



Lean production

Rick West outlines what you need to know about lean production

EXAM LINKS

This 'Revision focus' is relevant to the following topics in the **AQA**, **Edexcel**, **OCR** and **WJEC/Eduqas** A-level specifications:

- methods of production
- just-in-time (JIT) production
- kaizen
- total quality management (TQM)
- internal quality standards
- quality control and assurance
- improving quality
- waste minimisation
- competitive advantage from quality management and lean production

Lean production aims to minimise costs through waste minimisation, and enhance quality in order to offer firms a competitive advantage. Reduction of waste in terms of time, labour and resources is a key aim. Put simply, it is about getting more output with less input.

The reduction of waste comes through various techniques, including the following:

- just-in-time production
- kaizen
- total quality management (TQM)

JIT and jidoka

Just-in-time production (JIT) is a stock control strategy that originated in Japan. It aims to eliminate the need for buffer stocks completely, thus eliminating the costs of high stock levels.

JIT offers advantages and disadvantages. It can reduce waste, costs and space requirements. Waste and costs are reduced by avoiding the risk of stock becoming obsolete or perishing. However, there can also be a risk of running out of stock or being let down by an unreliable supplier, and firms can lose opportunities for bulk purchases. Firms need to work out systems to avoid the costs and risks of running out of stock. If the downsides can be overcome, the firm will benefit from lower working capital and ultimately greater profitability.

The process relies not just on getting fresh stock 'just in time' but also on these supplies being of good quality. JIT is a 'pull' system of production (i.e. production is only triggered by real customer demand) and can save a business money on insurance and rent linked to stock as well as enhancing overall efficiency.

Case study: Toyota

The Toyota production system (TPS) was established based on two concepts: the first is JIT, the second is *jidoka*, which can be loosely translated as 'automation with a human touch'. With *jidoka*, when a problem occurs, the equipment stops immediately, preventing defective products from being produced.

The TPS organises the car maker's manufacturing and logistics, including interaction with suppliers and customers. The system aims to eliminate waste and achieve the best possible efficiency, which is often called a **lean system**. Japanese industrial engineers Taiichi Ohno and Eiji Toyoda developed the TPS between 1948 and 1975, and it allows Toyota to create high-quality vehicles at the lowest cost and fastest pace. For many years Toyota had a much quicker replacement rate than European car-makers — it was able

to bring out updated models every 3 years, against 6–7 years for companies like Ford, Mercedes, BMW and Volkswagen.

Kaizen and TQM

Kaizen is a Japanese business philosophy of continuous improvement, where all employees are encouraged to identify and suggest possible improvements in the production process. These enhancements are often small, but frequent, leading to quality and productivity improvements. This usually involves quality circles or cell groups, where each small group of workers becomes expert in their area and are thus best-placed to find improvements. However, not all staff may want to be involved in kaizen, especially if there is a history of mistrust between workers and the management.

Total quality management is about encouraging all staff to consider how to improve the business, with particular regard to getting things right first time, every time. Quality becomes everybody's job as long as they all buy in to the philosophy, and it becomes deeply rooted in the company culture. This often requires extensive training, which can be expensive.

In the past, quality was managed through **quality control**, where inspectors check that the finished product meets the quality standards. This can be done by checking every product, or more usually by checking a sample, such as one in every 50 products. The objective is that no faulty items leave the business and are sold to customers. It requires little staff training and is therefore suitable for businesses with unskilled or temporary staff. The problem with this approach is that it encourages workers to only do just enough to meet the minimum quality standard.

Quality assurance can also be used where firms have a checking process at each stage of the production process. Quality assurance tends to follow a checklist approach where, once ticked off, items have passed the quality test. The aim is to have zero defects and it usually involves staff doing their own checking rather than having specially trained staff doing the checking. There is a risk however that staff will not check their own work thoroughly and thus defective items may make it onto the market.

PRACTICE EXAM QUESTION

Sirin Labs' super-premium secured smartphones cost more than £10,000 — ten times the price of a top iPhone. Backed by £50 million in funding from investor loans, a large overdraft facility and the founder's own assets, the company is betting it can succeed in selling smartphones as status symbols in a specialised market where others have struggled before. It plans to do this by making its phones to customers' exact specifications, offering military-grade security features, and using precious metals and diamonds in the phones' construction. The company's research backs up its product offering. Sirin Labs is considering how its objective of reducing costs could be achieved using either a just-in-time or just-in-case method of managing stock. Evaluate these two options and recommend which option Sirin Labs should choose in order to meet its objective of reducing costs. (20 marks, Edexcel)

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Total quality management is about encouraging all staff to consider how to improve the business



Case study: Leyland Trucks

Leyland Trucks, based in Lancashire, operates one of the most efficient truck factories in the world. High quality is ensured through its innovative robotic chassis paint facility and a state-of-the-art advanced planning and scheduling system. Leyland has invested in its people, IT systems and processes as part of developing a kaizen culture of continuous improvement. Crucial aspects include team-building, training and involving everyone in responsibility for decision-making and improving productivity.

Leyland Trucks can trace its origins back to the much-maligned Leyland Motors conglomerate, which struggled badly from the 1970s until a management buyout in 1993. However, since the late 1990s, Leyland Trucks has become a strong and profitable company, partly thanks to its embracing of these processes.

In exam answers

In your answers, remember to make links between TQM and other areas of the specification such as recruitment, training and motivation, which will allow wide-ranging analysis on the higher-mark questions. Also make sure that while you recognise the many advantages of lean production, you also highlight some disadvantages in your answer in order to evaluate effectively.

Lean production can offer firms a competitive advantage by enhancing a business's reputation for quality products, encouraging brand loyalty so that customers make repeat purchases, and adding value to allow firms to charge a premium price. With motivated employees who buy in to the TQM culture, productivity and creativity can be boosted. Lean production can also encourage faster development of new products, allowing the firm to be the first to market with new products. It is important not to forget the voice of the customer when discussing TQM. An insight into customer needs, wants, perceptions and preferences is essential in deriving quality objectives and driving quality improvement.

Rick West is head of business and deputy head of sixth form at Churcher's College, Petersfield.