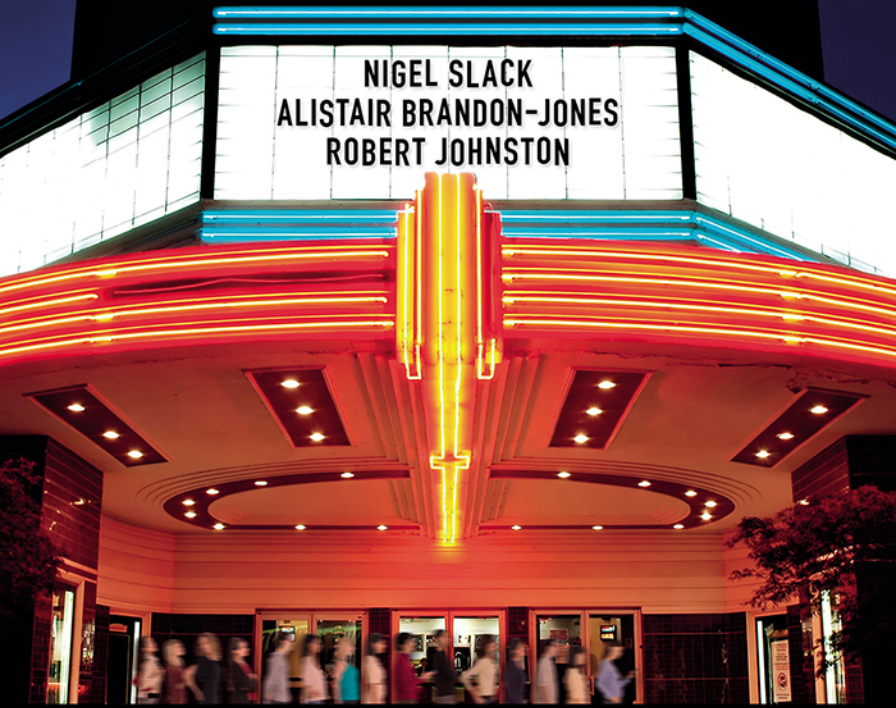
OPERATIONS MANAGEMENT

EIGHTH EDITION



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OPERATIONS MANAGEMENT

Eighth edition

Nigel Slack
Alistair Brandon-Jones
Robert Johnston

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Preface

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. And 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 efficiency and customer service 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 which 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' feature, which starts every chapter, the short cases that appear through the chapters, and the case studies at the end of each chapter, all explore the approaches taken by operations managers in practice.
- *International* in the examples that are used. There are over 110 descriptions of operations practice from all over the world.
- *Balanced* in its treatment. This means we reflect the balance of economic activity between service and manufacturing operations. Around seventy-five per cent of examples are from organizations that deal primarily in services and twenty-five per cent from those that are primarily manufacturing.

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 experience.
- *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 '4Ds' 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' cases that explain some of the issues faced by real operations.

Worked examples

Operations management is a subject that blends qualitative and quantitative perspectives; 'worked examples' are used to demonstrate how both types of technique can be used.

Critical commentaries

Not everyone agrees about what is the best approach to the various topics and issues with operations management. This is why we have included 'critical commentaries' that pose alternative views to the one being expressed in the main flow of the text.

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.

Case studies

Every chapter includes a case study suitable for class discussion. The cases are usually short enough to serve as illustrations, but have sufficient content also to serve as the basis of case sessions.

Problems and applications

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

Selected further reading

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 . . .

Teaching and learning resources for the 8th edition

New for the eighth edition

This 8th Edition is different. In fact, it's the biggest set of changes that we have made between editions. We have been consulting widely with our users, who have very kindly contributed to advising us on how we should further improve both the structure and content of the book. First the structure – we have retained the '4Ds' structure (direct, design, delivery and development) that has proved to be exceptionally popular, but we have shifted two chapters that were in the 'design' section into the 'direct' section. Our users, quite rightly, pointed out that 'design innovation' and 'the structure and scope of operations' (what was called 'Supply network design' in previous editions) were both fundamental and strategic, and so therefore should be included in the first part of the book. We have done this and made both chapters more strategic. We have also moved two chapters (Quality management and Project management) into the 'Development' section on the grounds that they are both increasingly seen as part of operations improvement. In terms of the content, we have included various aspects of sustainability and Corporate Social Responsibility in each chapter rather than separating the issue out at the end of the book. The issues covered are just too important to be segregated in that way. Needless to say, as usual, we have tried to keep up to date with the (increasingly) rapid changes taking place in the (wonderful) world of operations.

Specifically, the 8th edition includes the following key changes:

- There are now more than 110 of the popular 'Operations in Practice' examples throughout the book, over 40 per cent of which are new.
- The importance of sustainability and Corporate Social Responsibility (CSR) has been emphasised further, and included throughout the book.
- We have even further strengthened the emphasis on the idea that 'operations management' is relevant to every type of business and all functional areas of the organization.
- Many new ideas in operations management have been incorporated, including the 'three level' approach to performance, the relationship between innovation, creativity and design, crowdsourcing, ideas management, business ecosystems, triadic relationships, office layout, telecommuting and organisational 'ambidexterity'. However, we have retained the emphasis on the foundations of the subject.
- Six of the 19 cases at the end of the chapter are new (but the old ones are still available on the website), and provide an up-to-date selection of operations issues.
- The book has been visually redesigned to aid learning. Instructor's resources A completely new instructor's manual is available to lecturers adopting this textbook, together with PowerPoint presentations for each chapter and a Testbank of assessment questions. Visit www.pearsoned.co.uk/slack to access these. Most importantly, a new set of online resources to enable students to check their understanding, practise key techniques and improve their problem-solving skills now accompanies the book.

To the Student . . .

Making the most of this book

All academic textbooks 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, technology choice impacts on job design that in turn impacts on quality management; yet, for simplicity, we are obliged to treat these topics individually. The first hint therefore in using this book 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. But because each part has an introductory chapter, those students who wish to start with a brief 'overview' of the subject may wish first to study Chapters 1, 6, 10 and 16 and the chapter summaries of selected chapters. The same applies to revision – study the introductory chapters and summary answers to key questions.

The book 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 every-day business life look for examples and illustrations of operations management decisions and activities in newspapers and magazines. There are also examples which you can observe every day. Whenever you use a shop, eat a meal in a restaurant, borrow a book from the library or ride on public transport, consider the operations management issues of all the operations for which you are a customer.

The case exercises and study activities are there to provide an opportunity for you to think further about the ideas discussed in the chapters. Study activities can be used to test out your understanding of the specific points and issues discussed in the chapter and discuss them as a group, if you choose. If you cannot answer these you should revisit the relevant parts of the chapter. The case exercises at the end of each chapter will require some more thought. Use the questions at the end of each case exercise to guide you through the logic of analysing the issue treated in the case. When you have done this individually try to discuss your analysis with other course members. Most important of all, every time you analyse one of the case exercises (or any other case or example in operations management) start off your analysis with the 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

I could say that the best rule for getting a better grade is to be good. I 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:

Step 1 Practise, practise, practise. Use the Key questions and the Problems and applications to check your understanding.

Step 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 the chapter.

Step 3 Remember to use both **quantitative and qualitative analysis.** You'll get more credit for appropriately mixing your methods: use a quantitative model to answer a quantitative question and vice versa, but qualify this with a few well-chosen sentences.

Step 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 book.

Step 5 Research widely around the topic. Use websites that you trust – we've listed some good websites at the end of the book. You'll get more credit for using references that come from genuine academic sources.

Step 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 'hole in the wall' of your bank's ATM machines?

Step 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 Summary at the end of each chapter to get you started.

Step 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 to find out where you need to improve.
(b) Second, show that you know how to illustrate and apply the topic. The Case studies and 'Operations in practice' sections give you hundreds of different examples.
(c) Third, show that you can discuss and analyse the issues critically. Use the Critical commentaries within the text to understand some of the 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!

Step 9 Remember **what** the issue is about, but also **understand why!** Read the text 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.

Step 10 Start now! Don't wait until two weeks before an assignment is due. GOOD LUCK!

Nigel Slack

About the authors

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 and papers in the operations management area, including *The Manufacturing Advantage*, published by Mercury Business Books, 1991, and *Making Management Decisions* (with Steve Cooke), 1991, published by Prentice Hall, *Service Superiority* (with Robert Johnston), published in 1993 by EUROMA, *The Blackwell Encyclopedic Dictionary of Operations Management* (with Michael Lewis) published by Blackwell, *Operations Strategy* together with Michael Lewis, the fourth edition published by Pearson in 2014 and *Perspectives in Operations Management (Volumes I to IV)* also with Michael Lewis, published by Routledge in 2003, *Operations and Process Management*, with Alistair Brandon-Jones, Robert Johnston and Alan Betts, now in its 4th Edition 2015. He 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.

Alistair Brandon-Jones is a Professor in Operations and Supply Management and Associate Dean for Post-Experience Education at the University of Bath School of Management, He was formerly a Reader at Manchester Business School, an Assistant and Associate Professor at Bath School of Management and a Teaching Fellow Warwick Business School, where he also completed his PhD. His other books include *Operations and Process Management*, *Essentials of Operations Management*, and *Quantitative Analysis in Operations Management*. Alistair is an active empirical researcher focusing on e-enabled operations and supply management, healthcare operations, and professional services. This work, supported by a range of grants, has been published in many leading management journals. 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 several university, national, and international awards for teaching excellence.

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Nigel Slack
Alistair Brandon-Jones

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Figures

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Tables

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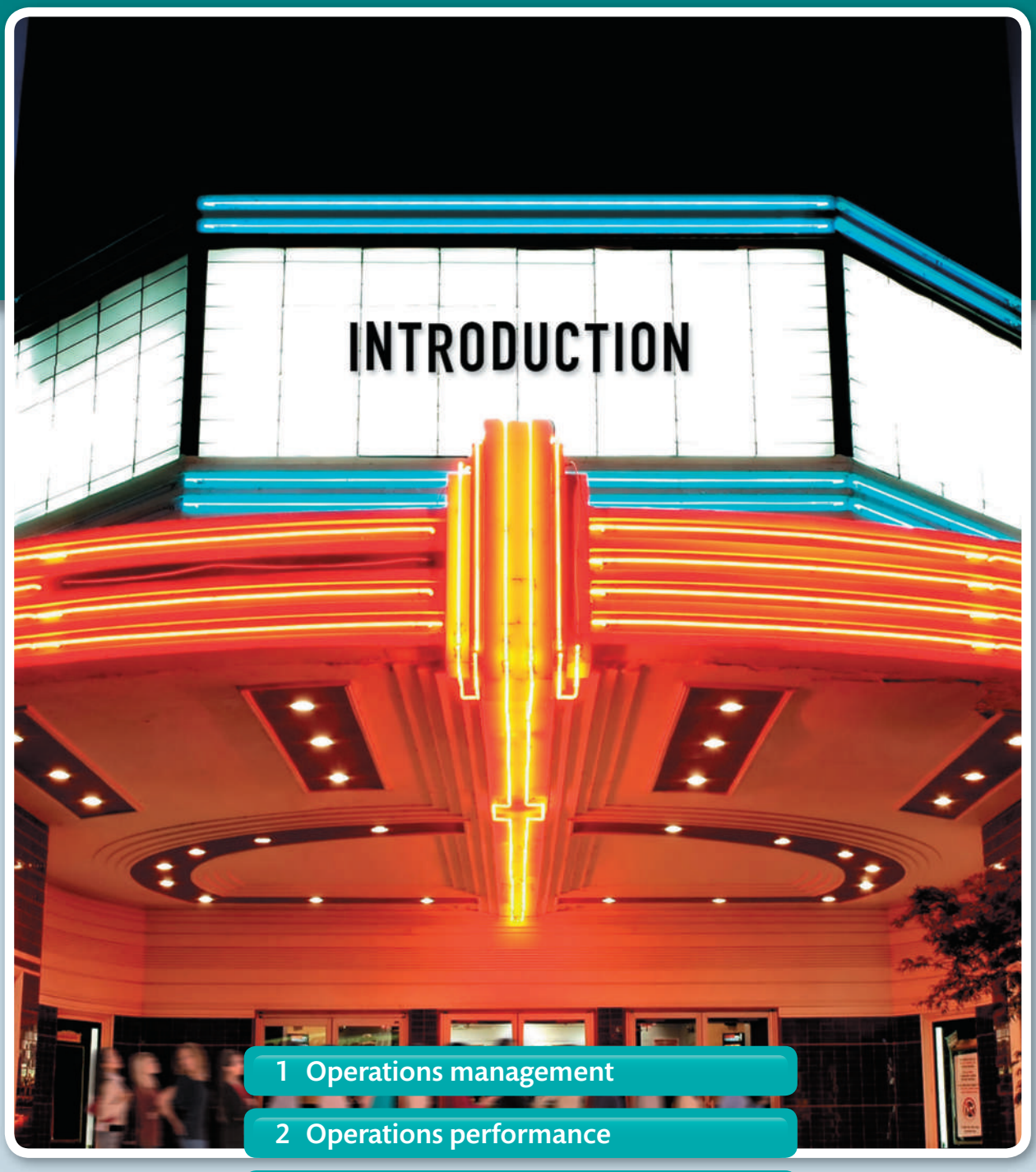


1 Operations management

2 Operations performance

3 Operations strategy

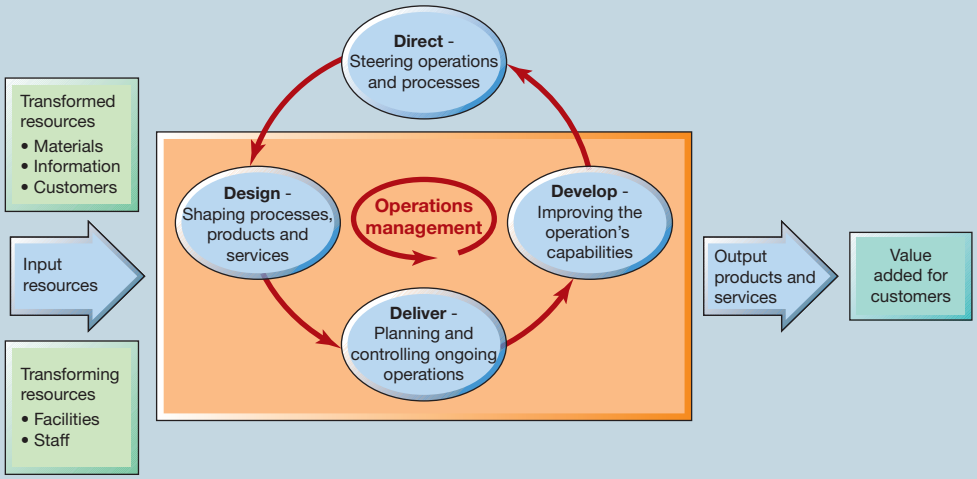
4 Product and service innovation

5 The structure and scope of operations

Part One
DIRECTING THE OPERATION

This part of the book introduces the idea of 'operations' and the operations function. It also examines the fundamental activities and decisions that shape the overall direction and strategy of the operations function. The chapters in this part are:

- Chapter 1 Operations management – This introduces the common ideas that describe the nature and role of operations and processes in all types of organization.
- Chapter 2 Operations performance – This identifies how the performance of the operations function can be judged.
- Chapter 3 Operations strategy – This examines how the activities of the operations function can have an important strategic impact.
- Chapter 4 Product and service innovation – This looks at how innovation can be built into the product and service design process.
- Chapter 5 The structure and scope of operations – This describes the major decisions that determine how and the extent to which an operation adds value through its own activities.



1 Operations management

Key questions

- What is operations management?
- Why is operations management important in *all* types of organization?
- What is the input–transformation–output process?
- What is the process hierarchy?
- How do operations and processes differ?
- What do operations managers do?

INTRODUCTION

Operations 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 comes to you courtesy of the operations managers who organized its creation and delivery. Every book you borrow from the library, every treatment you receive at the hospital, every service you expect in the shops and every lecture you attend at university – all have 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 tasks, issues and decisions of those operations managers who have made the services and products on which we all depend. This is an introductory chapter, so we will examine what we mean by 'operations management', how operations processes can be found everywhere, how they are all similar yet different, and what it is that operations managers do (see Fig. 1.1).

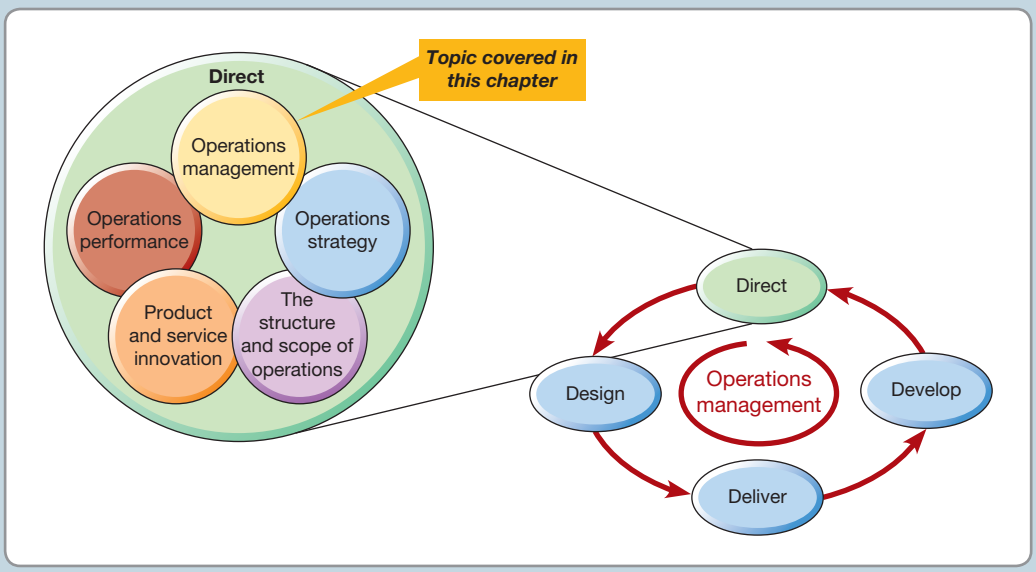


Figure 1.1 This chapter examines operations management

WHAT IS OPERATIONS MANAGEMENT?

Operations 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 some types of services and/or products. However, not all types of organization will necessarily call the operations function by this name. (Note in addition that we also use the shorter terms 'the operation' or 'operations' interchangeably with the 'operations function'.) Operations managers are the people who have particular responsibility for managing some, or all, of the resources that make up the operations function. Again in some organizations, 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.

✻ Operations principle

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

OPERATIONS IN PRACTICE

Lego: building a creative experience[1]

'We want any child playing with LEGO® bricks to have a high quality play experience, and in addition we also want to make a positive impact through the way we operate – from our focus on business ethics to reducing our impact on the environment,' says Jørgen Vig Knudstorp, CEO of the LEGO Group.

Of all businesses, the toy business is one of the world's trickiest. Difficult to forecast, unfailingly subject to fickle kids' latest fads and subject to constant technological innovation. Yet The LEGO Group, a privately held, family-owned company with headquarters in Billund, Denmark, has, in recent years, thrived in the business, becoming one of the most reputable companies in the world, according to the Reputation Institute, and one of the leading manufacturers of play materials. It is a success founded on a deceptively simple idea. One LEGO brick is unremarkable, but put one or two together and possibilities start to emerge. With another few bricks the number of things you can create rises exponentially. For example, there are more than 915 million possible ways of arranging six standard four-by-two bricks, and with the approximately 4,200 different elements in the LEGO range and 58 different colours together with various decorations, the total number of active combinations is many more. And, however many bricks you assemble, irrespective of what colour or set they are from, your pieces will always fit together perfectly. All of the basic LEGO elements use the same method to stick together. They have studs on top that are slightly bigger than and tubes on the inside. Pressing the bricks together produces an 'interference fit' that provides a temporary joint without the use of an additional fastener. But this principle does depend on the elements being made to very high levels of precision and quality, which explains the company's motto, 'Only the best is good enough'.

Source: Shutterstock.com: T P Feller

Ole Kirk Kristiansen, a Danish carpenter, who started selling wooden toys as a way of earning extra money, founded the company in 1932. These included wooden toy bricks, the forerunners of the plastic bricks, which are now so successful that it is estimated that there are now 86 bits of LEGO for every person on the planet. Bricks, and other LEGO 'elements', are manufactured at the group's factories in Denmark, Hungary, The Czech Republic and Mexico, locations that have been chosen to be near their key markets in Europe and the USA. These sites have been expanded to cope with increased demand, together with new factories built in Nyiregyhaza in Hungary and Jiaxing in China. Products made in these factories serve a global market. The aim, according to Bali Padda, Executive Vice President and

Chief Operations Officer of the LEGO Group, is to '*build a stable manufacturing base around the world, ultimately making sure that LEGO products are available to children and their parents when and where they want them*'. And it is the company's operations processes that are central to maintaining its reputation for quality, and its ability to produce millions of elements profitably and sustainably.

The process starts at the main warehouse that contains the silos holding raw plastic granulates. At the Billund operation, 60 tonnes of plastic is processed every 24 hours. The silos are linked to the moulding machines by a complex arrangement of tubes. The moulding stage is particularly important, because every LEGO piece must be made to a demanding level of precision, with tolerances as small as 10 micrometres. At each machine, the plastic is heated and pumped into the mould through a main channel, which divides into a number of narrower channels, each corresponding to a single brick. Water is used to cool the moulds, which can produce up to 32 bricks, and, when the plastic has solidified (only a couple of seconds), they release the bricks into containers. These moulds are expensive, and each element requires its own mould. The average cost of a mould is around €80,000 with some costing more than €360,000. A sensor detects when a container is full and a robot trolley is automatically sent. The robots travel between the machines, picking up boxes and leaving empty ones so production can be continued. The automation means that few people are required for the process. The robots transport the boxes to conveyors, which move them into the storage area where robotic cranes stack them until they are needed. From there some pieces go to the 'decoration' stage where they are individually painted. Decoration is the most expensive part of the LEGO process. Other pieces go straight to packing, where the LEGO sets take their final form. In the packaging process the pieces go into a machine that separates them individually, counts them using optical sensors, and places them in their box. The automatic movement system knows exactly how much a box should weigh at any stage and as the packing process continues, high-precision scales monitor the weight of the box. Any deviation, even of a few micrograms, sets off an alarm. At the end of the process the boxes are sealed shut, automatically weighed to ensure there are no missing components, checked by a worker trained to look for things like plastic bags sticking out of the box, packed by a robot six to a case, and finally sent off for distribution.

Quality assurance staff perform frequent inspections and tests on the various LEGO elements, such as drop, torque, tension, compression, bite and impact tests to make sure the toys are robust and safe. Only about 18 of every million LEGO elements produced, (that is 0.00002 per cent) fail to pass the tests. In addition, throughout the process, the company tries to achieve high levels of environmental sustainability. Plastic is extensively recycled in the factory. All scrap, for example the plastic that fills the channels that take the hot plastic into moulds, or faulty pieces that escape from automated handling, are ground up and used back into the production process. Similarly, the transparent plastic that is used to clean the channels when the production colour is changed in a moulding machine are also ground up and sold to other companies that produce other plastic products.

The LEGO example illustrates how important the operations function is for any company whose reputation depends on producing safe, high-quality, sustainable and profitable products or services. Its operations, like its market, are globally located, it is meticulous about ensuring that its processes operate to precise quality standards, and it has invested heavily in process technology that reduces the environmental impact of its operations and the cost of its products. 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.

Operations in the organization

The operations function is central to the organization because it creates and delivers services and products, which is its reason for existing. The operations function is one of the three core functions of any organization. These are:

Table 1.1 Some activities of the operations function in various organizations

Internet service provider	Fast food chain	International aid charity	Furniture manufacturer
Maintain and update hardware Update software and content Respond to customer queries Implement new services Ensure security of customer data	Locate potential sites for restaurants Provide processes and equipment to produce burgers etc. Maintain service quality Develop, install and maintain equipment Reduce impact on local area, and packaging waste	Provide aid and development projects for recipients Provide fast emergency response when needed Procure and store emergency supplies Be sensitive to local cultural norms	Procure appropriate raw materials and components Make sub-assemblies Assemble finished products Deliver products to customers Reduce environmental impact of products and processes

- the marketing (including sales) function – which is responsible for communicating the organization's services and products to its markets in order to generate customer requests;
- the product/service development function – which is responsible for coming up with new and modified services and products in order to generate future customer requests;
- the operations function – which is responsible for the creation and delivery of services and products based on customer requests.

In addition, there are the support functions which enable the core functions to operate effectively. These include, for example, the accounting and finance function, the technical function, the human resources function and the information systems function. Remember that different organizations will call their various functions by different names and will have a different set of support functions. Almost all organizations, however, will have the three core functions, because all organizations have a fundamental need to sell their products and services, meet customer requests for services and products, and come up with new services and products to satisfy customers in the future.

✻ Operations principle

Operations managers need to co-operate with other functions to ensure effective organizational performance.

In practice, there is not always a clear division between the three core functions or between core and support functions. This leads to some confusion over where the boundaries of the operations function should be drawn. In this book we use a relatively broad definition of operations. We treat much of the product/service development, technical and information systems activities and some of the human resources, marketing, and accounting and finance activities as coming within the sphere of operations management. We view the operations function as comprising all the activities necessary for the day-to-day fulfilment of customer requests within the constraints of environmental and social sustainability. This includes sourcing services and products from suppliers and delivering services and products to customers.

It is fundamental to modern management that functional boundaries should not hinder efficient internal processes. Figure 1.2 illustrates some of the relationships between operations and other functions in terms of the flow of information between them. Although it is not comprehensive, it gives an idea of the nature of each relationship. However, note that the support functions have a different relationship with operations than the other core functions. Operations management's responsibility to support functions is primarily to make sure that they understand operations' needs and help them to satisfy these needs. The relationship with the other two core functions is more equal – less of '*this is what we want*' and more '*this is what we can do currently – how do we reconcile this with broader business needs?*'

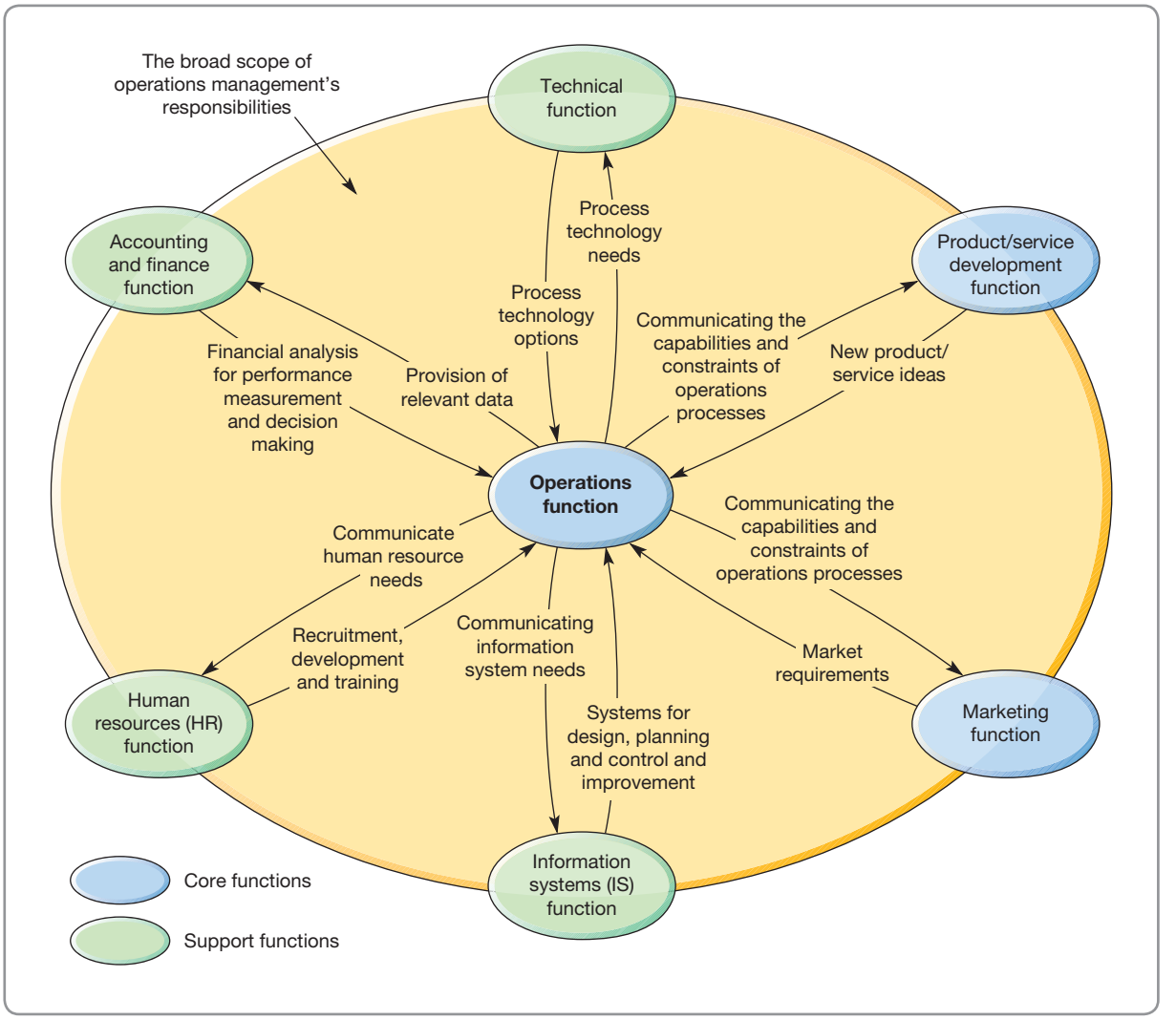


Figure 1.2 **The relationship between the operations function and other core and support functions of the organization**

WHY IS OPERATIONS MANAGEMENT IMPORTANT IN *ALL* TYPES OF ORGANIZATION?

In some types of organization it is relatively easy to visualize the operations function and what it does, even if we have never seen it. For example, most people have seen images of an automobile assembly. But what about an advertising agency? We know vaguely what these agencies do – they create the advertisements that we see in magazines and on television – but what is their operations function? The clue lies in the word 'create'. Any business that creates something must use resources to do so, and so must have an operations activity. Also the automobile plant and the advertising agency do have one important element in common: both have a higher objective – to make a profit from creating and delivering their products or services. Yet not-for-profit organizations also use their resources to create and deliver services, not to make a profit, but to serve society in some way. Look at the following examples of what operations management does in five very different organizations and some common themes emerge.

✻ Operations principle

The economic sector of an operation is less important in determining how it should be managed than its intrinsic characteristics.

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Automobile assembly factory – *Operations management uses machines to efficiently assemble products that satisfy current customer demands*

Source: Shutterstock.com: Stuart Jenner

Physician (general practitioner) – *Operations management uses knowledge to effectively diagnose conditions in order to treat real and perceived patient concerns*

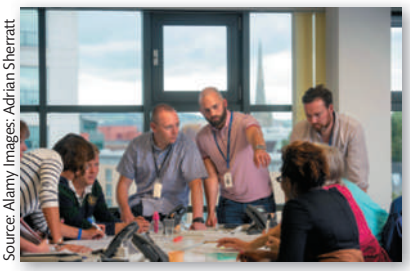
Source: Shutterstock.com: Indianstockimages

Management consultant – *Operations management uses people to effectively create the services that will address current and potential client needs*

Source: Getty Images: AFP / Romeo Gacad

Disaster relief charity – *Operations management uses ours and our partners' resources to speedily provide the supplies and services that relieve community suffering*

Source: Alamy Images: Adrian Sherratt



Advertising agency – *Operations management uses our staff's knowledge and experience to creatively present ideas that delight clients and address their real needs*

Start with the statement from the 'easy to visualize' automobile plant. Its summary of what operations management does is: '*Operations management uses machines to efficiently assemble products that satisfy current customer demands.*' The statements from the other