BARNES OPERATIONS MANAGEMENT – AN INTERNATIONAL PERSPECTIVE

Study Guide

CHAPTER 1

OPERATIONS MANAGEMENT

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Explain what is meant by the term operations management.
- Understand some of the basic concepts of operations management.
- Distinguish between different types of operations.

- Operations management is concerned with the management of the resources and processes required by an organization to produce goods or services for customers.
- Any operation can be depicted as a transformation process which converts inputs of resources to outputs of goods and services.
- Operations can be classified as materials processing, customer processing or information processing, depending upon which type of resource is predominantly being transformed.
- Service operations are distinguished by their intangibility, simultaneity, customer contact and subjective quality.

- In-service operations can usually be divided between the front office, which involves customer contact, and a back office, which customers do not normally visit.
- Most operations take place within a supply network, which comprises all the suppliers to the operation (plus their suppliers and their suppliers) and the customers of the operation (plus all their customers and their customers).

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OPERATIONS, STRATEGY AND OPERATIONS STRATEGY

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Understand the relationship between operations and strategy.
- Explain the roles that operations can play within organizational strategy.
- Understand the strategic significance of operations management to organizations of all kinds.
- List the key strategic decision areas of operations management that constitute an operations strategy.

- Strategy is concerned with the actions an organization takes in order to survive and prosper in its environment over the long-term. Strategy can exist at three levels in an organization: corporate, business and functional.
- An organization's operations strategy comprises the totality of the actions and decisions taken within the operations function. The decisions and actions taken have a direct impact on an organization's business and corporate strategy.

- An organization's operations can be a source of competitive advantage if they are managed strategically in pursuit of a clear goal for operations.
- There are five possible operations objectives (cost, quality, speed, dependability and flexibility). It is unlikely that any operation can excel at all of these simultaneously, so competitive priorities must be determined on which to base the operations strategy.
- The process of operations strategy concerns the way in which an organization develops its operations strategy. This might be top-down (i.e. formed in pursuit of its business and corporate strategy), bottom-up (i.e. formed from the actions and decisions taken with operations), market-led (i.e. formed in response to market requirements) or operations-led (based on the resources and capabilities within its operations).
- The content of operation strategy consists of the key decision areas concerned with the structure (i.e. the physical attributes of facilities, capacity, process technology and supply network) and infrastructure (i.e. planning and control, quality, organization, human resources, new product development and performance measurement) of operations.

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 Operations, Strategy and Technology: Pursuing the Competitive Edge, New York: John Wiley. Slack, N. and Lewis, M. (2002) Operations Strategy, Harlow: Pearson Education.

THE INTERNATIONALIZATION PROCESSES: DRIVERS, CHALLENGES AND BENEFITS

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Outline the forces driving the internationalization of operations.
- Understand the internationalization process.
- Discuss the main challenges of operating internationally.
- Understand the benefits to an organization in operating internationally.

- Many operations, both in services and manufacturing organizations, have become internationalized in recent years. Most operations now have an international dimension to some extent.
- The internationalization of operations is being driven by powerful forces of globalization. These forces are a combination of political, economic, socio-cultural and especially technological factors.
- There are a number of theories concerning the internationalization of organizations including Vernon's product cycle theory, Dunning's eclectic theory and various stage theories (e.g. the Uppsala model and Ohmae's). None of these offer entirely satisfactory explanations of the internationalization process. Services, especially customer contact services may be a special case of the internationalization process.

- Operating internationally presents many challenges to operations managers. The most significant of these is probably reconciling the conflicting demands globally and locally. Globally there is a pressure to maximize efficiency by standardizing operations for easier coordination and control. Locally there is a pressure to customize operations to meet the specific requirements of each location, which can lead to a fragmentation of operations. Successful international operations management requires that these conflicting pressures be balanced.
- Organizations can benefit from operating internationally if they can share the learning from their own experiences and also learn from the practices of other organizations that they come into contact within other countries.

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- Friedman, T.L. (2006) The World Is Flat: A Brief History of the Twentyfirst Century, London: Penguin Books.

INTERNATIONAL OPERATIONS STRATEGIES

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Assess the implications of international business strategy for an organization's operations.
- Identify the principal objectives that organizations can have in internationalizing their operations.
- Describe the different ways in which an organization can enter and serve foreign markets.
- Discuss the relationship between business strategy and operations strategy in an organization operating internationally.
- Highlight the benefits available from an appropriate international operations strategy.

SUMMARY OF KEY POINTS

 Operating internationally is more complex and difficult than operating in only a single country. The impact of an international business strategy on international operations can be assessed using the transformation model, as internationalization affects all three parts of the transformation process: inputs, the process and outputs.

- There are two generic international operations strategies; market access strategy or resource seeking strategy. Each is based on different motivations for the internationalization of operations.
- Each of the four different modes of entry into foreign markets (direct export, joint venture, establishing a sales subsidiary and establishing a production facility) has different implications for operations.
- There are four possible generic configurations of production facilities for an organization's operating internationally; home operations, multidomestic operations, regional operations and global co-ordinated operations.
- Operating internationally can provide sources of competitive advantages from global sourcing, location advantages, network effects and competition.

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FACILITIES

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Describe the factors that are most important to an organization making facilities location decisions.
- Discuss the issues that affect the scale and scope of operations facilities at particular locations.
- Appreciate the strategic role and importance of decisions about facilities in international operations management.
- Identify the factors that organizations need to consider when determining the configuration of their operations.

- Facilities decisions involve the consideration of location, scope (i.e. what goods and services should be produced at any given location), scale (i.e. what quantities of goods and services should be produced at any given location), configuration (i.e. the relationship between operations facilities at different locations) and strategic role and purpose.
- Two principal factors influence facilities location decisions: access to markets and access to resources. Facilities location decisions are complex and can involve a consideration of many factors, which will

vary depending upon the nature of the organization's business and the geographic region being considered for the location.

- Consideration of scale and scope requires determining whether to concentrate operations at one (or very few) facilities or whether to opt for a greater number of more geographically dispersed facilities. A limited number of sites should simplify operations and lead to lower unit costs due to economies of scale and scope. More dispersed operations should provide more flexibility and provide benefits from being closer to customers.
- The concept of focus argues that superior operations performance can be achieved if a facility dedicated itself to achieving a narrow range of tasks. Such a task can be based on market focus, product focus or process focus.
- The strategic role and purpose of a facility can be based on one of three possible primary strategic reasons: access to low cost inputs, access to specialist expertise or proximity to market. In international operations it is possible to categorize six types of facility, depending upon their strategic role: off-shore, source, server, contributor, outpost or lead.
- An organization's facilities should be configured with a view to achieving the operation's competitive priorities implied by its business strategy. In global co-ordinated operations, a network perspective is required in order to realize the full collective potential of all the organization's facilities. The strategic capabilities of an international

network of facilities derive from four factors: strategic targets

accessibility, thriftiness ability, operations mobility and learning ability.

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CAPACITY

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Appreciate the nature of capacity and the factors that affect it.
- Describe some well-known approaches to forecasting customer demand.
- Understand the factors that affect the timing and sizing of capacity expansion decisions.
- Explain the generic strategies for managing capacity.

- Capacity decisions are concerned with the ability of an operation to meet customer demand and to respond to changes in that demand over time.
- The productive capacity of an organization is not easy to define or measure as it is affected by many interrelated factors, including the size and location of each of an organization's facilities, and the size, type and mix of equipment and the working practices at a single facility (e.g. shift patterns, working hours and staffing levels).
- Forecasting involves trying to predict likely future demand on the basis of existing information. There are two basic approaches to forecasting; one relies on quantitative methods, the other on qualitative methods.

- There are three approaches in deciding how to increase capacity in line with market demand: capacity leads demand – always trying to maintain excess capacity so that any unexpected surges in demand can be met; capacity matches demand – trying to match capacity with demand as much as possible; capacity lags demand – only add capacity when there is approved demand.
- There are three generic capacity management strategies: level capacity – keeping capacity at the same level irrespective of demand; chase demand – flexing capacity to meet variations in customer demand; demand management – trying to smooth out demand by shifting customer demand away from peak times to periods of lower demand.
- Yield management seeks to maximize income from customer service operations by maximizing capacity utilization and prices paid by customers.
- In operations with variable arrival and processing rates, queuing theory shows that excess capacity of the order of at least 30 per cent is often required if excessive queues are to be avoided. This is particularly the case in customer service operations, where long queues can lead to dissatisfied customers and lost sales.

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PROCESS TECHNOLOGY

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Understand the criteria on which process technology choice decisions are made.
- Appreciate the crucial role that ICT plays in modern operations management.
- Explain the strategies available for technology adoption.
- Understand the issues involved in transferring technologies between different geographic locations.
- Outline the characteristics of generic process types in the context of the volume-variety model.
- Describe the basic layout types and their relationship with the generic process types.
- Appreciate the challenges of determining an appropriate configuration for process equipment.

SUMMARY OF KEY POINTS

 Materials processing technologies can be classified as designing, forming, moving or integrating technologies.

- Customer processing technologies involve the interaction of customers with the service provider's technology. These interactions can be passive, active or supported.
- Information processing technologies are in essence synonymous with the use of computers, which are increasingly connected via the Internet. Most organizations have incorporated the use of the Internet within their business operations.
- There are five ways (five levels) in which IT can be used to transform business operations: localized exploitation, internal integration, business process redesign, business network redesign and business scope redefinition.
- Decisions about what type of process technology to use need to consider the volume and variety of the intended output, the fit with existing technology and the level of maturity of the technology.
- There are three dimensions to process technology: its scale, its degree of automation and its degree of integration.
- Organizations can be broadly classified as either technology leaders or technology laggards with regard to their approach to new technology adoption. Either stance can constitute a viable strategy.
- Deciding whether to transfer process technology to a particular location requires an assessment of both the transferability of the technology and the appropriateness of the context where the technology will be operated.

- Processes can be categorized according to the volume and variety that they are suited to producing. For manufactured goods, there are five generic process types: project, jobbing, batch, mass and continuous.
- For services there are three: professional services, service shops and mass services.
- There are four generic layout types for process equipment: fixed position, process layout, group (or cell) layout and product layout. Choice of layout depends on process type, and output volume and variety.
- Queuing is probably inevitable in any process, whether for materials, customers or information. There are many different queuing configurations which can be used to try to minimize queuing times and make effective use of resources. When queues involve customers waiting in line, consideration needs to be given to the psychology of waiting.

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THE SUPPLY NETWORK

LEARNING OBJECTIVES

- On completion of this chapter, you should be able to:
- Describe the key issues in the configuration and co-ordination of supply networks.
- Explain the basis and importance of outsourcing decisions.
- Discuss the implications of global sourcing.
- Outline the different approaches to managing supplier relationships.

- The management of the supply network has become more important as organizations are increasing the proportion of inputs that they purchase. Supply networks are becoming more global in nature.
- Managing the supply network involves managing relationships with suppliers individually and collectively.
- Supply networks need to be configured with the aim of satisfying the end consumer. The rationalization of a supply network can facilitate improved efficiency and effectiveness.
- The basis of the successful co-ordination of a supply network is the integration of the activities of its various components to construct a seamless end to end process.
- Outsourcing is a decision with strategic implications. Care must be taken to avoid damaging an organization's core competences.

- Global sourcing can offer benefits other than cost reduction, including improved quality, increased capacity, access to technological expertise and broadening the supply base. But global supply networks are much more difficult to manage than domestic ones.
- The traditional approach to purchasing is based on an adversarial arm's length relationship between buyer and supplier. In contrast, the partnership approach is based on a close and co-operative relationship
- between buyer and supplier. The partnership approach is increasingly popular, but relies on mutual trust between buyer and supplier.
- There are advantages and disadvantages to single sourcing and multisourcing, although the recent trend has been for more single sourcing.
 However, this can leave the purchaser more vulnerable to disruptions
- in supply.

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PLANNING AND CONTROL

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Explain the principles and practices of planning and control in operations.
- Understand the different approaches to inventory planning and control.
- Describe the basis of ERP.
- Outline the principles of JIT and lean operations.

- The control loop offers a simple theoretical model for understanding the principles of planning and control for any operation. It involves measuring the output from a transformation process, comparing this to the plan and, if necessary, taking remedial action upon the process and/or its inputs.
- Planning and control involves actions at a number of levels, each involving decreasing timescales and increasing detail: strategic operations planning, aggregate planning, master production scheduling activity scheduling and expediting.
- There are in essence two ways in which an operation can respond to customer demand: produce-to-stock or produce-to-order.

- There are two basic philosophies of control in operations: supply-push and demand-pull.
- Inventory control for independent demand items is normally undertaken through an order point system, such as the re-order level or the cyclical review systems.
- MRP aims to minimize inventory of dependent demand items by calculating the quantities and timings of their requirements, so that their delivery from suppliers can be arranged accordingly.
- MRP2 applies the principles of MRP to the planning and control of all manufacturing resources and integrates the computer systems of all the business's functions. ERP makes the operation of MRP2 suitable for any kind of organization.
- JIT is a planning and control system that aims to produce what is
 required in exactly the required quantities at exactly the time it is
 required. JIT is based on the underpinning principles of eliminating
 waste, continuous improvement and the involvement and
 empowerment of all employees. JIT planning and control uses the
 kanban system for shop-floor control. JIT aims to eliminate inventory
 and requires close co-operation with suppliers. JIT principles are often
 referred to as 'lean thinking' and have been applied to many nonmanufacturing environments.

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- Womack, J., Jones, D. and Roos, D. (1990) The Machine that Changed the World, New York: Simon and Schuster.
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QUALITY

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Explain the different ways in which quality can be defined and measured.
- Describe the evolution of quality ideas over the last 50 years.
- Outline the best known approaches to managing quality in operations.
- Appreciate the existence of differences in managing quality in different national and cultural contexts.

- Ideas about quality have been evolving for more than 50 years. Initially quality management relied entirely on inspection to detect faulty goods.
 It grew to incorporate the concepts of quality control, then quality assurance and most recently TQM.
- TQM is a philosophy for quality improvement based on principles of the elimination of waste, continuous involvement and the involvement of all employees.
- Quality can be defined from a number of different perspectives.
 However, it is particularly important to understand how customers assess the quality of the products and services they experience.

- Quality problems can arise if there are gaps between customers' expectations and perceptions of their experience of products and services.
- Quality can be measured using operations, financial or customer measures.
- Statistical quality control (SQC) can be used where it is impossible, impractical or costly to measure very large numbers of outputs from a process.
- The ISO9000 series is a set of worldwide standards for quality management systems, which are suitable for any organization.
 ISO9000 is based on principles of 'saying what you do, and doing what you say' when managing quality.
- Quality awards such as the Deming Prize (Japan), the MBNQA (USA) and the EQA not only offer a way for organizations to assess their quality performance against world leaders.
- Six sigma is a structured methodology for improving quality, based on the application of the techniques of statistical quality control.
- Despite the global convergence of operations management technologies and practices there are national differences in the suitability and effectiveness of different aspects of quality management.

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WORK ORGANIZATION

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Understand the issues involved in designing appropriate organizational structures for the operations function.
- Explain the influences that organizational and national cultures have on work organizations.
- Appreciate the benefits and challenges of organizing employees into work teams.

- Work organization concerns the way that workers are brought together to undertake specific tasks. This is affected by organizational structure and culture.
- The key dimensions of organizational structure are centralization, formalization and specialization. The most appropriate structure for any organization depends on its strategy, size, technology and environment.
- The basic types of organizational structure are simple, functional, multidivisional, matrix and network.

- Organizational culture can be thought of as 'the way we do things around here'. It comprises three levels: artefacts, espoused values and basic assumptions.
- Culture varies at the organizational and national levels.
- Most operations are carried out by workers cooperating in a team.
- Four factors influence the effectiveness of a work team, namely work design, team composition, context and processes.
- Increasingly diverse workforces can be a source of strength for work teams, but training is needed to ensure that they function effectively.

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- Trompenaars, F. and Hampden-Turner, C. (1997) Riding the waves of culture, London: Nicholas Brealey.

HUMAN RESOURCE MANAGEMENT

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Describe how organizations recruit and select the people who work in their operations.
- Outline different organizational strategies for training and development of workers in operations.
- Explain the main approaches to job design.
- Understand different approaches to reward and remuneration and the issues associated with attempts to relate pay to performance.
- Appreciate national contextual factors that affect the management of human resources in operations.

- The traditional approach to recruitment has been to try to match the person and the job vacancy. A more far sighted approach is to recruit on the basis of a person's attitude, their aptitude for change and their ability to acquire new knowledge and learn new skills.
- International organizations face a dilemma of whether to recruit locally from host country nationals or whether to opt for expatriates from parent country or third country nationals.

- The purpose of training and development is to improve organizational performance by investing in human capital in order to increase the capacity and capabilities of human resources.
- Job design is the process of specifying the methods used by people performing work tasks and particularly the way that they interface with the technology they use.
- There are two basic approaches to job design: scientific management and behaviouralism.
- Scientific management is a management led approach to job design that seeks to establish the best way of performing any task through a process of disaggregation and routinization, using methods such as work study.
- Behavioural approaches to job design aim to improve motivation hence performance by increasing job satisfaction by satisfying workers' individual and collective social needs.
- The approaches to job design used in some Japanese manufacturing companies has combined aspects of scientific management and behaviouralism.
- Rates of pay must be sufficient to attract and retain sufficient numbers of suitably qualified workers.
- Pay differences within an organization must be seen to be justifiable.
 This poses a particular problem for international organizations paying different rates in different countries for the same work.
- Performance related pay schemes aim to motivate workers but can be costly to administer and cause dysfunctional behaviour.

 The management of people in operations is influenced and often constrained by economic, cultural and legislative factors specific to a particular country.

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NEW PRODUCT DEVELOPMENT

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Understand the importance of new product development.
- Describe the ways in which new product development activities are conducted.
- Appreciate the role of new technology in new product development.
- Explain how new techniques can be used to improve the new product development process.
- Appreciate the challenges of new product development in international organizations.

- The objective of design is to meet the known or anticipated needs and expectations of customers.
- Time is of the essence in NPD. The benefits of speedy NPD include increased market share, price premiums, faster response to competitors and setting industry standards.
- NPD can result in incremental products, next generation products or breakthrough products.
- New product ideas arise from either market-pull or technology push mechanisms.

- A formal NPD process includes stages for idea generation, idea selection, preliminary design, prototyping, testing and final design.
- NPD needs to be accompanied by the design of the processes that will produce the products. The design of processes and products should be an inter-related activity.
- Technological advances can impact on products, processes and NPD activities.
- Concurrent (or simultaneous) design can result in better designs and reduced time to market.
- The tools and techniques for NPD include DFM, QFD, Taguchi methods, complexity reduction, FMEA and VE/VA.
- The consideration of where international organizations locate their R & D units is influenced by whether they are research orientated or development orientated.

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PERFORMANCE MEASUREMENT

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Explain the importance and purpose of performance measurement in operations.
- Understand the basis of performance measurement and performance measurement systems.
- Explain how performance standards and benchmarking an be used to assess and improve performance.
- Describe the different possible approaches to performance improvement.
- Understand the challenges and risks associated with performance improvement initiatives.

- Performance measurement plays a central role in operations management as it enables the organization to quantify the efficiency and effectiveness of its actions. It is also integral to the planning and control cycle.
- It is also strategically important as it is part of the means of converting strategic intentions to action.

- One of the purposes of performance measurement is to change people's behaviour. Thus, care must be taken to avoid encouraging behaviours that can lead to unintended consequences.
- The three Es (economy, efficiency and effectiveness) model classifies performance measures on the basis of the transformation model of operations.
- It is generally considered that a performance measurement system needs to have multi-dimensional performance measures comprising financial and non-financial, internal and external and backward and forward looking measures and link operational performance to strategic objectives.
- Performance standards provide the means of comparing current levels of performance with those desired. They can be internally derived (based on past performance or internal targets) or externally derived (from an analysis of competitors' performance, best practice or market requirements).
- Benchmarking is the practice of comparing the performance of an operation with that of similar operations in another location. There are three main approaches to benchmarking: internal benchmarking, competitive benchmarking and best practice benchmarking.
- Performance improvement initiatives need to consider the scale and scope of the performance improvement required, the priorities for performance improvement and the approach to making the performance improvement.

- Performance improvements can be undertaken in one of two ways: step change or continuous improvement. The best approach is likely to combine the use of both approaches.
- Step change can involve new technology and/or new working methods.
- Business Process Reengineering (BPR) is the fundamental rethinking and radical redesign of business
- processes to achieve dramatic improvements in critical, contemporary measures of performance such as costs, quality, service and speed. It uses a step change approach to performance improvement that incorporates both new technology and new ways of working.
- Continuous improvement (kaizen) is based on undertaking an on-going series of small incremental improvements.

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CURRENT TRENDS AND EMERGING ISSUES

LEARNING OBJECTIVES

On completion of this chapter, you should be able to:

- Assess the implications of current trends in operations management.
- Discuss the likely impact of emerging issues on the future of operations management.

- In an increasingly interconnected world, organizations need to adopt a more international perspective in their operations management. This presents significant new challenges.
- In order to 'think global and act local', operations managers have to combine and balance the actions in both the structural and infrastructural decision areas of operations management to form a coherent and consistent operations strategy.
- Current trends in operations management include moving beyond the factory, the growing importance of services, the increased importance of the supply network, and the increased importance of ICT.
- Emerging issues in operations management are likely to centre on low cost labour, population changes, discontinuities, environmentalism and social responsibility.

- An organization's operations need to be able to respond to changes in the external environment.
- Operating internationally exposes organizations to different environments which can provide significant learning opportunities.

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