

Research and development

Research and development (R&D) is essential today for businesses to compete in a dynamic marketplace. It involves the identification of new ideas and turning them into products, services and processes. Businesses who invest in R&D are considered to be innovative and always looking to bring new ideas and products to the market.

Innovation

The commercial exploitation of an invention.

Bringing a new idea to the marketplace is known as ‘product innovation’. Doing so in the workplace is known as ‘process innovation’. Innovation is not cheap and resources have to be committed by the businesses to bring new products to the marketplace. Governments try to encourage innovation within the business community because an innovative culture will help grow the whole economy, creating both employment and wealth.

Research

Research is the inquiry into, and discovery of, new ideas.

Methods used to generate new ideas include:

- Pure research – research just to find out how or why, with no product objective. This type of research is often carried out by universities or research institutes.
- Laboratory research – for example, the testing of new pharmaceutical compounds on animals.
- Evaluation of existing products – are there problems with this product? How can such problems be resolved?
- Brainstorming using discussion groups – thinking outside of the box, novel ideas for solving existing problems.

Development

Development is the process which changes ideas that result from the research process into commercially viable products or processes.

Development is a costly and complicated process, which for some products may take many years. Concorde was originally conceived in 1962, but it did not enter regular service until

1975. Development of pharmaceuticals can take years as they progress through different stages of testing until approval is achieved.

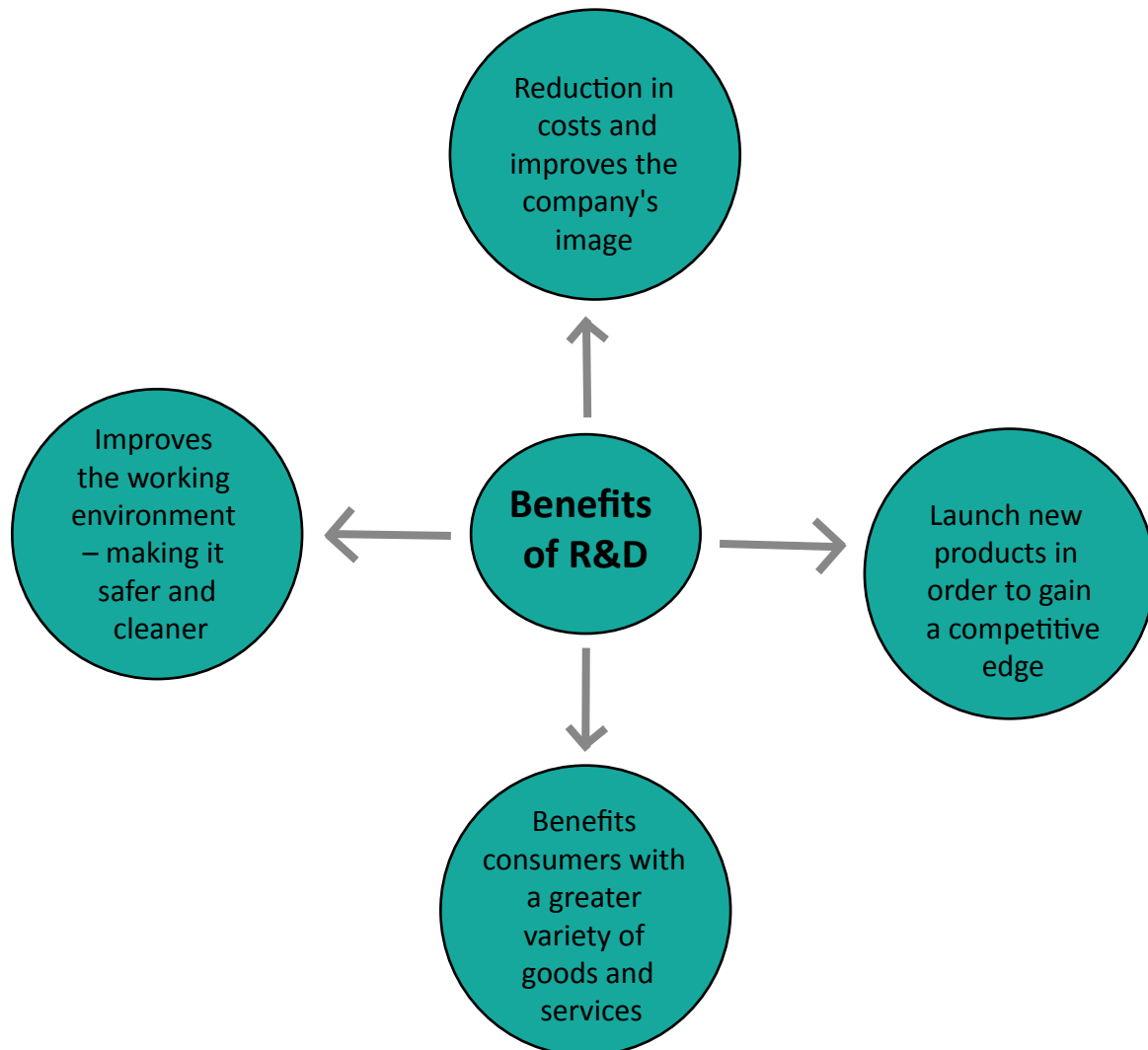
It is important that businesses reduce the development time of new products. Shorter product life cycles are now the norm. Prior to the turn of the century, with a few cosmetic adjustments, a car model could last a decade. Now, for motor manufacturers to stay competitive, a new model launch or major revamp of an existing model three times a decade is the norm. Development can be phenomenally expensive, costing hundreds of millions of pounds for car manufacturers, and even then success is not guaranteed.

The product design and development process

The development of new products have a number of distinct stages which takes the idea through to the launch:

- 1 Identification of problem**
- 2. Research**
- 3. Development of ideas and solutions to solve the problem**
- 4. Development of prototypes**
- 5. Final design**
- 6. Testing**
- 7. Manufacturing and launch.**

Why invest in Research and Development?



Research and development is needed by businesses because in most markets there is a constant requirement for invention and innovation to keep up with competition and attract customers. New products are required not only for a business to grow, but also to survive. It is often the case, however, that other businesses can wait for others to take the risk of launching new products or technologies and then move into the market once an idea has been proven. The expression, 'it is the second mouse that gets the cheese', is one that is worth remembering and copycat behaviour is often well rewarded.

Which type of companies rely on research and development?

For pharmaceutical, aircraft and electronics companies R&D is their lifeblood – without new products they will die. This is because their existing products are guaranteed to be redundant within a relatively small number of years as customers demand new and improved versions.

For a second group, which include car manufacturers and the construction industry, R&D has an important role to play: but in these industries there can be an element of waiting to see what the competition are up to. For example, it was only with the launch of the first successful SUV (Sports Utility Vehicle) that design departments in major motor companies throughout the world suddenly became covered in drawings of the Qashqai, Duster, Evoque and the like.

For a third group R&D can take a back seat – instead marketing comes to the fore. This group of industries includes retailers, who often just borrow ideas from each other.

UK businesses and R&D

In the past Britain had been a world leader in research. One study showed that of all the inventions and resulting products of the last 60 years that had a major effect on people's lifestyles, over 50% were originally conceived by British businesses, British inventors or British research scientists.

However, research and development has to be budgeted for as it is a **highly expensive business activity**. Companies must reinvest profits into R&D to grow. For many years Britain has had a poor investment record in this area, with many companies looking for short-term gains and profits. Such companies turned away from organic growth (growing from within) to easier external growth (takeovers and mergers). More recently there has been some reversal of this trend. Businesses have started to link with universities, providing funding and research fellowships, so that the latest science and technology can be used in R&D. Money is now more often used for pure research and many universities now have science parks attached to their campus, where small companies develop ideas that are based on university research work.

Product life cycles and R&D

Effective research and streamlined development shortens life cycles and is also used in a response to shorter life cycles. The example of cars used above demonstrates how R&D allows businesses to stay competitive, but also forces continually higher spending on R&D.

One effect of this shortening of product life cycles is that small businesses find it hard to survive because of the resulting R&D costs. In the UK, Lotus, Rolls Royce and Aston Martin have all become parts of larger motor groups as a direct result of being unable to afford the increased costs of R&D spending, which were necessary if they were to stay competitive.

Market research and R&D

Market research can be the foundation of targeted R&D. If latent (unfulfilled) demand

is discovered, then products need to be developed to meet this demand. This product development to satisfy market demand is part of being market-orientated.

Also, market research is used to help develop existing products. Market research is continuously being carried out, with the objective of discovering consumer attitudes to products. Product revamps and redesigns often occur as a direct response to market research findings.

NB – A common error learners make is to confuse Research and Development with market research. They are very different things, even though market research may lead on to R&D taking place. Learn the definitions thoroughly and you will not make this mistake.

Discussion themes

'Businesses that do not invest in R&D are doomed to failure.' To what extent do you agree with this statement?

Why is R&D considered risky by some stakeholders?

Evaluate the costs and benefits of innovation for a business and its stakeholders.

Why did the Canadian business buy this UK-based business?

Cardiff University spin-out technology firm Mesuro acquired by Canadian firm

<http://www.walesonline.co.uk/business/business-news/cardiff-university-spin-out-technology-firm-8530959>