

Manual Graphics

Advantages

- They can be produced using inexpensive equipment **such as:** drawing board, pencil and paper.
- Manual drawings are not prone to hacking.
- Manually produced graphics that are produced 'freehand' are a quick way of recording ideas.
- They can be produced 'on site'.
- They are useful when communicating ideas to clients **quickly**.
- There is no risk of loss **due to computer failure**.

Disadvantages

- Each drawing must be created separately **which is very time consuming**.
- **Extensive modifications can be difficult**, which can result in a complete re-draw.
- Drawings can take up a lot of **physical** space (drawers, folders etc) compared with electronic drawings.
- They cannot be sent electronically **without being made into digital files first**.
- It is generally slower to produce drawings by hand.
- They cannot be used to control manufacturing machinery.
- Accuracy depends on the skill of the person drawing it: there is no zoom command to help with small detail.
- Manual graphics make a demand on the environment by being drawn on paper.

Electronic Graphics

Advantages

- Drawing standards can be set in advance to ensure correct standard are always used.
- CAD drawings are easily modified, saving time and cost to a company.
- High accuracy can be achieved using the zoom command.
- Various views can be created at the click of a button without having to redraw e.g. Enlarged views, sectional views, exploded isometric.
- The speed of drawing is high because of features like 'snap to grid'.
- A CAD library can be set up meaning that repetitive elements do not need to be redrawn over and over.
- Features such as scales and orientation can be easily changed.
- Drawings can be printed and copied when needed without loss of detail.
- Drawings can be sent electronically to clients around the world.
- CAD drawings can be used to control CNC machines, making manufacturing quick and accurate.
- CAD models can be realistically rendered and animated to be used in promotional images and videos.
- CAD models can be tested to ensure designs work before manufacturing; this saves time and money.

Electronic Graphics

Disadvantages

- Initial set up costs can be expensive: companies need to buy computers and software.
- Maintenance costs of hardware and software can be high.
- Training may be required for software updates, costing a company money.
- Computer systems can be a target for industrial theft.
- A computer virus can cause loss of data.
- Computer systems require electricity to work: if there is a power cut, work will not be able to continue.