellow of Said Business School, Oxford University. Previously he has been Professor of Service Engineering at Cambridge University, Professor of Manufacturing Strategy at Brunel University, a University Lecturer in Management Studies at Oxford University and Fellow in Operations Management at Templeton College, Oxford. He worked initially as an industrial apprentice in the hand-tool industry and then as a production engineer and production manager in light engineering. He holds a Bachelor's degree in Engineering and Master's and Doctor's degrees in Management, and is a Chartered Engineer. He is the author of many books in Operations Management, including *Operations Management* (with Alistair Brandon-Jones and Robert Johnston), the eighth edition published in 2016, *Operations and Process Management* (with Alistair Brandon-Jones), the fifth edition published in 2018, *Operations Strategy* (with Michael Lewis), the fourth edition published in 2014, *The Manufacturing Advantage*, published in 1991, *Making Management Decisions* (with Steve Cooke) published in 1991, *Service Superiority* (with Robert Johnston), published in 1993, *The Blackwell Encyclopedic Dictionary of Operations Management*, published in 1997, and *Perspectives in Operations Management* (with Michael Lewis), published in 2003. Nigel has authored numerous academic papers and chapters in books. He also acts as a consultant to many international companies around the world in many sectors, especially financial services, transport, leisure and manufacturing. His research is in the operations and manufacturing flexibility and operations strategy areas.

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## Alistair Brandon-Jones

Alistair Brandon-Jones is a Full Chaired Professor in Operations and Supply Management at the University of Bath, and an Adjunct Professor at Hult International Business School. He was formerly a Reader at Manchester Business School, an Assistant and Associate Professor at Bath University and a Teaching Fellow at Warwick Business School, where he also completed his PhD. In addition to *Essentials of Operations Management*, his other books include *Operations and Process Management* (with Nigel Slack), the fifth edition published in 2018, *Operations Management* (with Nigel Slack and Robert Johnston), the eighth edition published in 2016 and *Quantitative Analysis in Operations Management* (with Nigel Slack), published in 2008. Alistair is an active empirical researcher, focusing on e-enabled operations

and supply management, professional services and healthcare operations. He has published this research extensively in world-leading journals including *Journal of Operations Management*, *International Journal of Operations and Production Management*, *International Journal of Production Economics* and *International Journal of Production Research*. He has also disseminated his research through various practitioner publications, conferences, workshops and white papers. Alistair has consulting and executive development experience with organizations around the world, in various sectors including petrochemicals, health, financial services, manufacturing, defence and government. In addition, he has won numerous prizes for teaching excellence and contributions to pedagogy, including from Times Higher Education, Association of MBAs (AMBA), Production Operations Management Society (POMS), University of Bath, University of Manchester and University of Warwick.

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*Nigel Slack and Alistair Brandon-Jones*

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## Text

**p. 41** From Cookson C (2015) Guildford's SSTL leads world in small satellite supply, Financial Times, June 12; **p. 48** From Ron Johnson (2011) What I Learned Building the Apple Store, HBR Blog network, November 21 <https://hbr.org/2011/11/what-i-learned-building-the-ap>; **p. 54** From <http://searchcio.techtarget.com/definition/outsourcing>; **p. 57** from Marty Lariviere (2011) How Apple spends on operations, The Operations Room, November 16; **p. 66** from Definition from [techtarget.com](http://techtarget.com), [searchdatacenter.techtarget.com/](http://searchdatacenter.techtarget.com/); **p. 73** from <https://www.merriam-webster.com/dictionary/innovation>; **p. 75** from (2012) iPhone was almost scrapped, says Apple design guru, The Times, July 30; **p. 388** from The EFQM Website, [www.efqm.org](http://www.efqm.org); **p. 401** from The EFQM Website, [www.efqm.org](http://www.efqm.org).

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# Operations management and performance



# Introduction



**O**perations management is about how organizations create and deliver services and products. Everything you wear, eat, sit on, use, read or knock about on the sports field, and every treatment you receive at the hospital, every service you expect in the shops and every lecture you attend at university has been created by 'operations'. While the people who supervised their creation and delivery may not always be called operations managers, that is what they really are. And that is what this book is concerned with – the activities and decisions of those operations managers who have made the services and products on which we all depend. It is a hugely important activity for any type of organization. As well as impacting the quality, cost and delivery of the services and products that we consume, operations management can help or hinder how an organization achieves its strategic ambitions, and how it fulfills its environmental responsibilities. In this introductory chapter, we will examine what we mean by 'operations management', why it is important, how operations processes are all similar yet different and what it is that operations managers do. Figure 1.1 shows the model of operations management that is developed in the chapter.

## Key questions

**What is operations management?**

**What is the input–transformation–output process?**

**Why is operations management important to an organization's performance?**

**What is the processes hierarchy?**

**How do operations and processes differ?**

**What do operations managers do?**

# What is operations management?

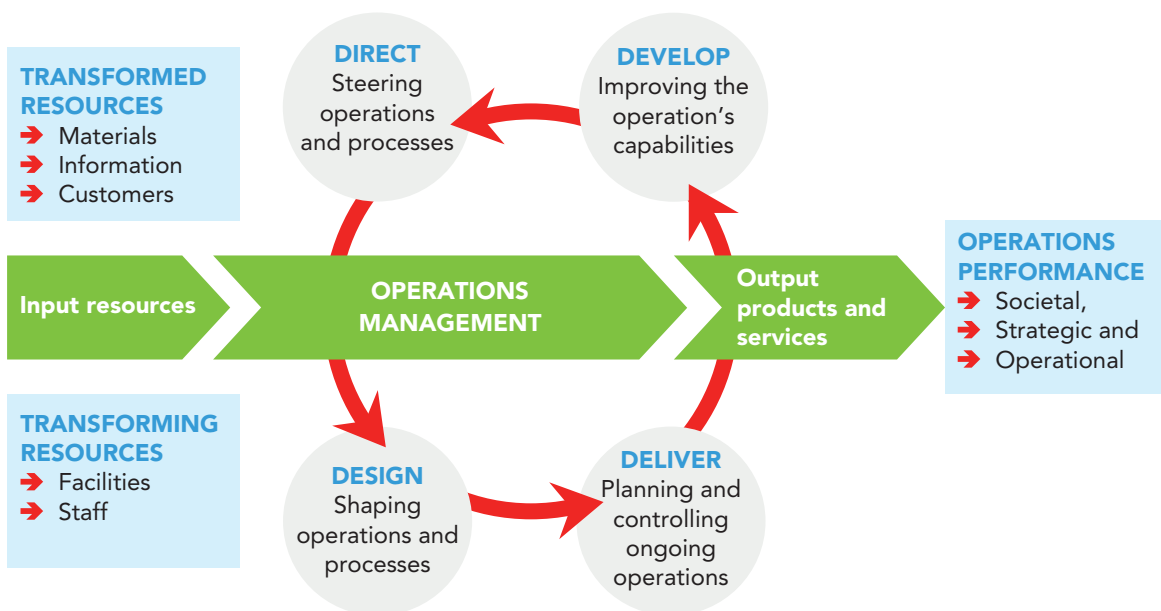
**O**perations management is the activity of managing the resources that create and deliver services and products. The operations function is the part of the organization that is responsible for this activity. Every organization has an operations function because every organization creates services and/or products. Operations managers are the people who have particular responsibility for managing some, or all, of the resources and processes within the operations function. However, not all types of organization will necessarily call the operations function by this name. (Note that we also use the shorter terms 'the operation' or 'operations' interchangeably with the 'operations function'.) Similarly, the operations manager could be called by some other name. For example, he or she might be called the 'fleet manager' in a distribution company, the 'administrative manager' in a hospital, or the 'store manager' in a supermarket.

The Prêt A Manger example illustrates how important the operations function is for any company whose reputation depends on producing safe, high-quality, sustainable and profitable services or products. Its customers could choose to go to its competitors if Prêt's operations failed to deliver excellent levels of service or to produce attractive products, which is why it is

## operations principle

All organizations have 'operations' that produce some mix of services and products.

**FIGURE 1.1** This chapter is an introduction to operations management and performance





## Customer service at Prêt A Manger<sup>1</sup>

**P**rêt A Manger is proud of its customer service.

'We'd like to think we react to our customers' feelings (the good, the bad, the ugly) with haste and absolute sincerity', its directors say. 'Prêt customers have the right to be heard. Do call or email. Our UK managing director is available if you would like to discuss Prêt with him. Alternatively, our CEO hasn't got much to do; hassle him!'





Prêt A Manger opened its first shop in London and now has over 350 shops spread across the UK, Paris, the USA, Hong Kong and Shanghai. It says that its secret is to focus continually on the quality of both its food and its service. It avoids the chemicals and preservatives common in most 'fast' food. 'Many food retailers focus on extending the shelf-life of their

food, but that's of no interest to us. At the end of the day, we give whatever we haven't sold to charity.' Prêt A Manger shops have their own kitchen where fresh ingredients are delivered every morning, with food prepared throughout the day. The team members serving on the tills at lunchtime will have been making sandwiches in the kitchen that morning. 'We are determined never to forget that our hardworking people make all the difference. When they care, our business is sound. If they cease to care, our business goes down the drain. In a retail sector where high staff turnover is normal, we're pleased to say our people are much more likely to stay around! We work hard at building great teams. We take our reward schemes and career opportunities very seriously.'

Examining customers' comments for improvement ideas is a key part of weekly management meetings, and of the daily team briefs in each shop. Moreover, staff at Prêt collect bonuses for delivering outstanding customer service. Every week, each Prêt outlet is visited by a secret shopper who scores the shop on such performance measures as speed of service, product availability and cleanliness. In addition, the mystery shopper rates the 'engagement level' of the staff; questions include, 'did servers connect with eye contact, a smile and some polite remarks'? Above a certain score, every team member receives an extra payment for every hour worked; and if an individual is mentioned by the mystery shopper for providing outstanding service, they get an extra payment. ●●●

meticulous about monitoring its quality and ensuring that its processes operate to precise standards. Of course, exactly what is involved in producing products and services will depend to some extent on the type of organization of which the operations function is a part. Table 1.1 shows some of the activities of the operations function for various types of organization.

**TABLE 1.1** Some activities of the operations function in various organizations

			
Internet service provider	Fast food chain	International aid charity	Furniture manufacturer
<ul style="list-style-type: none"> <li>▶ Maintain and update hardware</li> <li>▶ Update software and content</li> <li>▶ Respond to customer queries</li> <li>▶ Implement new services</li> <li>▶ Ensure security of customer data</li> </ul>	<ul style="list-style-type: none"> <li>▶ Locate potential sites for restaurants</li> <li>▶ Provide processes and equipment to produce burgers, etc.</li> <li>▶ Maintain service quality</li> <li>▶ Develop, install and maintain equipment</li> <li>▶ Reduce impact on local area, and reduce packaging waste</li> </ul>	<ul style="list-style-type: none"> <li>▶ Provide aid and development projects for recipients</li> <li>▶ Provide fast emergency response when needed</li> <li>▶ Procure and store emergency supplies</li> <li>▶ Be sensitive to local cultural norms</li> </ul>	<ul style="list-style-type: none"> <li>▶ Procure appropriate raw materials and components</li> <li>▶ Make sub-assemblies</li> <li>▶ Assemble finished products</li> <li>▶ Deliver products to customers</li> <li>▶ Reduce environmental impact of products and processes</li> </ul>

## Operations can produce both services and products

There is a common misperception that operations management is concerned largely with producing physical products. Not so. In all developed economies, services generate a far higher proportion of wealth than manufacturing. Of the four organizations in Table 1.1, the furniture manufacturer produces tangible products. The fast food chain produces food but also serves it to its customers. The international aid charity does not directly produce products but does distribute them and coordinate aid. The internet service provider has no tangible product as such – it provides intangible services. Yet they are all operations with (as we shall see later) similar activities and objectives. Of course, there are some differences between products and services. Products are usually tangible, whereas services are activities or processes. Also, while most products can be stored, at least for a short time, service only happens when it is consumed or used. So, accommodation in a hotel room, for example, will perish if it is not sold that night; a restaurant table will remain empty unless someone uses it that evening.

### operations principle

Most operations produce a mixture of tangible products and intangible services.

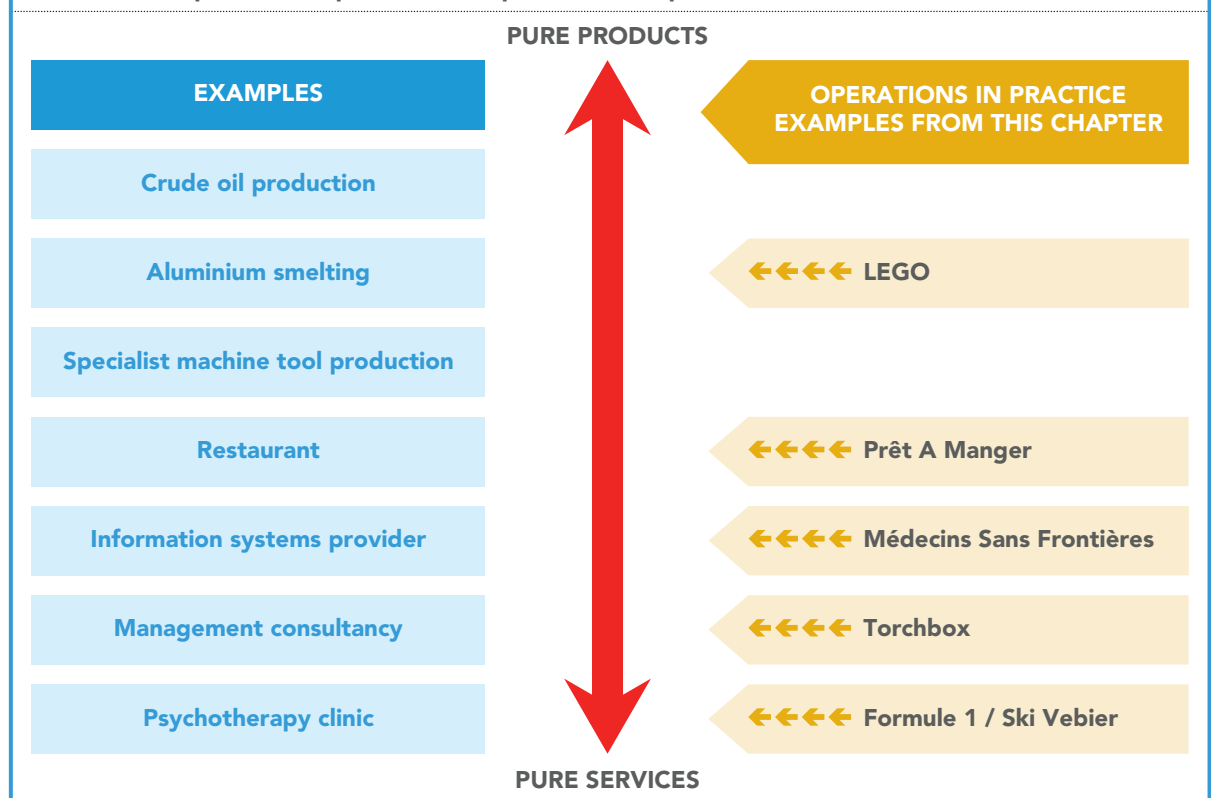
In fact, most operations produce both services and products. Figure 1.2 shows a number of operations positioned in a spectrum, from 'pure' products to 'pure' service. Crude oil producers are concerned almost exclusively with the product from their oil wells. Aluminium smelters are similar, but might also deliver some 'facilitating' services, such as technical advice. To an even greater extent, machine tool manufacturers deliver facilitating services such as technical advice and applications engineering. The restaurant is both a manufacturer of meals and a provider of service. An information systems provider may create software 'products', but primarily provides a service to its customers. Certainly, a management consultancy, although it produces reports and documents, is primarily a service provider. Finally, some pure services solely create and deliver services – a psychotherapy clinic, for example.

Increasingly, the distinction between services and products is difficult to define and not particularly useful. Software has moved from being primarily a product (sold on a disk) to an intangible download when sold over the internet, to an even less tangible rental or subscription service based 'in the cloud'. Indeed, one could argue that all operations are service providers that may create and deliver products as part of the offering to their customers.

### operations principle

Whether an operation produces tangible products or intangible services is becoming increasingly irrelevant. In a sense, all operations produce service for their customers.

**FIGURE 1.2** Most operations produce a mixture of products and services. Some general examples are shown here, together with some of the operations featured as 'Operations in practice' examples in this chapter





## Torchbox: award-winning web designers<sup>2</sup>

**W**e may take it for granted, yet browsing websites as part of your studies, your job or your leisure is an activity that we all do, probably every day, probably many times each day. All organizations need a web presence if they want to sell products and services, interact with their customers or promote their cause. And, not surprisingly, there is a whole industry devoted to designing websites so that they have the right type of impact. It has been one of the fastest-growing industries in the world. But it's also a tough business. Not every web design company thrives, or even survives beyond a couple of years. To succeed, web designers need technology skills, design capabilities, business awareness and operational professionalism. One that has succeeded is Torchbox, an independently-owned digital agency for the charity, non-profit and higher education sectors, with offices in Oxfordshire and Bristol in the UK and Philadelphia in the USA. Founded back in 2000, it now employs over 50 people, providing 'high-quality, cost-effective and ethical solutions for its clients'.

Co-founder and technical director Tom Dyson has been

responsible for its technical development. 'There are a number of advantages about being a relatively small operation', he says. 'We can be hugely flexible and agile, in what is still a dynamic market. But at the same time, we have the resources and skills to provide a creative and professional service. Any senior manager in a firm of our size cannot afford to be too specialised. All of us here have their own specific responsibilities; however, every one of us shares the overall responsibility for the firm's general development. We can also be clear and focused on what type of work we want to do. Our ethos is important to us. We set out to work with clients who share our commitment to environmental sustainability and responsible, ethical business practice; we take our work, and that of our clients, seriously. If you're an arms dealer, you can safely assume that we're not going to be interested.'

Nevertheless, straightforward operational effectiveness is also essential to Torchbox's business. 'We know how to make sure that our projects run not only on time and to budget', says Olly Willans, also a co-founder and the firm's creative director, 'but

we also like to think that we provide an enjoyable and stimulating experience – both for our customers' development teams and for our staff too. High standards of product and service are important to us: our clients want accessibility, usability, performance and security embedded in their web designs, and of course they want things delivered on time and on budget. We are in a creative industry that depends on fast-moving technologies, but that doesn't mean that we can't also be efficient. We back everything we do with a robust feature-driven development process using a kanban project management methodology that helps us manage our obligations to our clients.'

The 'kanban' approach used by the Torchbox web development teams originated from car manufacturers such as Toyota (and is fully explained in Chapter 10). 'Using sound operations management techniques helps us constantly to deliver value to our clients', says Tom Dyson. 'We like to think that our measured and controlled approach to handling and controlling work helps ensure that every hour we work produces an hour's worth of value for our clients and for us.' ● ● ●



## MSF operations provide medical aid to people in danger<sup>3</sup>

**M**édecins Sans Frontières (MSF) is an independent humanitarian organization providing medical aid where it is most needed and raising awareness of the plight of the people it helps around the world. Its core work takes place in crisis situations – armed conflicts, epidemics, famines and natural disasters. It delivers both medical aid and material aid (including food, shelter, blankets, etc.). Each year, MSF sends doctors, nurses, logisticians, water-and-sanitation experts, administrators and other professionals to work alongside around thousands of locally hired staff. It is one of the most admired and effective relief organisations in the world. But no amount of fine intentions can translate into effective

action without superior operations management. As MSF says, it must be able to react to any crisis with ‘fast response, efficient logistics systems and efficient project management’.

MSF response procedures are continuously being developed to ensure that they reach those most in need as quickly as possible. The process has five phases: proposal, assessment, initiation, running the project and closing. The information that prompts a possible mission can come from governments, the international community, humanitarian organizations or MSF teams already present in the region. Once the information has been checked, MSF experts carry out a quick evaluation and send a proposal back to the MSF office. After

approval, MSF select personnel, organize resources and secure funds. Initiation involves sending equipment and resources to the area. Thanks to their pre-planned processes, specialized kits and the emergency stores, MSF can distribute material and equipment within 48 hours, ready for the response team to start work as soon as it arrives. Once the critical medical needs have been met, MSF begins to close the project with a gradual withdrawal of staff and equipment. All of which depends on an efficient logistics system working from MSF’s four logistical centres based in Europe and East Africa, plus stores of emergency materials in Central America and East Asia where they purchase, test and store equipment. ● ● ●

## Operations management in not-for-profit organizations

Terms such as ‘business’, ‘competitiveness’ and ‘markets’, which are used in this text, are usually associated with companies in the for-profit sector. Yet operations management is also relevant to organizations whose purpose is not primarily to earn profits. Managing the operations in an animal welfare charity, hospital, research organization or government department is essentially the same as in commercial organizations. These operations have to create and deliver service and products, invest in technology, contract out