Usability

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Slides adapted from Daniela Rosner

Web Architecture, INFO 290
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Outline

Introduction what is “usability”

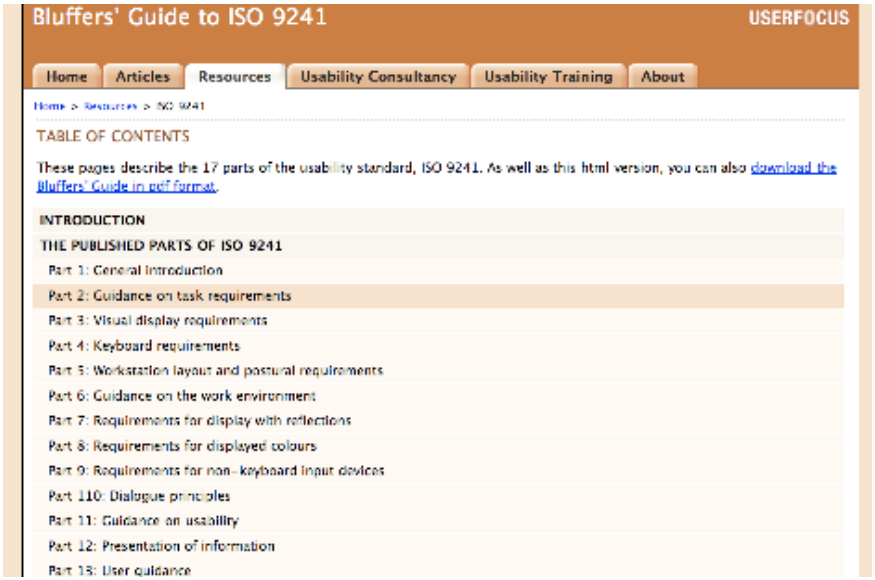
Best Practices common solutions

Design Patterns shared languages

New Patterns you design

Definition: 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.
— ISO 9241-11 (1998)



http://www.userfocus.co.uk/resources/iso9241/index.html

Definition: Usability

Learnability
Efficiency of use
Memorability
Few Errors
Satisfaction
— **Jakob Neilson**

http://www.userfocus.co.uk/resources/iso9241/index.html

Principles

Perceivable

Information and user interface components must be perceivable by users

Operable

User interface components must be operable by users

Understandable

Information and operation of user interface must be understandable by users

Robust

Content must be robust enough that it can be interpreted reliably by a wide variety of user agents

http://www.w3.org/TR/WAI-WEBCONTENT/

Manifesting Usability

Usability is as important as technical execution.

Build it in

Ensure a usable product by building usability in from the beginning.

Or fix it later

Evaluate completed projects for usability.

Fix what can be fixed.

Implementation may impose constraints.

Building in usability

User-Centered Design

Based on the work of Alan Cooper, et al.

Can be used to design non-technical products including bowling balls and ice cream flavors.

Ideally begins before or coincident with initial product design and development.

http://www.cooper.com http://en.wikipedia.org/wiki/User_centered_design

Building in usability

The User-Centered Design Process

A product development methodology based on actual user needs, abilities and perceptions.

Offers the most effective path to useful and usable products.

Personas

Are based on actual users.

Put a human face on the amorphous “user.”

Save time by focusing development away from unlikely “edge” cases.

Building in usability

Six phases of UCD

User Research

User Modeling

Requirements Definition

Delivery Method Definition

UI Design

Development Support

Building in usability

A lot of UX work is required before any UI design can begin. In the Agile process this is referred to as "iteration 0." Sometimes, there is no project-supplied UI. But there is always UX.

Six phases of UCD

User Research

User Modeling

Requirements Definition

Delivery Method Definition

Notice how many phases come before UI Design.

UI Design

Development Support

Building in usability

Six phases of UCD

User Research: Who are the users?

User Modeling

Requirements Definition

Delivery Method Definition

UI Design

Development Support

Building in usability

Six phases of UCD

User Research: Who are the users?

User Modeling: What are their needs, abilities and perceptions?

Requirements Definition

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UI Design

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Building in usability

Six phases of UCD

User Research: Who are the users?

User Modeling: What are their needs, abilities and perceptions?

Requirements Definition: How can the product meet their needs?

Delivery Method Definition

UI Design

Development Support

Building in usability

Six phases of UCD

User Research: Who are the users?

User Modeling: What are their needs, abilities and perceptions?

Requirements Definition: How can the product meet their needs?

Delivery Method Definition: How will the product deliver services?

UI Design

Development Support

Building in usability

Six phases of UCD

User Research: Who are the users?

User Modeling: What are their needs, abilities and perceptions?

Requirements Definition: How can the product meet their needs?

Delivery Method Definition: How will the product deliver services?

UI Design: How will the product appear to and work for the users?

Development Support

Building in usability

Six phases of UCD

User Research: Who are the users?

User Modeling: What are their needs, abilities and perceptions?

Requirements Definition: How can the product meet their needs?

Delivery Method Definition: How will the product deliver services?

UI Design: How will the product appear to and work for the users?

Development Support: How does the test version work for users? How can it be improved before release? How can the next version be improved?

1 User research

Who are the users?

We are not the users. They are not us.

If we're not careful, we'll assume that they are like us, or like someone we know.

The best way to get to know the users is to go to them and see what they're up to.

1 User research

Learn about users'

Goals

Behaviors

Attitudes

Methodologies

Interview

Contextual Inquiry

1 User research

Contextual inquiry

Takes place in task setting

Origins in ethnography

1 or 2 people with recording equipment:

- Note pad
- Audio recorder
- Still camera
- Video camera

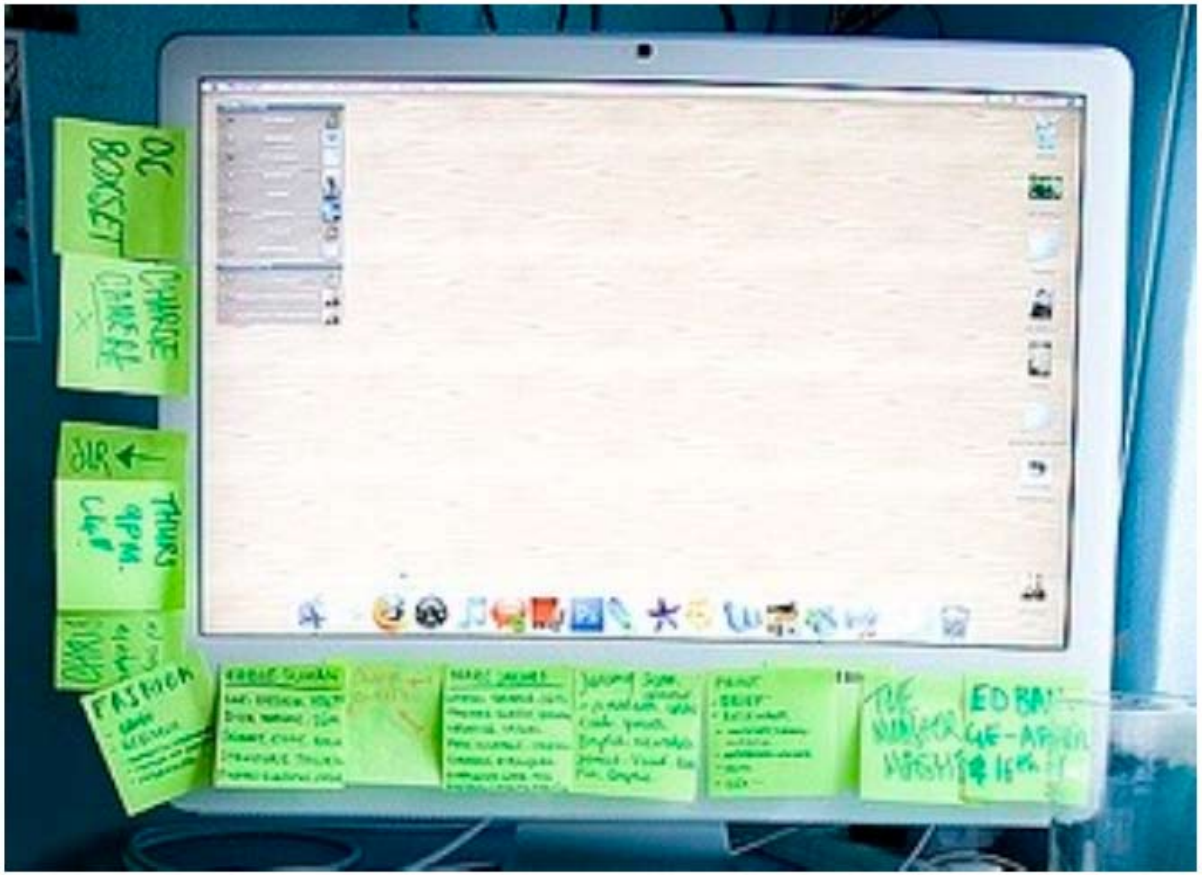
List of topics, and ability to follow the user's lead

1 User research

Contextual inquiry would reveal some constraints.

Source: http://www.flickr.com/photos/meestajack/486053407/

1 User research



Source: http://www.flickr.com/photos/plexual/447719264/

Notes and other items external to a system are called **artifacts**.

2 User Modeling

Making sense of user research

Documenting experience

Analyzing data

Finding patterns and clusters

Discovering dimensions

Eliminating edge cases

Developing personas

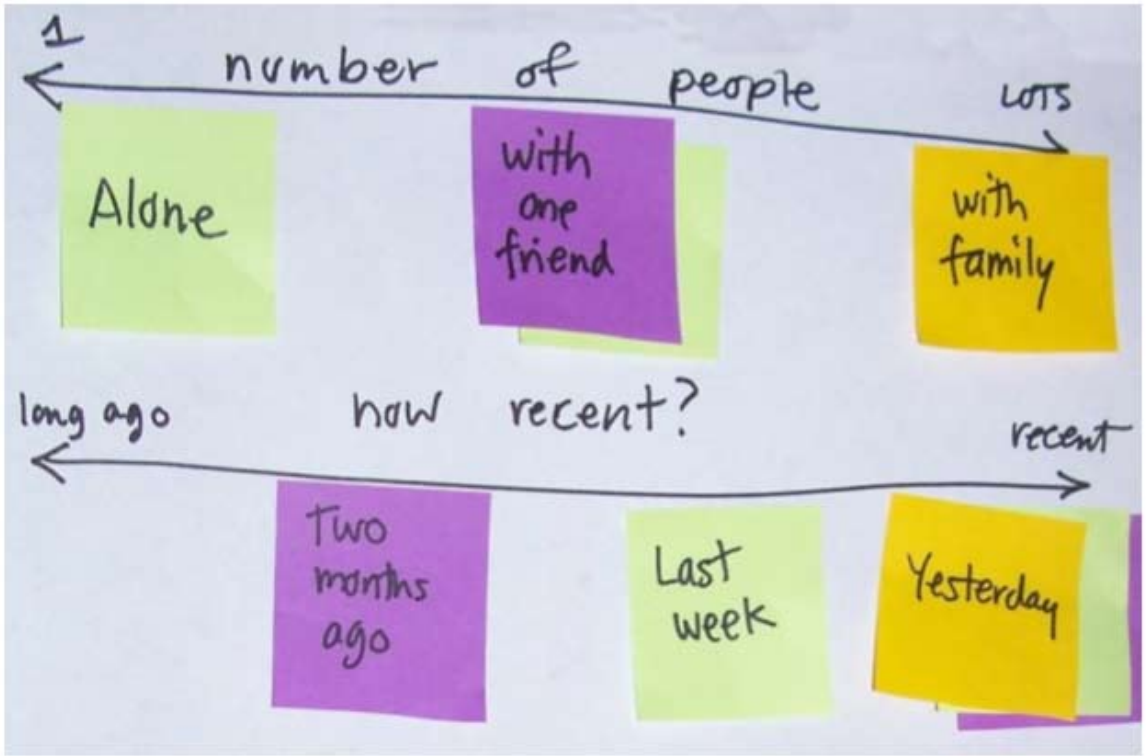
Writing functional principles

2 User Modeling

Raw data from research phase

2 User Modeling

Filter, cluster and organize



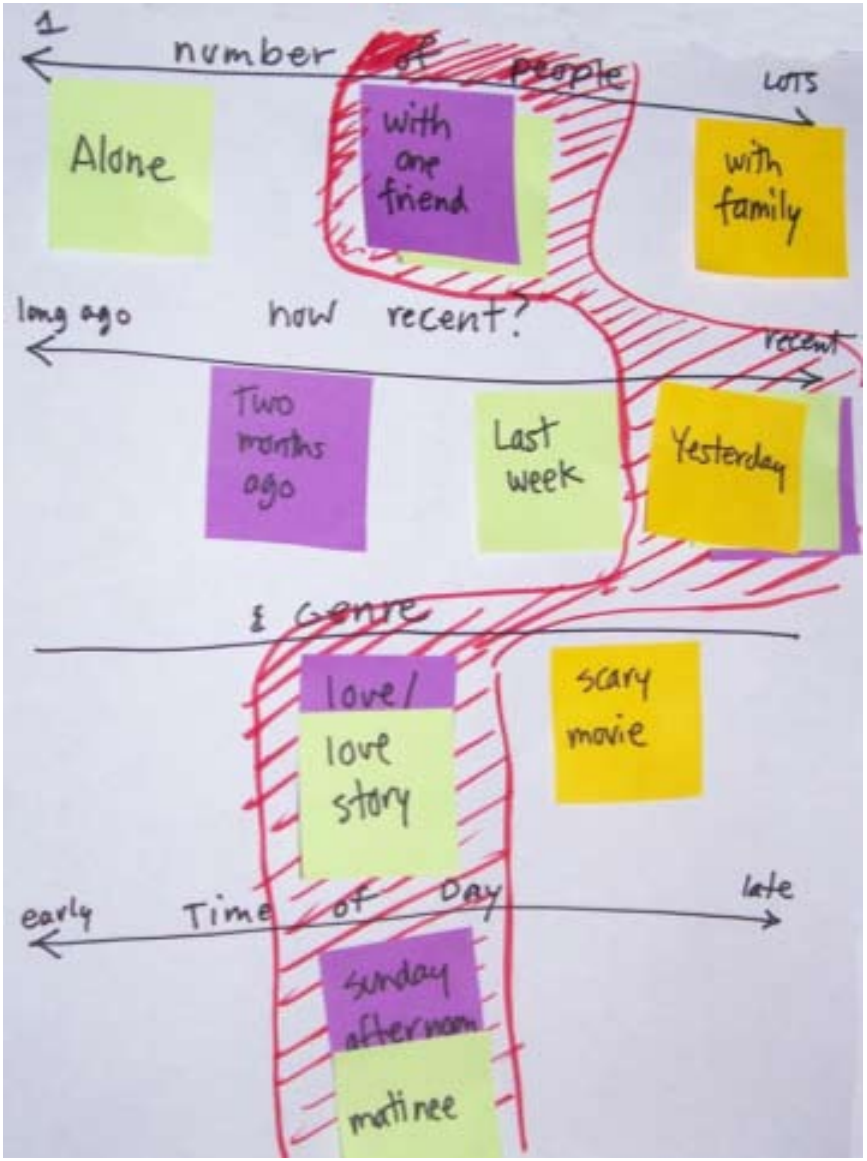
2 User Modeling

A pattern becomes a persona

"Sylvia":
- Who: With one person
- When: Yesterday
- What: Love story
- Time: Matinee

A persona is an archetype, not an actual person.

A name & photo is associated, to further humanize each persona.



2 User Modeling

Persona: Example 1

Persona - Jen Yang

Researcher, School of Nursing

Description

Jen is a full-time researcher at Stanford's School of Nursing. Along with her typical activities in the lab, she is a member of a 20 person research project studying nursing in the ER.

Jen is confident in her work and the project study but finds herself fighting with the web-based project site her team uses for "off-line" communication and to store and share project documents...particularly in finding the most current information.

She's familiar with using computer programs to create documents and exchange emails with colleagues and friends. She also likes to do her Christmas shopping on-line.

Goals

- Be "in the loop" on her projects - have the most current project information
- Not to let team members see her work until she is comfortable with it
- Spend her time doing research and minimize the administration overhead including time posting and finding documents on the Project site

Level of Expertise

Office products, email, on-line shopping

Source: The Fluid Project

2 User Modeling

Functional principles

High level statements about product qualities

Stable: subsequent UCD phases will not affect them

Inform subsequent UCD phases, including functional requirements

Examples

- Reminds me when I need it, but does not nag (assists)
- Tells me when something's important (reliable)
- Keeps my friends informed about my schedule (extends)

3 Requirements Definition

Functional requirements

Concrete statements about product features and functions

Stable: subsequent UCD phases will not affect them

Inform subsequent UCD phases, including Delivery Method Definition

Examples

- Two levels of authentication: user and user's designates
- Schedule is exportable to iCalendar format
- Course catalog is always current

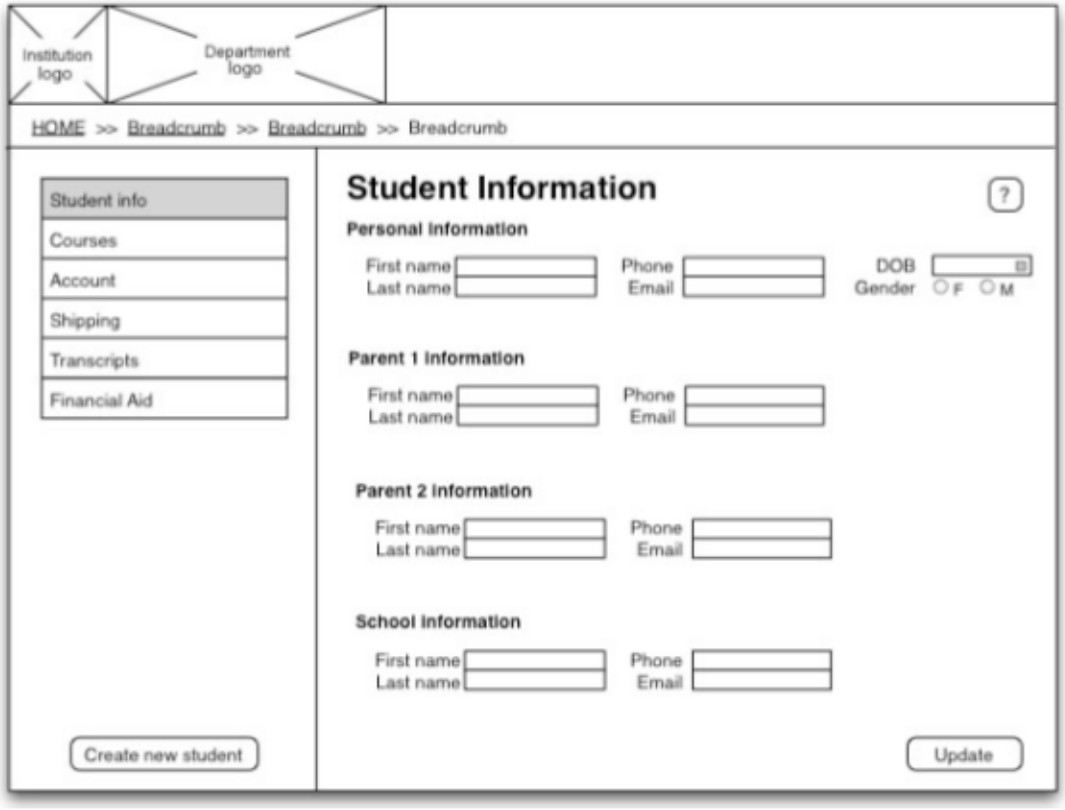
4 Delivery Method Definition

Examples

- Web application
- Smart phone application
- Dedicated hardware device

5 UI Design

Wireframe



6 Development Support

Activity

Iterate in response to usability testing

Limitations of UCD

Users may not always

Know enough to act in their own best interest.

Be motivated to meet an organization's goals.

Remediation

Educate the user about the merits of their options.

Communicate the user benefits of the organization's goals.

Make the institution's goals at least not conflict with the user's goals and habits, and at best provide incentives.

Improve Usability

Heuristic Evaluation

Evaluators examine the interface and judge its compliance with recognized usability principles.

User Testing

Run multiple small tests with users to discover interface elements that should be kept, changed, or removed.

Paper Prototypes

Involves creating rough drawings of an interface (on paper) to use as models of a design.

Competitive Analysis

Test interface designs with similar features for similar goals.

http://www.w3.org/TR/WAI-WEBCONTENT/

Heuristic Evaluation

Visibility of system status

Match between system and the real world

User control and freedom

Consistency and standards

Error prevention

Recognition rather than recall

Flexibility and efficiency of use

Aesthetic and minimalist design

Help users recognize, diagnose, and recover from errors

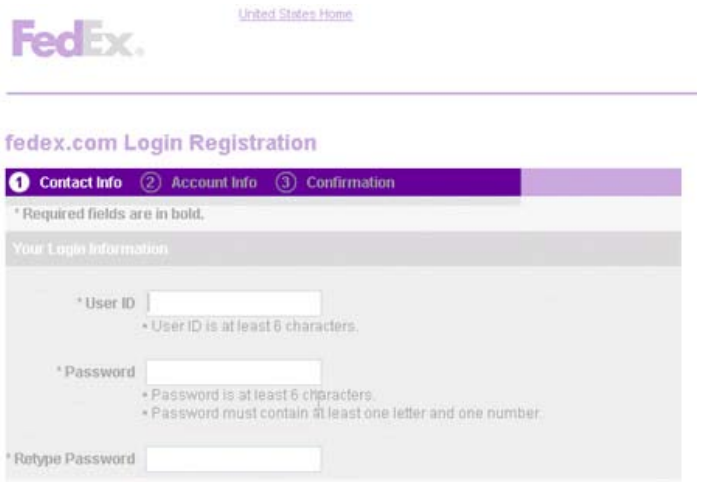
Help and documentation

http://www.useit.com/papers/heuristic/heuristic_list.html

Heuristic Evaluation

Visibility of system status

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.



Heuristic Evaluation

Match between system and the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

RATES

Mortgage | Home Equity | CDs

See today's average mortgage rates across the country. Source: Bankrate.com

Loan Type	Rate	APR
30-yr Fixed	5.98%	6.16%
15-yr Fixed	5.64%	5.92%
5/1 ARM	5.99%	6.94%

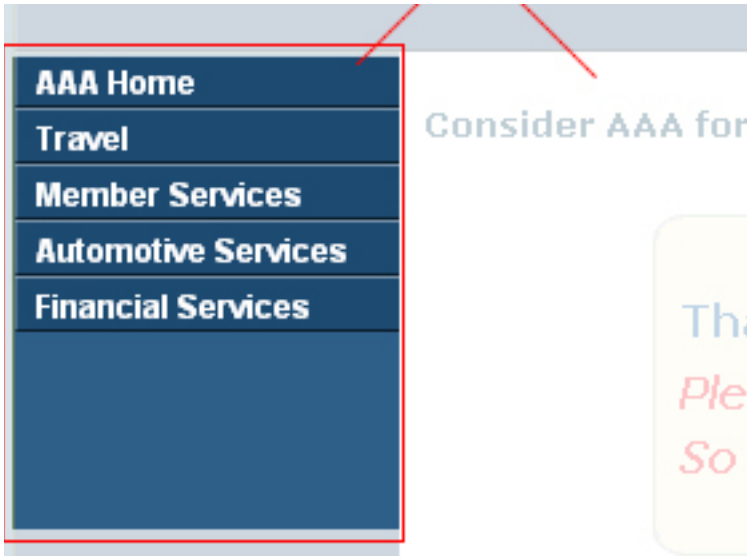
» View rates in your area

Sponsored by:
Countrywide - Low refi rates. No Closing Cost Refi

Heuristic Evaluation

User control and freedom

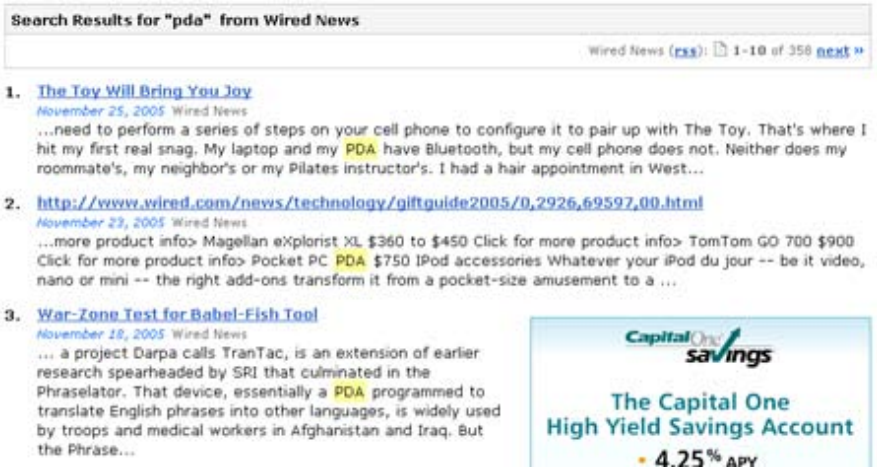
Users often choose system functions by mistake and will need a clearly marked “emergency exit” to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.



Heuristic Evaluation

Consistency and standards

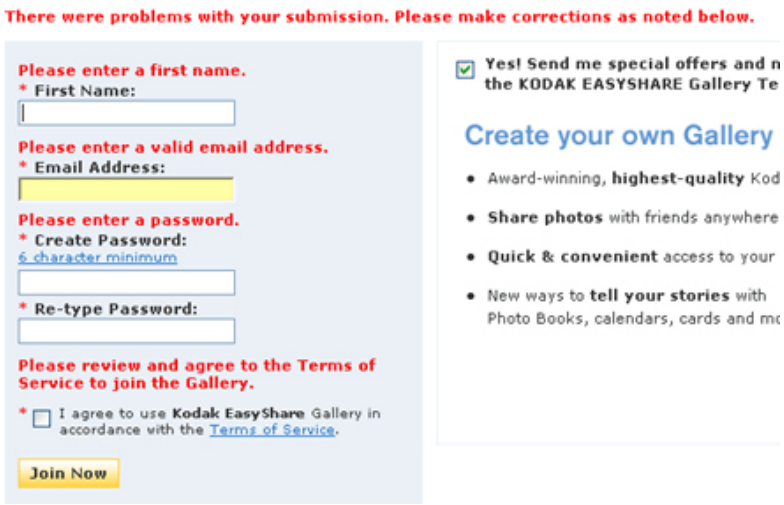
Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions. Consistency builds the user's feeling of mastery over the interface through recognizability, predictability, empowerment, and efficiency.



Heuristic Evaluation

Error prevention

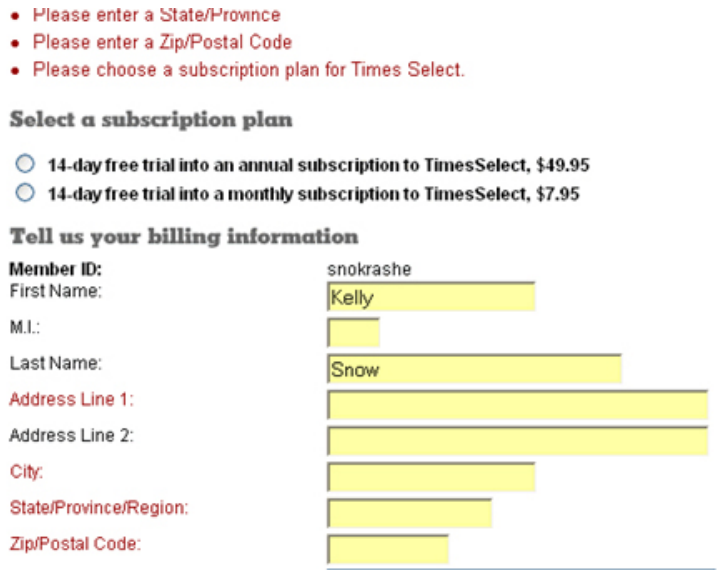
Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

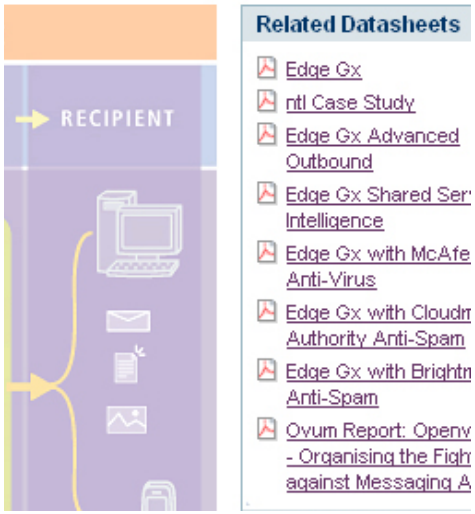


Heuristic Evaluation

Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.





Heuristic Evaluation

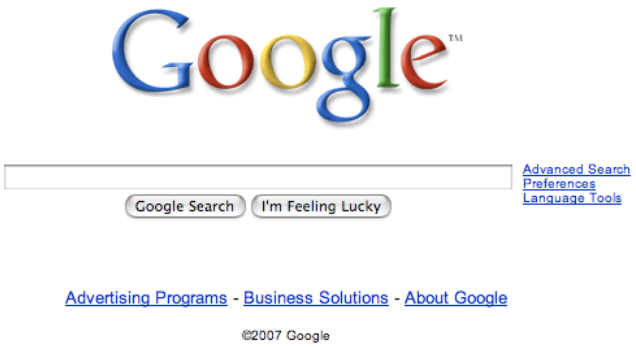
Flexibility and efficiency of use

Accelerators – unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

Heuristic Evaluation

Aesthetic and minimalist design

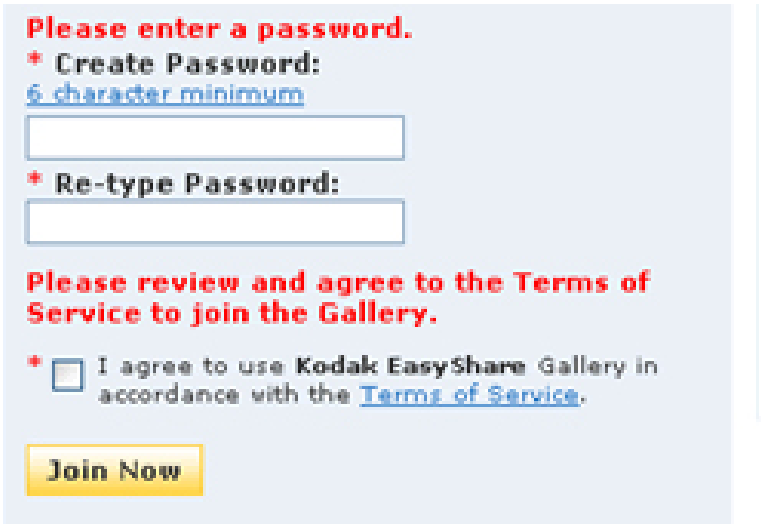
Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.



Heuristic Evaluation

Help users recognize, diagnose, and recover from errors

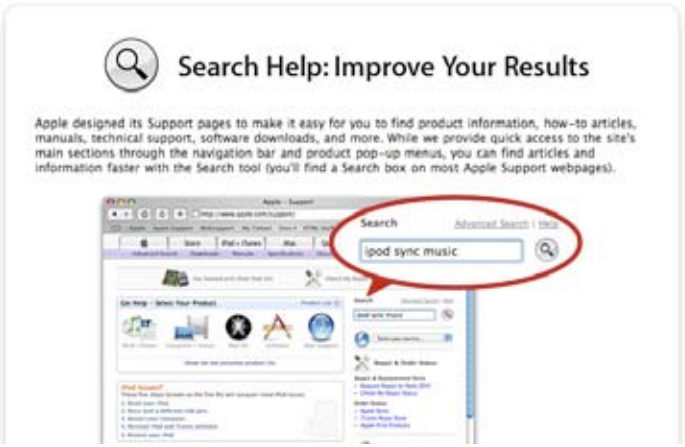
Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.



Heuristic Evaluation

Help and documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.



http://www.useit.com/papers/heuristic/heuristic_list.html
http://www.asktog.com/basics/firstPrinciples.html

Problems in Web Design

Knowledge about user interface and design is **distributed across many people** and often not shared

Knowledge about what constitutes good user interface is **inconsistent among designers and users**

Each person has their **own agenda** and goals motivating the design of an the interface

Design is not always **valued** as much as compiled code is. If almost anyone can make a web page, how hard can design be?

Confuson in Web Design

According to Jakob Nielson, multiple studies showed “23% of [web] design elements were done in so many ways that no single approach dominated.” Such design elements included:

- The main navigation schemes (left-hand menu, tabs across the top, navbar across the top)
- Placement of the search feature, which included upper right, upper left, middle, and elsewhere on the page
- The sign-in process.

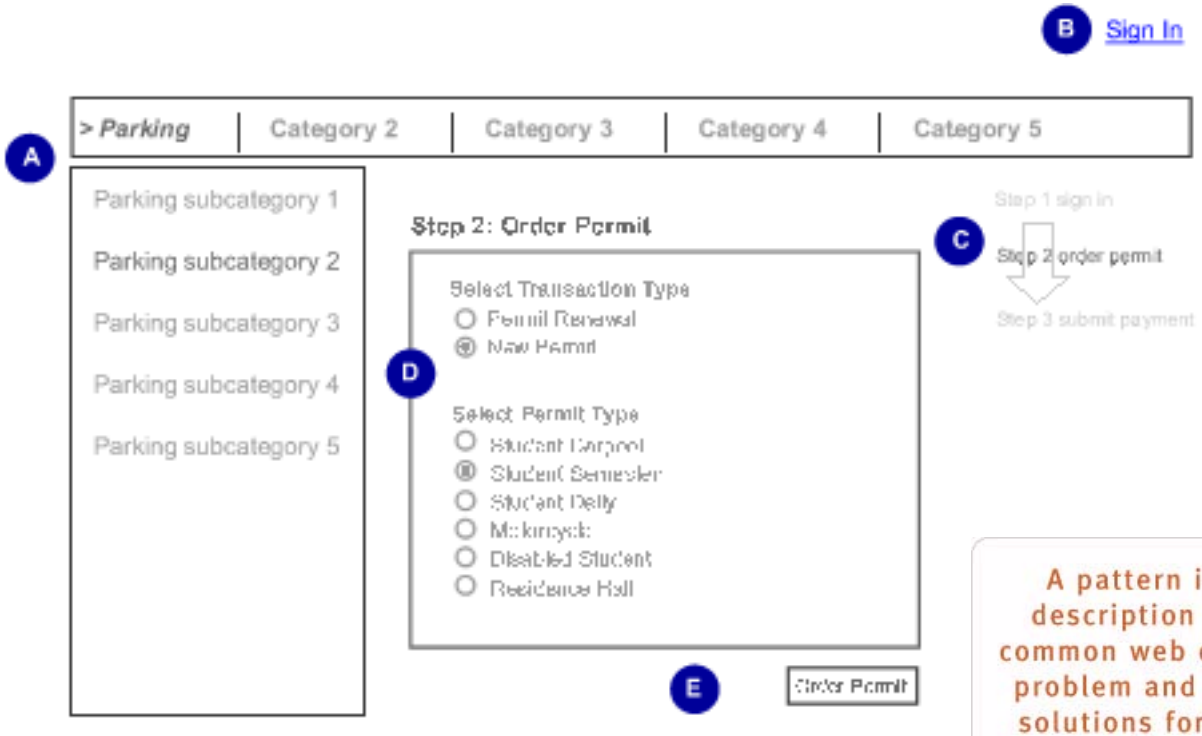
What are Web Design Patterns

Design Patterns are **best practices** and common practices in web design.

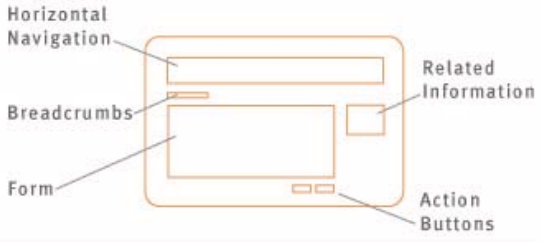
They are **not style guides**, rules or a mandate.

Flexible for different contexts and applications.

What are Web Design Patterns



A pattern is a description of a common web design problem and good solutions for that problem.



What are Web Design Patterns

Models for **common problems** and appropriate solutions in highly diverse development environments.

Provide a **common language** for people to use in their work process.

A Web Design Pattern

Breadcrumbs

[edit

(Other names for this pattern: Location Indicator, Location Breadcrumbs)

Design Problem

The user needs to know their current location within the Web site or application.

source: www.

Use When

- The page displayed is within a hierarchy of pages and is not the topmost page.
- The user arrived at their current location from and external source such as searc results, links in email, bookmarks or any other method that does not lead the us through the site hierarchy.

Solution

A. The breadcrumb should always be visible in the browser at the top of the page. should not need to scroll to see it.
B. The breadcrumb is a horizontal list of pages reflecting the site hierarchy starting the topmost page (Home) and ending with the current page.
C. Where possible, labels should match the title of the corresponding page, but sho kept short for readability.
D. Breadcrumbs often use some symbol like ">" between links to indicate direction trail. These symbols are not linked.
E. Breadcrumbs should provide links to each page in the trail with the exception of one. This signifies the users current location in the trail.

Rationale

- Breadcrumbs give clear visual cues for the user's current location and conte site hierarchy.

Examples

source: w

source:

This pattern from other collections

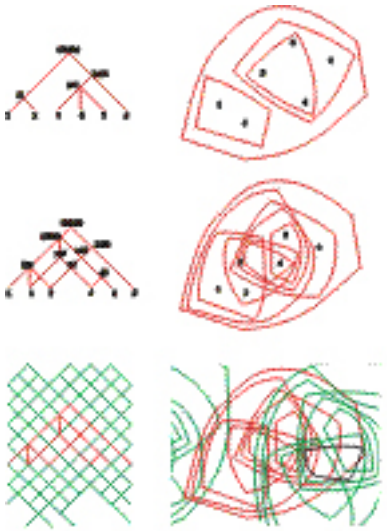
- http://www.welie.com/patterns/showPattern.php?patternID=crumbs
- http://developer.yahoo.com/ypatterns/pattern_breadcrumbs.php

Contributors

Kelly Snow, Tim Dennis

Web Design Patterns

"Each pattern is a three-part rule, which expresses a relation between a certain context, a problem, and a solution"
– Alexander 1979

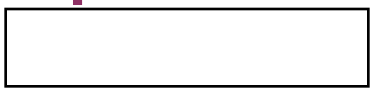


Design Problem

Problem

How Should Labels be Aligned?

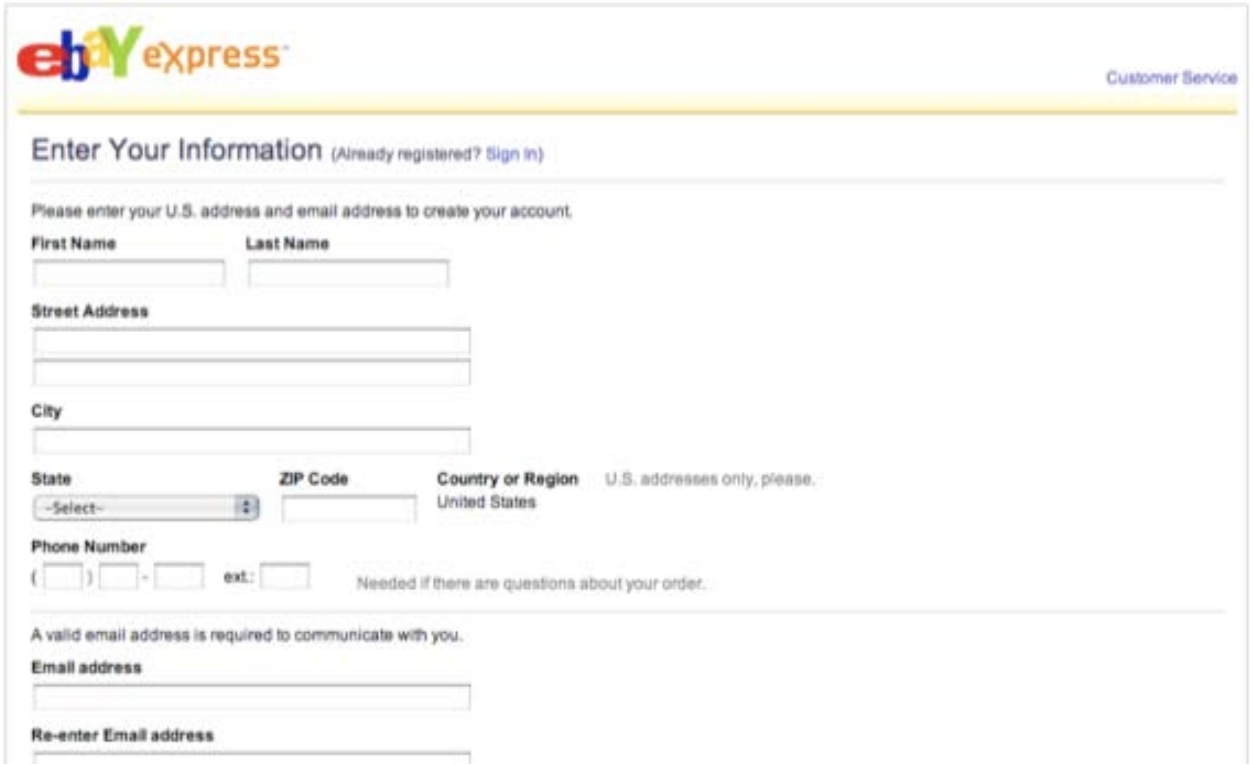
Top



Right

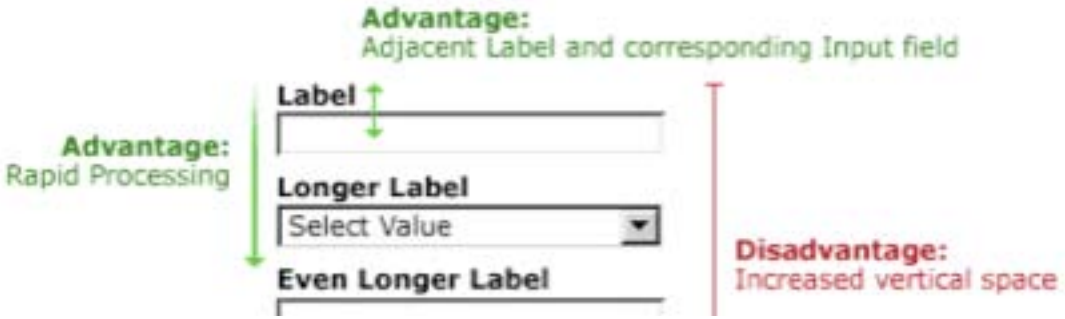
Left

Top Aligned Labels

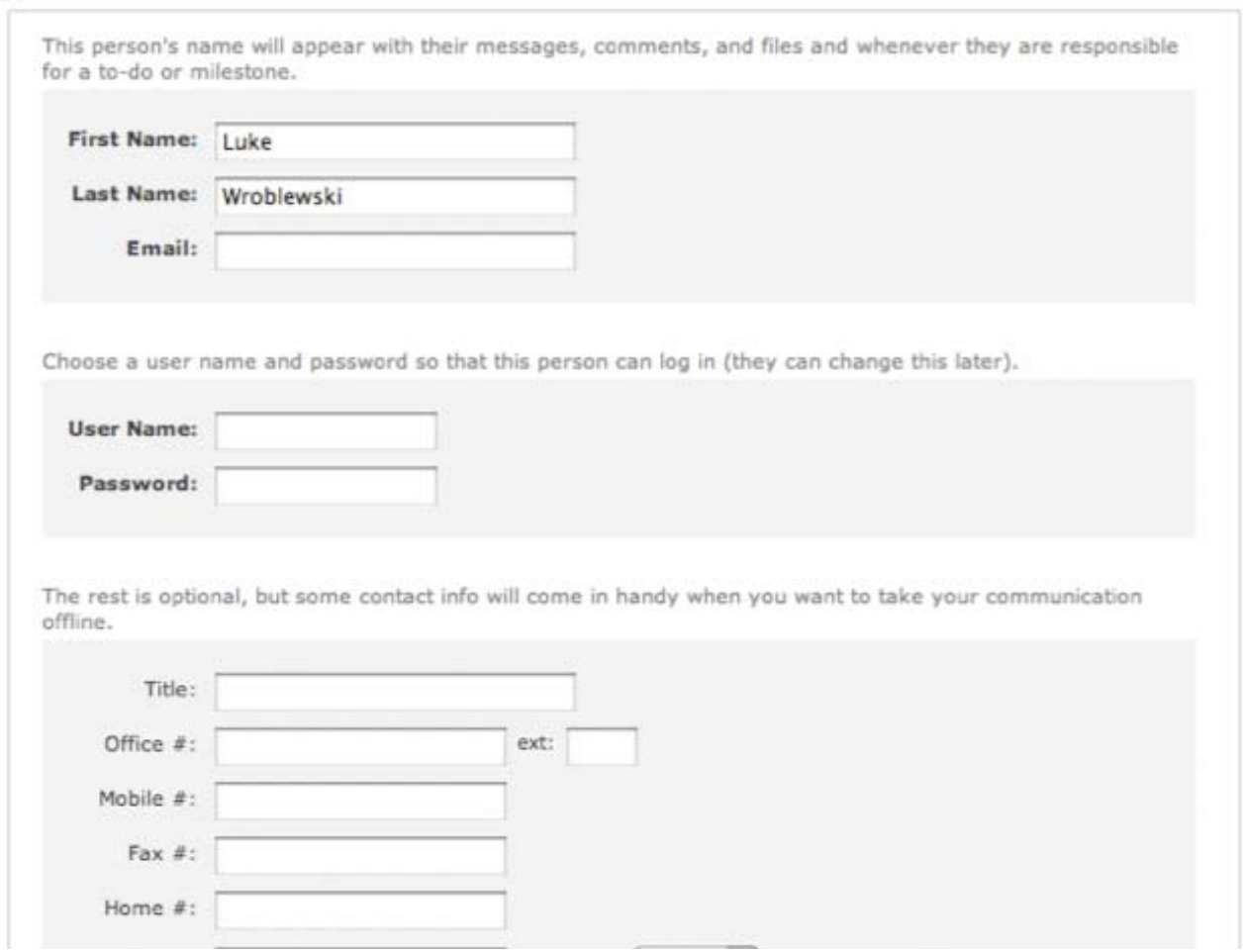


Top Aligned Labels

Top Aligned Labels



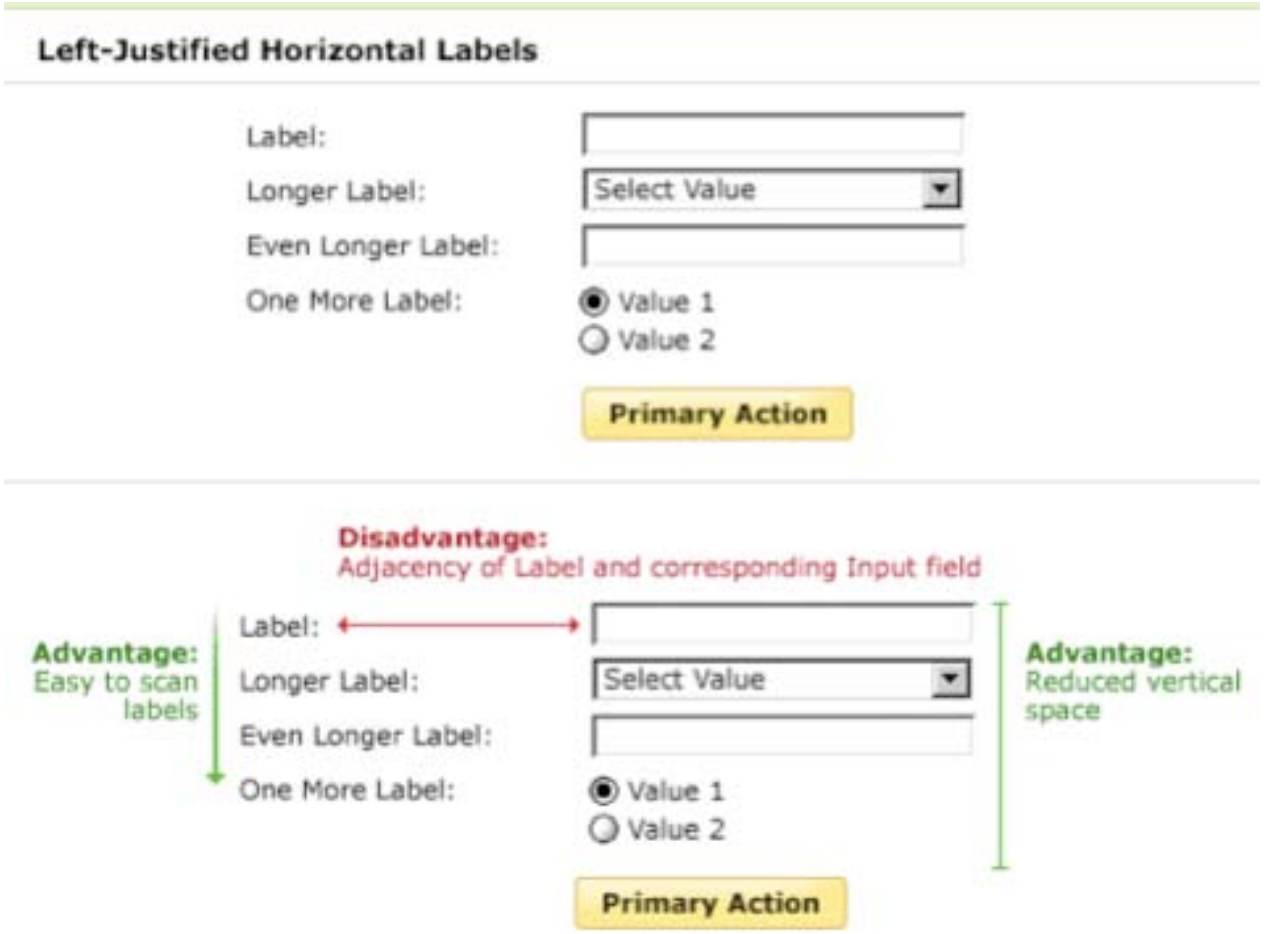
Right Aligned Labels



Right Aligned Labels

Left Aligned Labels

Left Aligned Labels



Problems

Drag and Drop. Drag and Drop Modules. In Page Editing. In Page Custom Editing. Direct State Editing. Grid Cell Editing. Inline Custom. Editing. Inline Tag Editing. Popup Custom Editing. Slide-out Custom. Editing. Inline Text Editing. Persistent Portals. Inline Reordering Indication. Busy Indication. Cursor Busy. In Context Busy. In Context. Progress. Inline Status. Auto Complete. Balloon Error Tip. Deferred. Content Loading. Dynamic Goal. Narrowing Choices. Refining Search. Live Search. Dynamic Filter. Invitation. Cursor Invitation. Drop Invitation. Tool Tip Invitation. Hover Invitation. Detail Zoom. Opacity Focus. Configurable Module - Faceplate. Configurable Module - Flip It. Configurable Module - Inline Configure. Configurable Module - Slide Out Drawer. Slide Out. Flip. Opacity Fade. Endless Scrolling. Expandable Paging Boundary. Fresh Content. Hover Detail. In Place Drill Down. Inline Assistant. Inline Validation. Validate Then Suggest. On Demand Refresh. Periodic Refresh. Resizable Modules. Scrolling Modules. Auto Save. In Context Tools. Remembered Collection. Remembered Preferences. Auto Form Fill. Rating an Object. Transition. Brighten Transition. Cross Fade Transition. Dim Transition. Expand Transition. Fade In Transition. Fade Out Transition. Flip Transition. Move Transition. Self-Healing Transition. Collapse Transition. Slide Transition. Rich Internet Object. Available. Selected.

Problems

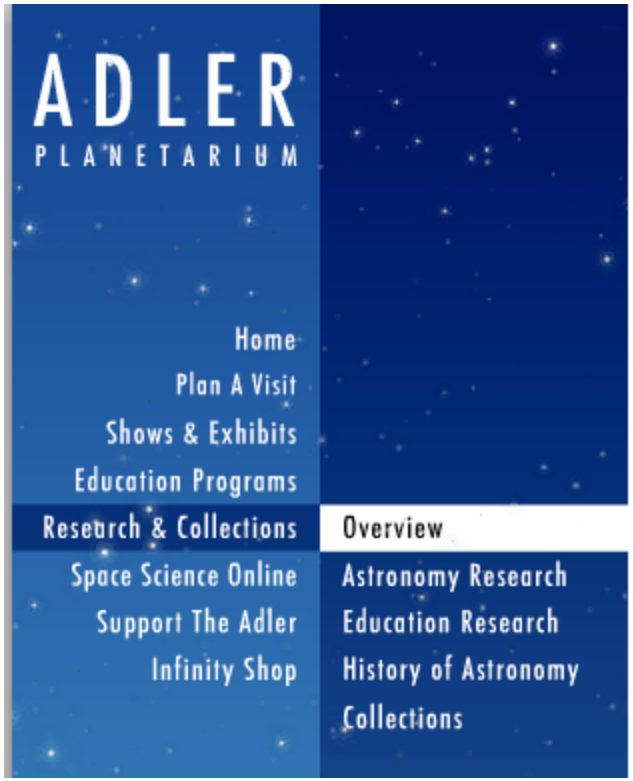
Can you think of a common design problem?

What's In A Pattern

Pattern

- Title
- Problem (situation)
- Use When (constraints)
- Solution
- Why (rationale)
- How (to apply)
- Examples
- Related Patterns
- Accessibility
- Code Samples

Solution



Pattern Name

Quick Access

Pattern Description

Context

User: Novice and expert

Workplace: Website

Problem

Help the user find useful pages that need to be accessed from any location on the site, regardless of the current state of the artefact

Solution

Group the most convenient action links, such as home, site map, and help; place it consistently throughout the whole Web site

Design Ideas: Your turn

Drag and Drop. Drag and Drop Modules. In Page Editing. In Page. Custom Editing. Direct State Editing. Grid Cell Editing. Inline Custom. Editing. Inline Tag Editing. Popup Custom Editing. Slide-out Custom. Editing. Inline Text Editing. Persistent Portals. Inline Reordering. Indication. Busy Indication. Cursor Busy. In Context Busy. In Context. Progress. Inline Status. Auto Complete. Balloon Error Tip. Deferred. Content Loading. Dynamic Goal. Narrowing Choices. Refining Search. Live Search. Dynamic Filter. Invitation. Cursor Invitation. Drop Invitation. Tool Tip Invitation. Hover Invitation. Detail Zoom. Opacity Focus. Configurable Module - Faceplate. Configurable Module - Flip It. Configurable Module - Inline Configure. Configurable Module - Slide Out Drawer. Slide Out. Flip. Opacity Fade. Endless Scrolling. Expandable Paging Boundary. Fresh Content. Hover Detail. In Place Drill Down. Inline Assistant. Inline Validation. Validate Then Suggest. On Demand Refresh. Periodic Refresh. Resizable Modules. Scrolling Modules. Auto Save. In Context Tools. Remembered Collection. Remembered Preferences. Auto Form Fill. Rating an Object. Transition. Brighten Transition. Cross Fade Transition. Dim Transition. Expand Transition. Fade In Transition. Fade Out Transition. Flip Transition. Move Transition. Self-Healing Transition. Collapse Transition. Slide Transition. Rich Internet Object. Available. Selected.

Questions

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Student Systems 2012 Project

http://students.berkeley.edu/wiki/

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Resources

Print

Brown, Dan Communicating Design New Riders 2007

Cooper, Alan About Face 3 WIley 2007

Saffer, Dan Designing for Interaction New Riders 2007

Tidwell, Jenifer Designing Interfaces O'Reilly 2006

Wroblewski, Luke Web Form Design Rosenfeld 2008

Web

Boxes and Arrows: boxesandarrows.com

Information Architecture Institute: iainstitute.org:

Jakob Nielsen: useit.com:

Design Pattern Libraries

Jenifer Tidwell
http://designinginterfaces.com

Open Source Design Pattern Library
http://uidesignpatterns.org/

UC Berkeley's web pattern library
http://groups.ischool.berkeley.edu/ui_designpatterns/webpatterns2/webpatterns/home.php

UI Patterns
http://ui-patterns.com/

Martijn van Welie
http://www.welie.com

Yahoo Design Pattern Library
http://developer.yahoo.com/ypatterns/