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# How to develop usable application

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Computer Graphics Group



*Sun*  
microsystems



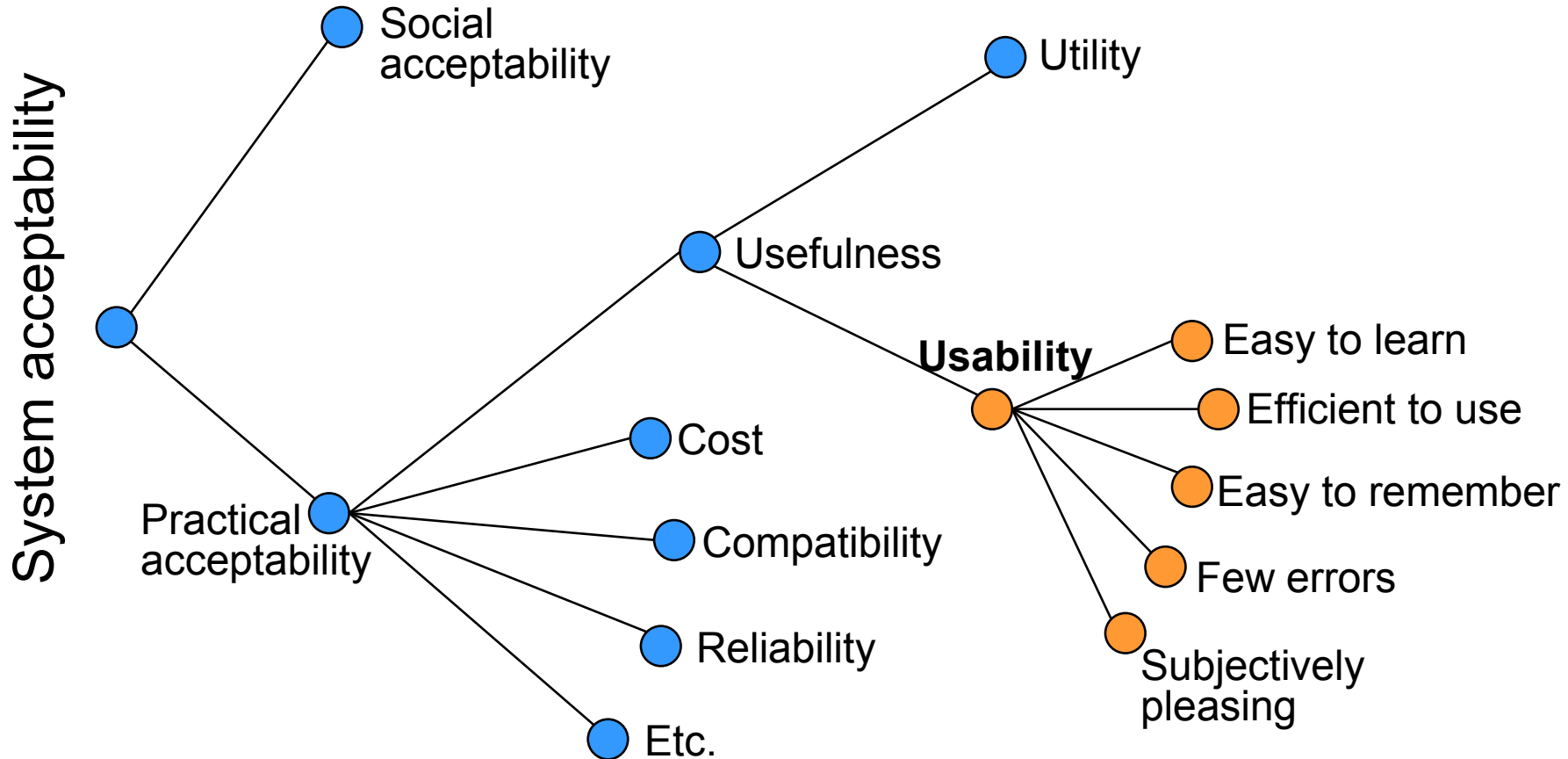
# What it is usability of an application?

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- how efficiently, easy and secure the user uses the application
  
- 3/4 of an application represents user interface



# What it is usability of the system?



Source: Jacob Nielsen, *Usability Engineering*



# Bad application design example

## Confusion at Palm Beach County polls

Some Al Gore supporters may have mistakenly voted for Pat Buchanan because of the ballot's design.

Although the Democrats are listed second in the column on the left, they are the third hole on the ballot.

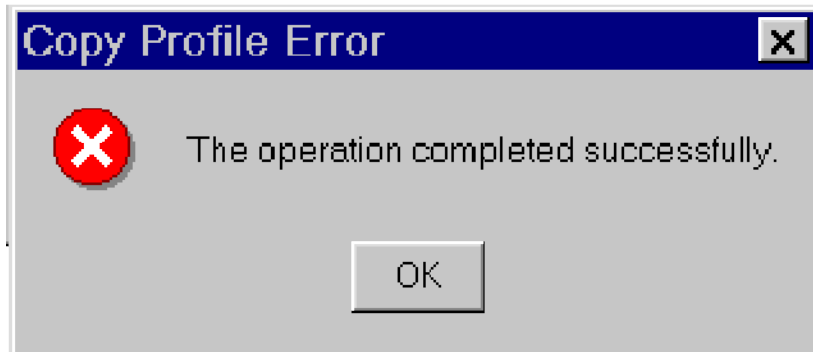
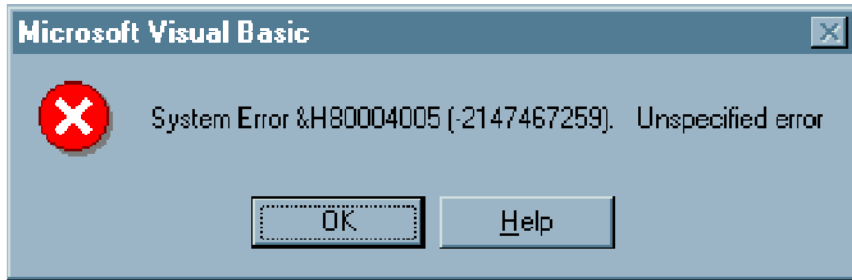
Punching the second hole casts a vote for the Reform party.

<b>ELECTORS FOR PRESIDENT AND VICE PRESIDENT</b> <small>(A vote for the candidates will actually be a vote for their electors.)</small> <small>(Vote for Group)</small>	(REPUBLICAN) GEORGE W. BUSH - PRESIDENT 3➔ DICK CHENEY - VICE PRESIDENT	○	Punching the second hole casts a vote for the Reform party.
	(DEMOCRATIC) AL GORE - PRESIDENT 5➔ JOE LIEBERMAN - VICE PRESIDENT	●	
	(LIBERTARIAN) HARRY BROWNE - PRESIDENT 7➔ ART OLIVIER - VICE PRESIDENT	○	
	(GREEN) RALPH NADER - PRESIDENT 9➔ WINONA LaDUKE - VICE PRESIDENT	○	
	(SOCIALIST WORKERS) JAMES HARRIS - PRESIDENT 11➔ MARGARET TROWE - VICE PRESIDENT	○	
	(NATURAL LAW) JOHN HAGELIN - PRESIDENT 13➔ NAT GOLDHABER - VICE PRESIDENT	○	
	(REFORM) PAT BUCHANAN - PRESIDENT 4➔ EZOLA FOSTER - VICE PRESIDENT	○	
	(SOCIALIST) DAVID McREYNOLDS - PRESIDENT 6➔ MARY CAL HOLLIS - VICE PRESIDENT	○	
	(CONSTITUTION) HOWARD PHILLIPS - PRESIDENT 8➔ J. CURTIS FRAZIER - VICE PRESIDENT	○	
	(WORKERS WORLD) MONICA MOOREHEAD - PRESIDENT 10➔ GLORIA La RIVA - VICE PRESIDENT	○	
<b>WRITE-IN CANDIDATE</b> <small>To vote for a write-in candidate, follow the directions on the long stub of your ballot card.</small>			

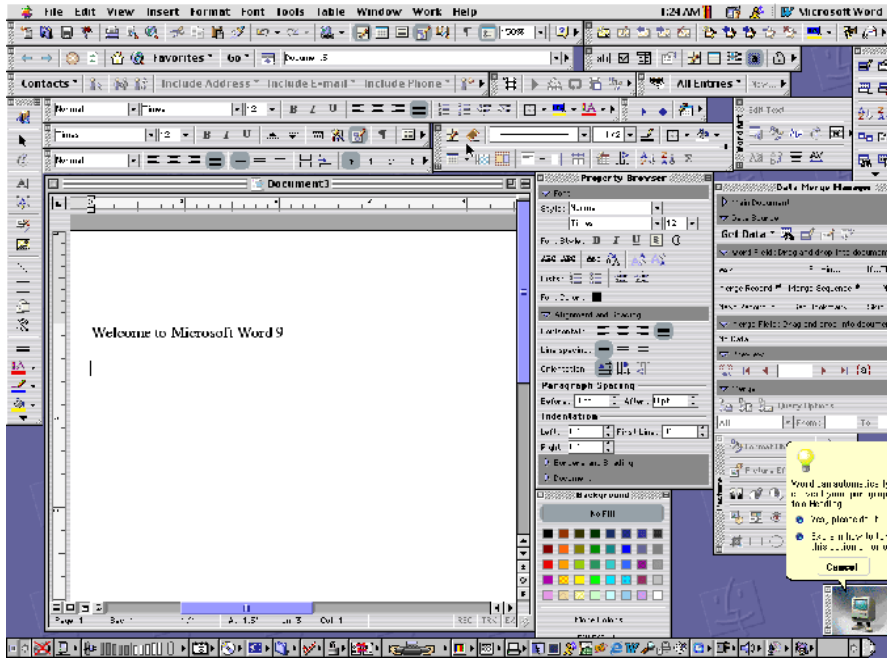
Sun-Sentinel graphic



# Bad application design example



# Bad application design example



# What is the problem and how to solve it?

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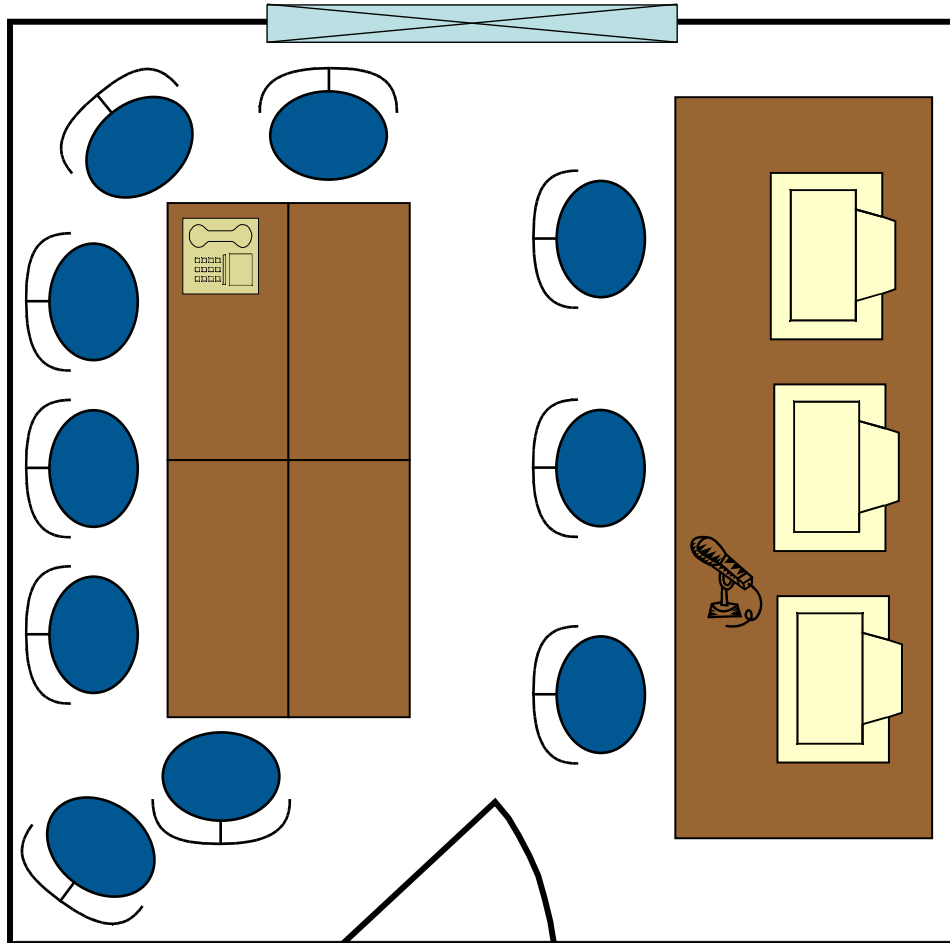
- Problem: design without involvement of the user
- Solution: allow the user to participate in the design
- Advantages of usability testing
  - real user involved into the development process
  - helps finding the optimal user interface
  - discovers errors in early stage of the development process



# Usability Lab – usability testing

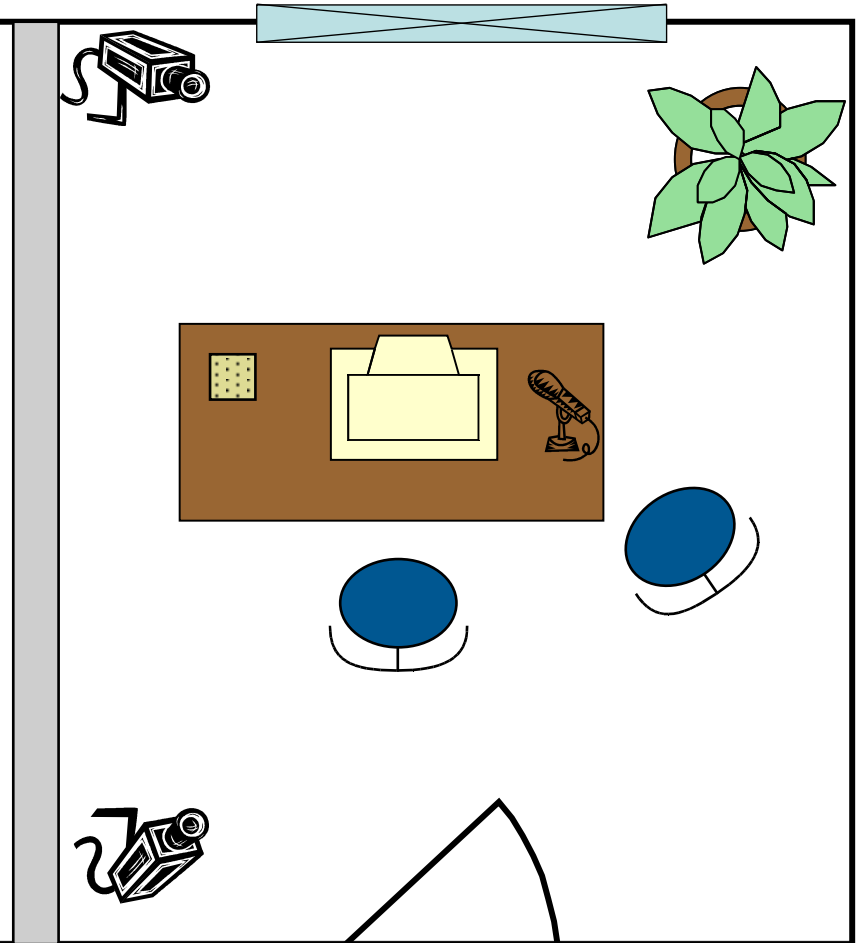
## Observer room

(UI designers, programmers, test organizers)



## Participants room

(test participant, moderator)





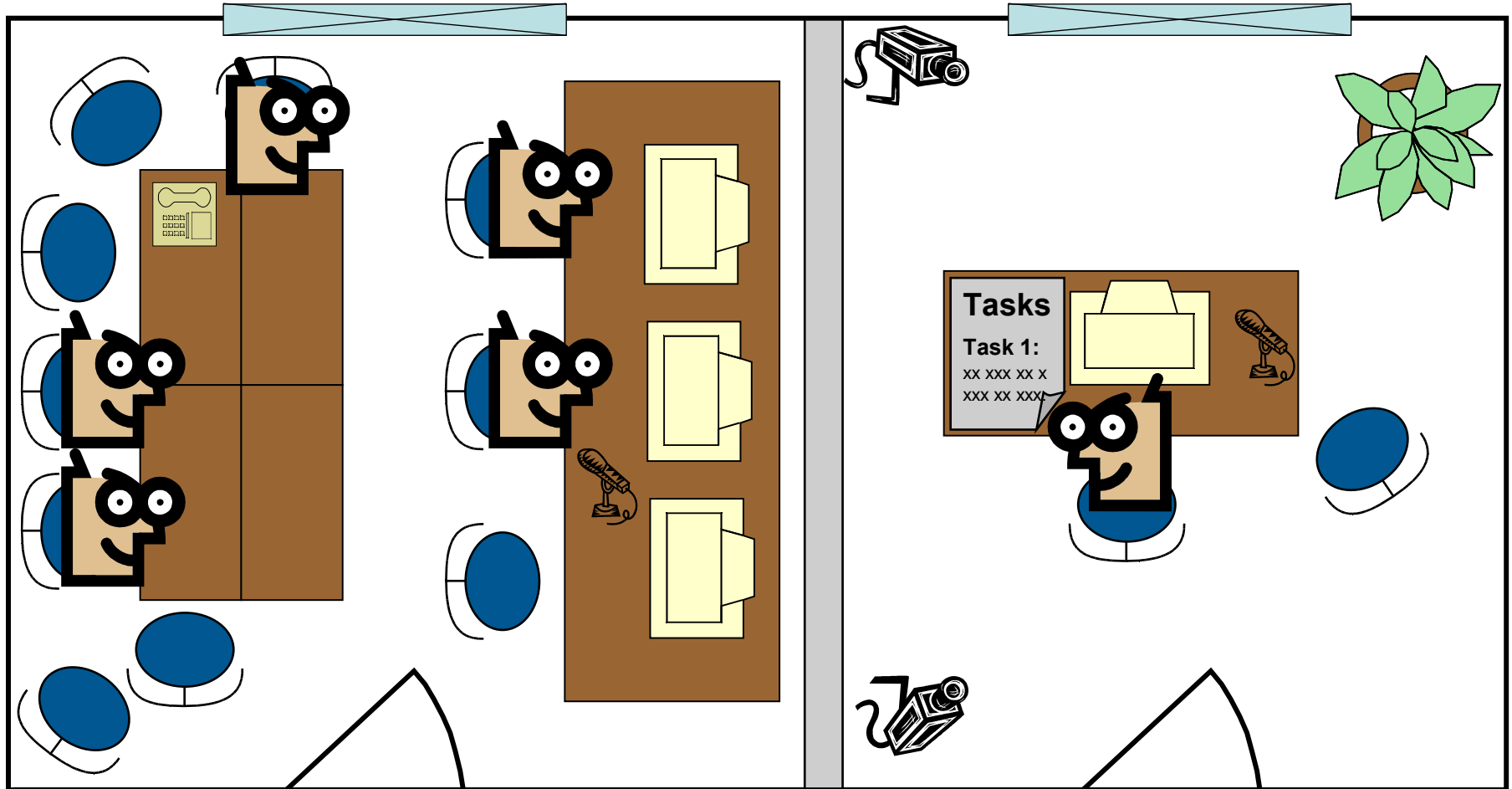
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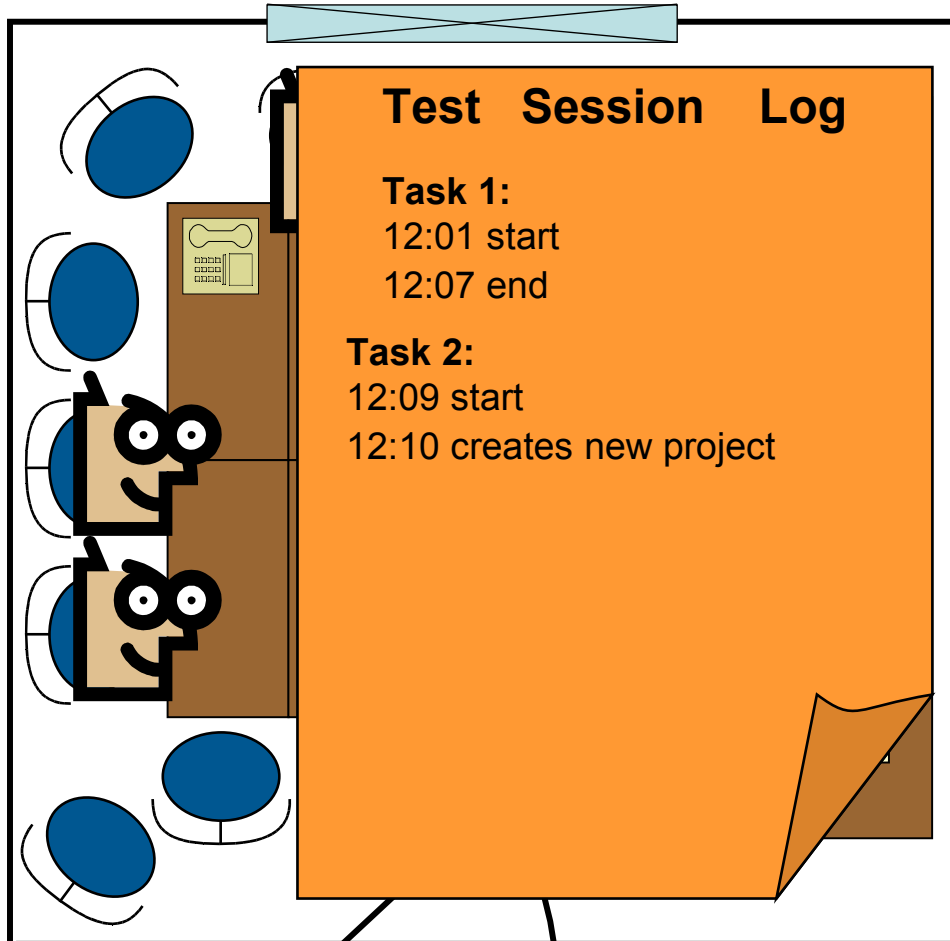
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# Usability Lab – usability testing

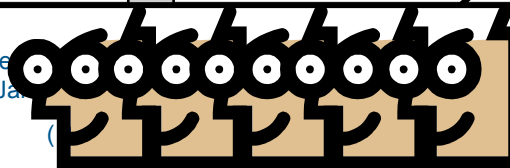
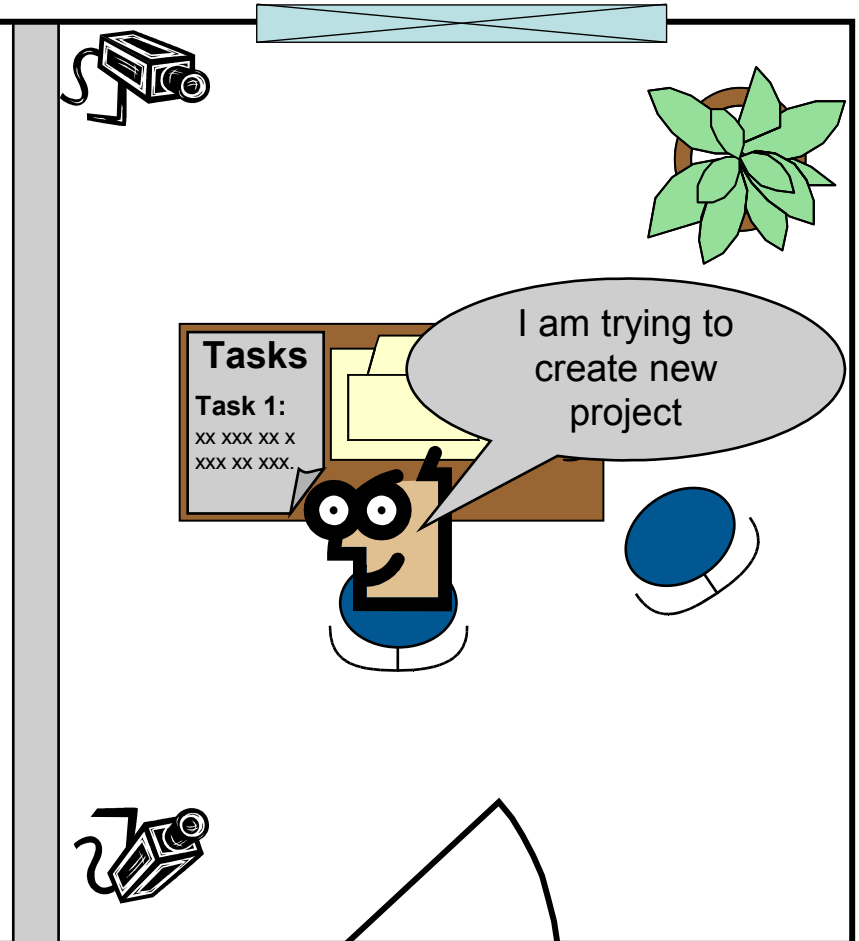
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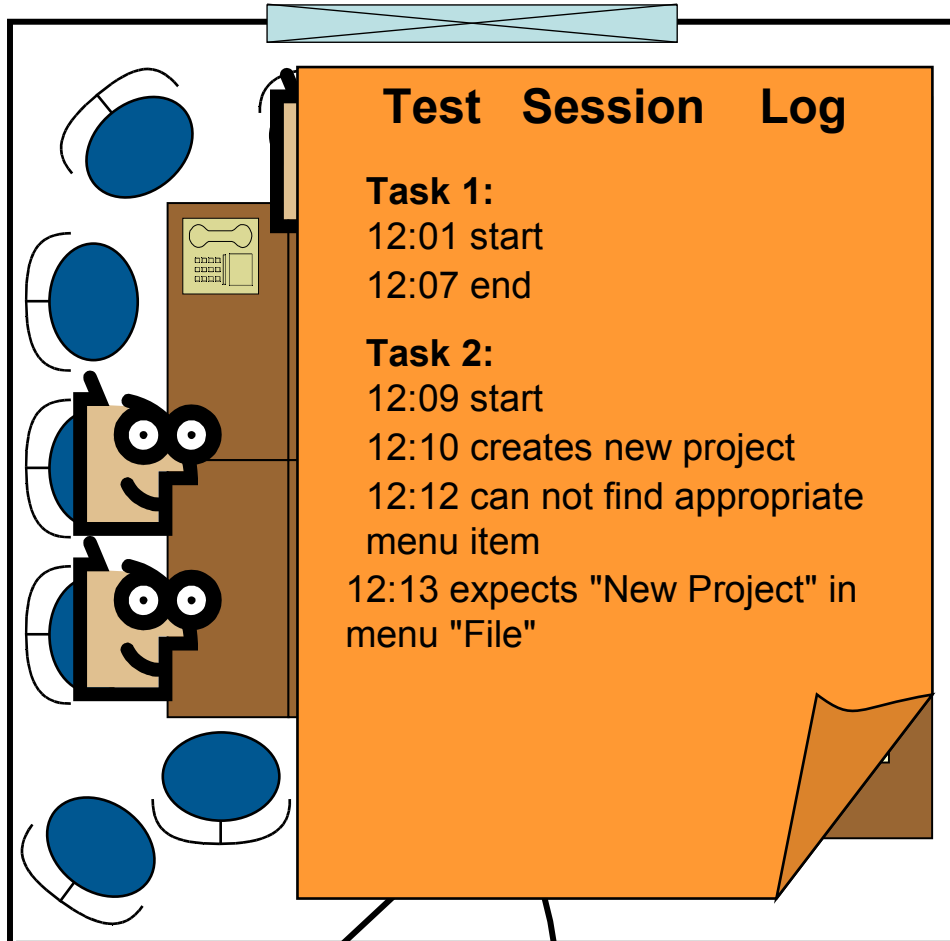
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# Usability Lab – usability testing

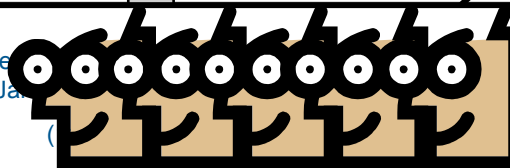
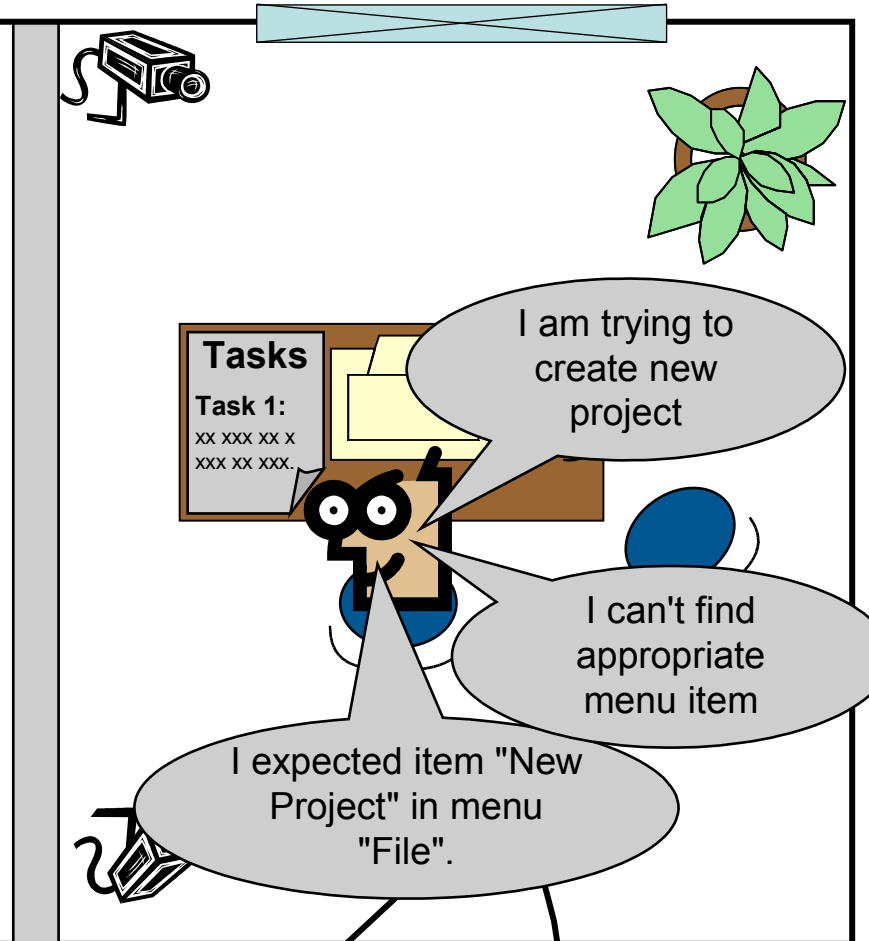
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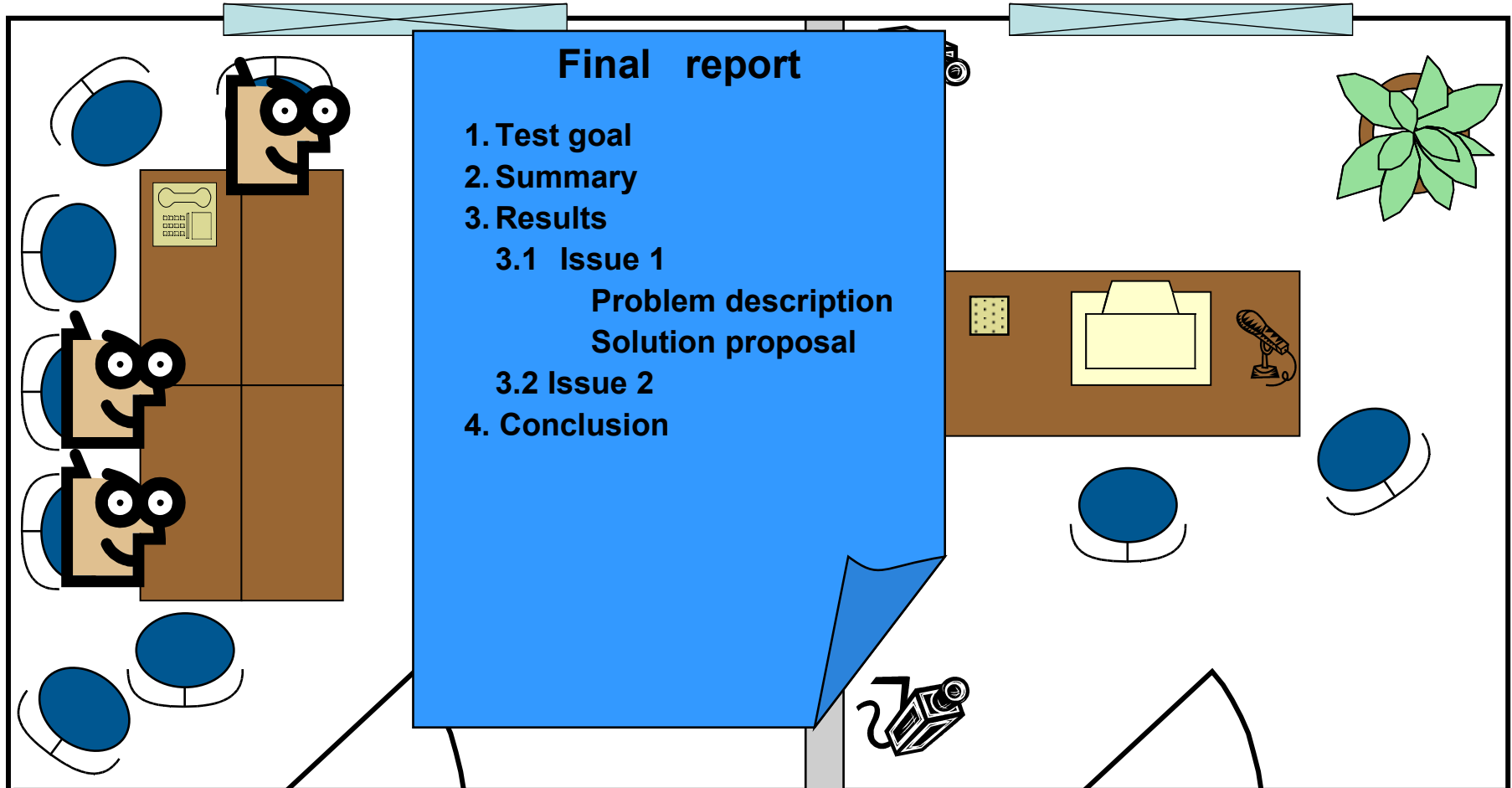
# Usability Lab – usability testing

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# Usability Test I: Mobile vector editor



Construction site

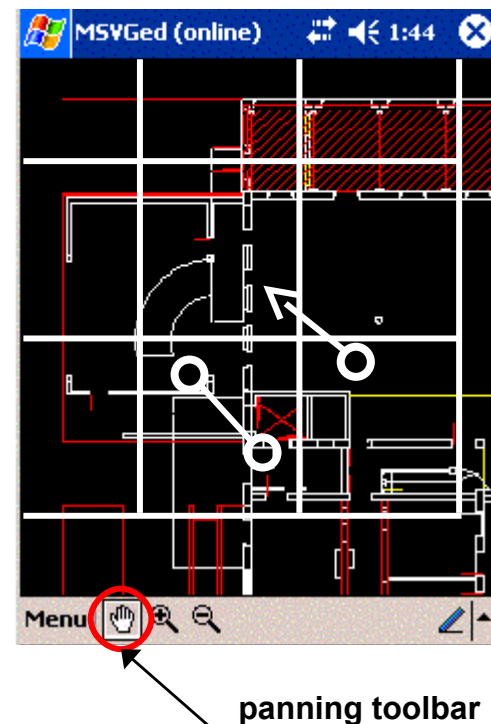
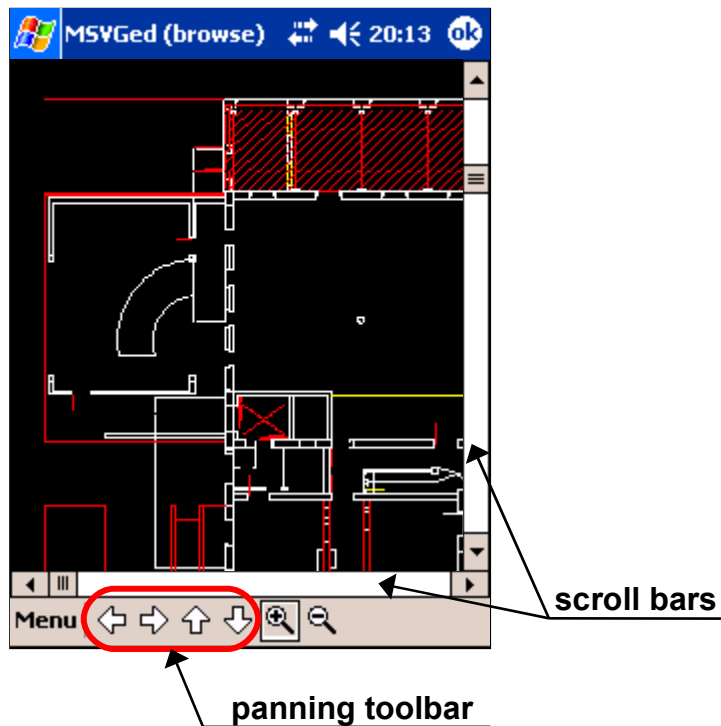


Inspector



# Navigation techniques

- scroll bars vs. grasp hand
- non-real time repainting -> feedback problem



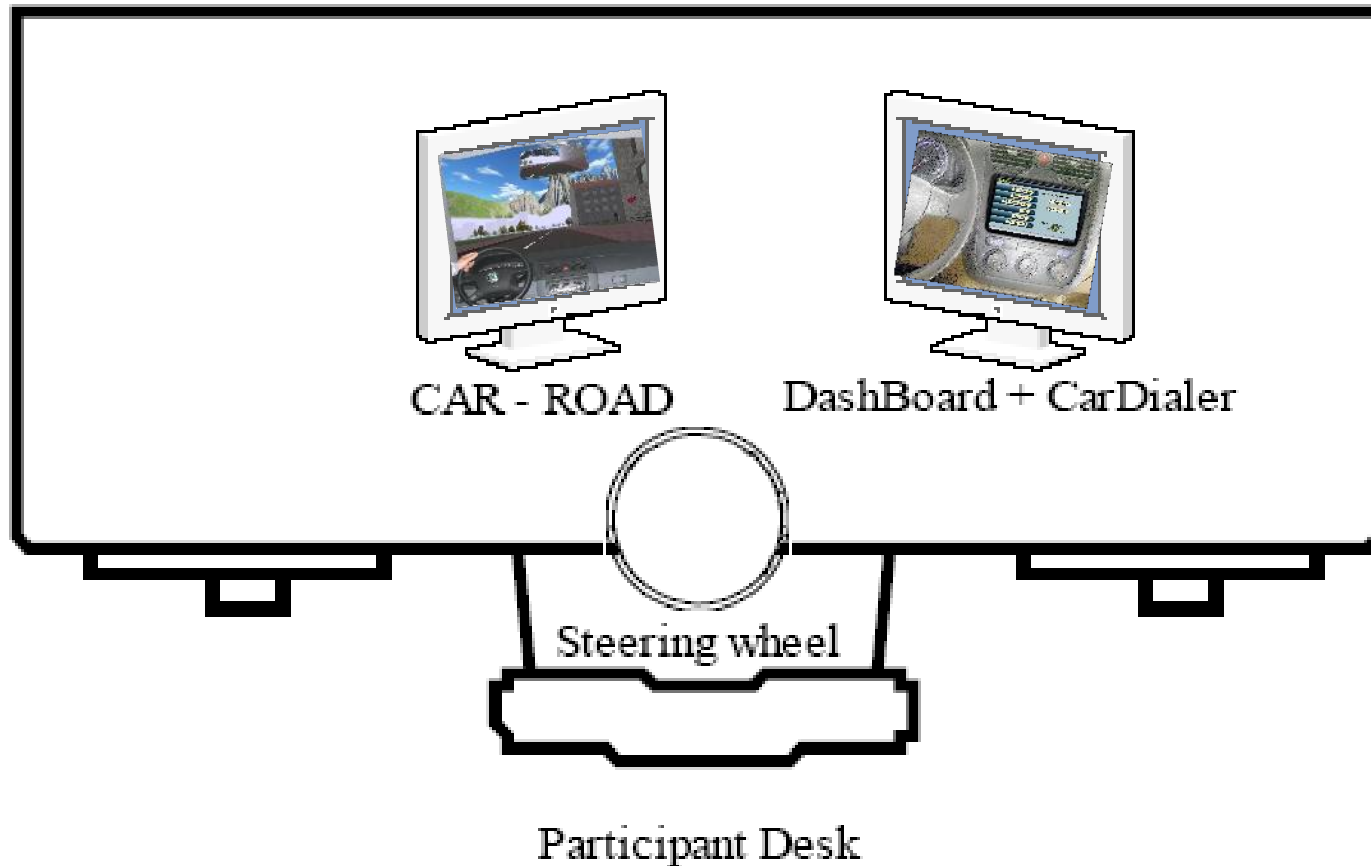
# Usability test II: CarDialer





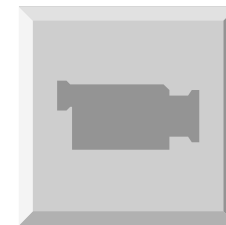
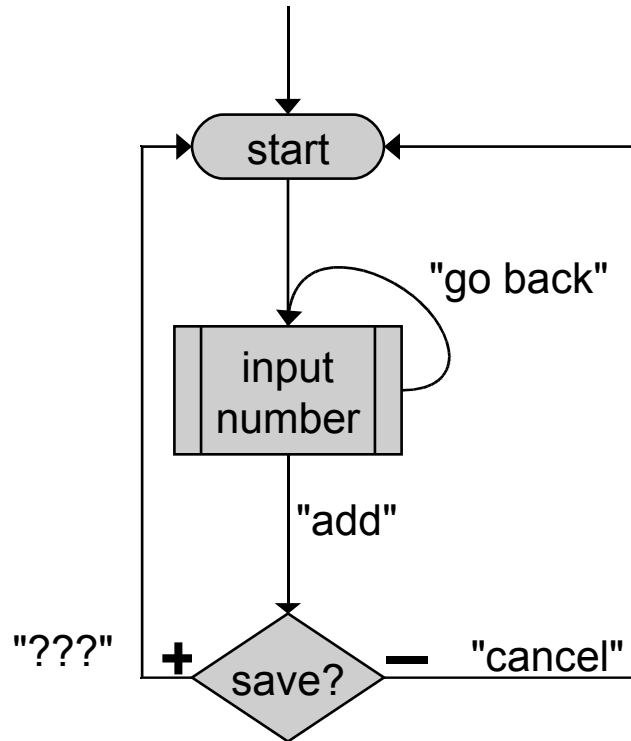


# CarDialer – Test setup



# Testing

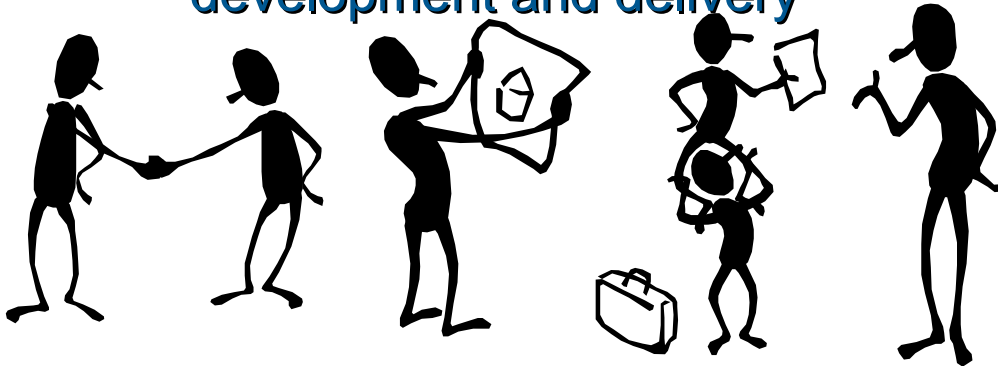
- CarDialer – "cancel, go back"



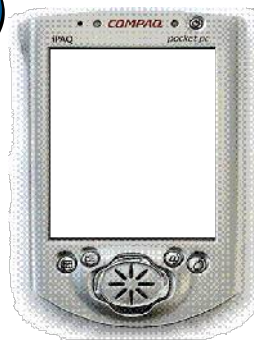
# Courses where usability testing is involved

- Software engineering

- a real life project development and delivery

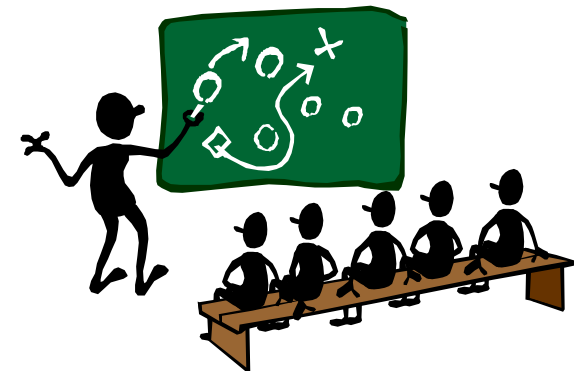


- PDA (Design of mobile applications)



- HCI courses

- HCI development
- Mockup test
- Usability test



# Benefits of usability testing for HCI research

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- research of user behavior while communicating with computer
- design of novel user interfaces
- design of new methods of interaction in special environments
  - mobile environment
  - users with special needs
  - multimodal communication



# Usability tests saves money

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- as sooner you find an error as cheaper it is
- each dollar invested into better usability saves 10-100 USD
- PARADOX: efficient method ! rare usage



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# Thank You

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