THIS IS ENGINEERING

17. Managing customers in engineering

Operations and business development
Managing engineering operations

A clear commitment to delivering customer value is essential and well-understood within any successful enterprise. However, some business courses compartmentalise this principle, instead of looking at a wholly 'customer-orientated' or 'market-orientated' approach that permeates every department. For engineers, this means that the technical solutions they devise, and the practical organisation and management of their production resources, must serve their customers' needs.

Royal Academy of Engineering

The customer-focused enterprise

Customers are stakeholders in a business: they affect the business and are also affected by it. **Every part of an enterprise must ask, and answer, versions of the question 'How do we best serve our customers?', to focus the whole enterprise on this essential goal.**

The answers help every part of an enterprise understand its customers, orientate its operations to support them, and deliver quality products and services. They act as a compass that every department (and employee) holds that always points to 'customer value', directing their thinking and behaviour.

Example

A startup provides software that links Internet of Things (IoT) sensors to CNC and robotics machinery to optimise how components flow through complex manufacturing processes. Different tiers of software are purchased, with sensors, on subscription.

Area of the enterprise	Example customer-focused questions
Founders	What customer problem are we aiming to solve? Is this so important that many people will pay to solve it?
Marketing	How can we describe a typical customer in detail? What 'pain points' do our customers have (common problems they need to solve)?
Software and hardware development	What performance aspects do our sensors need to detect? What levels of complexity do different customers need?
Sales	Who do we need to reach in our customers' organisations? How do we price our product to maximise our sales?
HR	What skills and experience does each department need? What qualities do we need to look for in employees?
Customer service	What help or guidance do customers typically require? How do customers want to communicate with us?
IT	How do we minimise service interruptions for customers? How do we roll out improvements and upgrades?

Check your understanding:

1. The example questions above relate to customers. However, the founders' own skills and experience also matter. What customer-focused questions might the founders of this startup need to ask about themselves?

2. What customer-focused questions might this startup's hardware developers ask about the physical design of the IoT sensors that would connect to each CNC machine or robot?

Building customer relationships

A successful enterprise responds to customer-focused questions through decisions and activities that build strong, positive customer relationships.

Desirable customer relationships encourage repeat sales and positive recommendations to others.

Example

The founders of a startup wish to train their employees on behaviours that cultivate the five positive relationship qualities below. They have identified helpful behaviours to embed across the startup's working culture:

Communication	We aim for high-quality communication that understands our customers and helps them choose and use our products. We communicate with honesty, integrity, and clarity.
Respect	We respect our customers' needs and their own commercial goals. We behave with courtesy.
Support	We help customers at every stage of their journey, from initial contact through to purchase and after-sales care. We help customers choose the right product for their needs, not for its profitability.
Trust	We act with fairness, honesty, and integrity. We aim to identify and resolve mistakes before they reach the customer. Where we get it wrong, we resolve the issue quickly and with minimum customer inconvenience.
Negotiation	We see negotiation as a way to understand our customers and align the company with the market. We aim for 'win–win' sales that satisfy our customers and our profit targets.

(These ideas link to the Statement of Ethical Principles jointly created by the Royal Academy of Engineering and the Engineering Council: www.engc.org.uk/standards-guidance/guidance/statement-of-ethical-principles/)

Building customer relationships should be proactive, not passive or responsive, by:

- building a customer-focused working culture
- using promotional tools like content marketing to help build relationships
- using customer relationship marketing (CRM) software to systematically gather, organise, and apply customer data to optimise each relationship.

Check your understanding:

3. Suggest what customer information and data a CRM system might gather and organise.

Customer focus, costs, and profitability

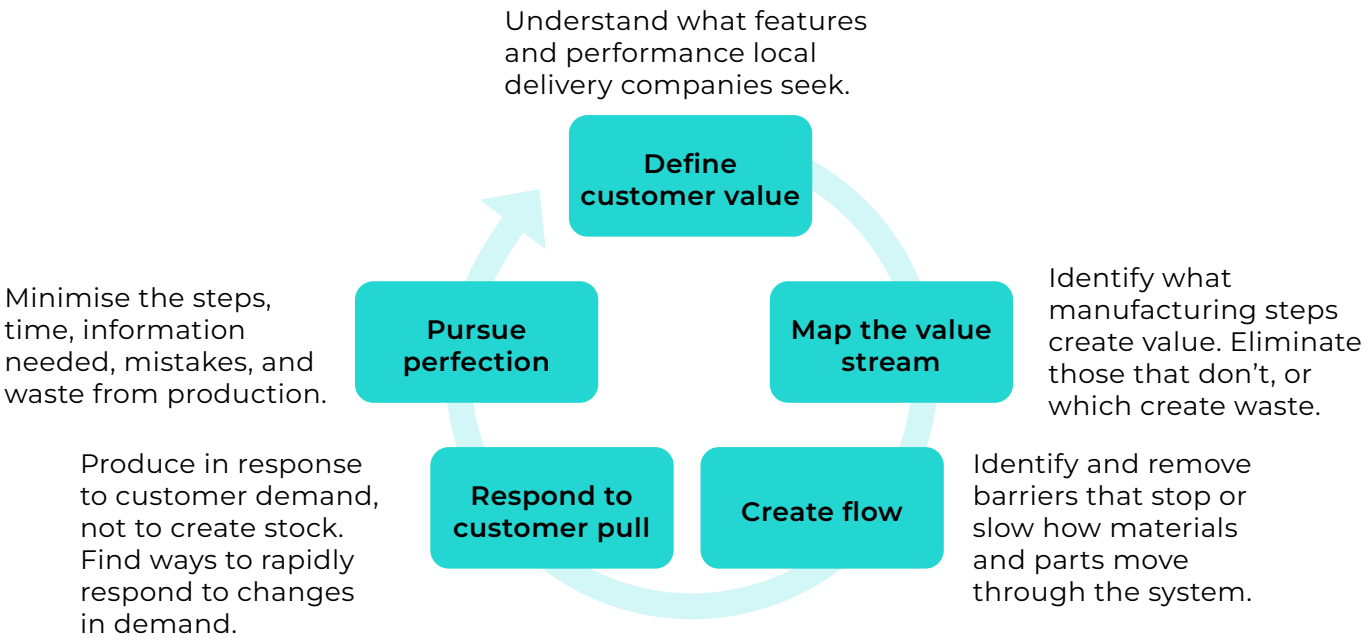
Enterprises aim to make a profit and build value for their owners and investors (some may also have social or environmental goals). **Delivering customer value is the means to achieving an enterprise's ultimate financial goals**, so customer focus must be delivered at an acceptable cost that allows sufficient profits to be made.

Several engineering **methodologies** (guidelines for making decisions) help an enterprise answer the question **'How do we best organise ourselves to maximise value creation?'**

Example

Lean thinking or **Lean** is a method that focuses on delivering customer value while eliminating waste including faulty products, materials, under-used skills and resources, and their costs.

The founders of a startup that makes small electric delivery vehicles identify how to apply the five lean-thinking principles to their enterprise:



Check your understanding:

4. Why is the lean-thinking diagram a cycle, and what practical actions does this suggest?

5. What types of information do you think need to flow through the production system to support a lean approach that responds to demand and eliminates waste?

Case study: The right response

Background

BotRov Ltd is a startup making autonomous mobile robots that move parts around warehouses and factory floors without the need for floor or QR code guidance systems. Instead, it uses the robots to create and maintain a detailed map of the environment.

A significant order for the robots is delayed because the incorrect material was ordered and parts have been machined from unsuitable stock. This will affect the customer's own manufacturing schedule as they seek to scale up capacity to meet customer demand.

A compensation clause in your contract states that you are liable for a reduction in the total cost of the robots for every day the order is late. You anticipate that the delay will wipe out your profit on this sale.

You are the founder of BotRov Ltd and are taking personal responsibility for resolving the issue. You operate a lean-thinking organisation and want to ensure a positive customer relationship for the future.

Your task

1. Suggest customer-focused questions that would help you understand the problem from their point of view.

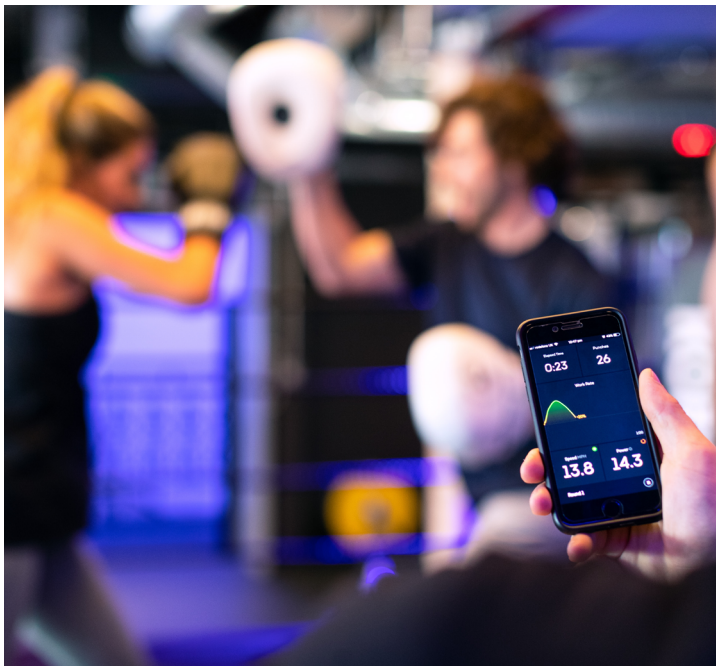
2. Use the helpful behaviours listed in the example in **Building customer relationships** (on page 3) to help you draft a brief initial response to the customer. You may also wish to use the resource **5. Communication skills for entrepreneurs** to help you.

3. Suggest what mistakes may have led to the problem, and what changes to production and ordering would help the enterprise eliminate waste and pursue perfection.

4. Suggest what steps you might take to rebuild your customer relationship, and what you will tell your investors.

Answers: Check your understanding

These are example answers – your own suggestions may differ.



The customer-focused enterprise

1 . Customer-focused questions the founders might ask of themselves include:

- What is our experience in developing IoT sensors and diagnostic software?
- What is our experience and understanding of our clients' working environments and needs?
- Do we properly understand what value they seek?
- Do we have the personal skills and qualities to support our customers?

2. Customer-focused questions the hardware developers might ask include:

- What does 'optimisation' mean for our customers?
- What data do we need to collect so we can deliver this?
- What sensors do we need and what accuracy and precision do they require?
- What hazards do we need to protect our sensors from?
- What brands of equipment do customers use and how would we connect to them?

Building customer relationships

3. A CRM system might gather and organise organisational names and locations, customer contact details, background information on their needs, details of past purchases and their costs, customer care or aftersales interactions, and details of all promotional interactions with them. Remember that gathering customer information obliges an enterprise to follow data protection laws.

Customer focus, costs, and profitability

4. The lean-thinking diagram is a cycle because maximising customer value while minimising waste is a continuous process. Markets, customers, and enterprises are all dynamic environments that change continually. Past improvements need to be sustained while new opportunities are identified and acted on.

5. The production system might need information about customer orders and forecasts (short and long term), daily work requirements/schedules, supplier orders and status, material/goods-in status and stock levels, material and part flow and locations, quality or other error alerts, finished order stock and status, and customer shipping status.

Answers: Case study

These are example answers – your own suggestions may differ.

1. Customer-focused questions that would help you understand the problem from their point of view might include:
    - What will the immediate impact of this be for you?
    - Could we deliver your order in several batches, to allow you to begin scaling up in stages?
2. A brief initial response to the customer might read:

> I am sorry to have to inform you that your order will be delayed. This is because critical parts have been machined from unsuitable stock. Using these parts would make our product unsafe, which we cannot allow to happen.
>
> I appreciate that this will affect your own schedule to scale up your production capacity, and that we are in breach of our contract to provide your order in full on the agreed date.
>
> I am taking responsibility for resolving this issue as soon as possible. We are exploring several options including:
>
> - running additional shifts to increase our production capacity for this order
> - exploring our options to divert other orders to fulfil your contract with us
> - delivering your order in several batches, if you are able to scale up in stages.
>
> Please accept my apologies for the delay. I will contact your assistant to arrange a meeting with you as soon as possible.

This response is:

- clear
- provides a reason
- acknowledges the impact of the delay
- outlines possible solutions.

3. The problem occurred because the correct material for the part was not specified, an incorrect material was ordered, or an incorrect material was supplied and not identified during the goods-in and quality assurance process prior to manufacturing. A more robust system would check all material specifications at every stage of the design, ordering, goods-in, and manufacturing process.
4. If the enterprise's cash flow, reserves, or investors permit, the founder may offer an additional reduction to the customer that means the enterprise makes a loss on this contract. This may help the customer to regain their trust and respect for the enterprise and retain them as a future customer. Investors might need to be warned of this as it may delay their ability to exit the business and realise their profits. However, this decision may improve the long-term success of the enterprise.