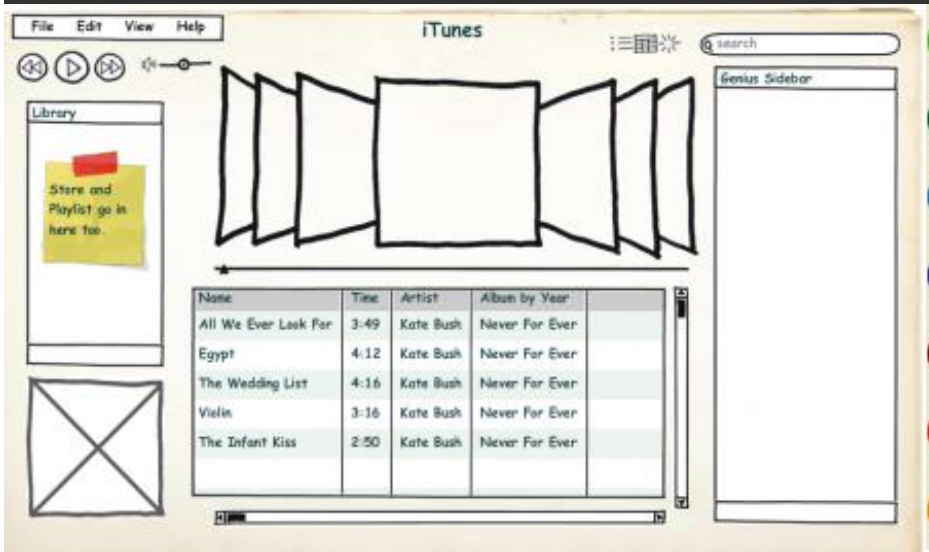
MONASH University

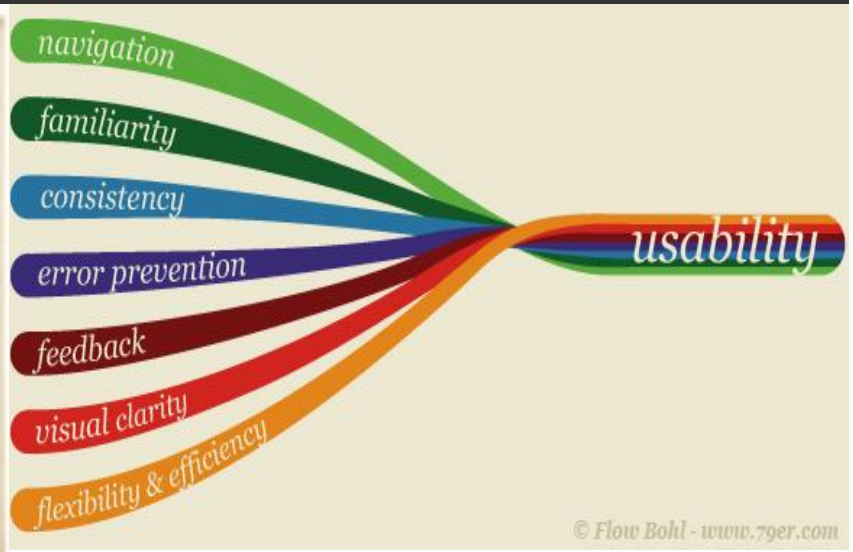
Information Technology

FIT2001 – Systems Development

Seminar 7.1 Investigating system requirements – Prototyping
Usability of systems

Chris Gonsalvez





Our road map:

- What are Information Systems?
- How do we develop them? Systems Development (SDLC) – key phases
- Traditional vs. Agile approaches to developing systems
- Some System Development roles and skills
- Understand the requirements gathering process
- Managing stakeholders
- A range of Requirements gathering and documentation techniques: User Story Mapping, User Stories, Activity Diagrams, Use Case Diagrams, Domain Class Models

Some more Requirements gathering techniques:

- Prototyping
- Usability of systems

At the end of this seminar you will:

- Be able to explain the role of prototyping in systems development – the advantages and disadvantages
- Understand the process for developing suitable prototypes for a given scenario
- Appreciate the need to develop usable systems
- Understand the benefits of considering usability in interface design

FIT2001 Student feedback

“I wanted to thank you for teaching me as your subject gave me a solid foundation for the work that I've been doing during my IBL placement at PwC. A significant portion of the content from FIT2001 has been relevant in some way. At first I was working on the Fraud and Forensics team as a data analyst and was able to apply what I'd learnt about stakeholder management and communicating with non-technical employees. A couple of times, I tried to get some experience with the Digital Change team and I think that I was welcomed onto the UX team (a sub-team within Digital) during the last six weeks of my placement because I had been able to demonstrate a good understanding of UX and the agile methodology ….

FIT2001 Student feedback (cont.)

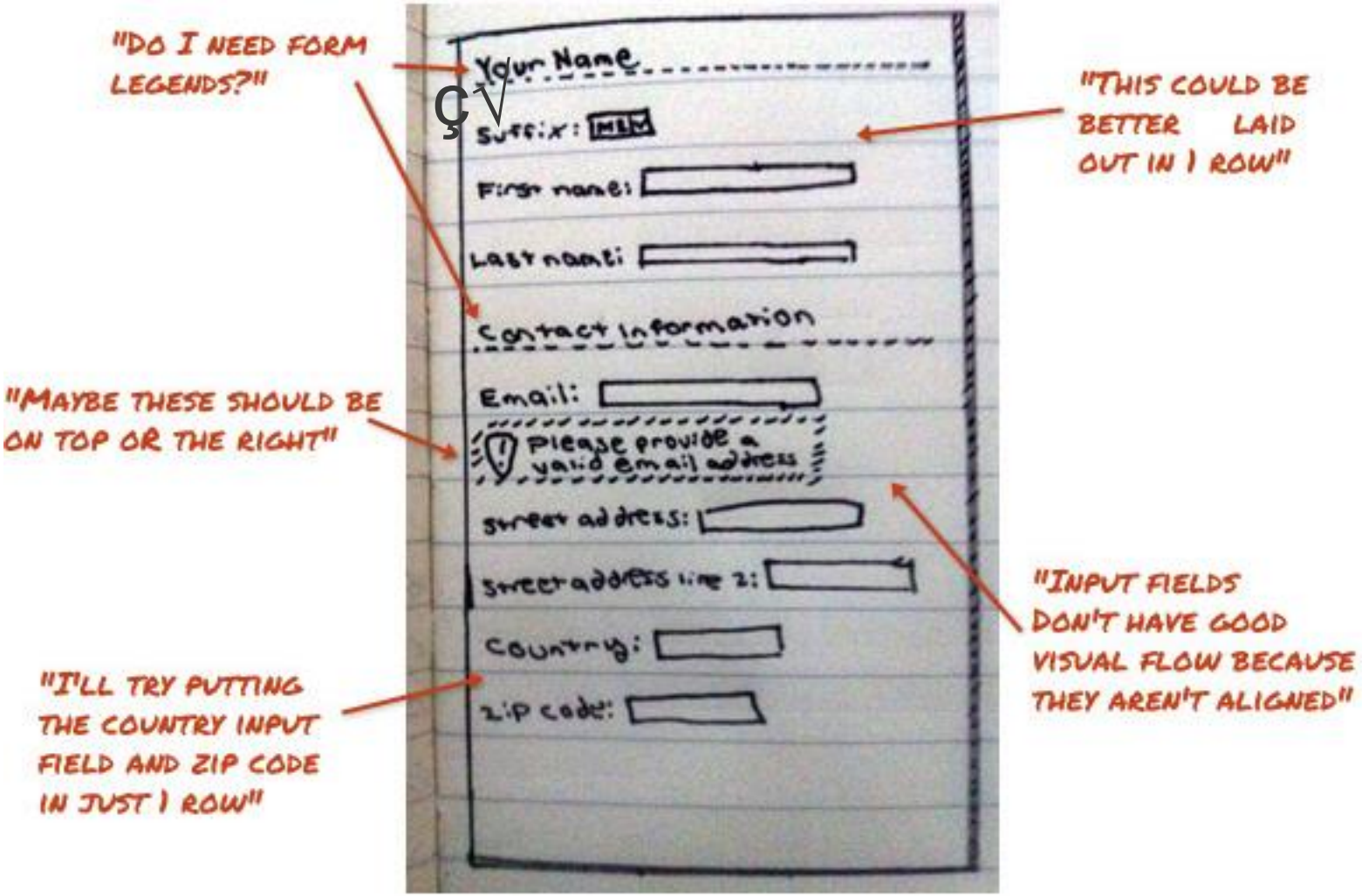
… I was able to follow the "UX lingo" with ease and required very little training when it came to conducting research, documenting business findings, creating personas/user journeys/user stories and designing prototypes. It was fantastic to join in on real stakeholder interviews and help conduct client workshops to understand the business and user requirements. After two weeks with the UX team, a contractor asked me about my background in UX, assuming I'd been in the field for a while, and I admitted that I'd only ever learnt the theory in University - this was my first UX project. I think that says a lot about the preparation I received.

I think it's fair to say that without FIT2001 and its well-structured curriculum I would not have been as successful during my placement, given such interesting tasks and maybe not have had the chance to work with the UX team at all."

Lecture Outline:

1. Prototyping Overview
2. Prototyping Process
3. Prototyping Example
4. Usability Issues
5. Usability Definition
6. Usability Importance
7. Usability Poor Examples
8. Usability Evaluation
9. Usability Cost

Prototyping – a picture speaks a thousand words



What is Prototyping?

- The process of quickly mocking up the future system functionality
- Uses visuals to describe thousands of words worth of design and development specifications that detail how a system should behave and look.
- It can be throw-away (experimental) or evolutionary
- It can be horizontal or vertical

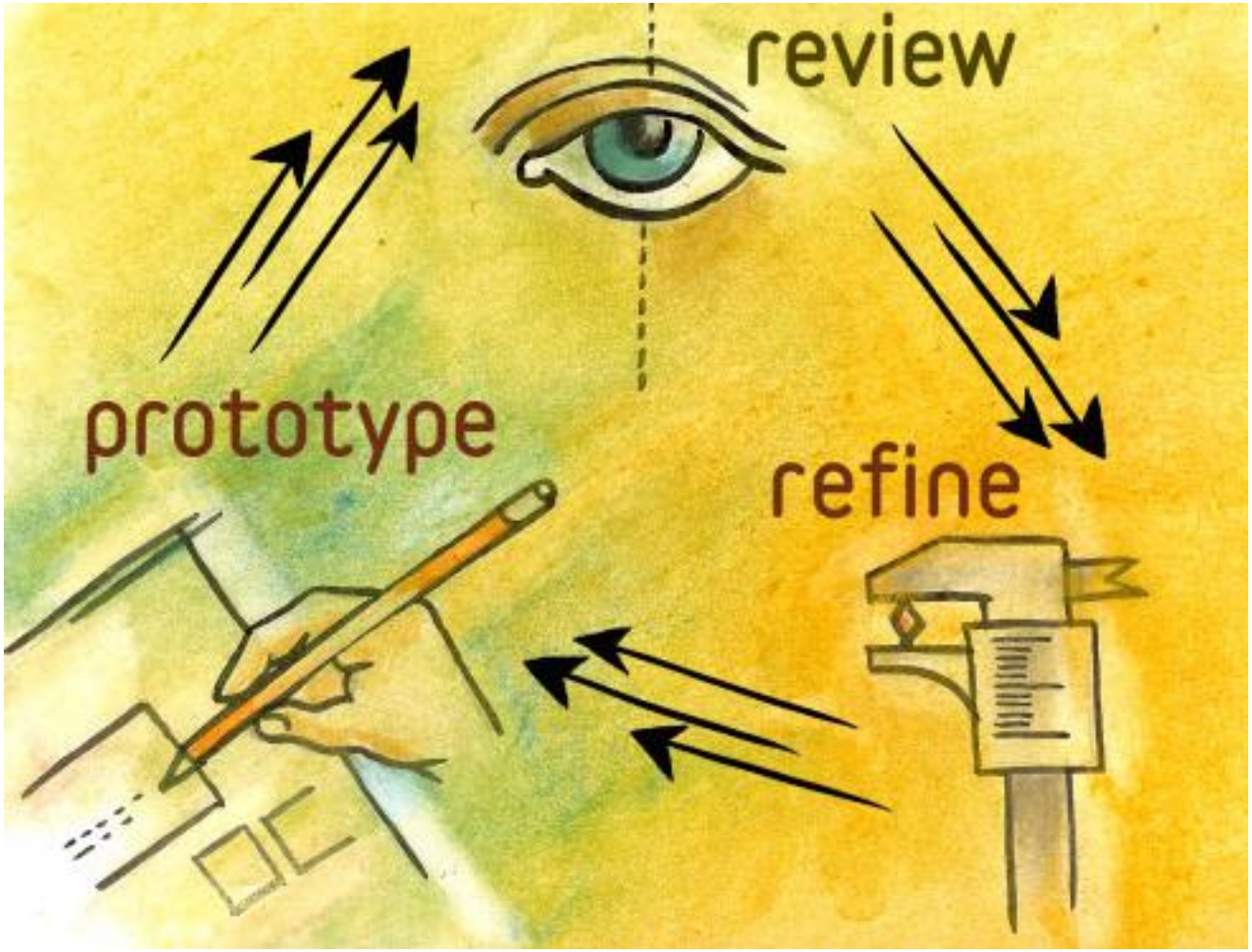
Why Protoype?

- Explore ideas before you invest in them
  - Improved communication, risk reduction, reduced maintenance, greater user satisfaction
- Saves time and money
- Proof of concept
- Design exploration
- Technical exploration

Some dangers of prototyping

- Prototyping might:
  - Make the users think the system is developed
    - Have to manage expectations carefully
  - Create a system that doesn't scale
  - Waste time (as developers spend a great deal of time making throw away prototypes look good)

The Prototyping process



Scoping a Prototype

- What needs to be prototyped?
  - Complex interactions, new functionality, changes in workflow
- How much should be prototyped?
  - The functionality that will be used most of the time
- Find the story
  - Prototype scenarios – user stories, different persona experiences
- Plan your iterations
  - Start broadly, then drill down for some functionality
- Choose the appropriate fidelity
  - Visual (style), Functional (Interactions), Content (real)

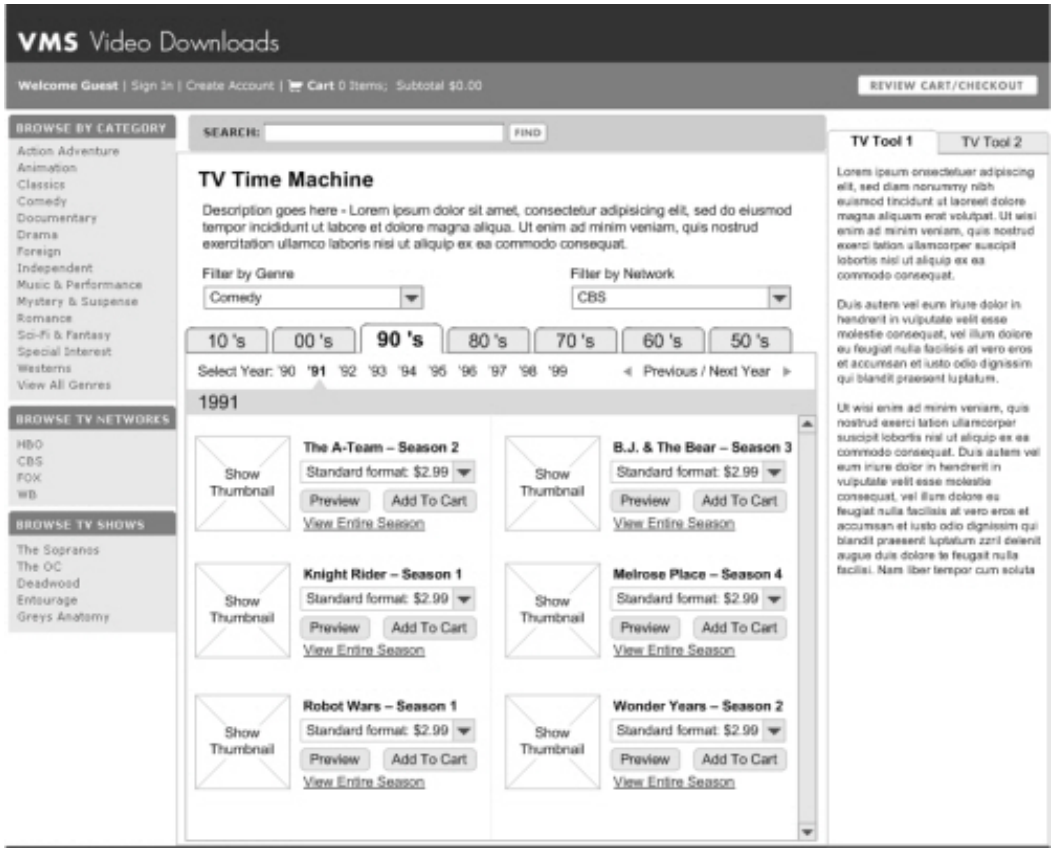
Choose the appropriate fidelity

The Prototyping spectrum

- Low fidelity
  - create rough paper based mock-ups
  - gets feedback on design approaches and concepts
  - lets you make changes easily and quickly

The Prototyping spectrum

- Medium fidelity
  - Increased fidelity with computer based tools
  - demonstrates behaviour of the application – simulates interactions



The Prototyping spectrum

- High fidelity
  - Most realistic, often mistaken for final product
  - Excellent reference for developers
  - Great for usability testing and training
  - Learning curve for developers

Selecting Prototyping Tools

- Evaluate tools – feature set and strengths What are your needs and requirements?
  - How easy is it to learn and use the tool?
  - Is it flexible to support all types of applications?
  - Is there a repository of reusable stencils, templates or widgets available?
  - How easy is it to share for review? Can feedback be captured using the tool?
  - How easy is it to make changes on the fly or to incorporate feedback?
  - Does it have any collaboration features, such as allowing multiple people to work on it at the same time?
  - What are the licensing terms and costs?

Do

- Work collaboratively with all stakeholders
- Avoid “prototype creep” - set expectations – why are you doing it?
- When creating interactive high-fidelity prototypes and simulations, build in realistic delays
- Reuse, reuse, reuse – save template for future projects
- Begin every prototype review session with the disclaimer that this is just a prototype, a mock-up, not the actual solution.

Don't

- Don't prototype features or functionality that cannot be implemented – understand your technology
- Don't take every change or request that comes out of a prototype review as a new requirement. Be aware of scope creep
- Be very specific about the type of feedback you are looking for – Are the steps logically arranged? Is the navigation clear and intuitive?
- Don't be a perfectionist - just good enough to give everyone a common understanding
- Don't prototype everything – just enough to understand what is required

ON THE SPOT COURIER SERVICES

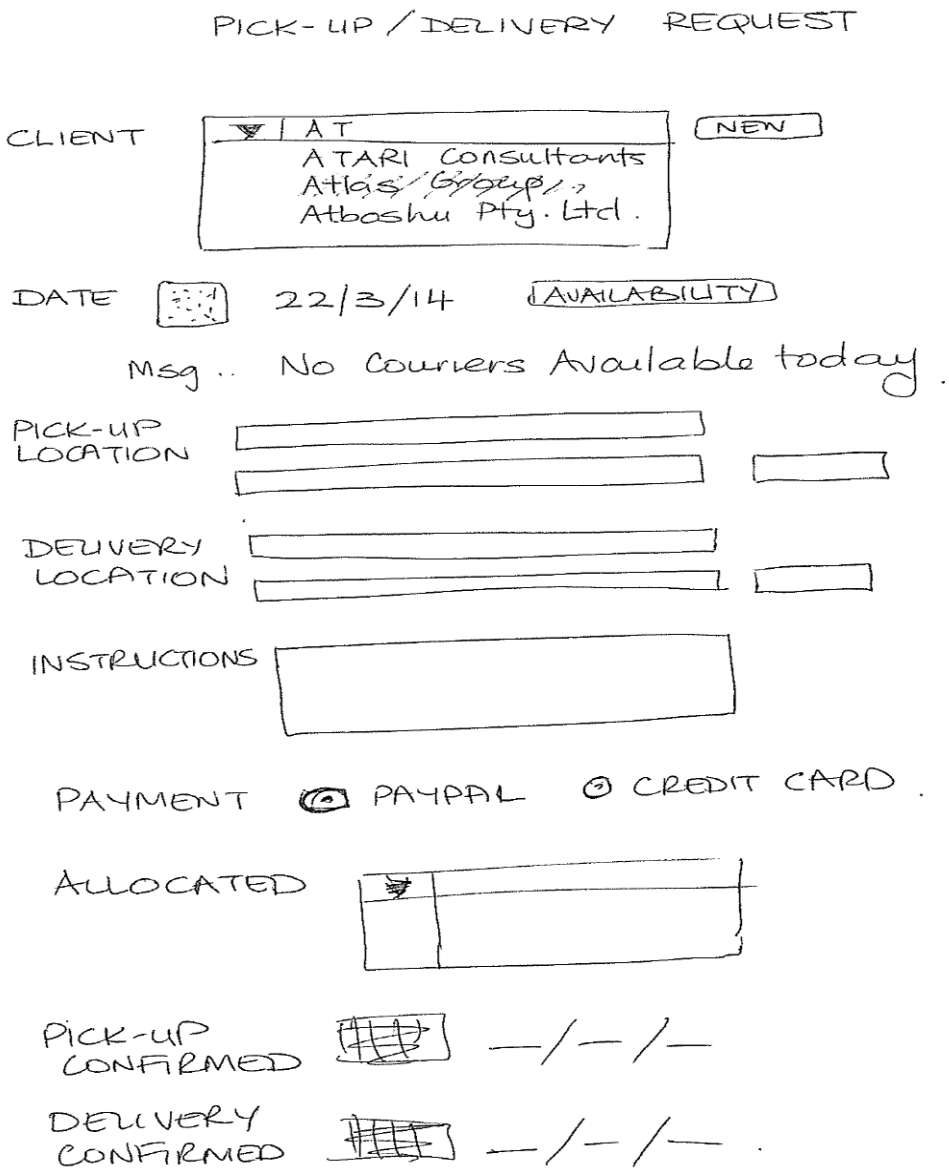
Bill Wiley – Pick-up and Delivery function

When Bill Wiley receives a request for pickup, he enters the pickup information on a form and processes the payment. If the payment is approved, he contacts his courier staff with the pick up and delivery information. When they pick up the package they ring Bill to inform him that they have picked up the package and he notes it on the form. They also ring him when the pack is delivered, which Bill also notes on the form. The package has to be signed by an approved person before it is delivered.

Create low fidelity rough mock-ups for the Pick-up and delivery function for On the Spot Courier Services

3. Prototyping Example

Pick-up and Delivery function: Low Fidelity Mock-up



Usability


usability
design
users
user
system
methods
testing
Usability
information
tasks
edit
evaluation
use
test
time
product
also
studies
process
method
used
often
errors
must
designers
interaction
interface
task
analysis
software
problems
important
data
site
tests
may
context
using
provide
interfaces
focus
perform
part
work
working
development
feedback
shortcuts
team
problem
easy
help
areas
make
different
better
ideas
expert
final
find
making
way
computer
specific
Cognitive
learn
need
principles
personas
factors
set
based
useful
designs
satisfaction
general
quantitative
group
people
several
environment
costs
solution
early
goal

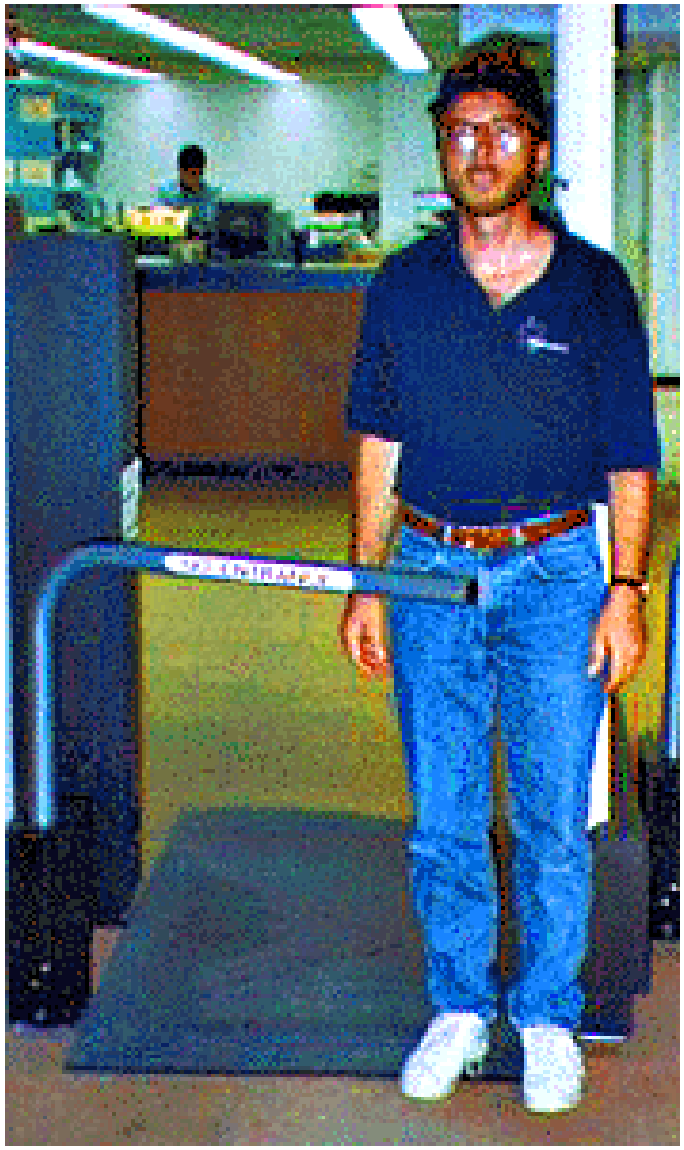
How usable are these products ?

What about these instructions?

Images courtesy of Usability Professionals Association: http://worldusabilityday.org/

When trying to open this file cabinet users found themselves pulling the handle on the top (See arrow).

Guess what happened?



Ouch !!!!!

Don Norman – The Godfather of UX

User Experience

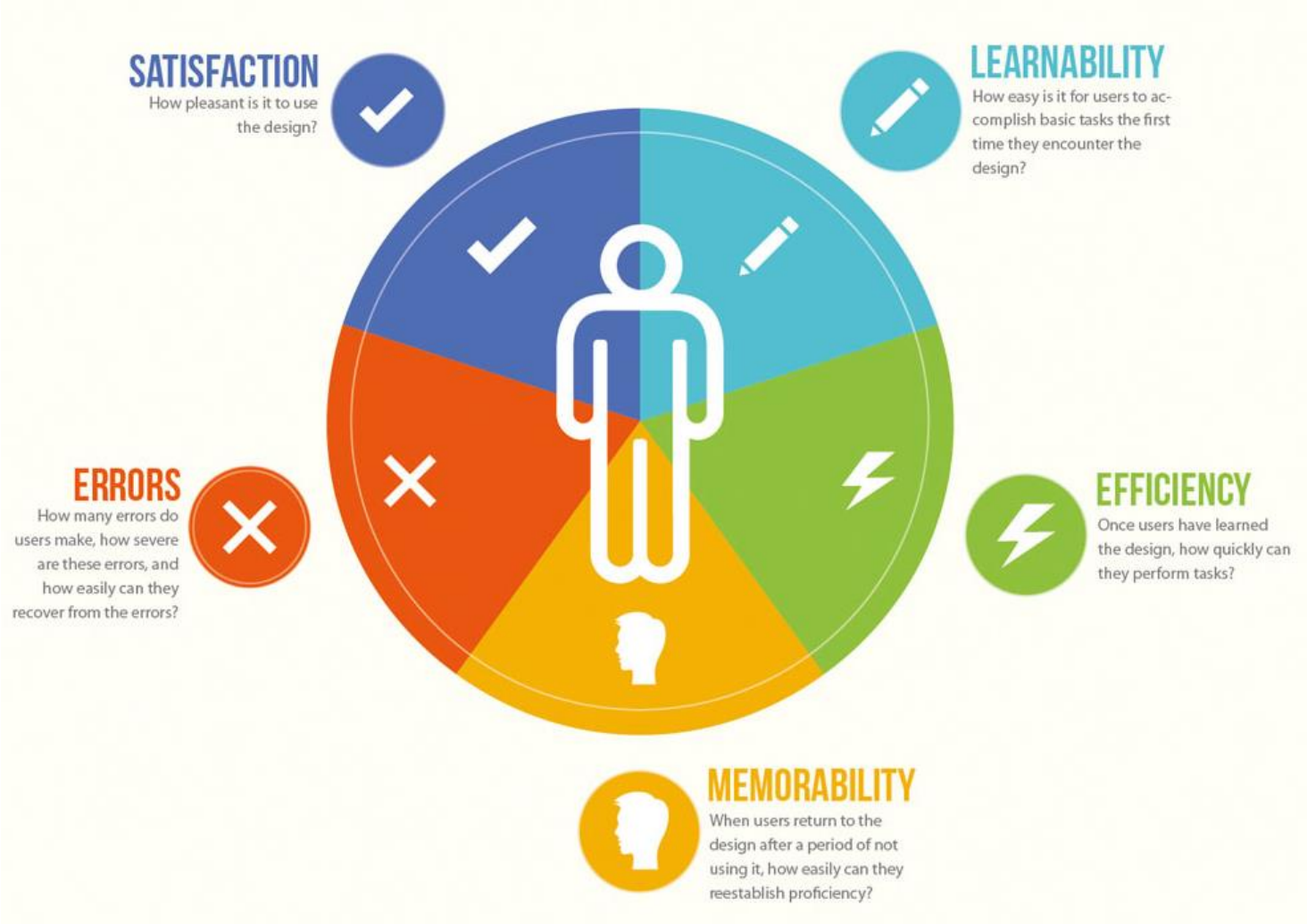
https://www.youtube.com/watch?v=RlQEoJaLQRA

We want to develop USABLE information systems that are of real value to our clients

What is Usability?

- ISO 9241-11: **Usability is**: 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.
- **Effectiveness:** accuracy and completeness with which users achieve specified goals.
- **Efficiency:** resources expended in relation to the 'effectiveness' with which users achieve goals.
- **Satisfaction:** the comfort and acceptability of the work system to its users and other people affected by its use.

Evaluating Usability?



Evaluating Usability – 5 criteria?

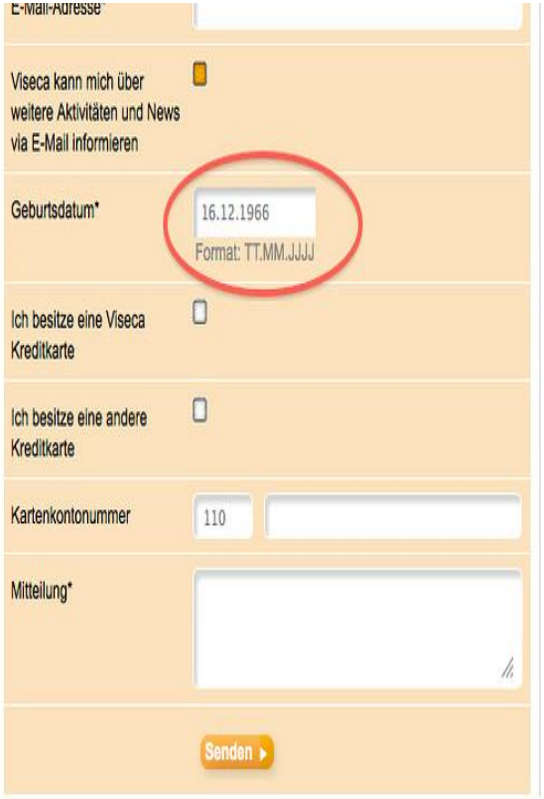
- **Learnability**: How easy is it for users to accomplish basic tasks the first time they encounter the design?
- **Efficiency**: Once users have learned the design, how quickly can they perform tasks?
- **Memorability**: When users return to the design after a period of not using it, how easily can they re-establish proficiency?
- **Errors**: How many errors do users make? How severe are these errors? How easily can they recover from the errors?
- **Satisfaction**: How pleasant is it to use the design?

Usability problems

Design a birthday form field in contact form

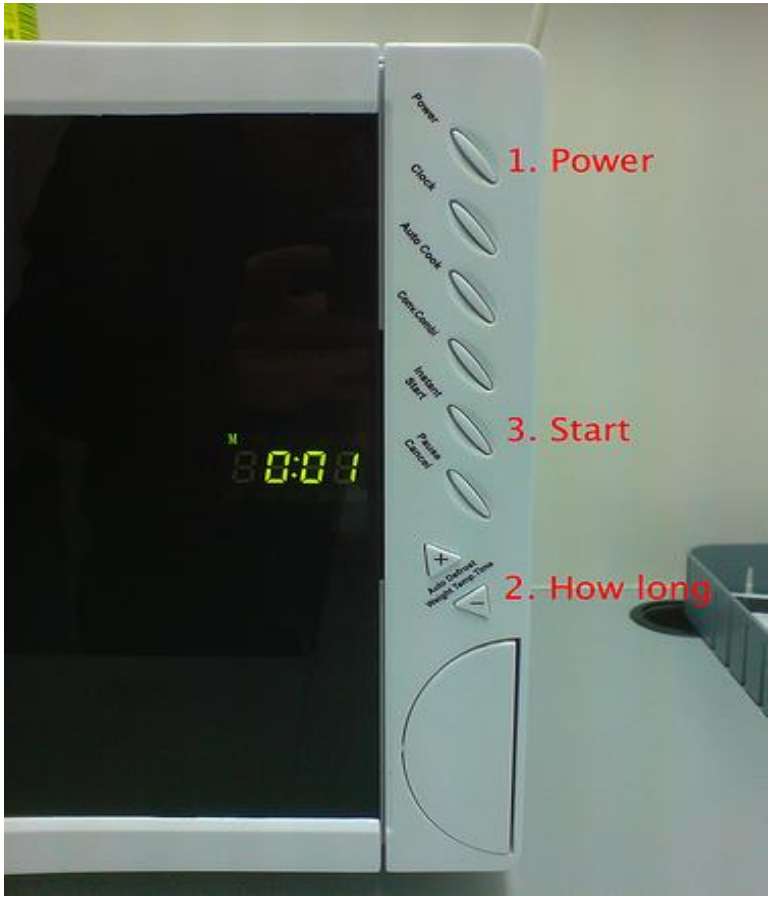
Issue: Birthday field is not long enough to show a full birthday date like 16.12.1966

Issue: A date-picker does not make much sense for a birthday date (it even contains a very **non-useful "Today" button**).

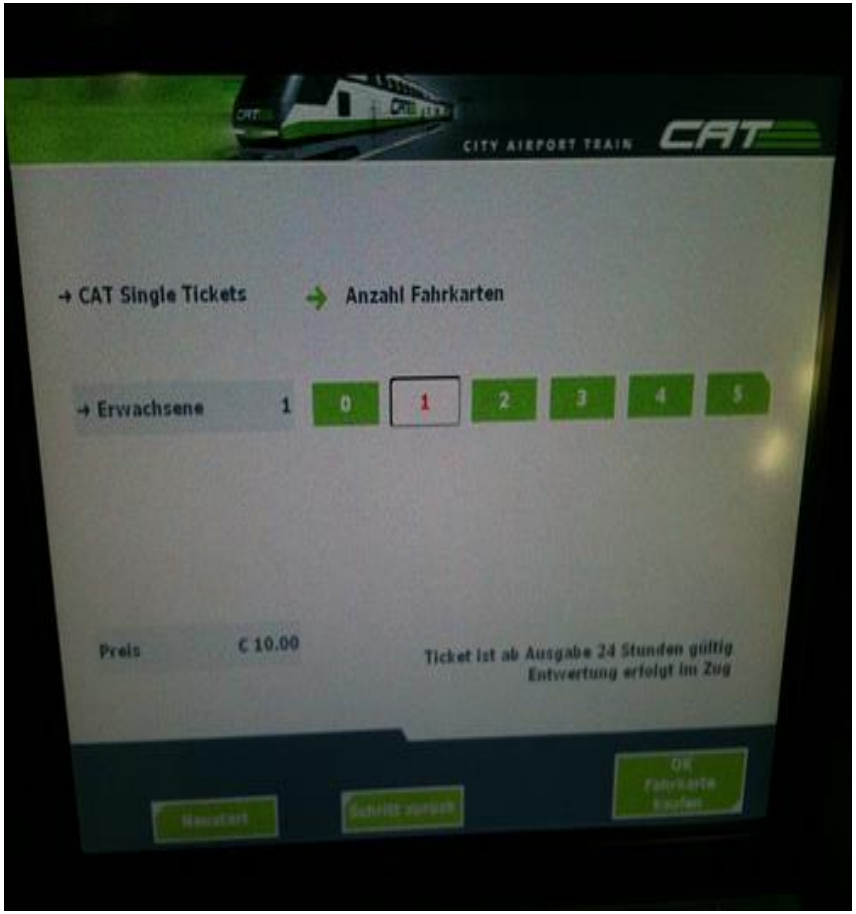


Much better: Format clearly shows the format of the date entry

Usability problems



Sequencing is important



At Vienna Airport, a screen showing the number of tickets (**including 0**) a passenger can buy to travel to city via the City Airport Train

Usability should NOT be …

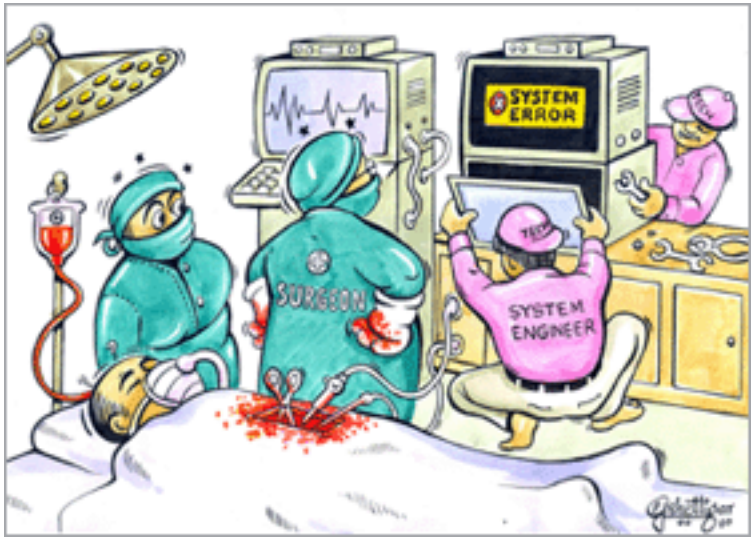
- Expensive
- Time consuming
- A creativity killer
- Focus groups
- Customer satisfaction surveys

"It is far better to adapt the technology to the user than to force the user to adapt to the technology."

- Larry Marine

Why is usability important?

- Helps improve user efficiency
- Can make users feel more in control
- Can improve user satisfaction
- Helps improve sales of commercially available software products
- Helps improve actual usage of systems (e.g. ERP, e-commerce)



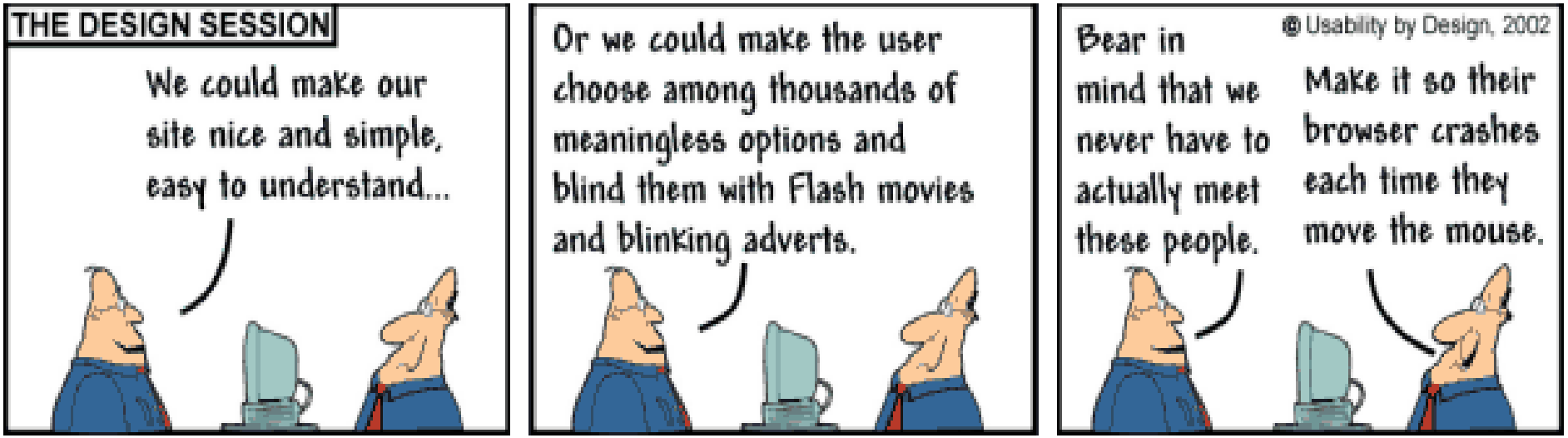
Why is usability important?

For e-commerce usability is essential to survive:

- If systems are difficult to use, people leave.
- If users get lost, they leave.
- If systems (web sites) are hard to read or don't answer users' key questions, they leave.
- If users cannot find the product on web sites, they cannot buy it.
- If users don’t know how to buy the product, they cannot buy it.
- If users cannot find the price of a product, they will not buy it.

> “The joy of an early release lasts but a short time. The bitterness of an unusable system lasts for years.”
>
> - *Anonymous*

Usability: Is it important?



Stupidity is rife ….. some examples

7. Usability Poor Examples

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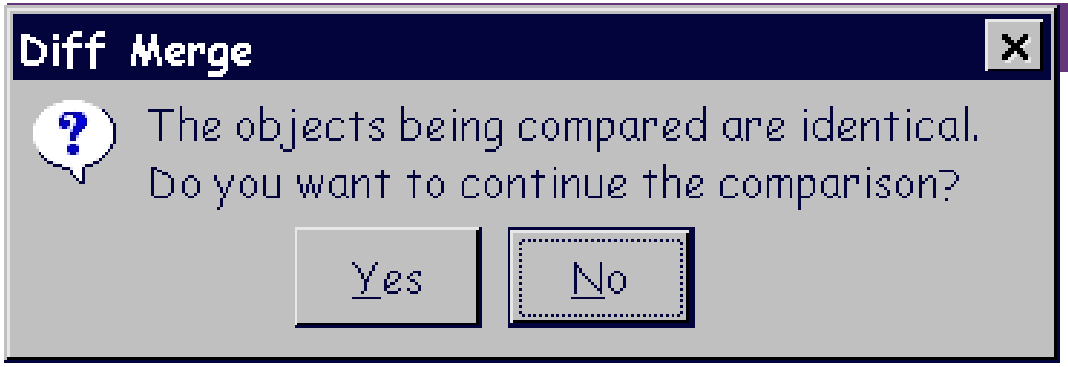
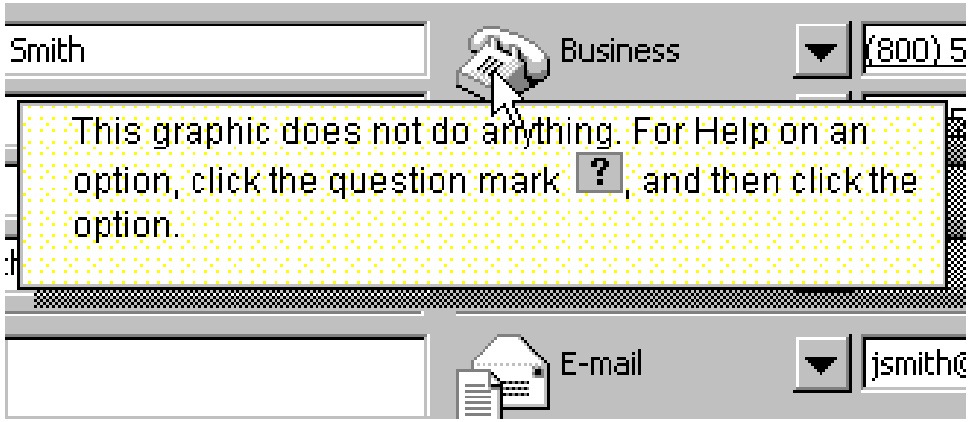
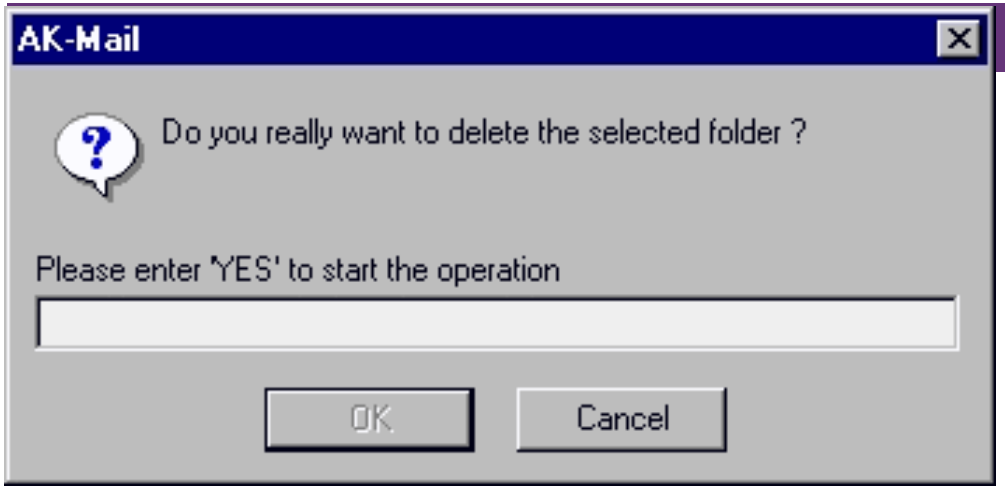
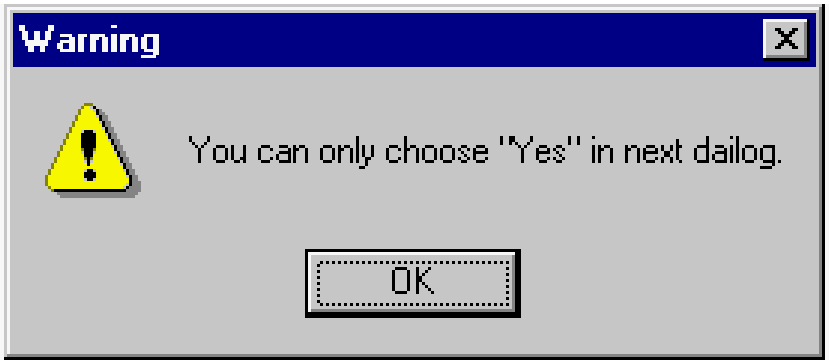
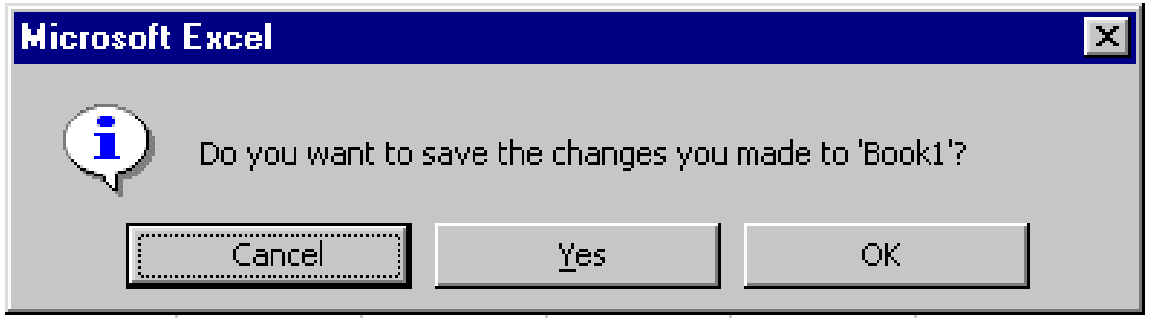




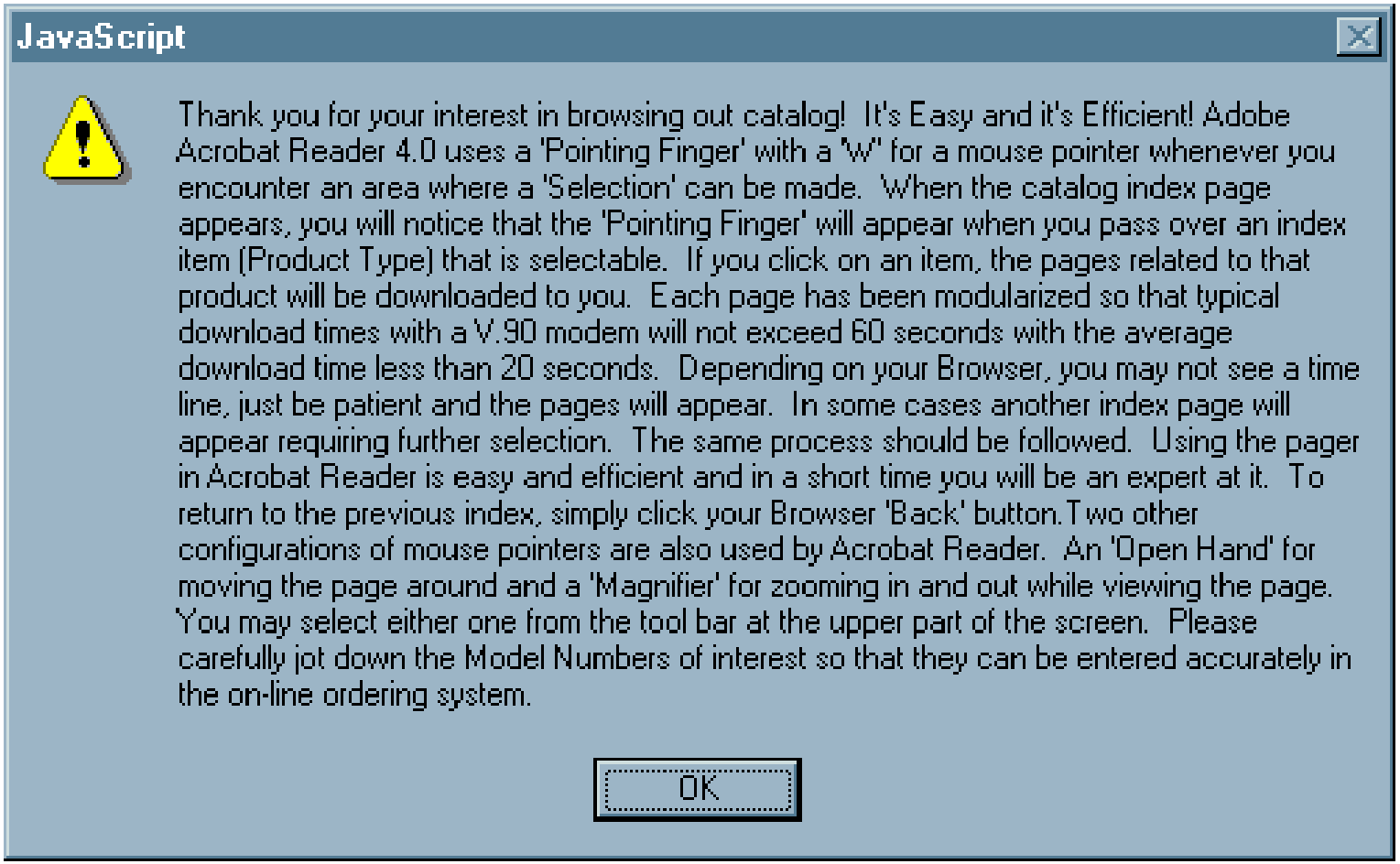
7. Usability Poor Examples







Thank you!


JavaScript
Thank you for your interest in browsing out catalog! It's Easy and it's Efficient! Adobe Acrobat Reader 4.0 uses a 'Pointing Finger' with a 'W' for a mouse pointer whenever you encounter an area where a 'Selection' can be made. When the catalog index page appears, you will notice that the 'Pointing Finger' will appear when you pass over an index item (Product Type) that is selectable. If you click on an item, the pages related to that product will be downloaded to you. Each page has been modularized so that typical download times with a V.90 modem will not exceed 60 seconds with the average download time less than 20 seconds. Depending on your Browser, you may not see a time line, just be patient and the pages will appear. In some cases another index page will appear requiring further selection. The same process should be followed. Using the pager in Acrobat Reader is easy and efficient and in a short time you will be an expert at it. To return to the previous index, simply click your Browser 'Back' button.Two other configurations of mouse pointers are also used by Acrobat Reader. An 'Open Hand' for moving the page around and a 'Magnifier' for zooming in and out while viewing the page. You may select either one from the tool bar at the upper part of the screen. Please carefully jot down the Model Numbers of interest so that they can be entered accurately in the on-line ordering system.
OK

How do you evaluate usability?

- Formative evaluation
- Summative evaluation

Formative Evaluation

- Let the users experience prototypes and identify usability problems
- Users provides feedback based on a review of functionality and interface
- Takes place during development
- Types of formative evaluations:
  - Users review the product and influence the final outcome
  - Evaluation by HCI experts
    - Heuristic evaluation, Cognitive walkthrough - learnability

Summative Evaluation

- Takes place post development:
  - Via lab experiments … experts observe users using the interfaces through *one-way mirrors*
- Quantitative results collected
  - The current usability of an interface is measured by things like task times, completion rates and satisfaction

Usability measures

- Time to learn
  - How long does it take to learn the task
- Speed of performance
  - How long does it take to perform the task
- Rate of errors by users
  - How many errors and what kinds of errors are made?
- Retention over time
  - Frequency of use and ease of learning help user retention
- Subjective satisfaction
  - Allow for user feedback

Usability testing with eye-tracking

- The process of measuring the point of users' gaze
- Special devices are used to track user's eye movements as users use software
  - from headsets to simple web cams
- Produces a "**heatmap**" that shows how long users looked at each section of the screen

www.sr-research.com

www.tobi.com

Sample “heatmaps” of recruiters reviewing resumes

- In the six seconds they spend on a resume, recruiters focus on name, current title and company, current position start and end dates, previous title and company, previous position start and end dates and education

Sample “heatmaps” of how people look at your Facebook

- When potential dates, employers and friends glance at your online social profiles, what do they see?
- EyeTrackShop, a startup runs eye-tracking studies for advertisers. The find the following:
  - profile pictures matter
  - who you know gets noticed
  - content on top wins
  - the further something is down a page, the fewer number of people look at it.

Do a five second test

- Five second tests help a software developer understand people's first impressions of their designs.
- By finding out *what a person recalls about your design in just 5 seconds,* developers can ensure that their message is being communicated as effectively as possible.

- http://fivesecondtest.com/

How much does Usability cost?

- Cost: Best practice - spend **10% of project budget** on usability
  - **More than doubles** a web site's desired quality metrics
  - Slightly less than **doubles** an intranet's quality metrics

- Benefits :
  - For internal users,
    - Cuts training budgets in half or more
    - Reduces bottlenecks by enabling more non-specialized personnel to perform duties
  - For external users
    - Doubles (or more) the number of registered users
    - Doubles (or more) number of products ordered

Workshop Preparation

Focus on Assignment 2 and working collaboratively with your team

Thanks for watching

Hope you are enjoying your break

Resources:

Prescribed text:

– Not covered in the text

Other resources:

Prototyping

– http://scottberkun.com/essays/12-the-art-of-ui-prototyping/

Usability

– http://www.nngroup.com/articles/usability-101-introduction-to-usability/