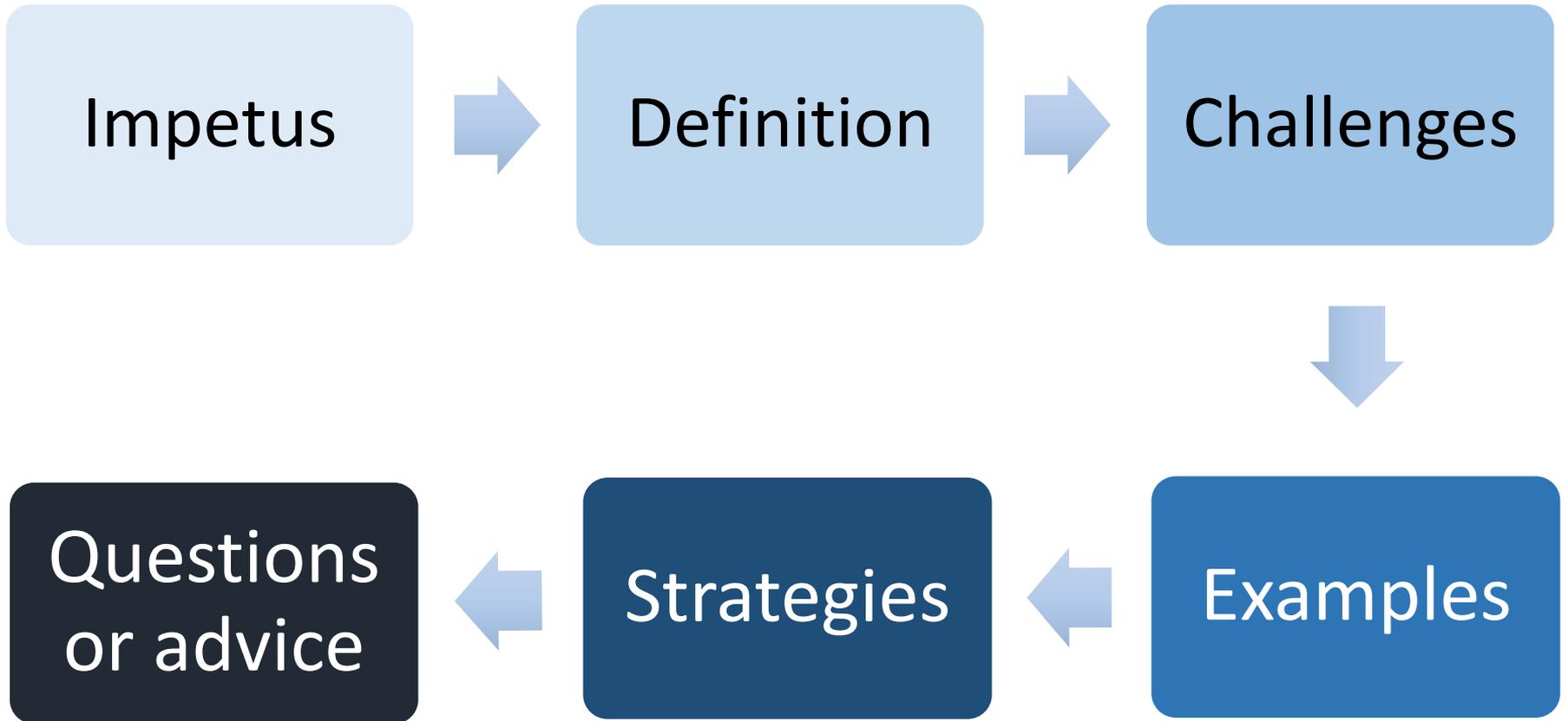


# User-centered Design

Felicia Chong

Ph.D. in Rhetoric and Technical Communication

fchong@oakland.edu || Writing and Rhetoric



Impetus

Definition

Challenges

Questions  
or advice

Strategies

Examples









**Michigan  
Technological  
University**<sup>®</sup>

# **USER**

**{noun} (you-sir)**

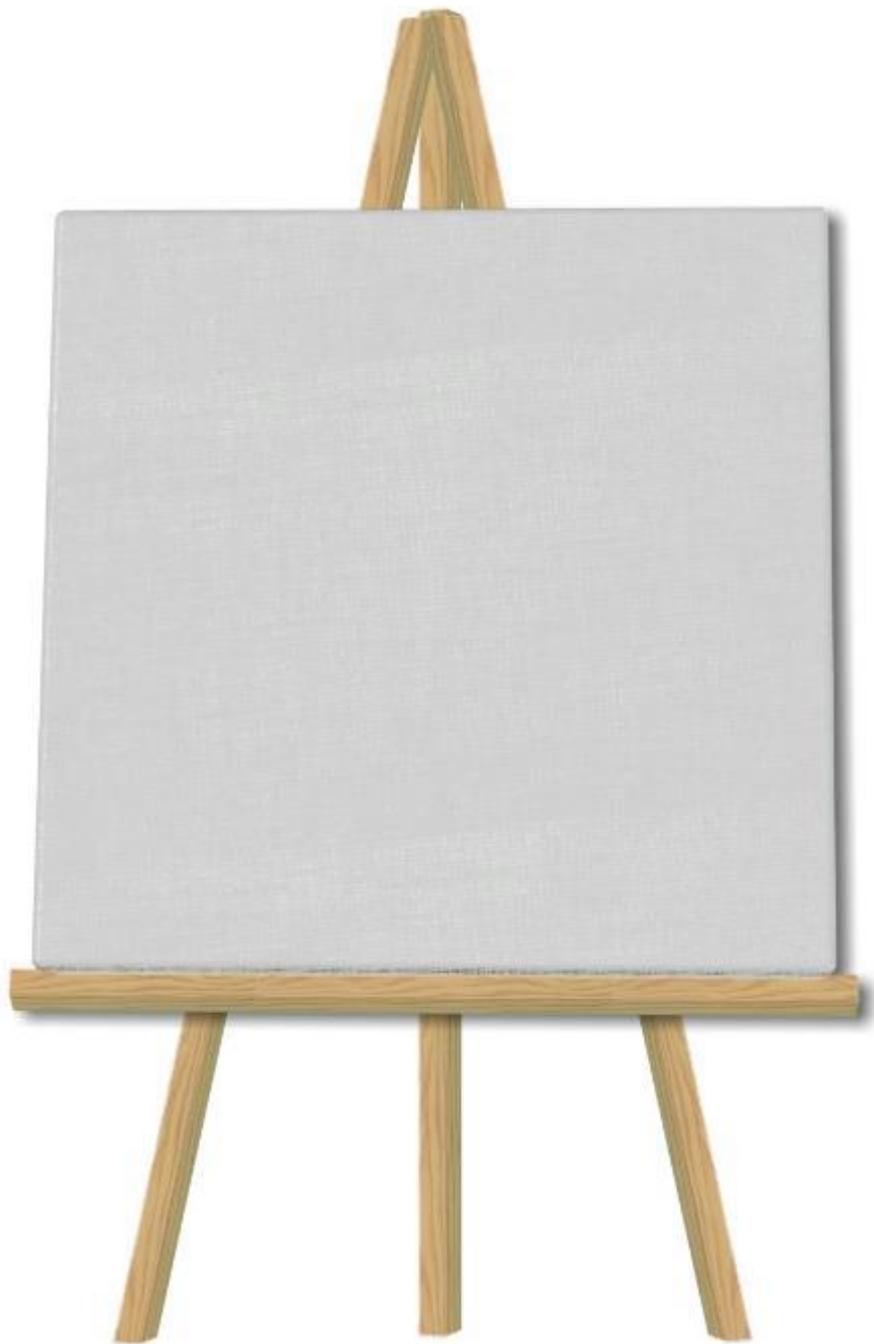
**The word computer  
professionals use  
when they mean  
"idiot"**

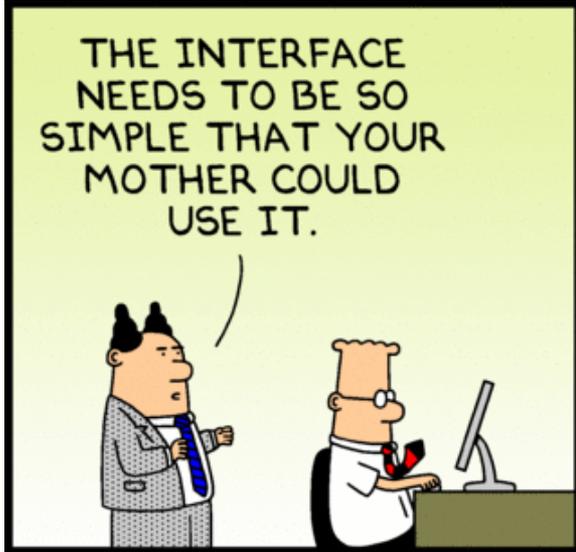


users are

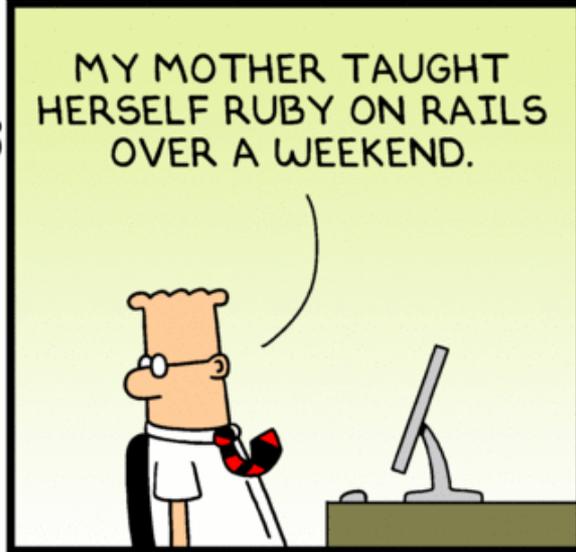


*Report inappropriate predictions*





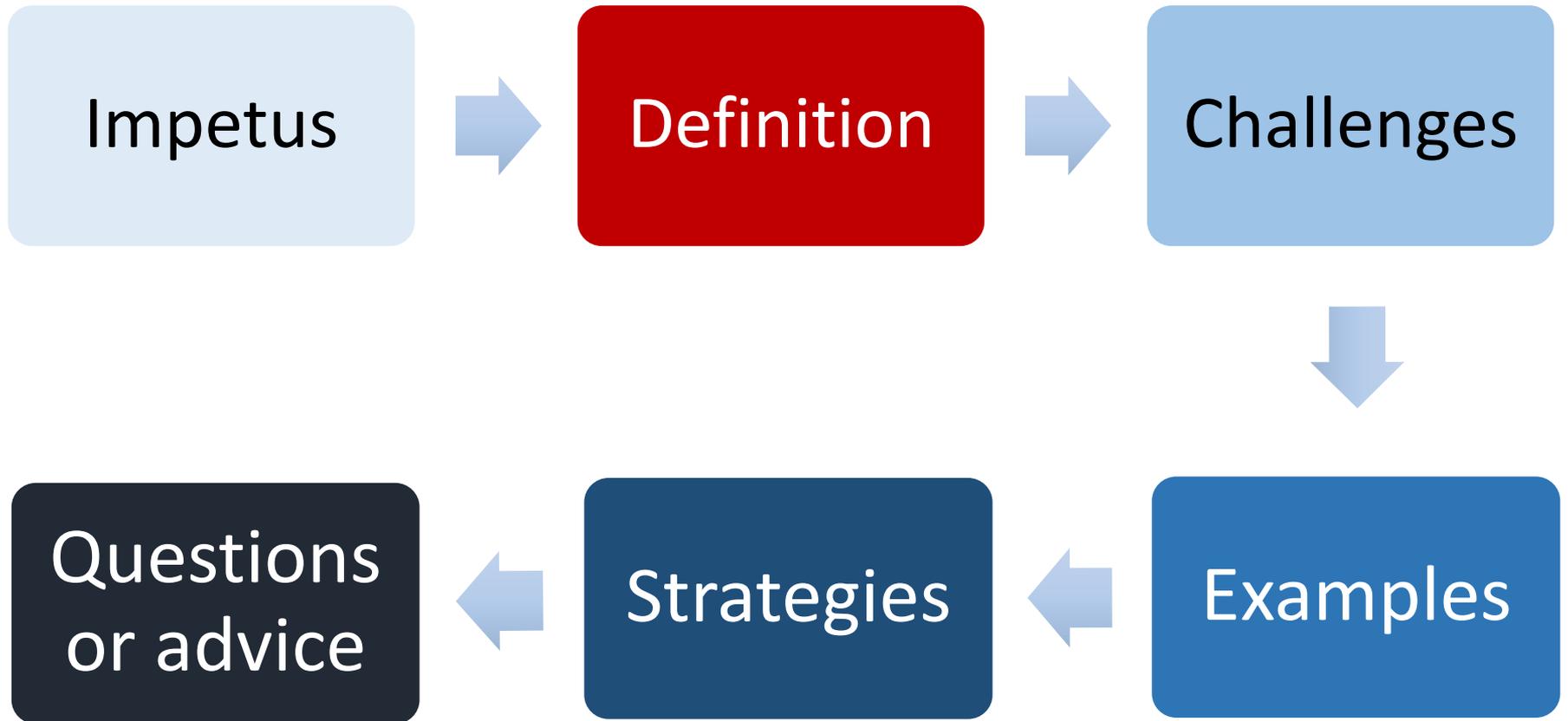
Dilbert.com DilbertCartoonist@gmail.com



8-5-14 ©2014 Scott Adams, Inc./Dist. by Universal Uclick

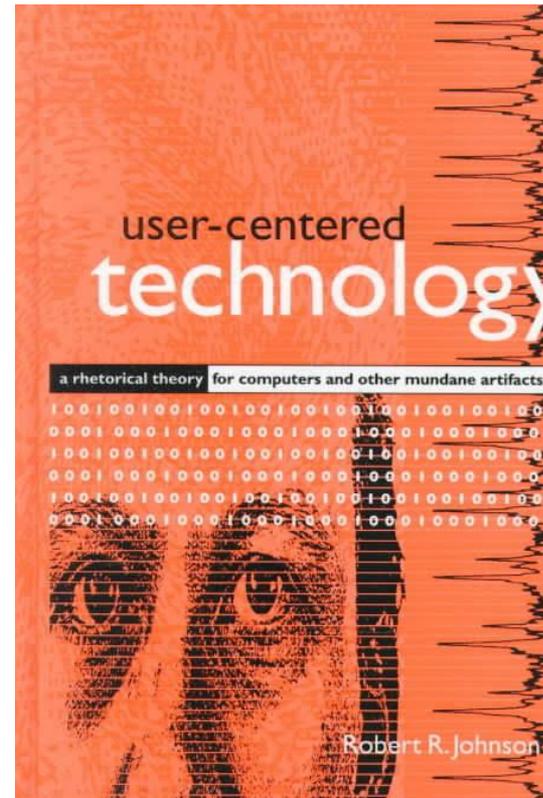
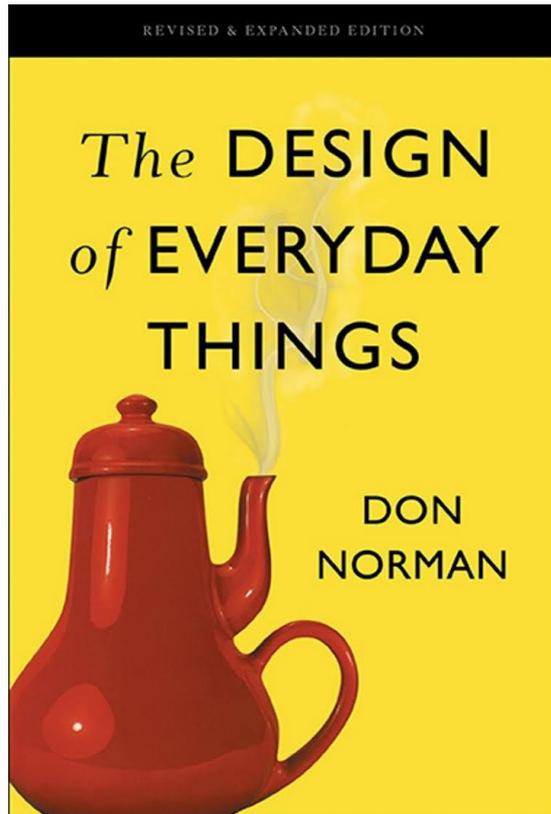


Video



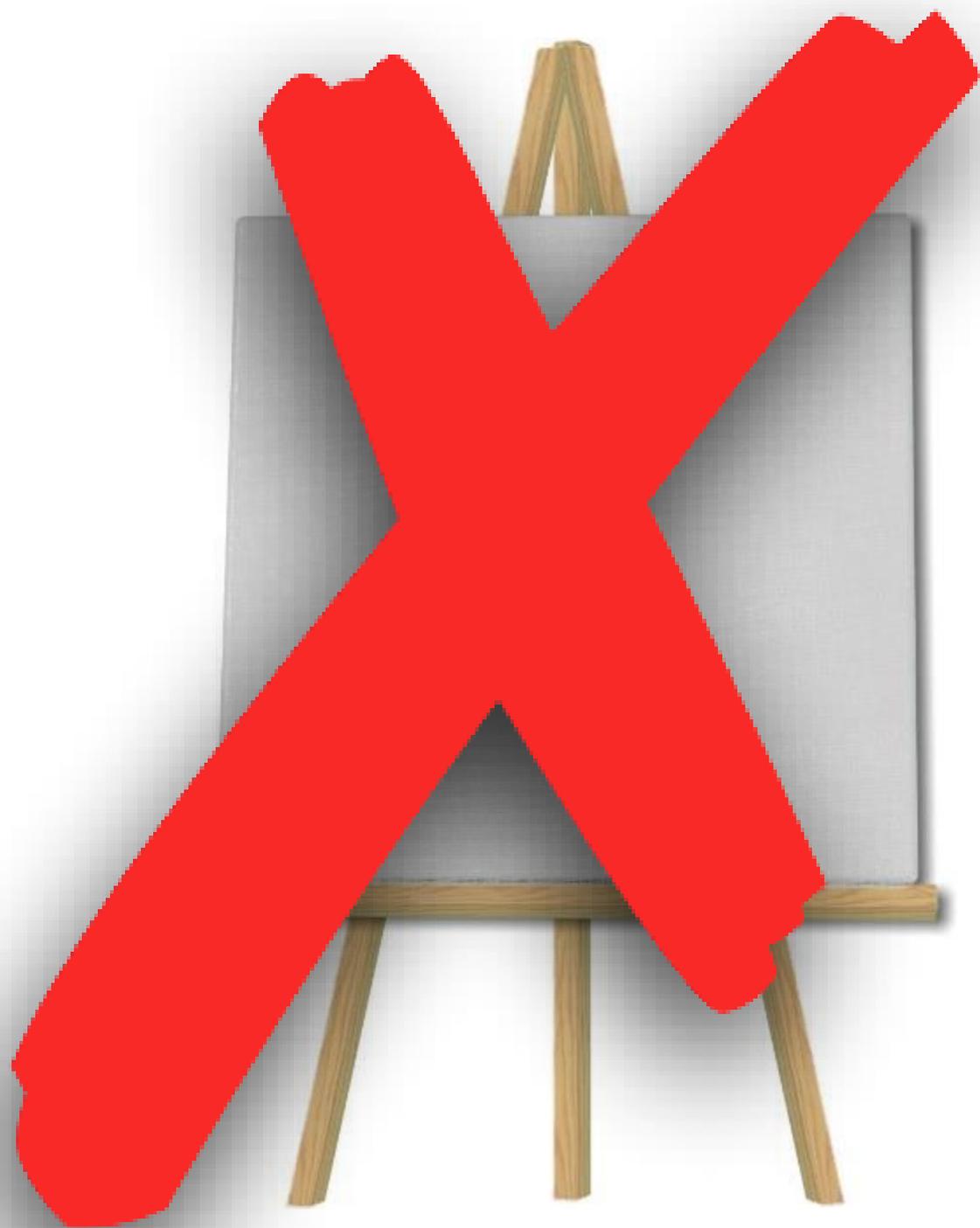
# What is user-centered design (UCD)?

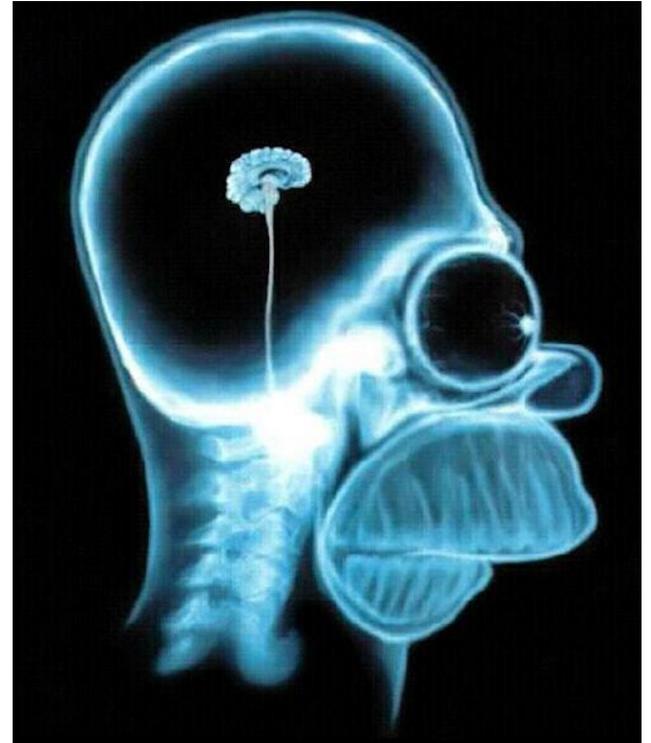
“...putting human needs, capabilities and behavior first...”



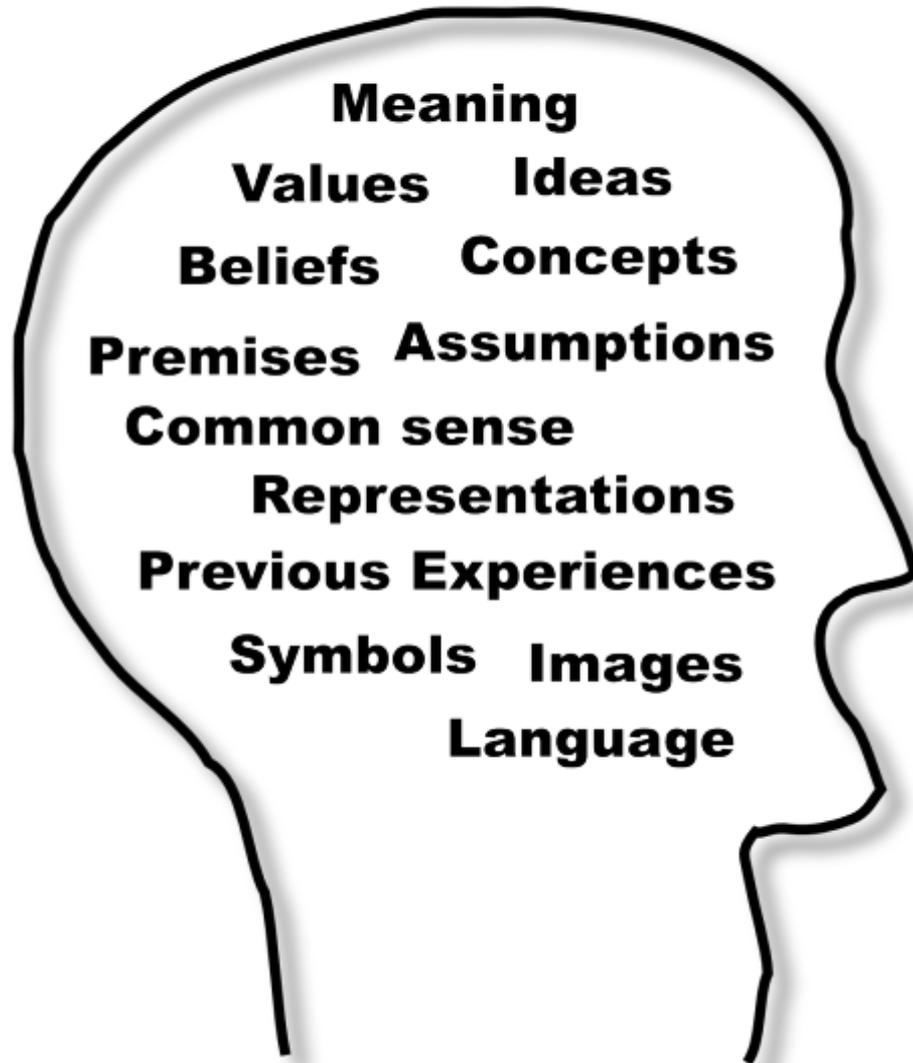
User-centered **≠** “user-friendly”

User-centered **≠** “easy”





## **What are Mental Models made of?**



# *Affordances*

What actions are possible?



# *Natural Mappings*





## *Signifiers*

Clues on where/how the action should take place

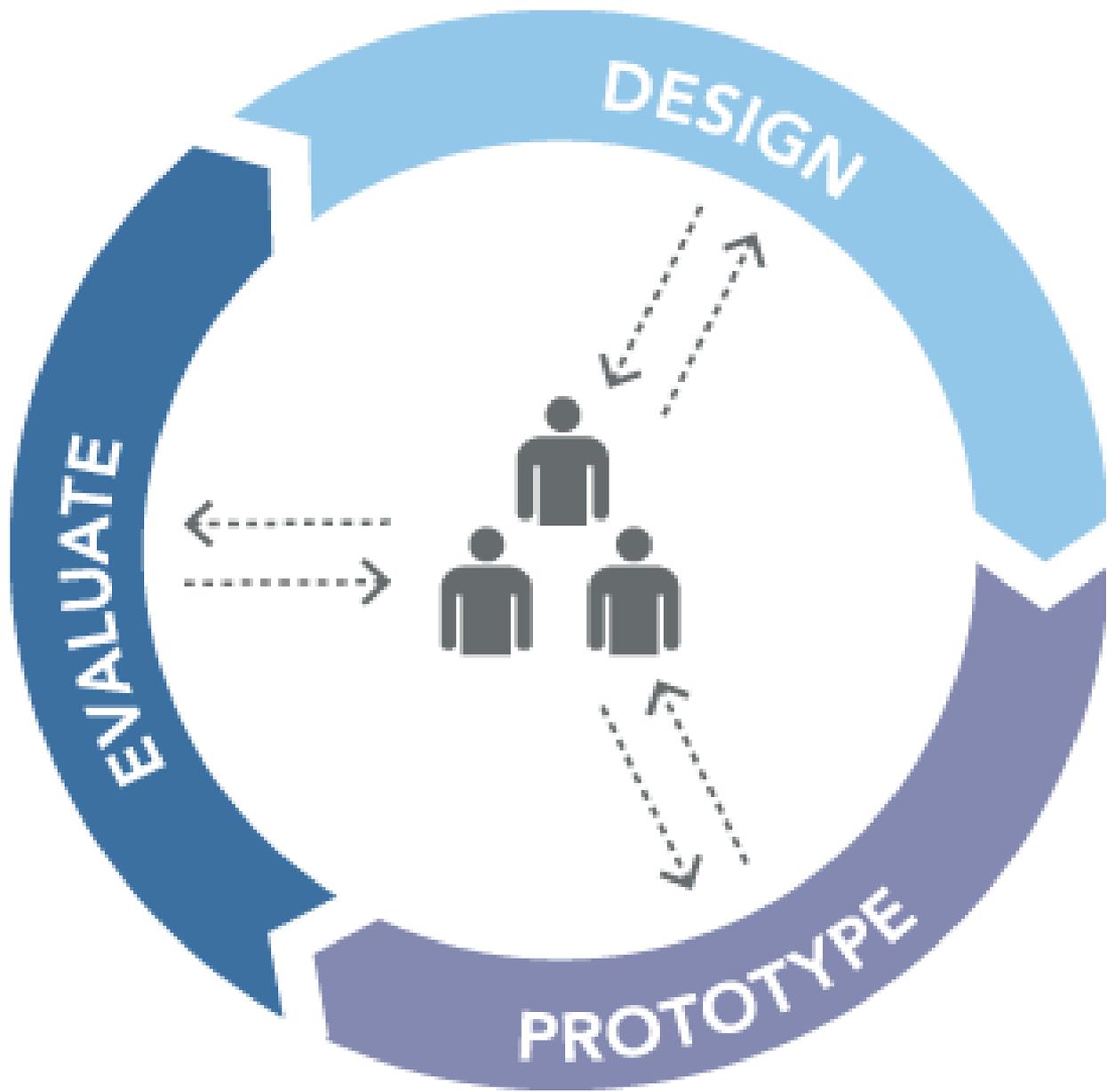
Mental  
Models

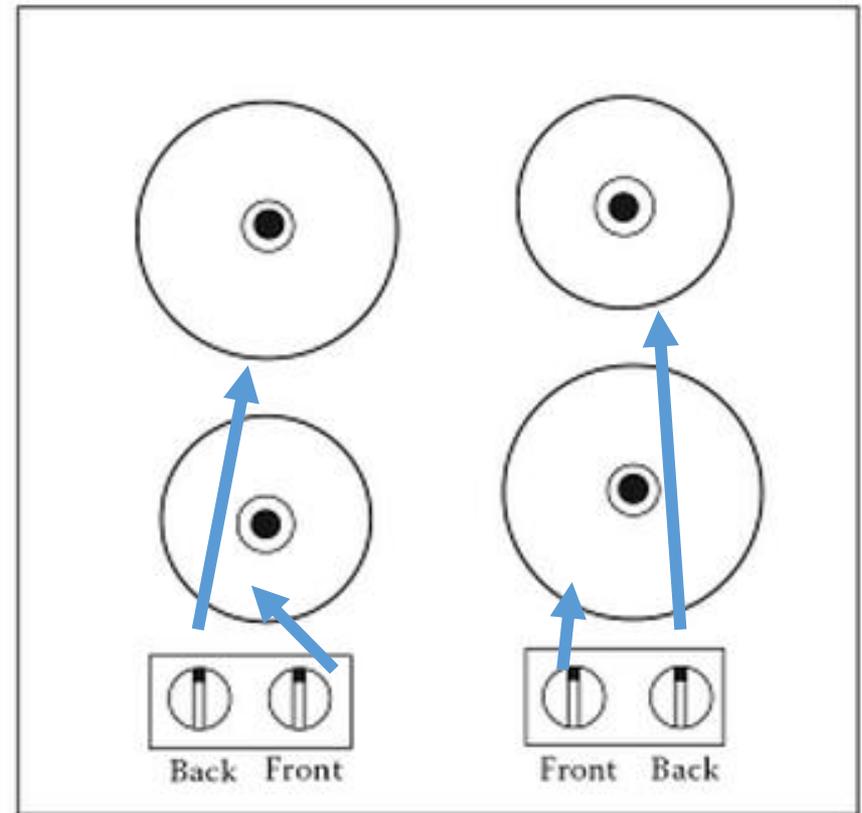
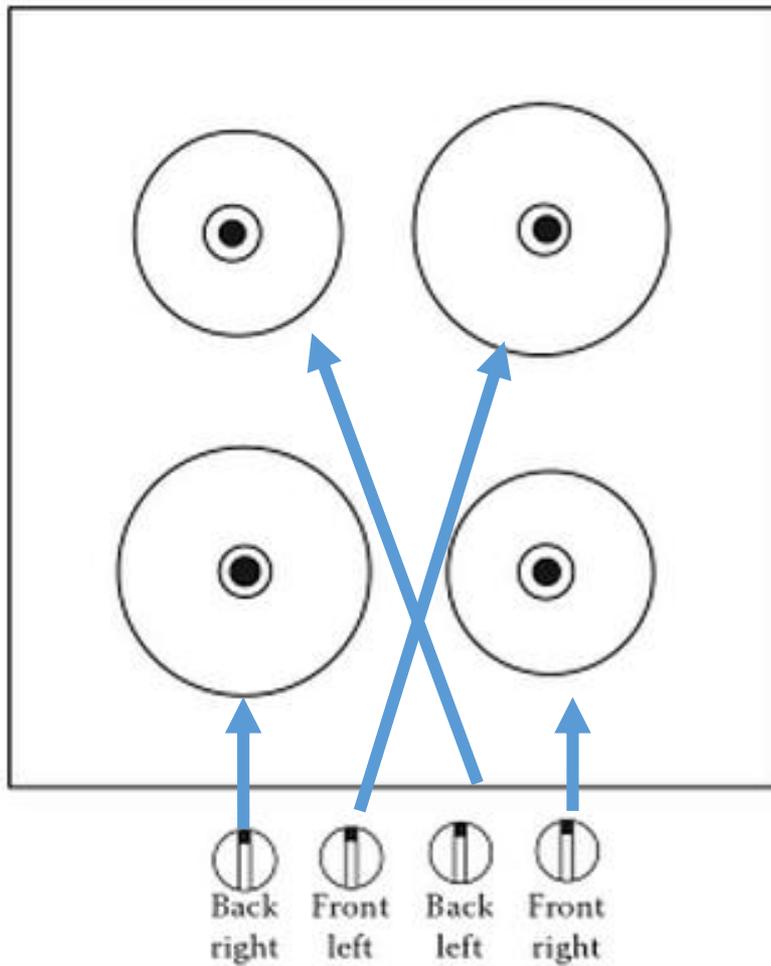
The diagram consists of two overlapping circles. The left circle is labeled 'Mental Models' and is associated with the 'User'. The right circle is labeled 'Conceptual Models' and is associated with the 'Designer'. The circles overlap in the center, representing a shared area of understanding or communication between the user and the designer.

User

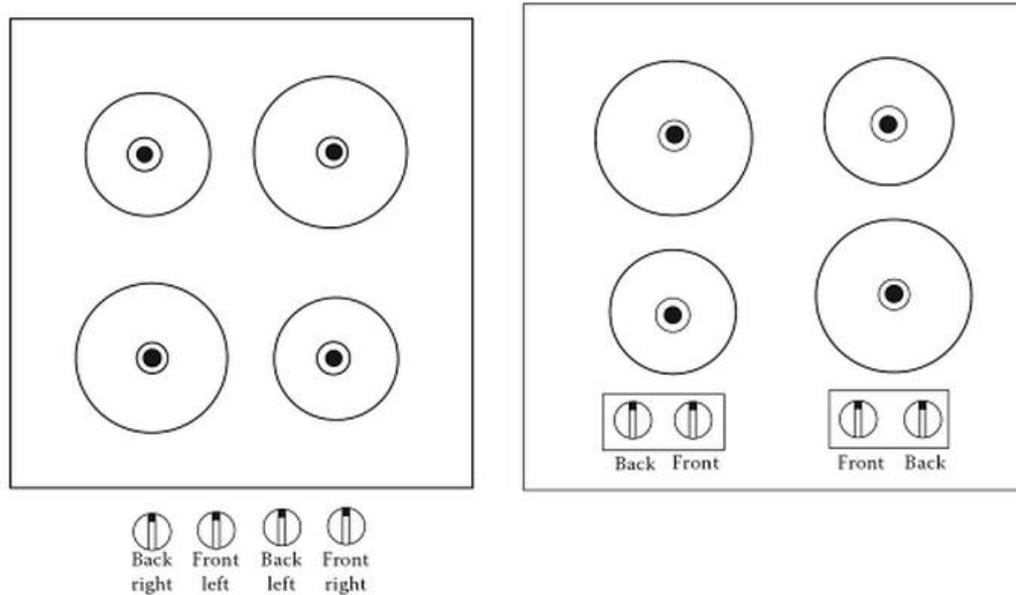
Conceptual  
Models

Designer



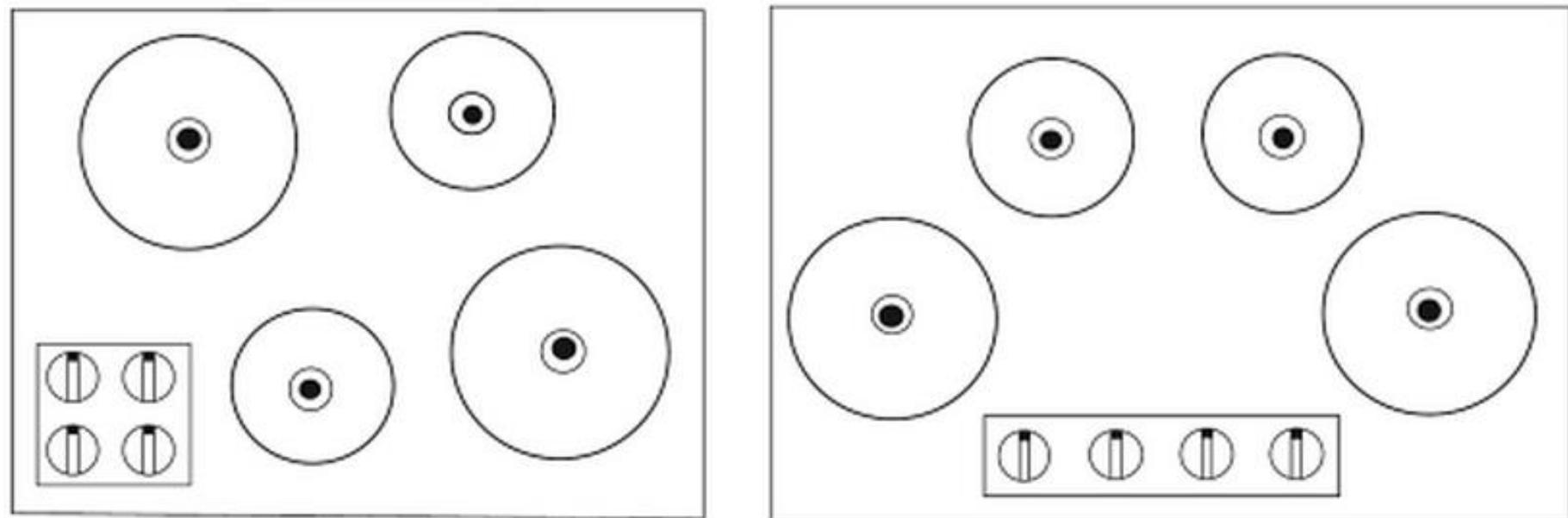


*Figure 12.1* Stove with four top burners and corresponding control knobs, but poor mapping. (From Chapanis, A., *Research Techniques in Human Engineering*, The Johns Hopkins Press, Baltimore, MD, 1959.)



How would you arrange the burners and the control knobs to be more user-centered?

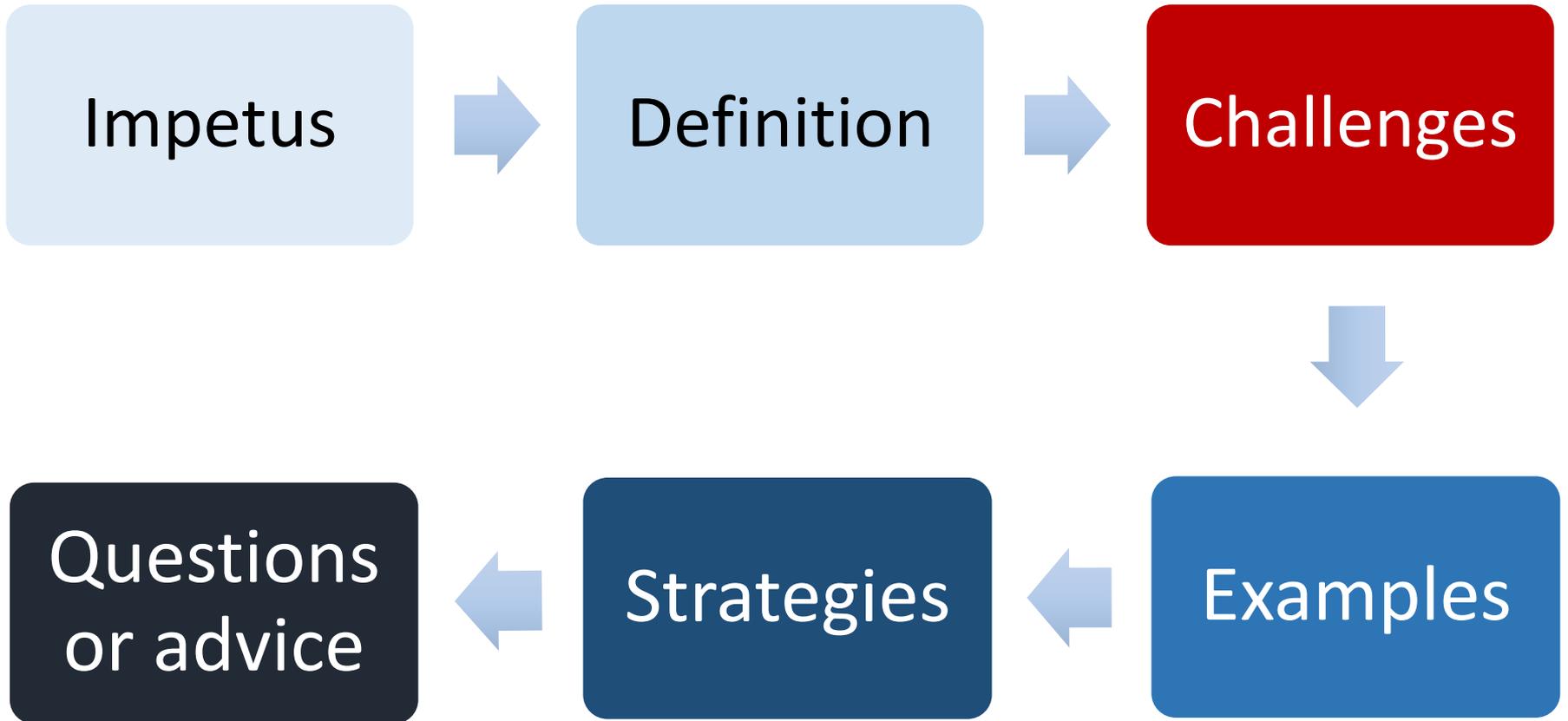
Constraint: The knobs have to “stay together” either vertically, horizontally, or “squarely.”



*Figure 12.2* Alternative stove control–burner mappings. (From Chapanis, A., *Research Techniques in Human Engineering*, The Johns Hopkins Press, Baltimore, MD, 1959.)



...then why does poor design still exist?



WE COULD DESIGN THE PRODUCT WITH A SIMPLE POINT-AND-CLICK INTERFACE...



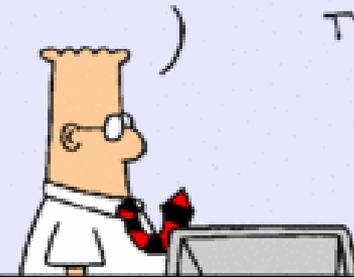
5. Adams  
B. Mill: SCOTTADAMS@AOL.COM

OR WE COULD REQUIRE THE USER TO CHOOSE AMONG THOUSANDS OF POORLY DOCUMENTED COMMANDS, EACH OF WHICH MUST BE TYPED EXACTLY RIGHT ON THE FIRST TRY.

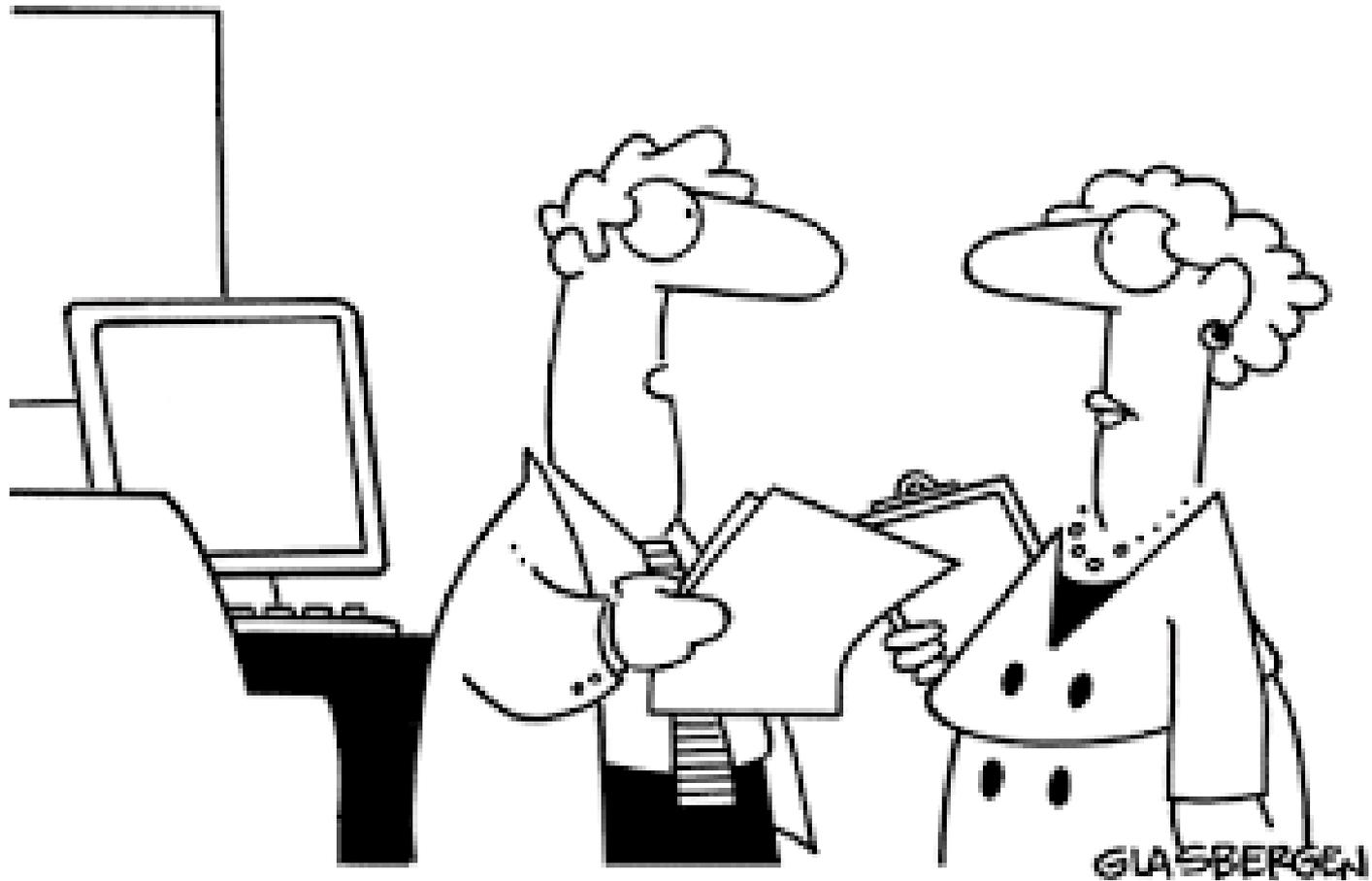


9-30  
© 1994 United Feature Syndicate, Inc.

BEAR IN MIND, WE'LL NEVER MEET A CUSTOMER OURSELVES.



MAKE IT SO THEY HAVE TO REBOOT AFTER EVERY TYPO.



**“My team has created a very innovative solution,  
but we’re still looking for a problem to go with it.”**

# System-centered or Expert-centered Model

D

Decide

A

Announce

D

Defend

**HELLO**  
I AM...

**AN EXPERT**

**THINK**

**LIKE I DO**

© Farnel & Farnel, Inc.

**EMPATHIZE**

**DEFINE**

**IDEATE**

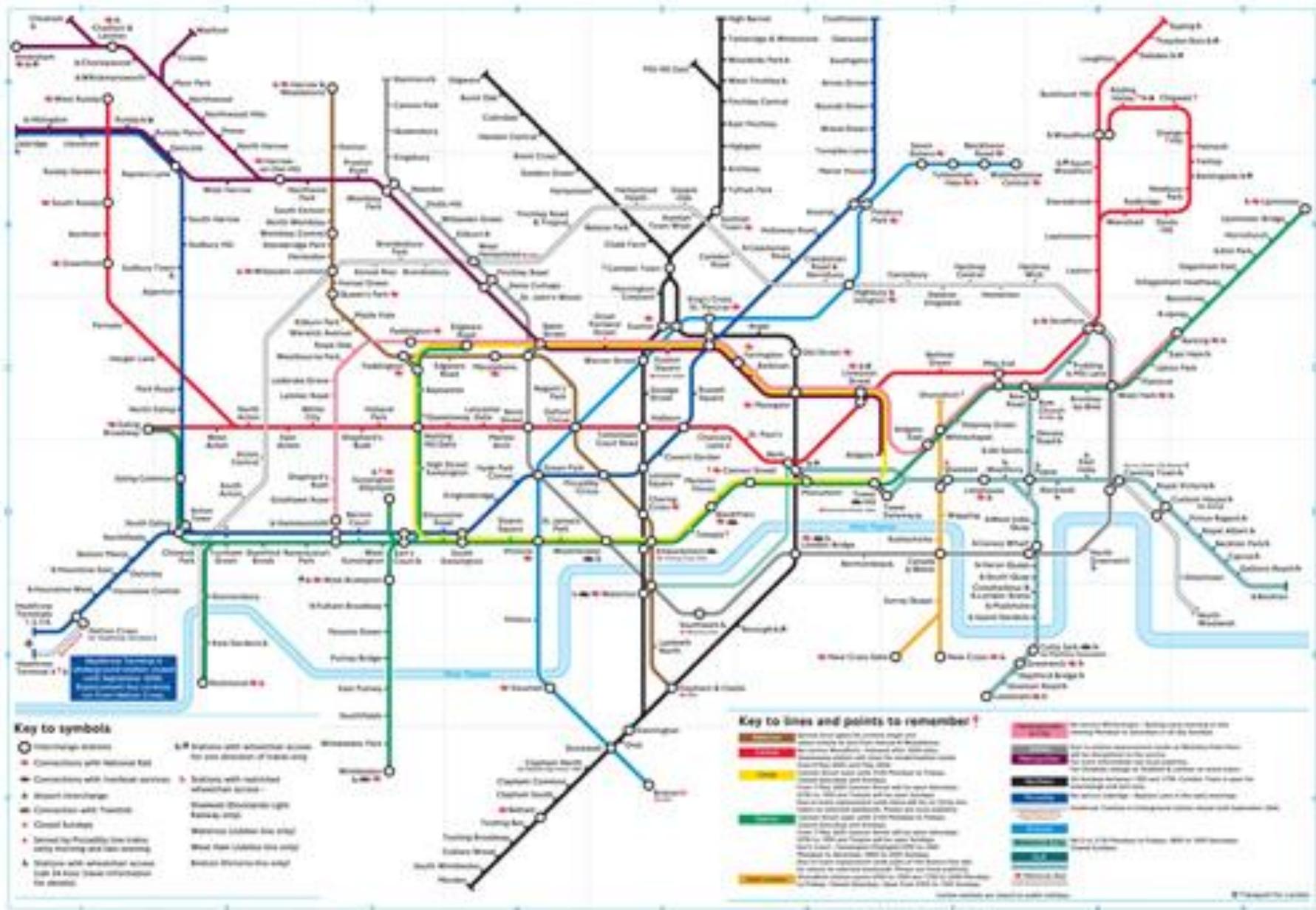
**PROTOTYPE**

**TEST**

# Constraints



time, economic, physical, technological, ethical, political

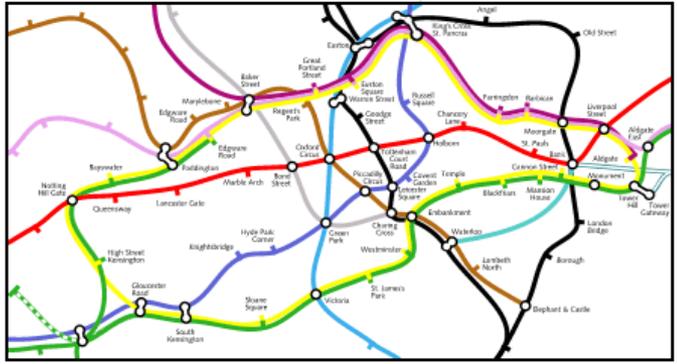
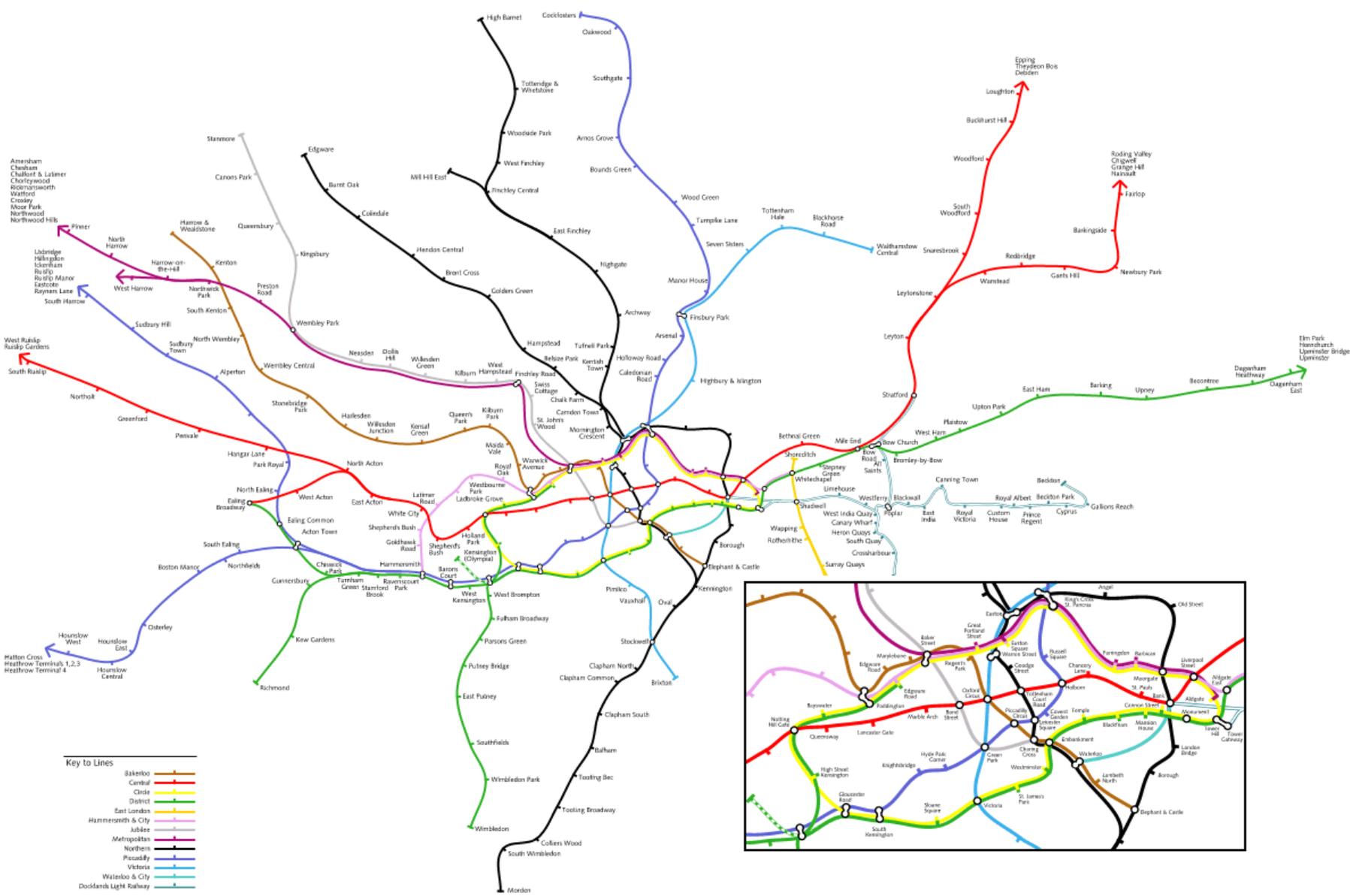


**Key to symbols**

- Interchange station
- Connections with National Rail
- ▲ Station interchange
- ◆ Connection with Trambus
- ⊙ Closed station
- ⊙ Station possibly to be built with existing and new services
- ⊙ Station with wheelchair access with 24 hour ticket information for details
- ⊙ Station with wheelchair access for one direction of travel only
- ⊙ Station with restricted wheelchair services
- ⊙ Station (Overground light rail only)
- ⊙ Station (London bus stop)
- ⊙ West End (London bus stop)
- ⊙ Station (London bus stop)

**Key to lines and points to remember**

- Central Line** (Red): London's longest line, runs from the north to the south of the city.
- Northern Line** (Purple): London's deepest line, runs from the north to the south of the city.
- Bakerloo Line** (Green): London's second longest line, runs from the north to the south of the city.
- Circle Line** (Blue): London's innermost line, runs in a circle around the city.
- District Line** (Grey): London's longest line, runs from the north to the south of the city.
- Hammersmith & City Line** (Black): London's shortest line, runs from the north to the south of the city.
- Metropolitan Line** (Brown): London's second longest line, runs from the north to the south of the city.
- Piccadilly Line** (Dark Blue): London's longest line, runs from the north to the south of the city.
- Victoria Line** (Orange): London's newest line, runs from the north to the south of the city.
- Waterloo & City Line** (Pink): London's shortest line, runs from the north to the south of the city.

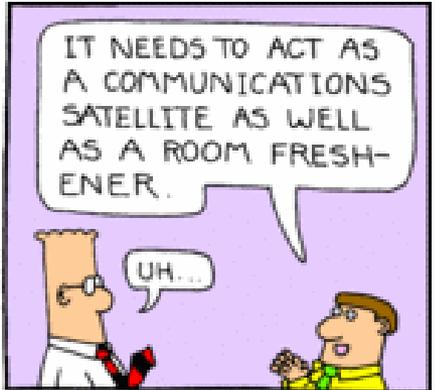
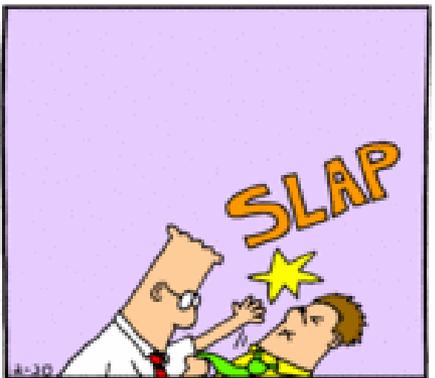
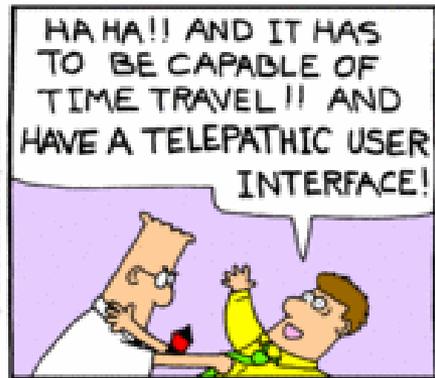
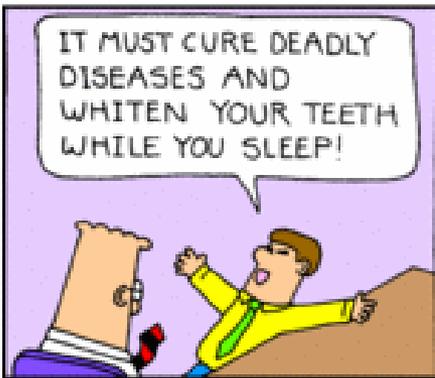


# Simplified Transport Maps

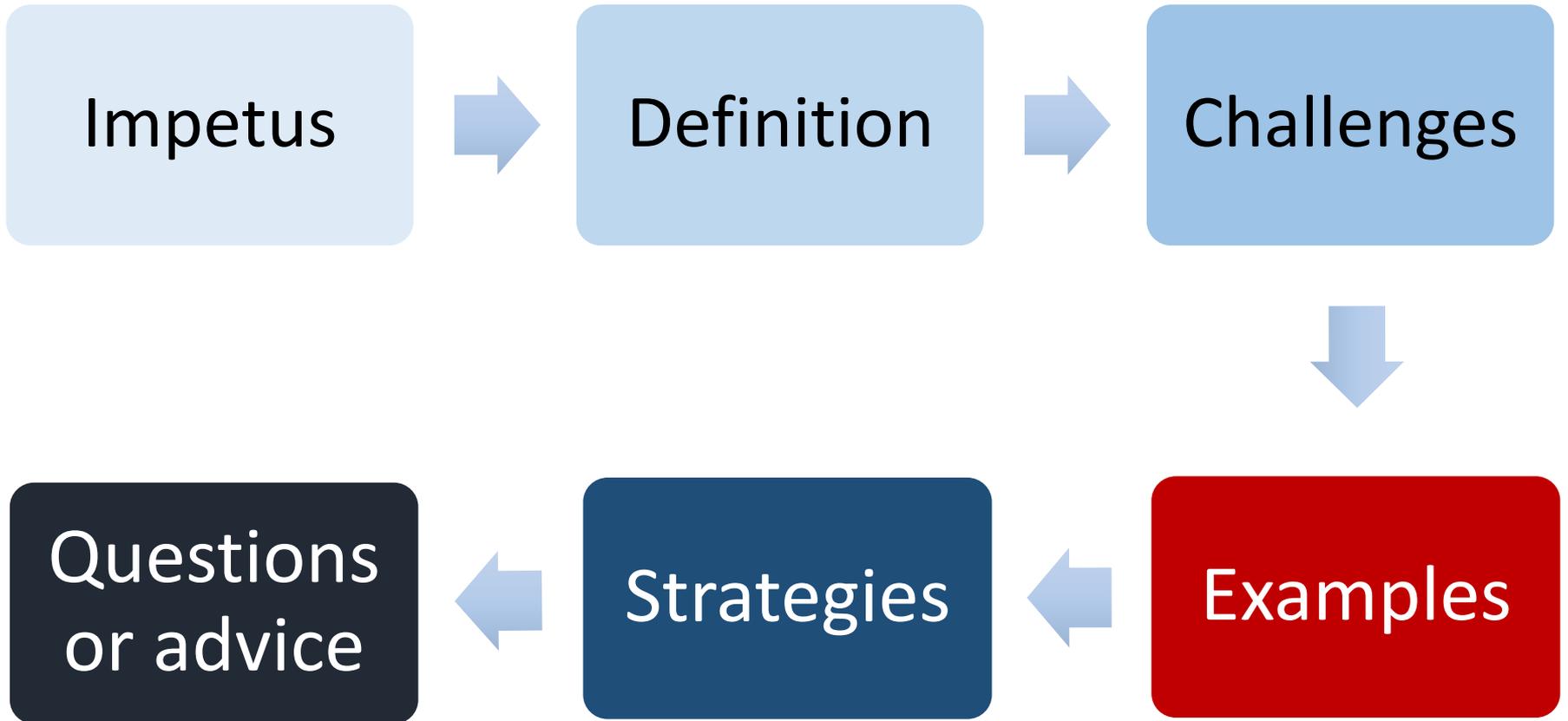
Maps such as the classic London Tube map simplify geographical reality. This makes it easier to get a coherent overview of a complex system so the user can quickly plan their route and, over time, build their own mental model of the network. Simplified maps have also been proposed for the New York subway but these haven't been widely adopted.

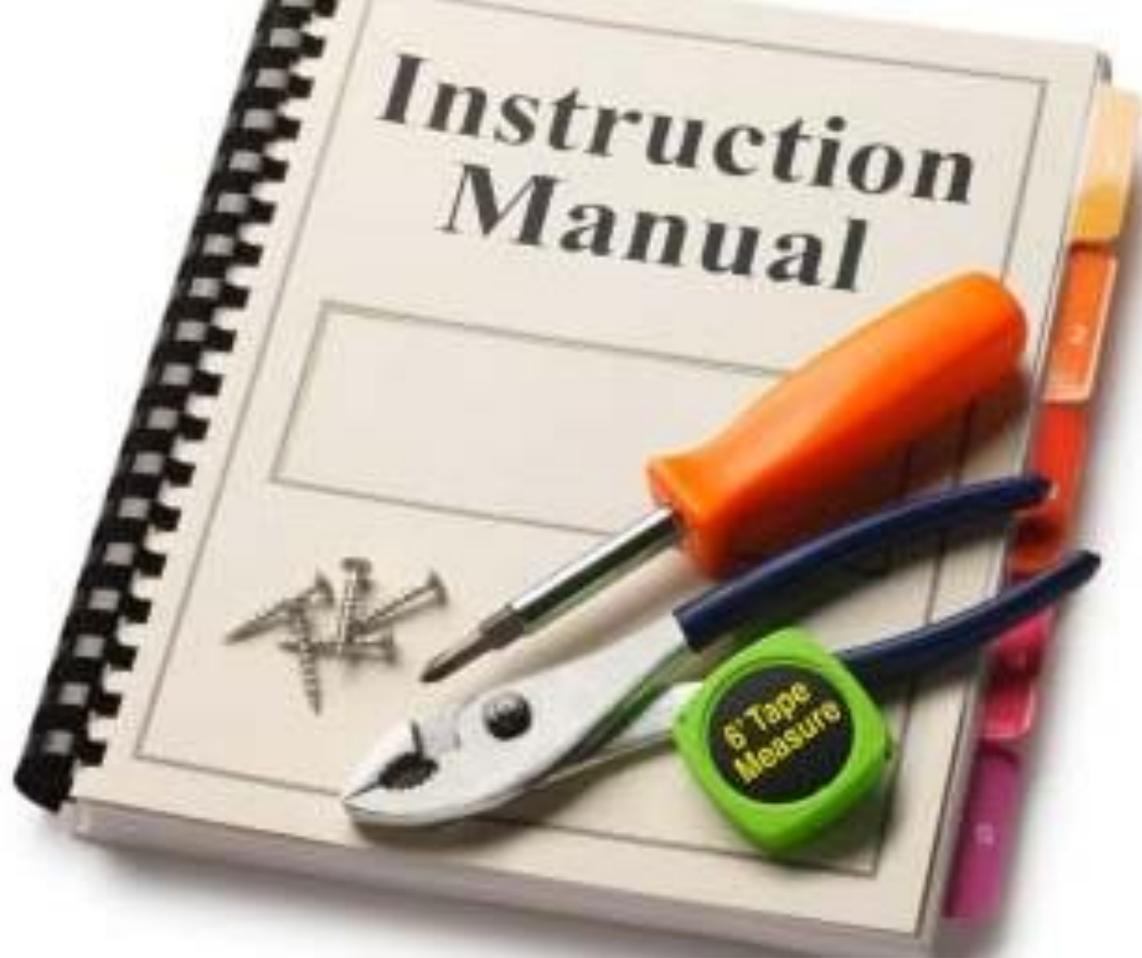


HOW GREAT PRODUCTS ARE DESIGNED.



S. Adams  
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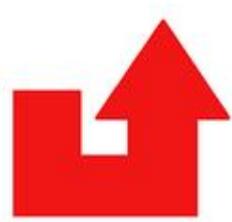




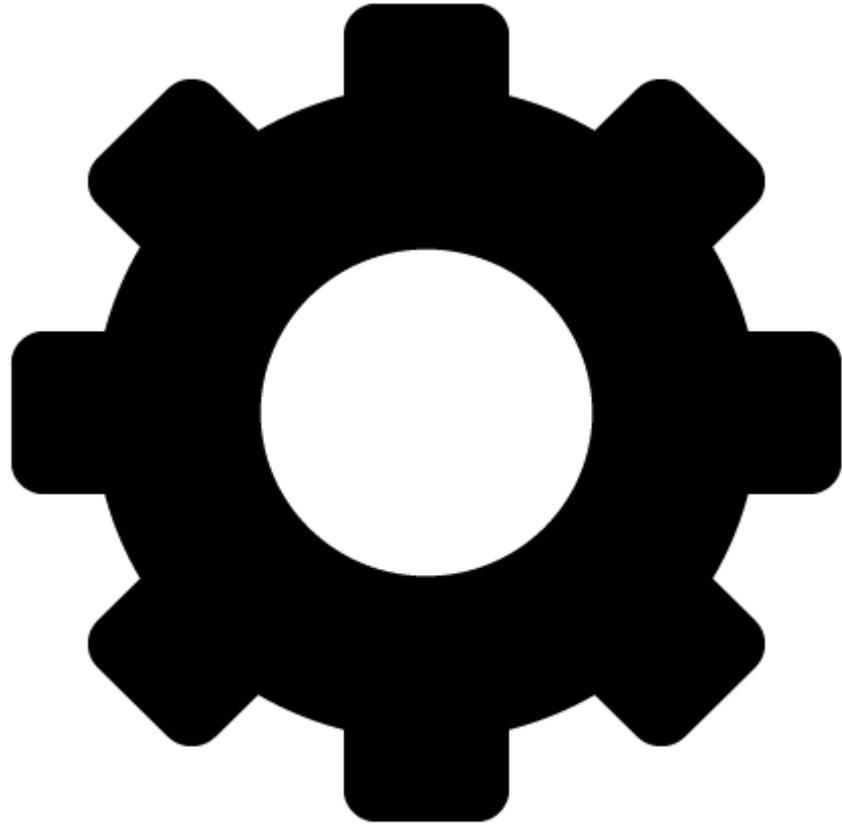
Instructions **cannot** compensate for poor design.













# Cisco IP Phone 7800 Series User Guide

## Book Contents

Book Title Page

Your Phone

Calls

Contacts

### Recent Calls

Voicemail

Applications

Settings

Accessories

Product Safety and Security

Find Matches in This Book

## Chapter: Recent Calls

> Chapter Contents

### Recent Calls Lists

You use the Recents lists to see the 150 most recent individual calls and call groups.

Calls in the Recents list are grouped if they are to and from the same number and are consecutive. Missed calls from the same number also get grouped.

### View Your Recent Calls

Check to see who's called you recently.

#### Procedure

- Step 1** Press **Applications** .
- Step 2** Select **Recents**.
- Step 3** Select a line to view.

### Return Recent Call

You can easily call someone who has called you.

#### Procedure

- Step 1** Press **Applications** .
- Step 2** Select **Recents**.
- Step 3** (Optional) If multiple lines exist, select **All Lines** or the required line.

# Toy Instructions

If something doesn't make sense to me...



Sad

I am an idiot. I am just not “good” at it.



Confused

There is something wrong with the instructions.



Angry

There is something wrong with the design.

# Why are instructions important?

- safety
- efficiency
- convenience

# Safety

- **WARNINGS**
- **CAUTIONS**
- **NOTES**

**WARNING**-TO AVOID DANGER OF SUFFOCATION, KEEP AWAY FROM  
BABIES AND CHILDREN. DO NOT USE IN CRIBS, BEDS, CARRIAGES OR PLAY PENS.

**THIS BAG IS NOT A TOY**



**Wearing of This  
Garment Does Not  
Enable You to Fly**



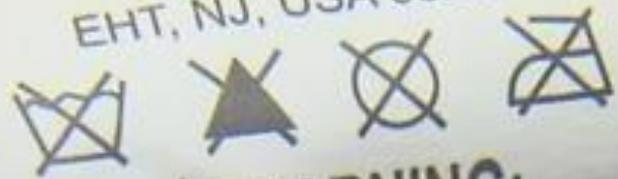
**GMA Investigates**

**HALLOWEEN COSTUME FIRE DANGER  
MATERIAL CAN IGNITE QUICKLY**

**abcNEWS**  
.com

Some companies would rather  
*take the easy way out* by putting  
on instructions instead of  
changing poor design.

EHT, NJ, USA 08234



**WARNING:**

Keep Away From Fire.

ATTENTION: Tenir loin du feu

**WARNING:**

CHOKING HAZARD-Small parts  
Not for children under 3 years.

ATTENTION: RISQUE DE SUFFOCATION  
Ne convient pas

TAKING ACTION FOR YOU

om

**HALLOWEEN COSTUME DANGERS**

CPSC RECOMMENDS "FLAME RESISTANT" COSTUMES

Made in/Fabri  
14-04-PAL001-SP  
ove This Labell



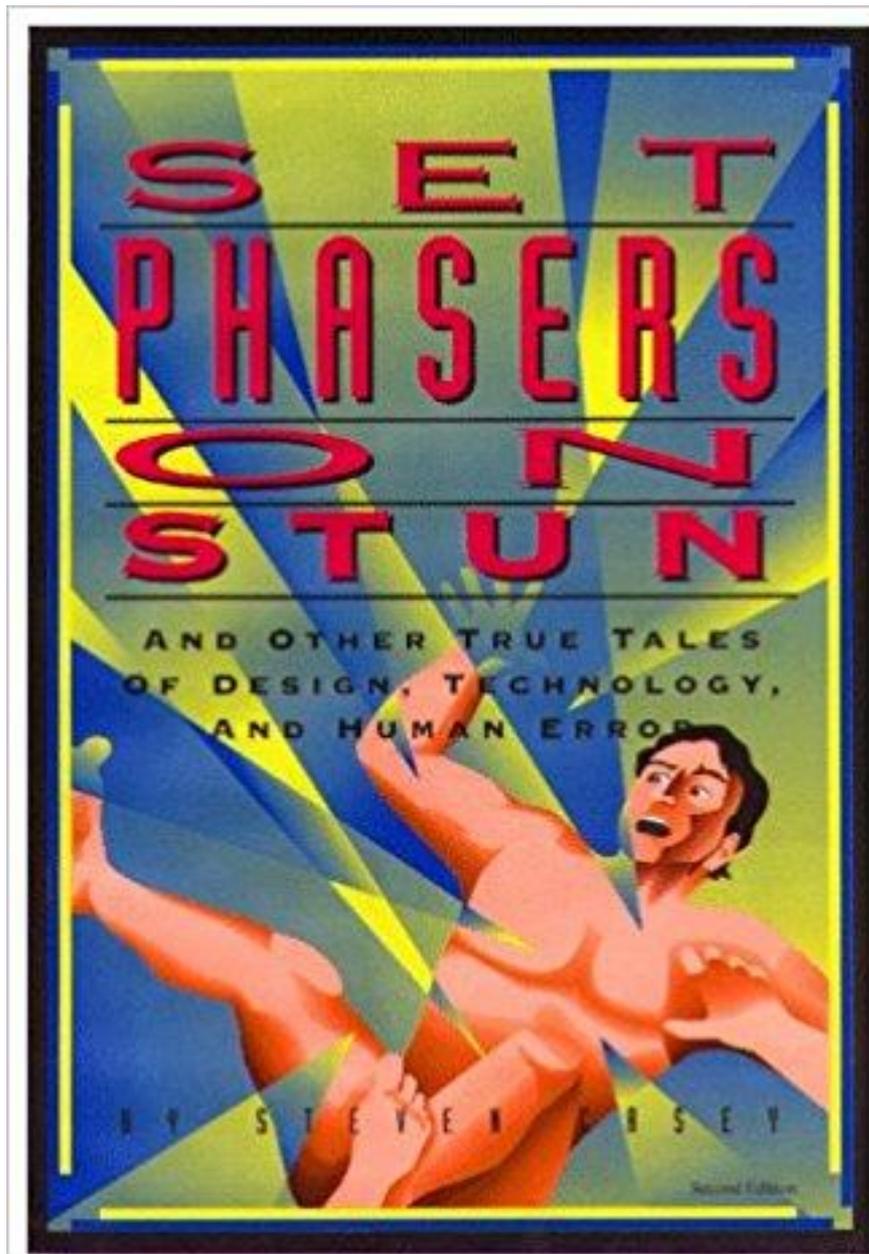
5:14 88°

SET  
PHASERS  
OZ  
STUN

AND OTHER TRUE TALES  
OF DESIGN, TECHNOLOGY,  
AND HUMAN ERROR

BY STEVEN LEBEY

Second Edition





# 80 year-old Stella Liebeck



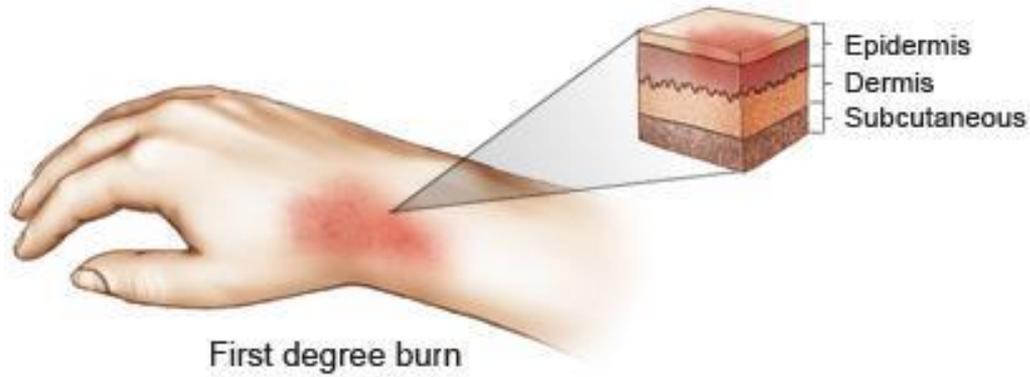


SHE HAD TROUBLE REMOVING THE LID, SO SHE PUT THE CUP BETWEEN HER LEGS FOR BETTER LEVERAGE.

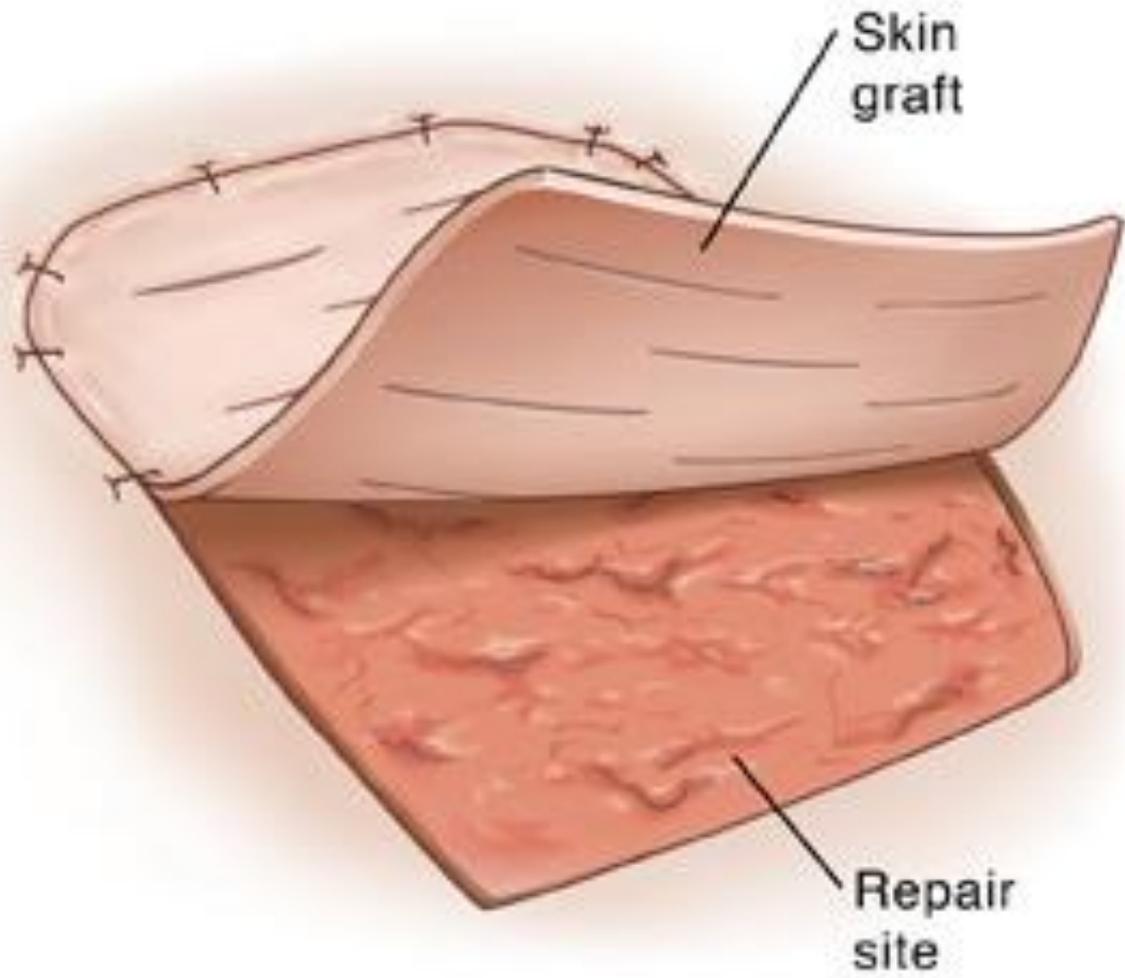


AS SHE OPENED THE LID, SCALDING HOT COFFEE SPILLED IN HER LAP.





Legs  
Lap  
Groin area



\$800

\$20,000



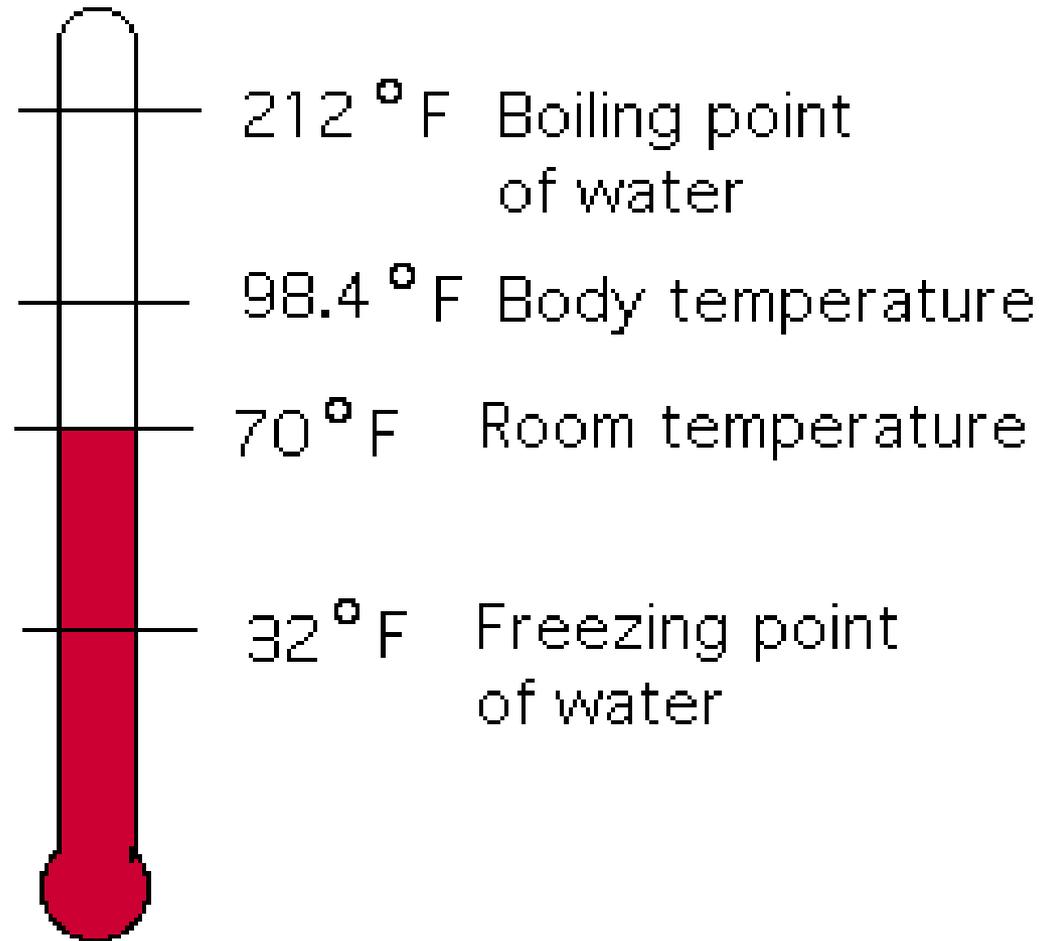
135°-140°



180°-190°



180°-190°



*Water temperature*      *Time for a third degree burn to occur*

155° F	68° C	1 second
148° F	64° C	2 seconds
140° F	60° C	5 seconds
133° F	56° C	15 seconds
127° F	52° C	1 minute
124° F	51° C	3 minutes
120° F	48° C	5 minutes
100° F	37° C	safe temperature for bathing



700+

**Complaints**



$180^{\circ}$ - $190^{\circ}$  = optimum flavor

Mr. Elliott, the juror, said he began to realize that the case was about

**"callous disregard for the  
safety of the people."**



# Why are instructions important?

- safety
- efficiency
- convenience

Industrial strength machine dish detergent  
that is highly caustic:

- User? Settings?
- Name?
- Color?
- Scent/odor?
- Instructions?

# Peppermint Twist











**ECOLAB**

**Ultra Kleene**

**12716**

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## Cott v. Peppermint Twist Mgt. Co.

**Annotate this Case**

**253 Kan. 452 (1993)**

**856 P.2d 906**

JOHN H. COTT, et al., Appellees and Cross-appellants, v. THE PEPPERMINT TWIST MANAGEMENT COMPANY, INC., et al., Appellants and Cross-appellees.

No. 67,575

**Supreme Court of Kansas.**

Opinion filed July 14, 1993.

Steve R. Fabert, of Fisher, Patterson, Sayler & Smith, of Topeka, argued the cause, and James P. Nordstrom, of the same firm, was with him on the briefs for appellants and cross-appellees.

What would you tell the researchers if you could go back in time?





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### Ecolab® ET Ultra Klene™ Warewashing Detergent - 5 Gal.



[OSHA SDS & MSDS](#)

>> Attacks Contamination <<



Does It Way Faster

**Item # EL-12716**

Ecolab 12716 Ultra Klene ET machine dish detergent gets it done right the first time, unlike others that leave disgusting crud and residue . . . wasting your time, money and damaging your hard-earned reputation will cost you far more. Top Choice: Restaurants, Resorts & Hotels, Class A Offices, Corporate Cafeterias, Schools, Universities, Grocery, Deli, Catering, Stadiums, Military, Hospitals, etc. Execs and others disgusted with little remnants of disgusting food and grease . . . that will absolutely kill your reputation for sanitation and cleanliness . . . and in the food business, folks will tell their friends and social media instantly. What's your reputation worth? Ecolab Ultra Kleen for when you need it done right and fast the first time . . .

5 Gal., ea

Manufacturer Item #: 12716

Quantity:

Others: \$420.98/PL

**Express: \$270.63/PL**

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  - Cleaning Chemicals >
  - OSHA Bottle Labels >
  - OSHA PPE & Safety >
  - OSHA & Staff Training >
  - Cleaning Tools & Gear >



# Poisoned tea traced to sugar mixup; Utah victim critical

By Michael Mcfall The Salt Lake Tribune

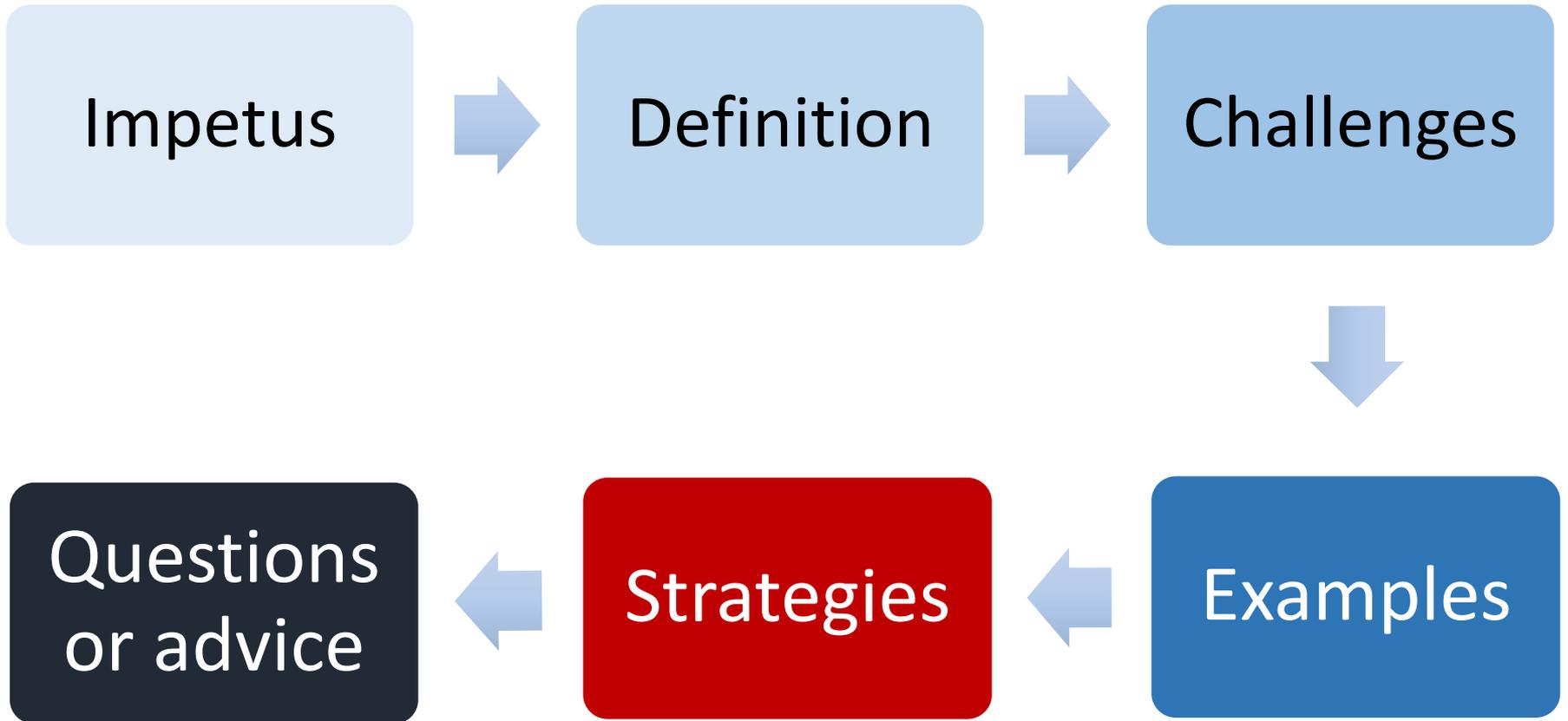
Published August 15, 2014 7:32 am



**Dickey's BBQ • Restaurant employee thought toxic cleaning agent was sugar, injured woman's attorney says.**

Do your research...

*Your best guess is*  
**NOT GOOD ENOUGH**



Impetus

Definition

Challenges

Questions  
or advice

Strategies

Examples

Students do not *innately*  
know how to conduct  
user research.

# Usability

“The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use.”

“There are many ways of measuring usability, and **no single measure** will be optimal for all projects.”

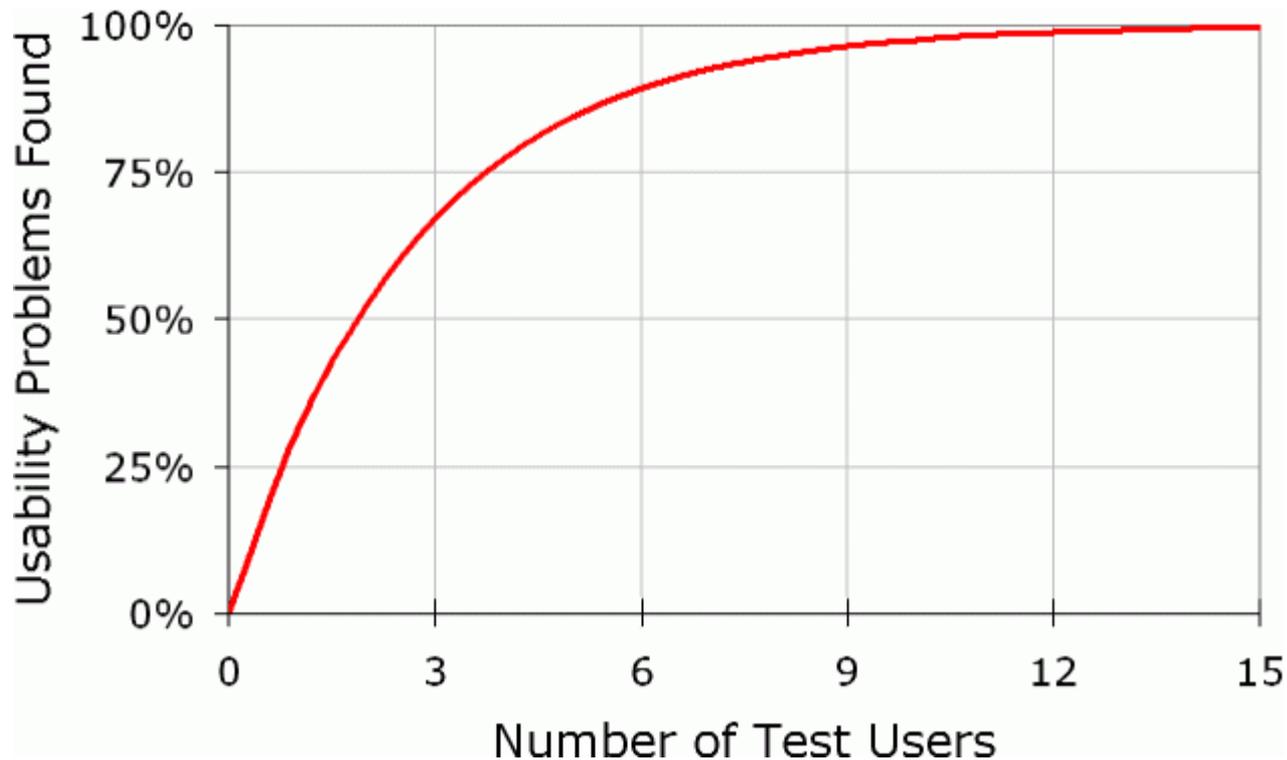


*Observation*

*Heuristic evaluation* is a review or “inspection” of a product by experts.

# Usability Testing: Testing with actual users

- Summative (end of the design process)
- Formative (during the design process)



To get good results from small studies, you need to incorporate the following essential elements:

- define the user profile
- create task-based scenarios
- use a think-aloud process
- make changes and test again



# OAKLAND UNIVERSITY

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## 'BIOBLITZ' TO HELP DOCUMENT BIODIVERSITY AT OAKLAND UNIVERSITY

[APPLY NOW](#)

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[TRANSFER](#)

*Admissions Events*

**TRANSFER INFO SESSION**

May 16





Developer watching videotape of usability test.

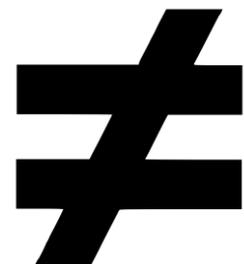
user-centered



**Pick TWO.**

Good

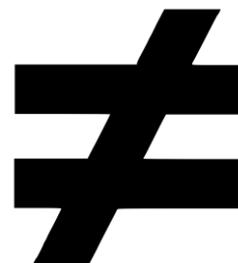
Cheap



Fast

Good

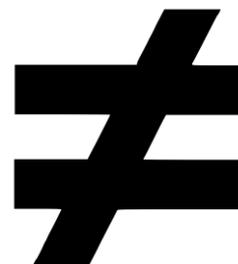
Fast



Cheap

Fast

Cheap



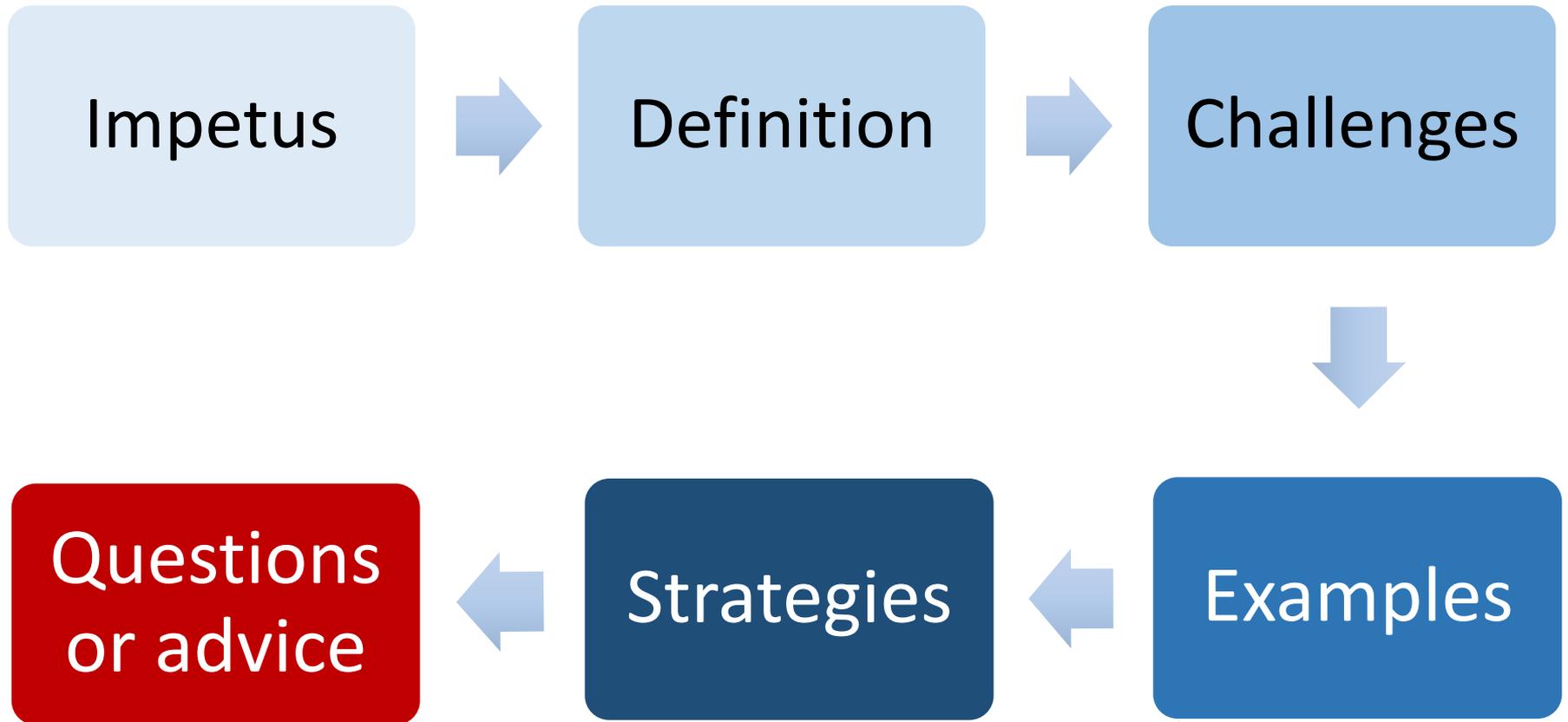
Good

**DON'T MAKE IT PERFECT**  
**or universal**

**DON'T MAKE EXCUSES**

**HAVE SHORT-TERM ACHIEVABLE**  
**GOALS**

**GO FOR IT**



How do/can you  
incorporate user-centered  
design into your classes?

# User-centered Design

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