Interfaces

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What are Interfaces? - Definitions

- The place where two systems come together and have an effect on each other.
- A connection between two computers or between a person and a computer.
- Qualities something has which enables interaction.

(A vehicle contains several interfaces)

What are Interfaces?

Your vehicle has several interfaces such as:

- Dashboard Display
  - Gas Monitoring
  - Speedometer
  - Engine Light
- A/C Temperature Control
- Steering Wheel
- Touchscreen
- More . . .

What are Interfaces? - 10 Types

1999 article by Deborah Kreuze stating her top 10 interfaces:

1. Loudspeaker
2. Touch-Tone Telephone
3. Steering Wheel
4. Magnetic Stripe Card
5. Traffic Light
6. Remote Control
7. Cathode-Ray Tube
8. Liquid Crystal Display
9. Mouse/Graphical User Interface
10. Barcode Scanner

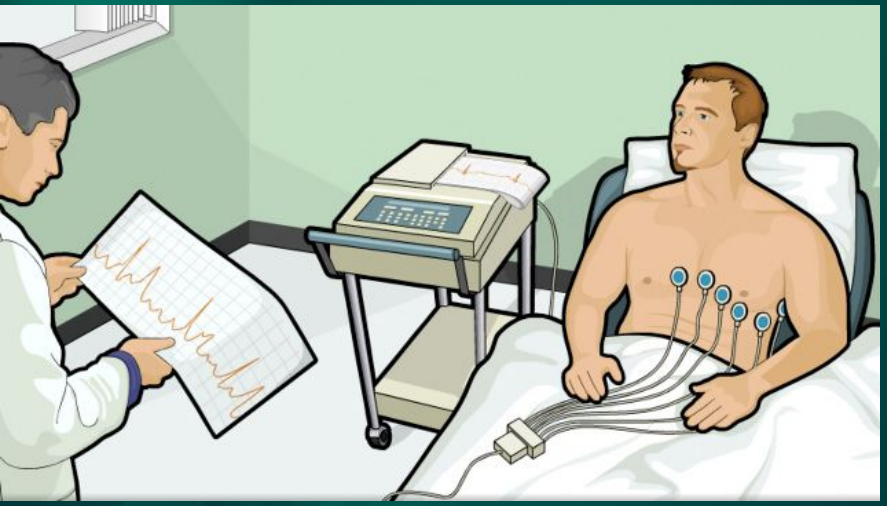
Student Interfaces

Back in 2002, Dr. Kardas asked students in his Cognitive Science class to list some interfaces and got some unique answers.

- Body Armor
- Elevators
- Shoes
- Toilet Paper
- Answering Machine
- Drive Through Windows
- Doors

What are Interfaces? - EKGs and Pulse Ox.

An EKG is used to measure the electrical activity of the heart. This allows for detection of heart abnormalities such as atrial fibrillation, heart attacks and poor blood flow.



A Pulse Oximeter is used to measure blood oxygen and heart rate. It converts physiological conditions to numeric values.

Very Cool Interfaces

Has anyone heard of NeuroLink? This is an example of a Brain-Computer Interface!

- Brains and Computers both use electrical signals to function.

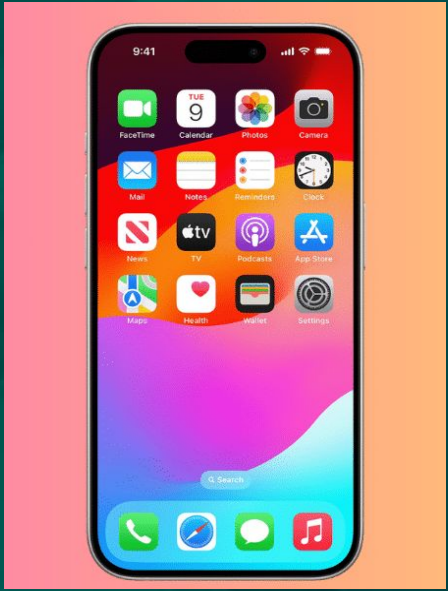
Someone with a spinal cord injury may be paralyzed. Their brain is no longer able to communicate with their muscles. This problem can and has been solved, thanks to advanced prosthetics and Brain-Computer Interfaces.

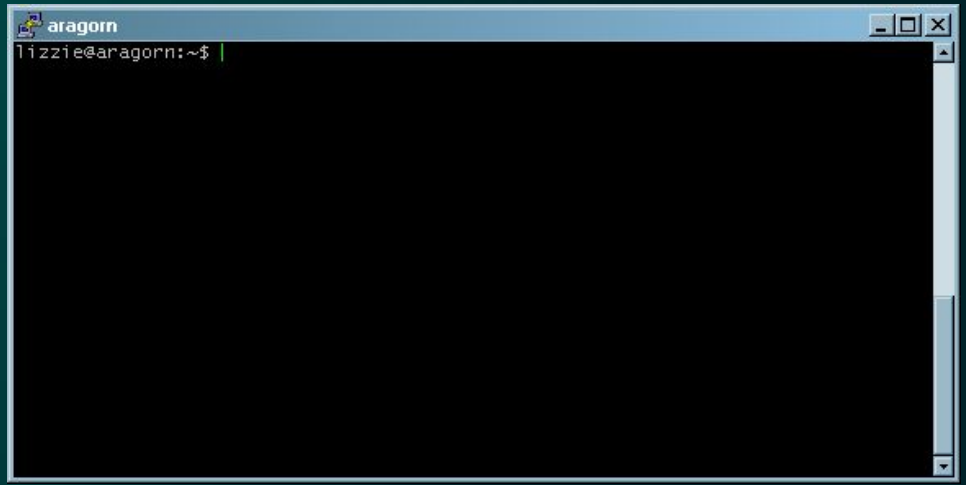
Additionally, some researchers and engineers have been able to replicate the sense of touch! (Niewijk, 2023)

Daily Examples of Interfaces

These are main types of interfaces we interact with daily:

- Computer screens
- Graphical User Interface (GUI)
- Command Line Interface (CLI)
- Smartphones





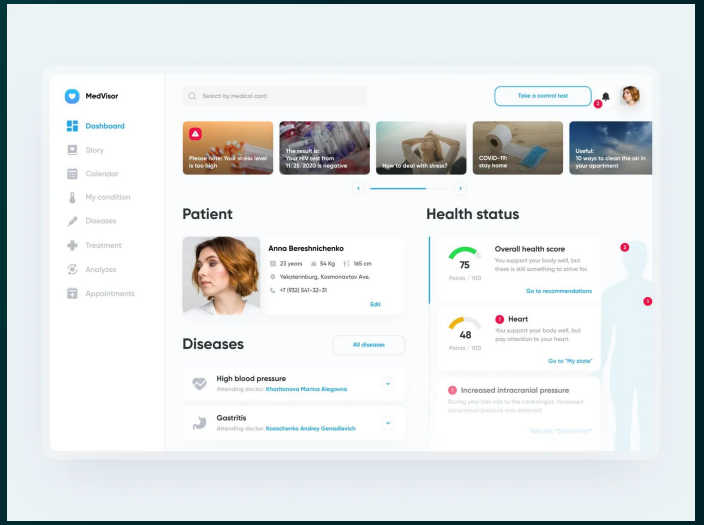
What Makes an Interface Easy to Use?

- Clarity
- Consistency
- Feedback
- User Control
- Direct Manipulation

Cluttered Website

vs.

Clean Website



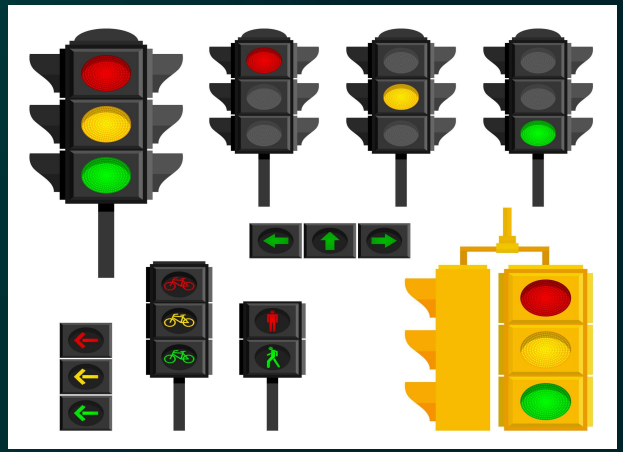
SAU's Website

The Southern Arkansas University's website has:

- Moving graphics on front page
- Search function
- Links for job applicants
  - Also provides links to apply for enrollment, tours, and donations
- Calendar for upcoming events

Other Real-World Interfaces

Real-world interfaces don’t have to be digital—they’re any systems we interact with to complete everyday tasks, like self-checkout machines, ATMs, elevators, and even things like door handles or traffic lights. Like digital interfaces, they need to be clear, intuitive, and easy to use without instructions. Good design helps people understand what to do quickly and reduces confusion.



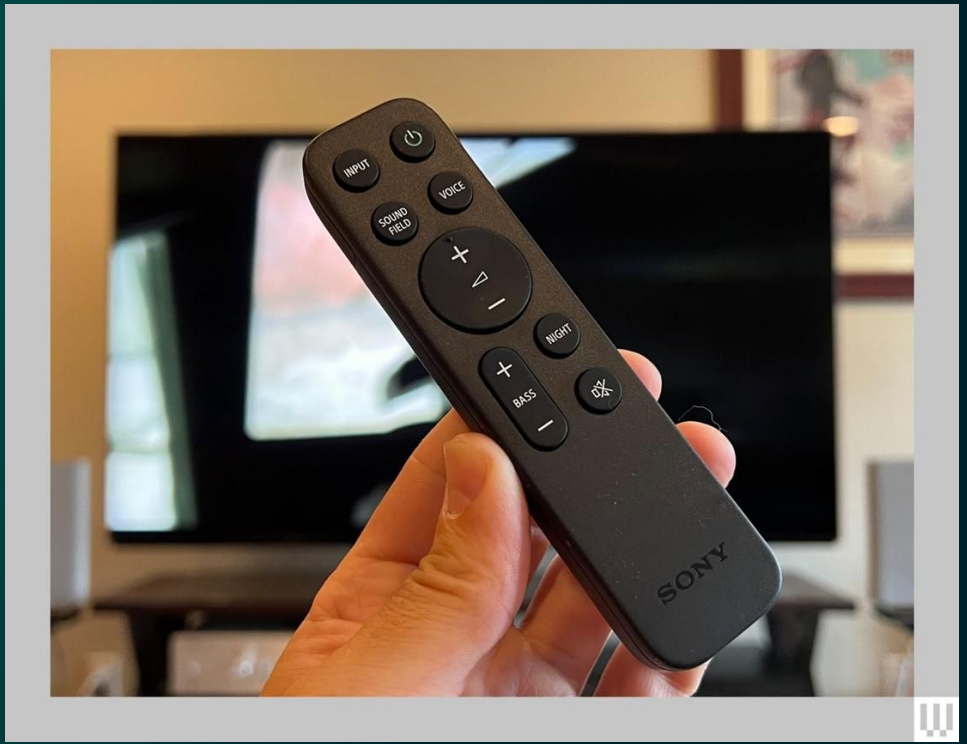
When Design Goes Wrong...

Common issues:

- Cluttered layouts
- Unclear instructions
- Poor contrast
- Too many unnecessary steps

Leads to:

- User errors
- Wasted time
- Overall negative experience



Complex Interfaces

Interfaces can be complex when the input manuals are hard to process or understand in a timely manner.

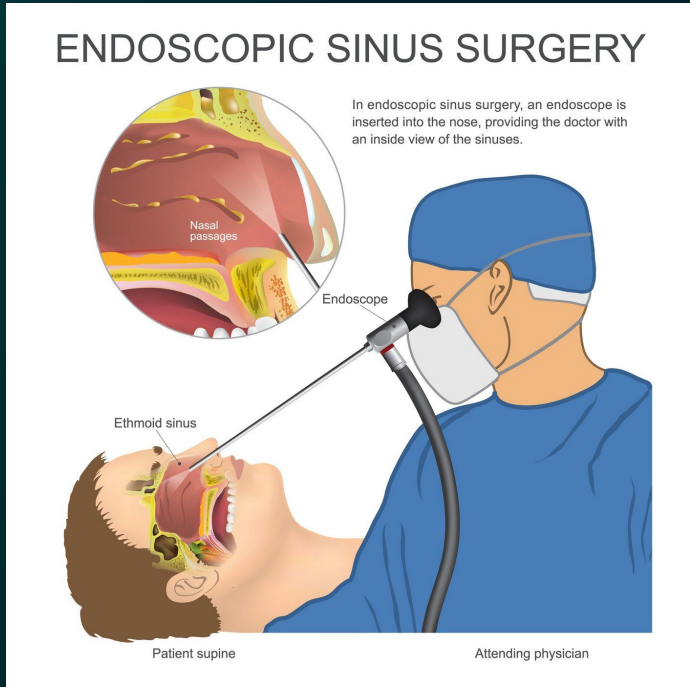
- Check out the older Boeing 747 cockpit compared to the new one:
- Old: Hundreds of dials, buttons, and gages. Requires multiple people to operate

New: Less gages and other inputs, requires less people to operate.

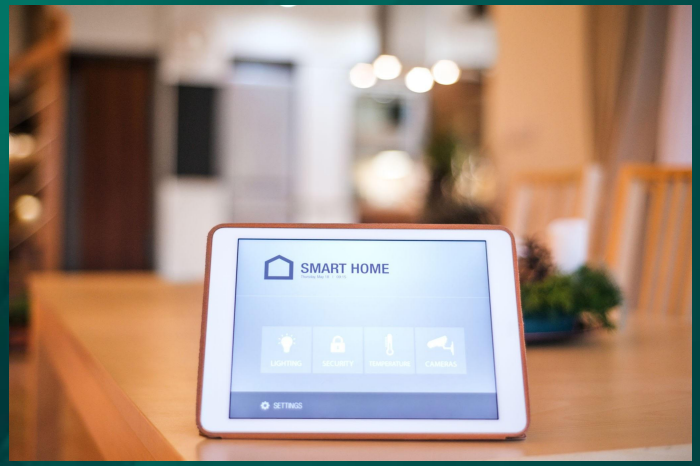
When Interfaces are Faulty - TruDi software

In 2021, the TruDi Navigation System, which assists in minor surgeries involving sinus inflammation received an update adding **AI**.
These surgeries are typically simple, minimally invasive, outpatient operations. TruDi was designed to help doctors visualize the procedure. Complications arose resulting in major injuries, including but not limited to:

- Carotid Artery Damage
- Stroke
- Punctured Skull



The Best Interface…. Is No Interface



- Works Automatically
- Reduces unnecessary steps
- Focuses on the user’s experience
- Solves problems without interaction

Example: Smart home lights and automatic car climate

- These show “no effort”

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