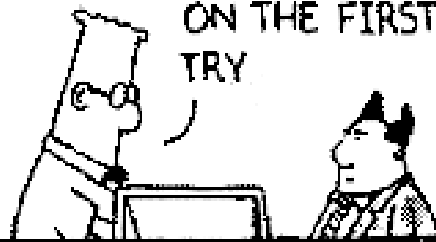


WE COULD DESIGN THE  
PRODUCT WITH A SIMPLE  
POINT-AND-CLICK  
INTERFACE . . .



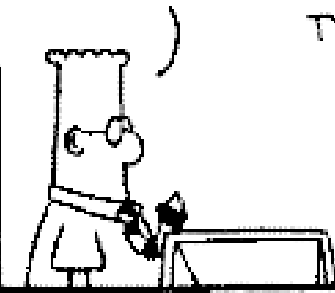
E-Mail: SCOTTADAMS@AOL.COM  
S Adams

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



© 1994 United Feature Syndicate, Inc.  
9-10

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



MAKE IT  
SO THEY  
HAVE TO  
REBOOT  
AFTER EVERY  
TYPO.

# Software Prototyping

Prototypes as Assets not Toys

Why and How to Extract Knowledge from prototype

Kurt Schneider, May 1996

# Agenda

- Definition of Prototype
- History of Prototyping
- Uses of System Prototypes
- Taxonomy of Prototypes
- Prototyping languages
- Pros & Cons
- Prototyping, to use or not ?
- Designing a prototype

# What can be a prototype?

- Sketches
- Diagrams & Frameworks
- Machined construction
- Virtual models
- Graphics
- Role play, Experiences
- Video
- And more ...

# Definition

- Article – A tool to explore the introduction of computer into new domains
- Wikipedia – An activity during certain software development, is the creation of prototypes, i.e., incomplete versions of the software program being developed

- Reference 1 – Animating and demonstrating system requirements

Reference 2 – A representation of a design before the final artifacts exist

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# Sketching

Paper mock-up of the interface look, feel, functionality

- Quick and cheap to prepare and modify
- Initial representation/user reaction
- Elicit user modifications / suggestions

Invite

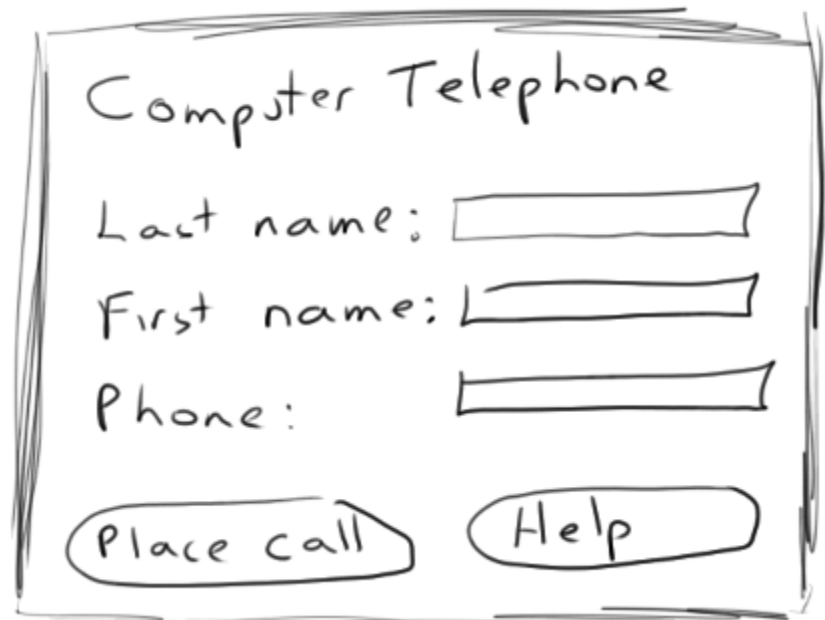
Suggest

Explore

Question

Propose

Provoke



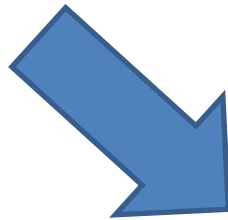
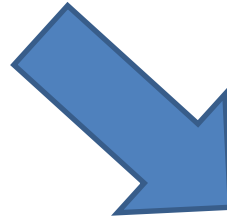
# From Sketching Low Fidelity Prototypes

Computer Telephone

Last name:

First name:

Phone:



**Computer Telephone**

Last Name:

First Name:

Phone:

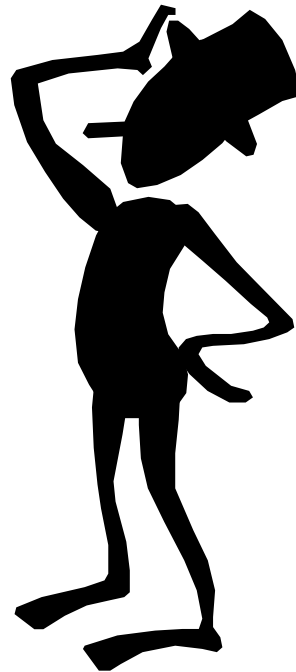
# And the story continues...

- From Sketches and low fidelity prototypes to medium / high fidelity prototypes



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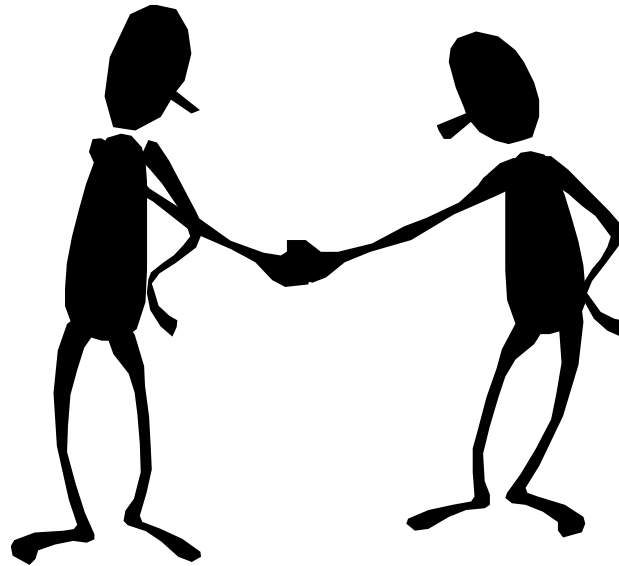
The user is  
just  
like me

Golden rule of interface design:

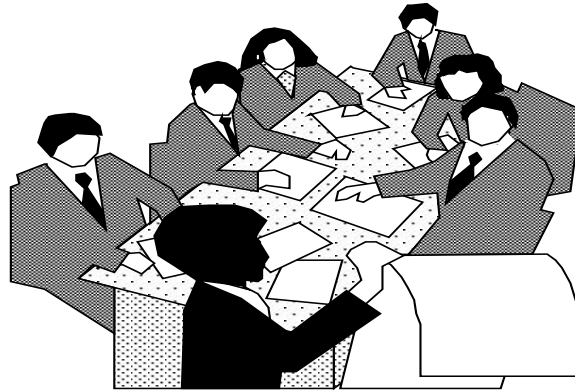
***Know The  
User***

# Uses of System Prototypes

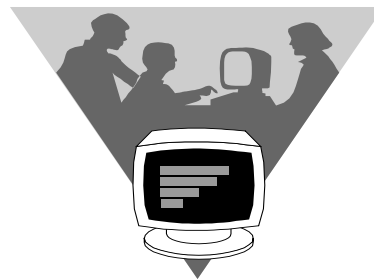
- The principal use is to help customers and developers understand the requirements for the system



- The prototype may be used for user training before a final system is delivered



- The prototype may be used for back-to-back testing



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## Role of prototype:

## Presentation prototype

### Description and characteristics:

- Early project phase, supports acquisition of project, attracts customers
- Will be abandoned
- Covers only very limited part of the target system (mostly user-interface)

## Role of prototype:

## Prototype proper

### Description and characteristics:

- Parallel to modeling the application domain, a temporary, executable system is developed
- Covering several functions and the user-interface
- The prototype lacks important properties of the target system (e.g., error handling)

## Role of prototype:

## Breadboard

### Description and characteristics:

- Derived from a domain model or specification to allow study of alternative solutions
- Also to foster creativity of developers

## Role of prototype:

## Pilot System

### Description and characteristics:

- No distinction between prototype and target system
- Prototype is actually used in the application domain as kernel of the full target system, evolves gradually

# Purpose of prototype

Approach	Purpose	Investigating
Explorative	Elicit requirements, determine scope and different alternatives of the computer support	Requirements
Experimental	Try out technical Solutions to meet requirements	Particular solutions
Evolutionary	Continually adapt a system to a rapidly changing environment	Evolving requirements and solutions

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# Prototyping languages

Language	Type	Application domain
Smalltalk	Object-Oriented	Interactive systems
Java	Object-Oriented	Interactive systems
Prolog	Logic	Symbolic processing
Lisp	List-based	Symbolic processing
Miranda	Functional	Symbolic processing
APL	Mathematical	Scientific systems
4GLs	Database	Business DP

# Choice of prototyping language

- What is the application domain of the problem?
  - What user interaction is required?
  - What support environment comes with the language?
- 
- Different parts of the system may be programmed in different languages. However, there may be problems with language communications

# Database programming languages

- Domain specific languages for business systems based around a database management system
- Normally include a database query language, a screen generator, a report generator and a spreadsheet.
- The language + environment is sometimes known as a fourth-generation language (4GL)

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# Pros & Cons

## Pros:

- Misunderstandings between software users and developers are exposed
- Missing services may be detected
- Confusing services may be identified
- A working system is available early in the process

# Pros & Cons

## Pros:

- The prototype may serve as a basis for deriving a system specification
- Reduced time and costs
- Improved and increased user involvement

# Pros & Cons

## Cons:

- Insufficient analysis
- User confusion of prototype and finished system
- Developer misunderstanding of user objectives
- Developer attachment to prototype
- Excessive development time of the prototype
- Expense of implementing prototyping

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# Prototyping, to use or not ?

There is no constant rule but ...

- Design and analysis of on-line systems (e.g. transactions processing)
- In general, application that need a lot of interaction with the user

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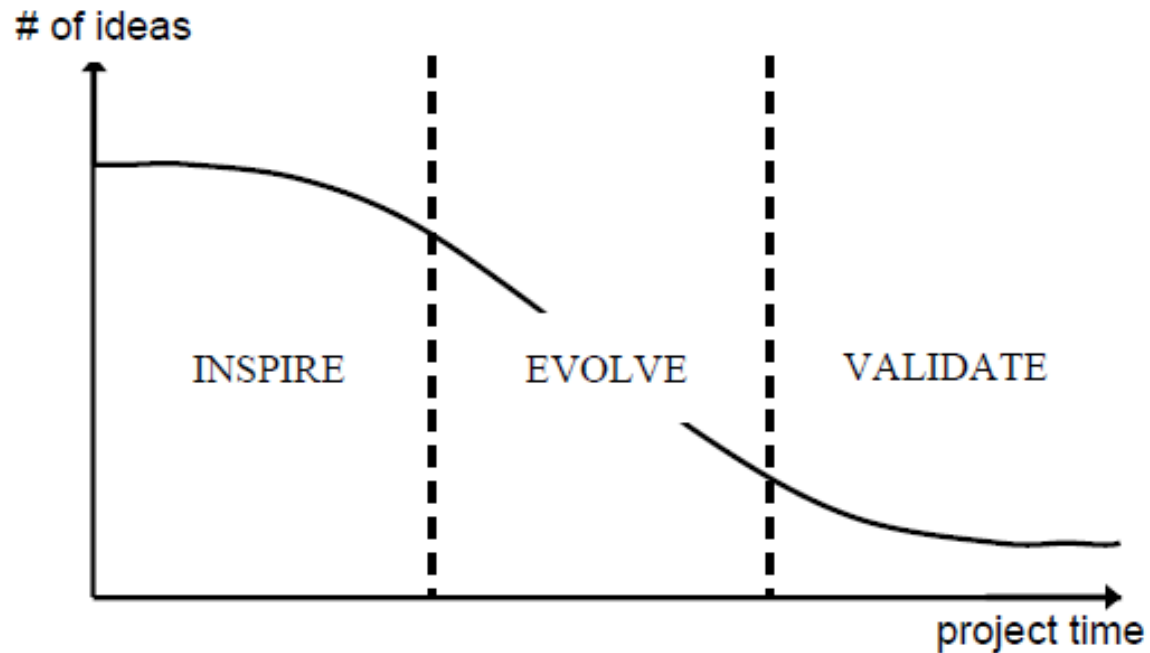
# Designing a prototype

Open mind and ideas first !!!

- Quality is a function of the number of iterations and refinements a design undergoes before it hits the street
- To get a good idea, get lots of ideas.

# Designing a prototype

## 3 stages of prototyping



prototype driven specs → spec driven prototypes

# Designing a prototype

- Choose what aspects to prototype for relevance to your project goals
- Identify measurable design goals
- Good enough to provide feedback but flexible enough for significant changes to be made down the line

Thank you  
for  
listening