

User interface, CLI, GUI, NUI, RUI, VUI for Competitive Exams

A **user interface**, also sometimes called a human-computer interface, comprises both hardware and software components.

It handles the interaction between the user and the system.

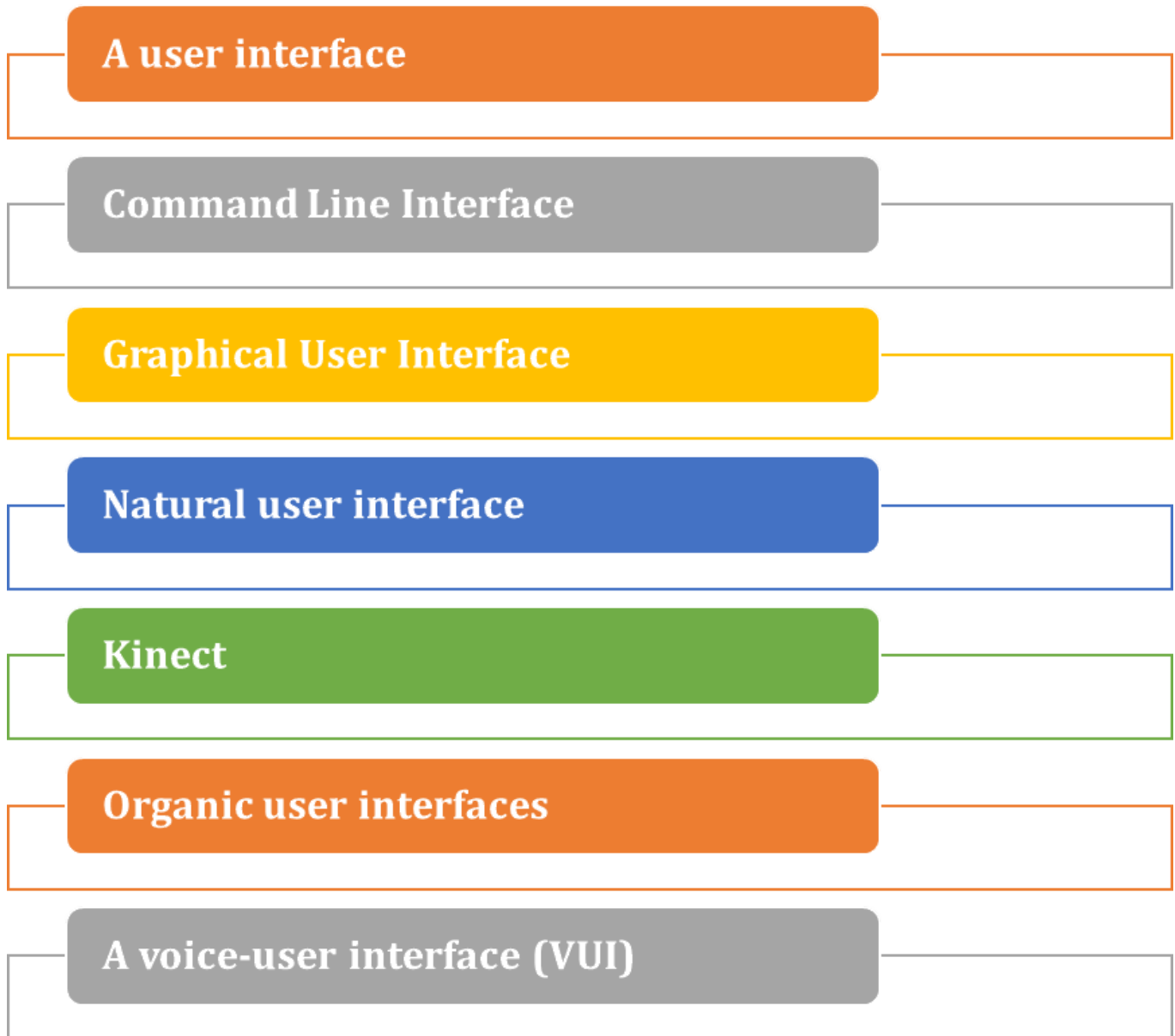


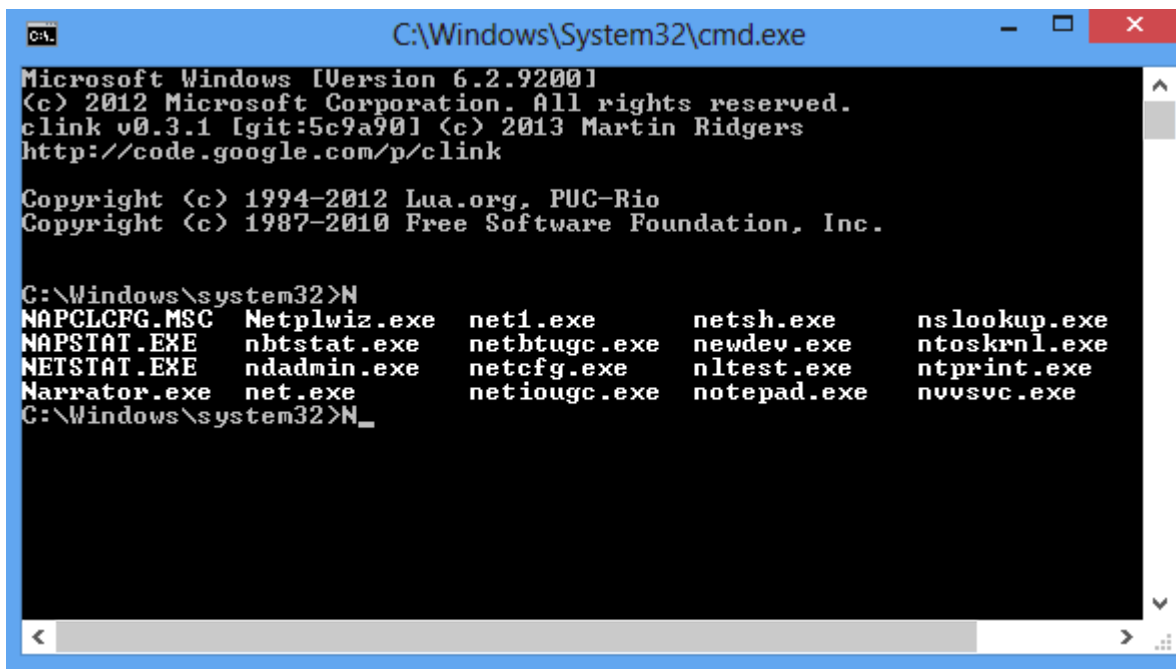
Diagram Shows User Interface

Command Line Interface - Command line interfaces are the oldest of the interfaces discussed here.

It involves the computer responding to commands typed by the operator.

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This type of interface has the drawback that it requires the operator to remember a range of different commands and is not ideal for novice users.



Command Line Interface

Graphical User Interface

- Graphical user interfaces (GUI).are sometimes also referred to as WIMP because they use Windows, Icons, Menus, and Pointers.
- Operators use a pointing device (such as a mouse, touchpad or trackball) to control a pointer on the screen which then interacts with other on-screen elements.
- The term was created in the 1970s to distinguish graphical interfaces from text-based ones, such as command line interfaces.
- The first commercially available GUI, called "PARC," was developed by Xerox.
- It was used by the Xerox 8010 Information System, which was released in 1981. After Steve Jobs saw the interface during a tour at Xerox, he had his team at Apple develop an operating system with a similar design.
- Apple's GUI-based OS was included with the Macintosh, which was released in 1984. Microsoft released their first GUI-based OS, Windows 1.0, in 1985.



Graphical User Interface

Natural user interface, or NUI, is a user interface that is effectively invisible, and remains invisible as the user continuously learns increasingly complex interactions.

- The word natural is used because most computer interfaces use artificial control devices whose operation has to be learned.
- A NUI relies on a user being able to quickly transition from novice to expert. While the interface requires learning, that learning is eased through design, which gives the user the feeling that they are instantly and continuously successful.
- Thus, “natural” refers to a goal in the user experience - that the interaction comes naturally, while interacting with the technology, rather than that the interface itself is natural.

Example Minority report



Natural User Interface

- Several design strategies have been proposed which have met this goal to varying degrees of success.

- One strategy is the use of a “**Reality user interface**” (“RUI”), also known as “reality-based interfaces” (RBI) methods.

One example of an RUI strategy is to use a wearable computer to render real-world objects “clickable”, i.e. so that the wearer can click on any everyday object to make it function as a hyperlink, thus merging cyberspace and the real world. Because the term “natural” is evocative of the “natural world”, RBI are often confused for NUI, when in fact they are merely one means of achieving it.

In the 1990s, **Steve Mann** developed a number of user-interface strategies using natural interaction with the real world as an alternative to a command-line interface (CLI) or graphical user interface (GUI).

Mann referred to this work as “natural user interfaces”, “Direct User Interfaces”, and “metaphor-free computing”.

A good example of an NUI is the hydraulophone, especially when it is used as an input device, in which touching a natural element (water) becomes a way of inputting data.

In 2006, **Christian Moore** established an open research community with the goal to expand discussion and development related to NUI technologies.

Kinect is a motion sensing input device by Microsoft for the Xbox 360 video game console and Windows PCs that uses spatial gestures for interaction instead of a game controller.

According to Microsoft’s page, Kinect is designed for “a revolutionary new way to play: no controller required.” Again, because Kinect allows the sensing of the physical Sony PlayStation Move.

In human - computer interaction, an **organic user interface (OUI)** is defined as a user interface with a non-flat display.

After Engel Bart and Sutherland’s graphical user interface (GUI), which was based on the cathode ray tube (CRT), and Kay and Weiser’s ubiquitous computing, which is based on the flat panel liquid-crystal display (LCD), OUI represents the third wave of display interaction paradigms, pertaining to multi-shaped and flexible displays.

These inputs are provided through direct physical gestures, rather than through indirect point-and-click control. Note that the term “Organic in OUI was derived from organic architecture, referring to the adoption of natural form to design a better fit with human ecology.

Organic user interfaces were first introduced in a special issue of the Communications of the ACM in 2008.

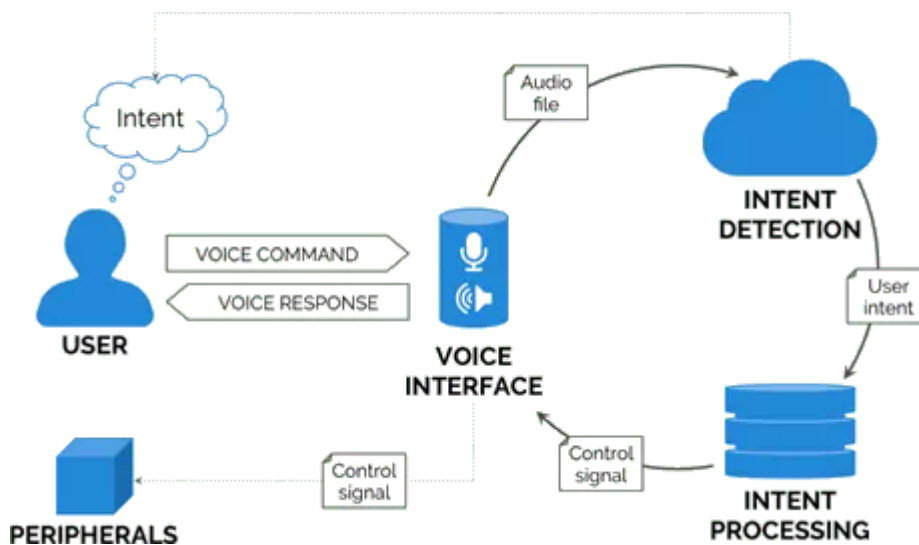
- The first International Workshop on Organic User Interfaces took place at CHI 2009 in Boston, Massachusetts.
- The second workshop took place at TEL 2011 in Madeira, Portugal.

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- The third workshop was held at MobiIeHCI 2012 in Monterey, California, and the fourth workshop at CHI 2013 in Paris, France.

A voice-user interface (VUI) makes human interaction with computers possible through a voice/speech platform in order to initiate an automated service or process.

- It is the interface to any speech application. Controlling a machine by simply talking to until recently, this area was considered artificial intelligence.
- However, with advances in technology, VUIs have become more commonplace, and people are taking advantage of the value that these hands-free, eyes-free interfaces provided in many situations.



A Voice-User Interface (VUI)