

From CAD to CAM

There is a vast array of specialist software which allow the designer to go from designing, simulating and testing their design 'on screen', to physically producing it using machinery.

- CAM machines operate using CNC (computer numerical control).
- CAM (computer-aided manufacture) uses CAD files to produce a physical outcome.
- Laser cutters can be used to cut and engrave various materials.
- Vinyl cutters are used to cut vinyl, flock and cards for a range of outcomes.
- CNC routers and millers can create 3D outcomes in various materials.
- CNC lathes can turn items.
- Embroidery machinery can stitch patterns, logos, motifs and designs onto various fabrics.

Benefits of CAD

There are many benefits to using CAD, for products produced as one-off prototypes right up to thousands of items made using mass production. Listed below are the advantages of CAD.

- Increases productivity (faster than manual workers) whilst decreasing errors.
- Often higher quality or more complex design can be achieved.
- Designs can be edited / reused easily.
- Designs can be easily understood.
- CAD files can be easily shared.
- No physical space required.
- Saves time and improves accuracy.
- Links to CAM seamlessly.

Benefits of CAM

There are many benefits to designers, manufacturers and end users for the use of CAM in the manufacturing process. For example, CAM...

- is faster and more accurate than manual workers (eliminates costly errors)
- continually produces identical outcomes
- creates complex outcomes (that might not be able to be achieved using other methods)
- is cost efficient over time
- reduces the company's labour costs
- consistently replicates outcomes.

Disadvantages of CAD/CAM

There are naturally some negative aspects when designers and manufacturers use CAD/CAM.

- CAD and CAM can be expensive, especially initial set up costs.
- CAD/CAM machines may require servicing and maintenance. Parts can be expensive too!
- Training is required before users become literate.
- Faults can delay design and production.
- Technological advancement can often mean that new versions replace older ones, so upgrades may be required.
- Manual workers are still required to oversee CAM manufacturing.
- Production can become reliant on CAD/CAM and errors can cause delays and cause supply problems.

Computer integrated manufacturing (CIM)

CIM refers to the use of computers during the manufacturing process. Computers can control machinery, but also automate systems during manufacture. CIM increases the speed of the manufacturing process and uses real-time sensors and closed loop control processes to automate manufacturing, increasing speed and efficiency.

Manufacturing becomes less error-prone with the use of computers. CIM systems are also known as 'flexible manufacturing systems' where design, analysis, planning, purchasing, cost accounting, inventory control and distribution are all linked through the computer with factory floor activities, such as materials handling and processing.

Digital media is any form of media that uses electronic devices for distribution. This form of media can be created, viewed, modified and distributed with electronic devices, and commonly includes software, video games, videos, websites, social media and online advertising.

Digital media is used in the **visual communication** field when sharing designs, concepts and proposals with clients and customers through any visual means.

Visual communication also links with graphic design, digital animation, digital photography, animation, computer illustration, mixed visual media and advertising.