

# SUBJECT: BTEC Tech Award Digital IT

## UNIT: Component 1: Learning Aim A



### User Interfaces

A user interface is the hardware and software that a user interacts with to use or control a computer or electronic device. Software features include virtual keyboards and virtual buttons that can be clicked, such as to close a window.

Many human features are used for computer interaction, including:

- Movement – fingers on a keyboard/mouse/touch screen; moving to cause infra-red sensors to turn on a security alarm
- Voice – a microphone and software can interpret commands

### GUIs are Graphical User Interfaces

WIMP (Windows, Icons, Menus and Pointers) are used for traditional computers. Smartphones still use icons and menus but they don't use pointers when touch screens are used.

### Speech is increasingly used to interact with devices

Speech has been used since the 1990s for voice dictation in word-processors.

The quality and accuracy has improved considerably so that it is now used for:

- Personal assistants such as Amazon's Alexa and Google Assistant
- Apple's Siri and the Android Assistant
- Telephone automated assistants

### Factors affecting the choice of user interface including:

Performance / response time, ease of use. User requirements, user experience. Accessibility and storage space.

### Hardware and software influences:

- Operating systems and platforms, types/size of screen, types of user input
- Hardware resources available such as processor and memory

### Ways that users can interact with an user interface:

**Audio** – commands spoken to voice assistants, text to speech, sound tracks, music, warning sounds

**Mouse** – click, drag, select, double click, scroll

**Touchscreen** – touch, swipe, double touch, pinch, swipe left/right, swipe up/down

**Haptic** – vibrate

**Buttons** – click, hold

**Keyboard** – press keys, enter text

### Techniques that can be used to improve both the speed and access to user interfaces.

- Use of keyboard shortcuts
- Informative feedback
- Easy reversal of actions
- Ensuring buttons/links are distinguishable
- Using bigger objects to influence selection and reduce selection time
- Making objects stand out to reduce focus time
- Placing related objects next to each other to reduce selection time

### Needs of the audience and how they affect both the type and the design of the interface:

- Accessibility Needs – visual, hearing, speech, motor, cognitive
- Skill Level – expert, regular, occasional, novice
- Demographic – age, culture, beliefs/values, past experiences

### Design Principles provide both appropriate and effective user interaction with hardware devices:

Colours, font styles/size, language, amount of information, layout, user perception, retaining user attention, intuitive design.