Core objective: produce goods and services effectively and efficiently

Relationship to objectives & strategies
- Operational objectives to achieve organisational objectives
- All departments assist improving operations

Operations: all activities in which managers engage to produce goods and services

U3 AOS 3 Operations management

Key elements of an operations system
- Inputs...transformation...outputs

Corporate social responsibility considerations
- Environmental sustainability of inputs
- Amount of waste generated from processes and production of outputs

Technological developments
- Automated production lines
- Computer-aided design
- Computer-aided manufacturing
- Website development

Waste minimisation
- Principles of lean management

Strategies to improve efficiency and effectiveness

Global considerations in operations management
- Global sourcing of inputs
- Overseas manufacture
- Global outsourcing
- Overview of supply chain management

Materials
- Forecasting
- Master production schedule
- Materials requirement planning
- Just In Time

Quality
- Quality control
- Quality assurance
- Total Quality Management

Characteristics of operations in manufacturing and service businesses
<table>
<thead>
<tr>
<th>Business objectives</th>
<th>Operations objectives</th>
<th>Operations strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>To make a profit</td>
<td>Reduce costs</td>
<td>Through just in time</td>
</tr>
<tr>
<td>Increase market share</td>
<td>Improve quality</td>
<td>Quality control</td>
</tr>
<tr>
<td>Provide a return for shareholders</td>
<td>Increase productivity</td>
<td>Introduce automated production lines</td>
</tr>
<tr>
<td>Contribute to the wellbeing of the community</td>
<td>Minimise waste</td>
<td>Establishment of lean management</td>
</tr>
</tbody>
</table>
ELEMENTS OF AN OPERATIONS SYSTEM

1. **INPUTS**
   - Materials, components, labour, capital, technology, information, time

2. **TRANSFORMATION/PROCESS**
   - Inputs transformed into intangible products
   - Heavy interaction with customers - labour is crucial to transformation service performed
   - Medical treatment, surgery, therapy

3. **OUTPUTS**
   - Intangible product - labour is purchased. Cannot be stored.
   - Treated patients
Table 6.2  Differences between goods and services

<table>
<thead>
<tr>
<th>Goods</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangible</td>
<td>Intangible. Quality levels are therefore more difficult to measure</td>
</tr>
<tr>
<td>Production and consumption occur separately, e.g. manufacture soft drink, then distribute to retailer, customer purchases and consumers drink</td>
<td>Production and consumption often occurs concurrently/simultaneously, e.g. patient goes to see a doctor who performs the service (i.e. provides medical treatment at the time of consultation)</td>
</tr>
<tr>
<td>Can be stored as inventory</td>
<td>Difficult to store; however, record of service is maintained, e.g. medical history, legal advice on file</td>
</tr>
<tr>
<td>Can be standardised/consistent quality, e.g. Mars bars, cars, clothing</td>
<td>Often specifically provided/tailored to meet individual client/customer requirements, e.g. tax advice</td>
</tr>
<tr>
<td>Minimal customer contact, e.g. manufacturer will deal with wholesaler/distributor – not generally with final consumer</td>
<td>Higher degree of customer contact established</td>
</tr>
<tr>
<td>Produced</td>
<td>Performed</td>
</tr>
</tbody>
</table>

**SIMILARITIES:**

- Use technology
- Deal with customers and suppliers
- Plan and develop organisational objectives
- Need to optimise productivity and quality
- Aim to produce high quality goods or services at the lowest cost
COMPUTER AIDED DESIGN (CAD)
- Creation & modification of product designs
- Speeds up design process & improves accuracy
- Design and modify inputs to suit budget.

COMPUTER AIDED MANUFACTURING (CAM)
- Designs and controls manufacturing process
- Machine fed instructions from central computer
- Calculates required inputs

AUTOMATED PRODUCTION LINES
- Machinery and equipment arranged in a sequence with components added to the goods as they proceed through each step.
- An automated production line does not need employees directly involved in operations.
- Computers manage the processes and humans monitor the operations system.
- Specialise in complex tasks
- Efficient - less human error
- No wages & work many hours

WEBSITE DEVELOPMENT
- All modern businesses require a website.
  - Can be used for marketing and operations purposes.
  - Can conduct sales and provide information to employees and customers.
  - Can be used to sell goods and services.
  - Need to be upgraded to remain up to date.

Strategies to improve efficiency and effectiveness of operations related to technological development
- Improves quality of products and offers efficiency savings.
- Failure to keep up with technology can lower competitiveness.
- Increase in production...lower labour...increase profitability.
Qualitative forecasting:
- subjective
- information gathered is based on opinions
- sourced from market research and questionnaires

Forecasting: a materials planning tool that relies on data from the past and present and analysis of trends to attempt to determine future events.

Operations managers use forecasting to develop a production plan and reduce the uncertainty of future events.

Businesses forecast the quantity and timing of demand to ensure they are able to meet it with sufficient supply.

Businesses know:
- what to produce
- how to produce it
- how much to produce

How materials are received, stored and making sure they are available when required.

Strategies to improve efficiency and effectiveness of operations in relation to materials

JUST-IN-TIME (JIT)

Minimised inventory; right amounts of input at right stage of production

Key elements:
- small quantity of inputs
- Kanban method (production materials control where orders placed in response to need further up the line; materials only replaced when used)
- Employee participation to identify and eliminate wasteful practices

Master production schedule
Details of what is to be produced and when.
Scheduled to delivery dates & future contracts

Must assess productivity capacity correctly to meet schedule. Cannot increase production without increasing inputs.

Materials requirement planning
Itemised list of all material involved in production to meet orders.
- Done after MPS
Need to know...
- lead time for supplies
- exact inputs required
- stock at hand
- purchasing procedures
Proactive approach to ensure standards are met. External body used to audit and provide certification of national or international standards, e.g. ISO 9000.

**QUALITY ASSURANCE**

Stages in Quality Assurance:
1. Employ consultant to advise on standards.
2. Adjust process to be in line with standards.
3. Certification granted.
4. Use standards authority logo.

Quality: the degree of excellence in goods or services and the ability to satisfy the customer.

**QUALITY CONTROL**

Stages of Quality Control:
1. Establish quality benchmarks/standards.
2. Inspections at each production stage.
3. Compare results with benchmarks.
4. Correct process to prevent defects.

Strategies to improve efficiency and effectiveness of operations in relation to quality.

Quality Management aims:
- Reduce waste & defects - improve efficiency.
- Obtain high standards.
- Achieve quality standards and benchmarks.

**TOTAL QUALITY MANAGEMENT**

Holistic approach to quality where all members of organisation participate in ongoing improvement of quality.

Quality Circles:
- Groups of employees discuss quality and production issues.

TQM Concept:
1. Continuous improvement.
2. Customer focus - everyone has a customer.
3. Defect prevention.
4. Universal responsibility.
5. Employee empowerment.
WASTE MINIMISATION STRATEGIES

- redesigning products and packaging
- procurement of materials made from recycled materials
- reusing scrap material
- improving quality control
- exchanging waste with other businesses
- introducing all systems approaches, such as lean production

LEAN MANAGEMENT

Seven types of waste

- waiting time
- over-production
- excess inventory
- excess motion
- defects or errors
- over-processing
- excess transportation

Lean management principles

- Value - identify what is important to the customer
- Value stream - identify all steps to produce product, eliminate those that do no add value
- Flow - make steps occur in tight sequence so product will flow towards customer
- Pull - improved flow means customers can 'pull' the product as needed
- Perfection - continuous improvement, minimising errors and defects

Lean management: a process involving the reduction of the amount of unwanted or unusable resources produced by a business in an attempt to improve the efficiency and effectiveness of operations.

5S methodology

Seiri (sort) - remove unnecessary items from work space
Seiton (set in order) - arrange items for easy selection, arrange workstation with tools in close proximity
Seiso (sweep) - clean workplace and machinery regularly
Seiketsu (standardise) - maintain high standards and best practice, people know processes of jobs
Shitsuke (sustain) - 'do without being told' - discipline and training to maintain order, ensure standards adhered to

Lean management practices

Kaizen - continuous improvement to quality and efficiency, making positive changes on a regular basis.

Jidoka - 'automation with human touch' that can stop production in case of defect

Just-In-Time - right amount of materials delivered to the operations system as needed
Environmental sustainability of inputs

Strategies for environmental sustainability of inputs
- Purchase sustainable technology and equipment such as hybrid vehicles
- Purchase sustainable input options: recycled materials
- Choose local suppliers that reduce carbon footprint and transport costs
- Purchase and use green options - reduces carbon emissions

Corporate social responsibility considerations in an operations system

Amount of waste generated from processes

Sustainable and socially responsible processes
- Utilise practices that minimise resources
- Reuse resources
- Recycle resources
- Ensure employees have access to training and development
- Utilise green technologies
- Retain processes within Australia. Ensures Australians are employed and carbon emissions associated with transport are reduced.

Production of outputs

Social responsibility and environmentally sustainable considerations
- Outputs are of good quality and fit for purpose
- Outputs are non-harmful and safe: unsafe products must be recalled and the production of products with potential to cause harm should be managed to minimise social harm.
- Honest marketing - truthful and non-deceptive marketing campaigns
- Packaging - product packaging should have minimal environmental impact
- Packaging should use recyclable or biodegradable materials.
Global sourcing of inputs

Global outsourcing

Overseas manufacture

Supply chain management

Global considerations in operations management

**Global sourcing**: the practice of seeking the most cost efficient materials and other inputs from countries overseas.

Many businesses purchase inputs from overseas to improve efficiency.

**Reasons include:**
- low-cost of skilled labour
- low-cost of raw materials
- lower taxes
- low trade tariffs due to free trade agreements

**Global outsourcing**: contracting a specific business operation to an external person or business.

Tasks not part of core activities such as accounting or call centres may be outsourced and contracted to another business.

**Global outsourcing** means contracting to companies around the world. Some people disapprove as it affects local jobs and suppliers.

**Overseas manufacture**: refers to the production of a good in a country that is different to the location of the business's headquarters.

By manufacturing goods in a country where the market is located, businesses can reduce production and delivery costs.

Businesses may choose to manufacture overseas to reduce labour, overhead and component costs while keeping other operations, such as R&D, in Australia.

**Supply chain management**: A typical supply chain:

1. source natural resources
2. manufacturing - construction and assembly
3. storage
4. delivery to consumer

Need to:
- assess location of suppliers in terms of distance
- consider efficiency of delivery
- consider stock rate use
- consider quality, pricing and comparison with similar suppliers