

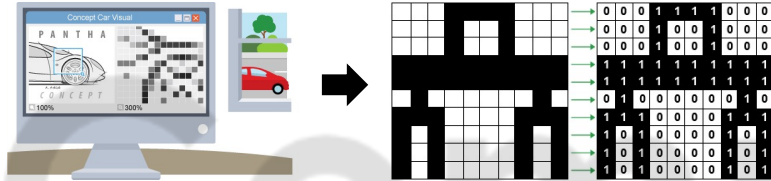
KEYWORDS

Digital Images

Graphics on a screen are made up of tiny blocks called **pixels**. The more pixels on the screen, the higher the **resolution** and the better the quality of the picture will be. The higher the image resolution, the more **memory** is needed to store the graphic.

Image files can be either **bitmaps** or **vectors**.

Bitmap images are widely used on digital cameras, **smartphones** and online. Common bitmap image file types include **JPEG**, **GIF** and **PNG**.



Each colour of an image is stored as a **binary** number. In the black-and-white image below, each pixel is either black or white.

Vector graphics can be scaled without losing resolution. They can be enlarged or reduced in size - but the file size will stay almost exactly the same. Used in CAD packages, Animated movies and PDFs



Resolution is a measure of **pixel density**, usually measured in **dots per inch (dpi)**. Images on websites usually have a resolution of 72 dpi. This means that a 1-inch square contains a grid of pixels that is 72 pixels wide by 72 pixels high. $72 \times 72 = 5184$ pixels per square inch.

The greater the **colour-depth** of an image (bits per pixel), the more colours are available.



Bitmap – An image which is organised as a grid of coloured squares called pixels.

Vector – An image which uses **scalable** shapes such as straight lines or curves.

Pixel - short for (picture element) is a single point within an image

Scalable (Vector) - Able to be changed in size without losing quality

Colour-depth - The number of bits available per pixel

Resolution – a measure of the number of pixels within an image e.g. $8 \times 8 = 64$

Graphical (GIU) – Made up of images/icons e.g. Graphical User Interface

Command-Line – interface navigated by typing commands

Copyright – a legal right that protects the use of your work once your idea has been physically expressed
Copyright, Designs and Patents Act 1988

User Interfaces

COMMAND-LINE

A command-line interface allows the user to interact with the computer by typing in **commands**. The computer displays a prompt, the user keys in the command and presses enter or return.
Examples: MS-DOS, Terminal/Command Prompt

- ✓ Fast if you know the commands
- ✓ Doesn't require much storage and processing as it is just text
- ✗ If never used, can be confusing
- ✗ Commands have to be typed precisely
- ✗ Large number of commands to be learned

Windows, Icons, Menus & Pointer

GUI

Makes use of graphics and WIMP
Examples: Windows, macOS, iOS, Android and Linux



- ✓ Easy to use
- ✓ Easy to navigate due to WIMP
- ✓ Don't need to learn commands
- ✗ Take up a lot of storage and processing due to all graphics
- ✗ Can be slow for experienced programmers who prefer CLIs

MENU-DRIVEN

Users are given Menus to navigate from. These may be simple menus, full screen menus or a menu bar at the top of the screen like in Microsoft Word



- ✓ Step-by-step options given – easy to use
- ✓ No commands to learn/remember
- ✗ Irritating if too many menus
- ✗ If poorly designed – slow to use

Adobe Fireworks

Importing an Image – File -> Import (Ctrl + R)

Use the states window to add animation!

Key Tools:

Pointer Tool
(used to select elements)

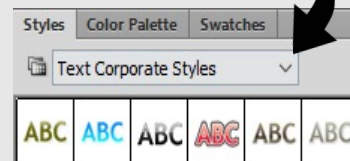
Crop Tool
(used to resize images)

Magic Wand Tool
(used to select pixels based on tone/colour)

Eyedropper Tool
(used to select a specific colour)

Shape Tool
(used to select a **vector** shape)

Text Tool
(used to insert **Text**, you can then select a style)



Designing a UI

A **good user interface** should:

1. be attractive and pleasing to the eye
2. allow the user to try out different options easily
3. be easy to use
4. use suitable colours for key areas
5. use words that are easy to understand aimed at the type of user
6. have help documentation/annotated

It should also consider the needs of the users. For example, young children are likely to prefer pictures to words and people with disabilities may benefit from particular **input** or **output devices**.