Visual Structure

Goals of this Presentation

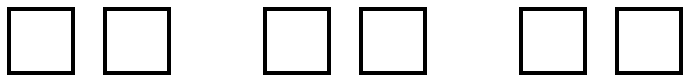
- Desceibe four principles of Gestalt Psychology
  - Gestalt -> form
- Give examples - good and bad - of visual design and explain how they follow - or don't follow - the principles of Gestalt Psychology
- Explain how those principles apply to good visual design of user interfaces:
  - **Use Visual Structure to Reinforce Logical Structure**

Four Gestalt Psychology Principles

1. Proximity
2. Similarity
3. Common Fate
4. Closure

Principle 1: Proximity

- Our eyes/brain logically group together visual elements that are "proximate" (close) to one another.
- Given the following image, do you see
  - Six squares?
  - Three groups of two squares?



- More will answer "Three groups of two squares"

Proximity Example

- Items close together appear to have a relationship
- Distance implies no relationship

Time:

Time:

Visual Structure (Proximity) Reinforces Logical Structure

- Proximity creates groups to reinforce alphabetization

ATE	**GET**
BAT	**GOT**
BIT	**HAT**
CAT	**HIT**
DOG	**HOT**
EAT	**LAP**
FAR	**MAP**
FAT	**PAT**

ATE BAT BIT CAT DOG EAT

FAR FAT GET GOT HAT HIT

HOT LAP MAP PAT

Visual Structure (Proximity) Opposes Logical Structure!

- Proximity counters alphabetization

Bad

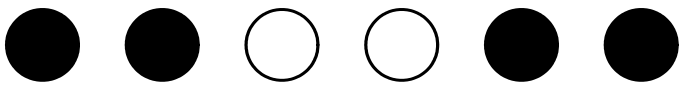
ATE	**BAT**
BIT	**CAT**
DOG	**EAT**
FAR	**FAT**
GET	**GOT**
HAT	**HIT**
HOT	**LAP**
MAP	**PAT**

Worse!

ATE	**BAT**
BIT	**CAT**
DOG	**EAT**
FAR	**FAT**
GET	**GOT**
HAT	**HIT**
HOT	**LAP**
MAP	**PAT**

Principle 2: Similarity

- Our eyes/brain logically group together visual elements that are similar to one another.
- Given the following image, do you see
  - Six circles
  - Three groups of two circles



- More will answer "Three groups of two circles"

Similarity Example

- Given the following image, do you see
  - Six letter 'A's?
  - Three groups of two 'A's?

AAAAAA

- More will answer "Three groups of two 'A's"

Similarity Creates a Typographical Hierarchy

This is a level 1 heading

This is a level 2 heading

This is another level 2 heading

This is a level 3 heading

Yet another level 3 heading

Back up to level 2

Down to level 3

Still at level 3

Back to level 1

Principle 3: Common Fate

- Our eyes/brain associate elements that are similar to one another (not same as similarity for grouping).
- What associations do you see here?

Lines are not vertically aligned
=> do not have common fate
=> do not seem grouped together

Lines are vertically aligned
=> do have common fate
=> do seem grouped together

Grids Provide Structure Using Common Fate

- Grids are (hidden) horizontal and vertical lines
  - They help place graphic elements
- Alignment to same grid line creates logical grouping
  - Common fate
- Grids avoid disconcerting irregularities
  - That attract the eye

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Grids Provide Structure Using Common Fate

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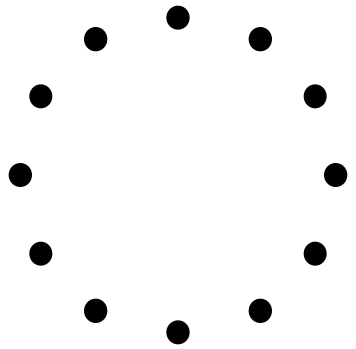
- Alignment to same grid line creates logical grouping
  - Common fate
- Grids avoid disconcerting irregularities
  - That attract the eye
  - Like this

Principle 4: Closure

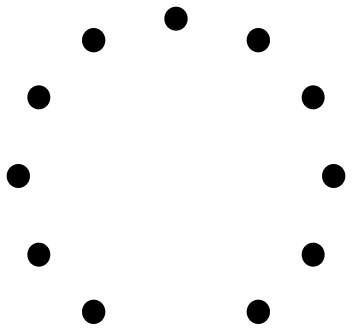
- Our eyes/brain logically group together visual elements that approximate a closed shape, to form that closed shape
- Given the following image, do you see
  - Twelve dots?
  - A circle?



  - More will answer “A circle”

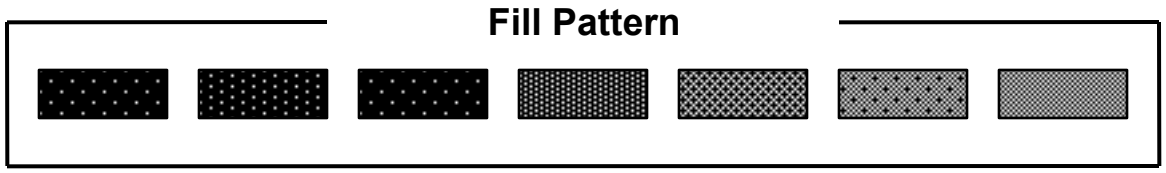
Closure Example

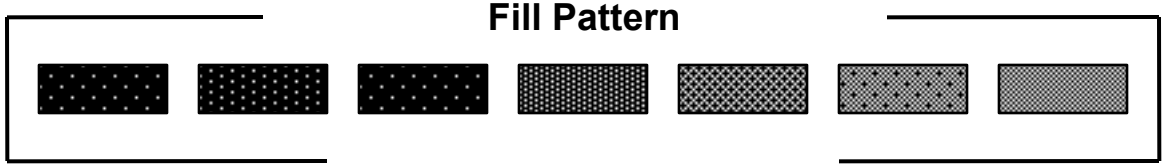
- Given the following image, do you see
  - Eleven dots?
  - A circle?

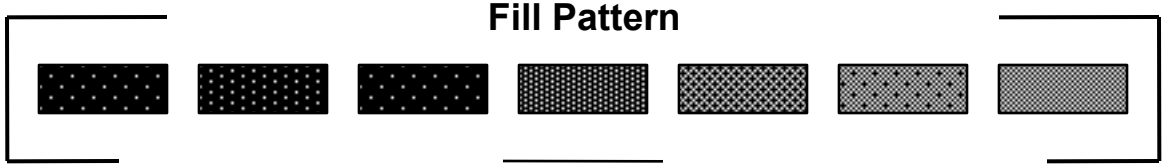


- More will answer “A circle” - despite the missing dot

Closure Example – Each Palette Has Progressively Less Closure - and Works

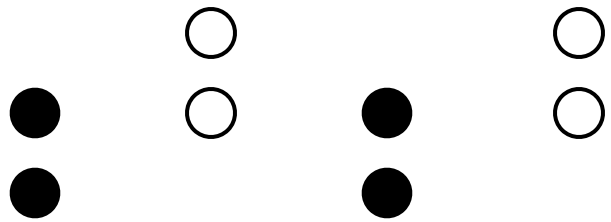






Principles can be Combined

- Proximity and similarity => grouping



- Proximity and closure => grouping

[ ] [ ]

- Proximity opposes closure

][ ][ ]

Combining Principles - Menu Example

No visual structure to reinforce logical structure

Rotate X
Rotate Y
Rotate Z
Zoom In
Zoom Out

Grouping created by

- Proximity within clusters
- Visual separation between clusters

Rotate X
Rotate Y
Rotate Z

Zoom In
Zoom Out

Hierarchy created by

- Indentation (common fate)

Rotate
  X
  Y
  Z

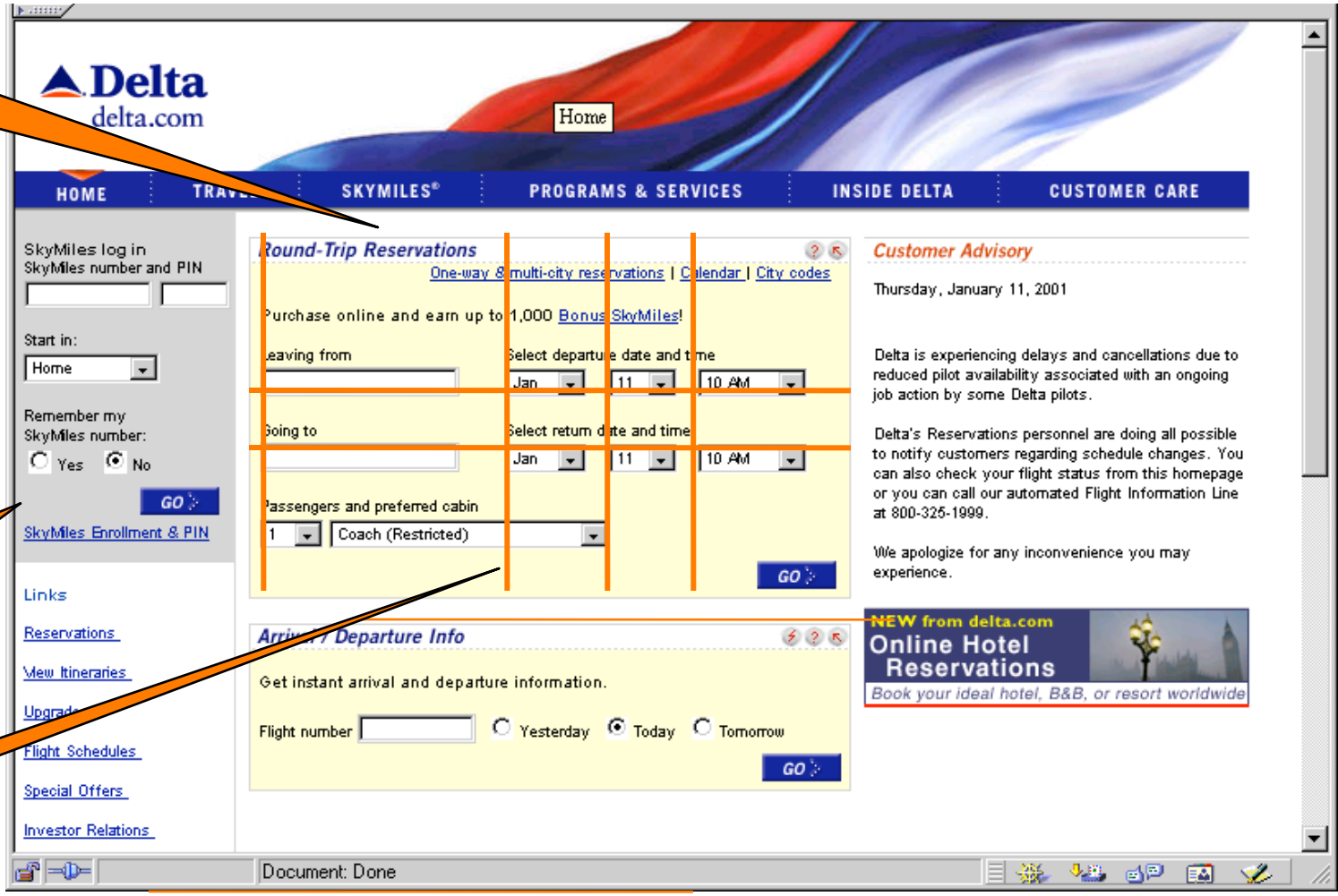
Zoom
  In
  Out

Combining Principles – Web Example

Grouping defined by background (common fate) and by box (closure)

Grouping defined by background (common fate)

Grid (common fate)



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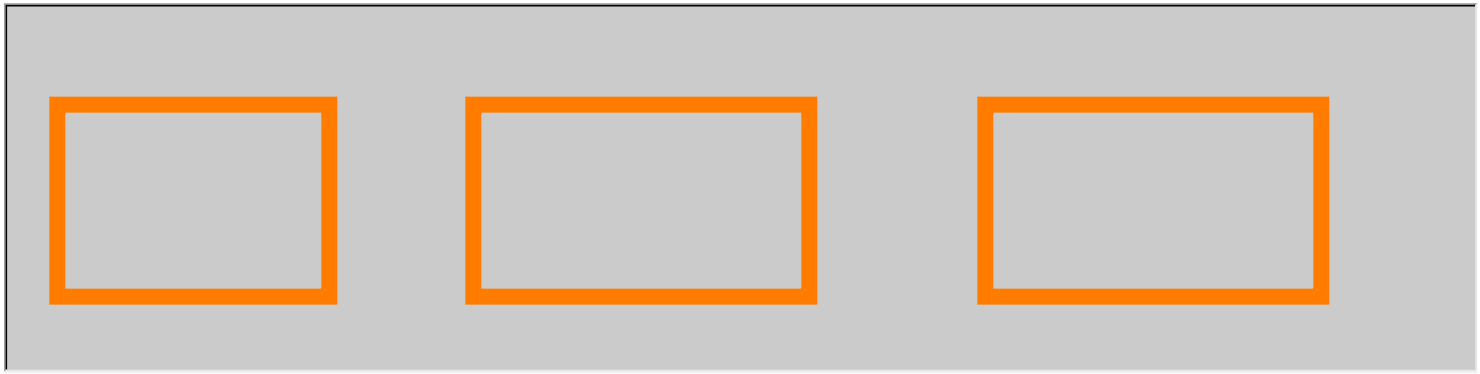
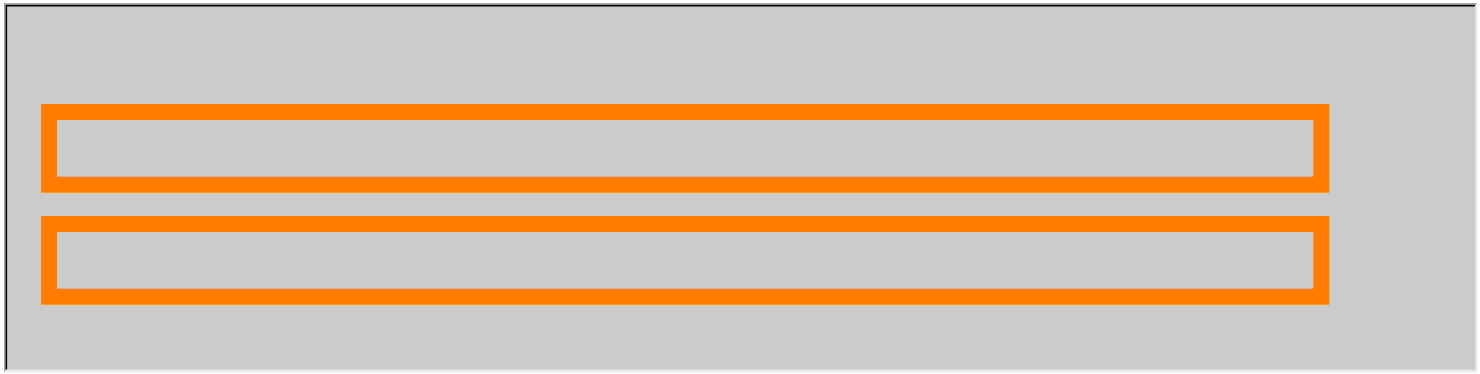
Grouping: Poor Dialogue Box Design

- Logical structure hard to understand – proximity problem

Which is the Logical Structure?





Grouping: Two solutions; Which is Better?

More vertical space creates less vertical proximity

Horizontal rule creates two areas (closure) to overcome proximity

Combine Similarity + Common Fate => Stronger Typographical Hierarchy

This is a level 1 heading

This is a level 2 heading

This is another level 2 heading

This is a level 3 heading

Yet another level 3 heading

Back up to level 2

Down to level 3

Still at level 3

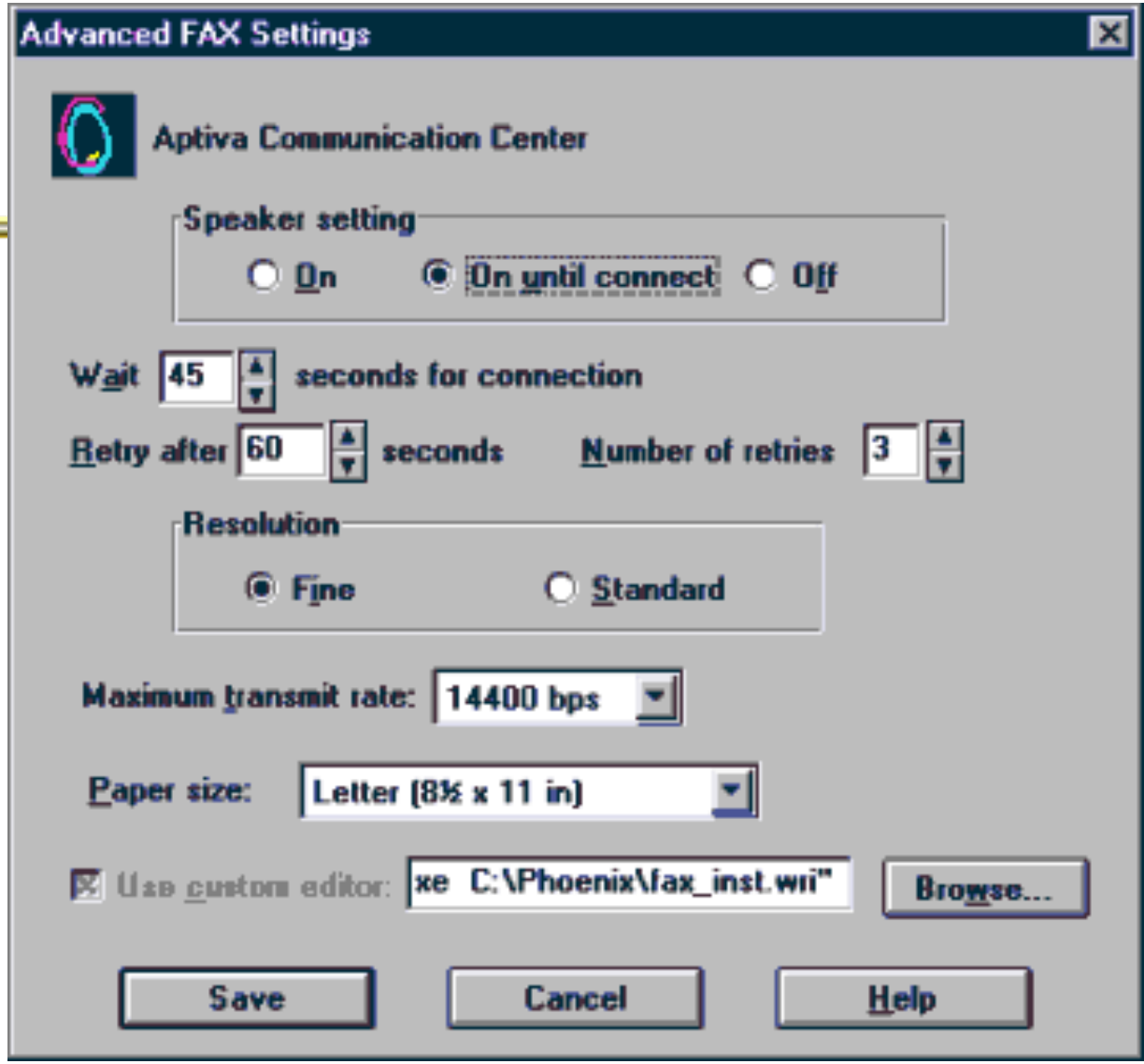
Back to level 1

Using Gestalt Principles is REALLY, REALLY Important

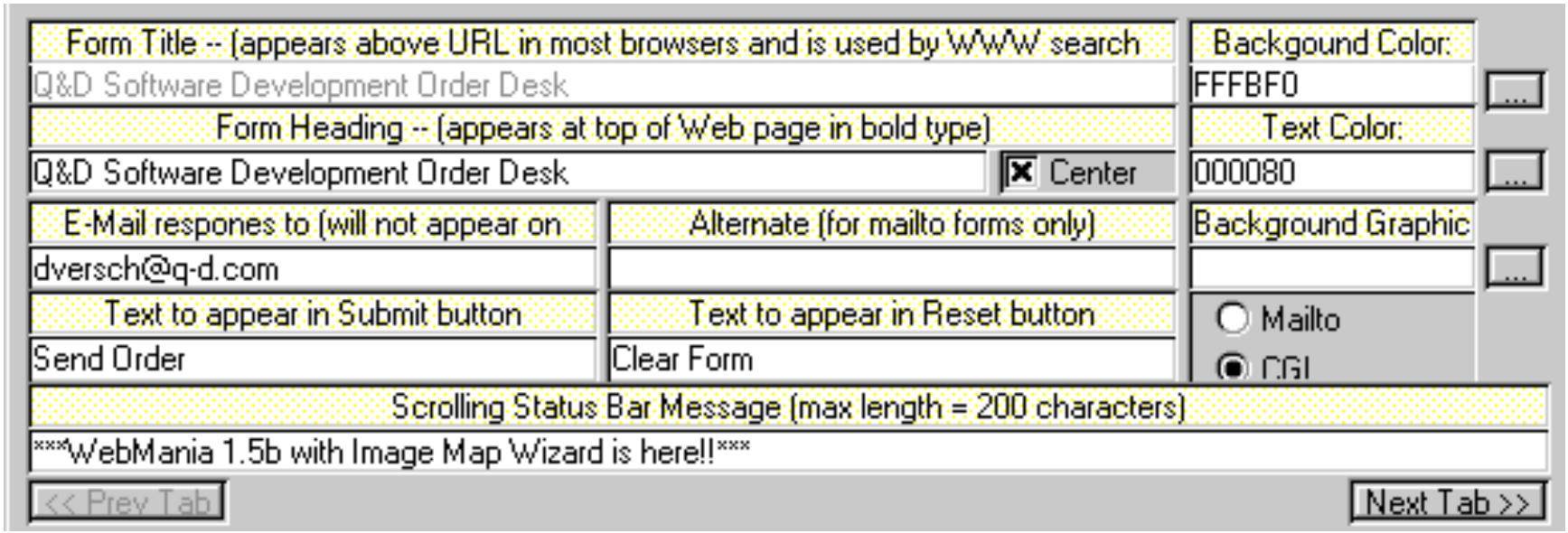
- **Use visual structure to reinforce the underlying logical structure**

Bad Example

- No gridding
- Inconsistent use of visual cues for grouping
- Inconsistent space between label and data



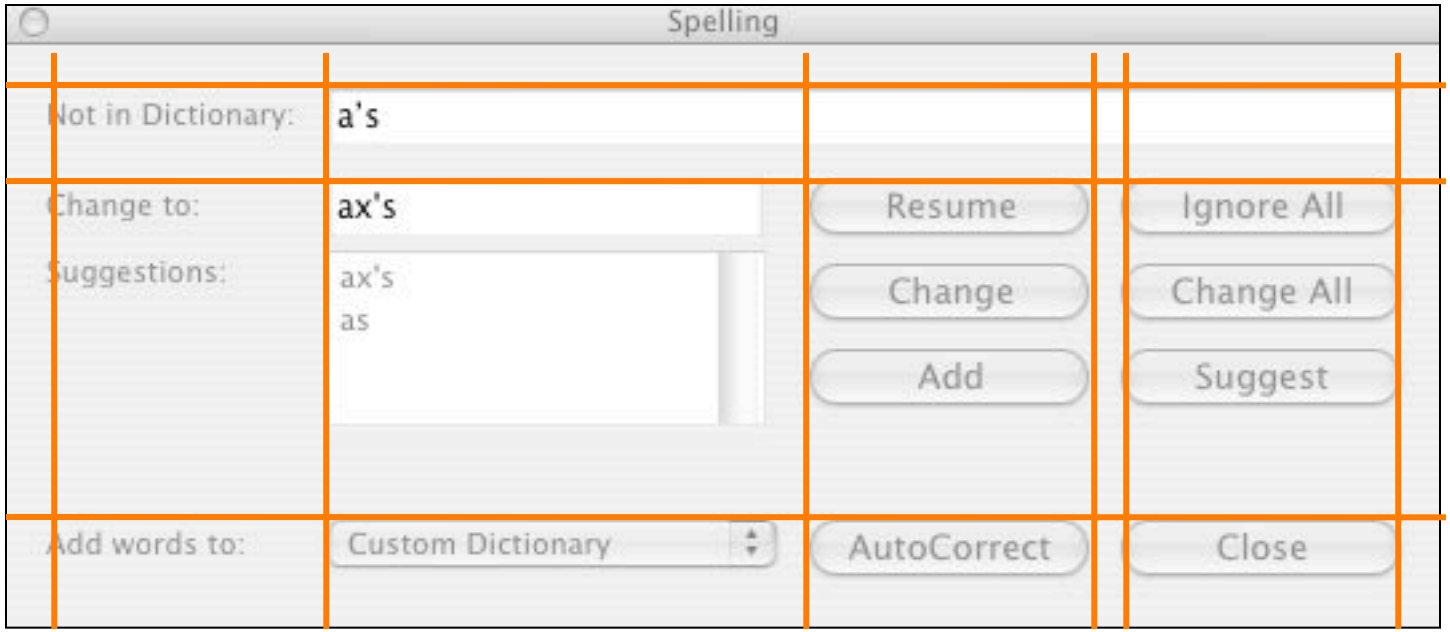
Bad Example



- Hint: Yellow fields are labels
- So-so visual grouping
- So-so logical grouping

A Well-Designed Dialogue Box

Strong grid structure (common fate)

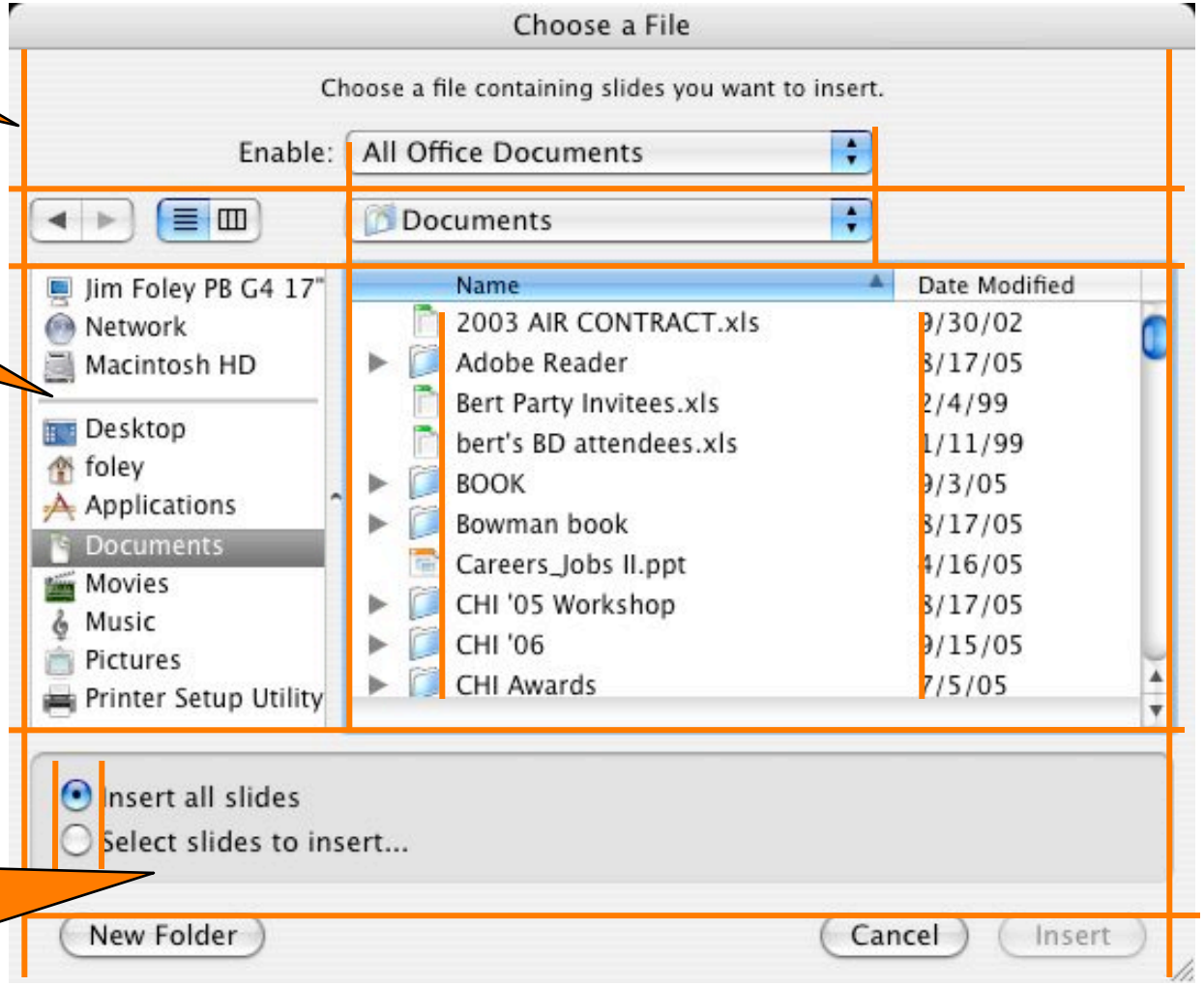


Another Well-Designed Dialogue Box

Strong grid structure (common fate)

Horizontal line uses closure to create two groups and counter proximity

Box surrounding related Items (closure) Different background color (common fate)



Thank You

for participating in this study!