

# Industry and Enterprise

## What you need to know:

- Understand how new and emerging technologies have changed the way we live and how they continue to shape the modern world
- Be aware of how computers and automation have impacted upon the design and organisation of the workplace through the use of robotics
- Understand how innovation can drive product development

## New and Emerging Technologies Introduction:

Design and Technology is the practical application of Science. Design technologists utilise discoveries from Science and turn these into new ideas, materials and products to fulfil human needs. As a Design Technologist your role will be to embrace change and turn ideas into reality. The driving force behind many new inventions is the human instinct to strive for a better and easier life.

To stay at the cutting edge of design and development—designers and manufacturers need to keep up to date with the latest inventions and ideas in materials development, electronics and designing.

The Industrial Revolution began around 1760—it began with the discovery of how to harness water power to drive machinery leading to the invention of the steam engine. This invention led to greater automation and since then an ever-increasing number of new technologies has helped to shape and improve the way we live. For example; electricity was discovered, this led to the invention of the light bulb, the telephone, the internal combustion engine, the computer, the internet...

The first personal computer was built in 1975, a significant number of people didn't have access to one on a regular basis until the mid 1990's. Within the last 20 years there has been a huge change in how computers have been included into our lives—especially when we consider the introduction of the smartphone. It is impossible to consider how our society could exist without computers in our daily lives, but this was the case not so long ago!



## Industry and Automation

Prior to the industrial revolution most people lived in the countryside working on the land. As automation developed and led to larger workshops and factories, more people moved away from the countryside to find work in these environments. Gradually a society based on consumerism and enterprise developed around areas of manufacturing—people had money to buy goods and so services and manufacturing areas boomed. This was the start of the society that exists today.

Greater demand for products originally created jobs as the machines needed manual labourers and operators to keep them running. Today with the introduction of intelligent machines and robotic production lines many of these jobs have been lost. Fully automated production lines only require a few highly skilled engineers to ensure that smooth running is maintained.

## Key Questions:

- Which inventions do you feel have significantly changed the way people live their lives? Justify your responses with examples.
- Which technological developments in agriculture have led to fewer people being needed within the industry?
- How could automation have affected the hierarchical structure of an organisations staffing? Give examples.
- Why is the ability to sketch and design by hand still considered important by many designers despite the advancement of Computer Aided Design?
- List the positive effects that full automated robotic production lines have had on employment.
- List the negative effected that full automated robotic production lines have had on employment.
- Explain the low-cost methods of self-promotion and advertising that could be used by young designers to get their ideas noticed.
- How might the staff-owners of a worker co-operative be motivated differently to the staff of a non-cooperative style organisation?

## The place of work:

The development of the internet, improvements in communication technology and the speed of data transfer across the world allows teams of people to collaborate remotely—they don't have to be in the same, single place of work. Software designed to enable collaborative working allows teams of designers to work on one project from different parts of the world at the same time. Designs can be send to machines to be tested using CAM techniques including CNC machines (i.e. laser cutters) and RPT machines (i.e. 3D printers).

A manufacturing company also needs to consider the layout of it's buildings. The work-flow will need to be logically designed to ensure each stage of designing, manufacturing and delivering a product to market is as efficient as possible. This allows a company to minimise unproductive time, unnecessary movement and the waste of materials, making the company as efficient and therefore profitable as possible.

## Enterprise

Enterprise in relation to design means that an idea is cultivated into a business proposal that has a commercial viability as a production. The use of the internet and the boom in social media platforms allows creative people to get their ideas noticed by potential investors rather than visiting bank managers or sending proposals out to existing companies.



A number of agencies look out for start-up businesses to invest in, one of the biggest growth areas is in app design and development for smart devices. The ensure that original ideas and inventions remain the intellectual property of the person who invented them a patent can be applied for. This legal process proves that you are the first person to have registered the ideas. In theory it stops individuals or other companies using a patented idea without permission. You could see a registered logo on a product to show that it has been registered.

The way in which designers, architects, engineers work has altered dramatically with the introduction of computers and specialist software.

Sketching of initial ideas and designs is still seen as the best way to get thoughts on to a page to communicate them, the development of those designs will almost always involve the use of COMPUTER AIDED DESIGN (CAD). By using specialist software packages the detailed analysis and manipulation of designs can be achieved quickly—saving valuable time and money.

Software can also work out very complex tasks including virtual stress tests, flow dynamics and the manufacturability of a product. This is called computer-aided testing (CAT)

Key words: (Find out what these mean!)

Virtual Marketing	Computer Aided Design	CAD
Virtual Retail	Computer Aided Testing	CAT
Fairtrade	Flow Dynamics	RPT
Crowdfunding	Computer Aided Manufacturing	CAD
Enterprise	Rapid prototyping	CNC
Automation	Collaborative working	Commercial viability

## Crowdfunding

This is a popular way for designers and entrepreneurs to raise money to enable the manufacture of their products. Crowdfunding is an internet based way to gain small contributions from many different investors who believe in the product or idea. www.kickstarter.com is an example of a crowdfunding site for design and technology based ideas.

## Virtual Marketing and Retail:

This means using websites, social media and digital marketing t reach a wider audience to promote a product or idea. Virtual campaigns can use social media to spread the word and have become a popular way to launch product. Blogs and Vlogs are also targeted to appeal to new audiences. A more subtle form is search engine optimisation—companies make efforts to boost their website higher in search engine results. It can also include paid for advertisements in social news feeds or on search results.

A cooperative is an enterprise that is owned and run by its members—the members may comprise its workforce or its customers. They enable a group of people with the same business interest to have greater protection, they can be cost effective way to sell goods, and services are usually based around a community. They are set up to protect the tights of its members.

Fairtrade is about better prices, decent working conditions and fair terms of trade for workers in less economically developed countries. It is based in partnership between those who grow the food and those who consume it. The Fairtrade mark means the ingredients in the product have been produced by small-scale farmer organisations that meet Fairtrade standards.