

Welcome

Voice User Interface design

Abbas Moallem, Ph.D.

Among the great things which are to be found among us, the Being of Nothingness is the greatest

Leonardo Da Vinci



Overview

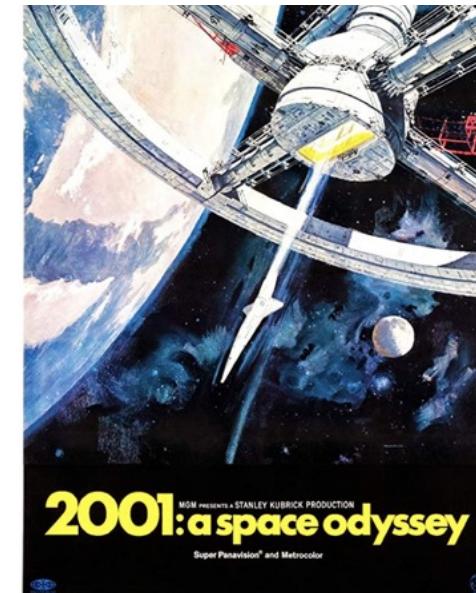
- Brief History of VUI
- Voice User Interface Development
- Different Types of VUI





Speaking to Computers

- Arthur C. Clarke's 1968 fantasy of the HAL 9000 computer in the book and movie *2001: A Space Odyssey* has set the standard for performance of computers in science fiction and for developers of natural language systems
- The reality is more complex

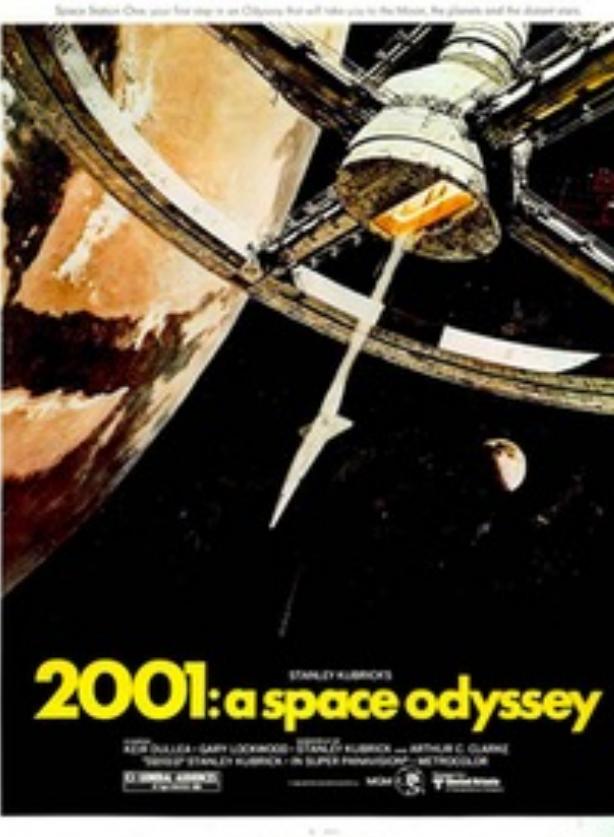




Brief History of VUI



An epic drama of
adventure and exploration





Brief History of VUI

1960- 1980s

Research: Speech
Recognition



1990s-Early 2000

Interactive Voice Response
IVR



Present Time

Voice User Interfaces





Voice-activated Digital Assistants

- A few years ago, you would only see someone talking into their phone if somebody was on the other side
- Fast forward a bit and now talking to your phone when you are not on a call is no big deal
- Siri for iPhone revolutionized the behavior, and nowadays it is common to see people use their voice to control their phones





Speech Recognition are used

- When users have physical impairments
- When the speaker's hands are busy
- When mobility is required
- When the speaker's eyes are occupied
- When harsh or cramped conditions preclude use of a keyboard
- When application domain vocabulary and tasks is limited
- When the user is unable to read or write (e.g. children)



Speech Technologies

- **Store and replay (museum guides)**
- **Dictation (document preparation, web search)**
- **Close captioning, transcription**
- **Transactions over the phone**
- **Personal “assistant” (common tasks on mobile devices)**
- **Hands-free interaction with a device**
- **Adaptive technology for users with disabilities**
- **Translation**
- **Alerts**
- **Speaker identification**



Speech Production

- Speech production is usually successful when the messages are simple and short; and users' visual channels are overloaded
- There are three general methods to produce speech:
 1. Formant synthesis – machine-generated speech using algorithms
 2. Concatenated synthesis – uses tiny, recorded human speech segments
 3. Canned speech – fixed, digitized speech segments



Advantages of VUI

- Speed: Faster than Typing
- Hands Free: When hand are busy, Surgeon, Dentist, Cooking
- Intuitiveness: Accessible to most people
- Empty: Human Voice properties, Tone volume



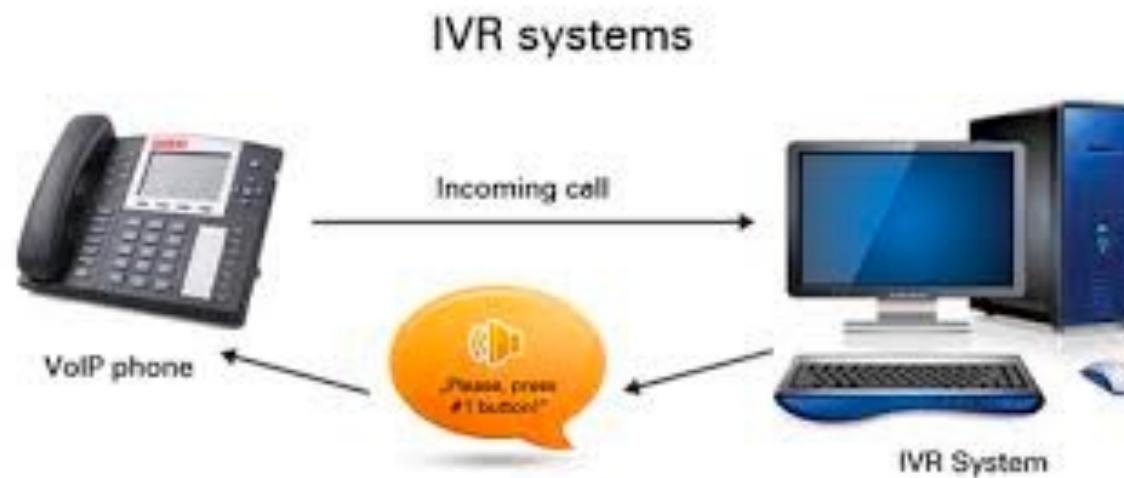
Disadvantages of VUI

- **Public Space**
- **Discomfort speaking to computer**
- **Security**
- **Privacy**



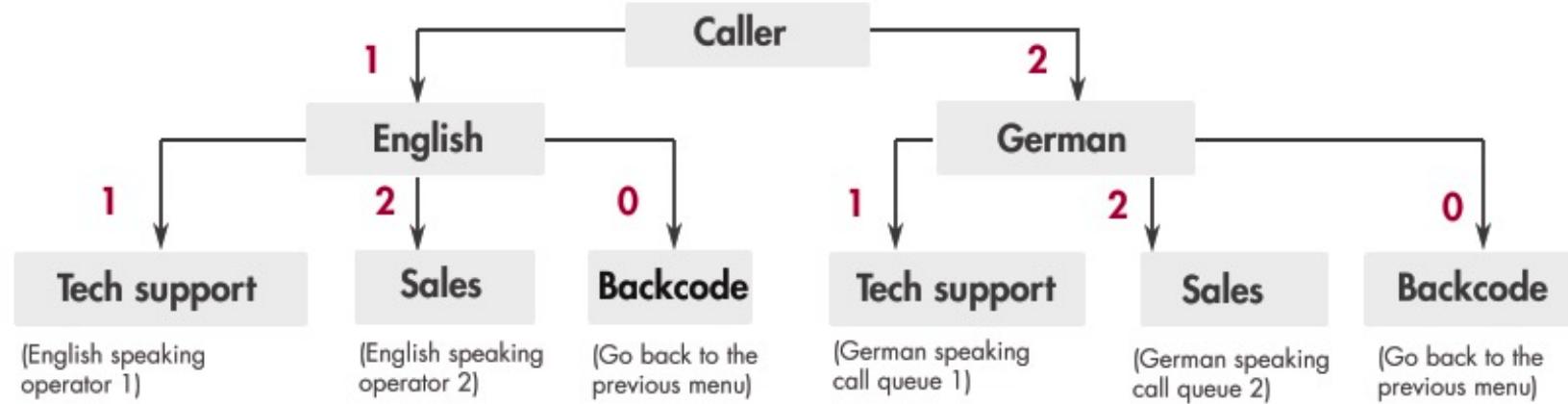
Interactive Voice Response

- Mostly Targeted Telephone Support System
- Designed for Automated Tasks





IVR application





Voice User Interfaces



Siri



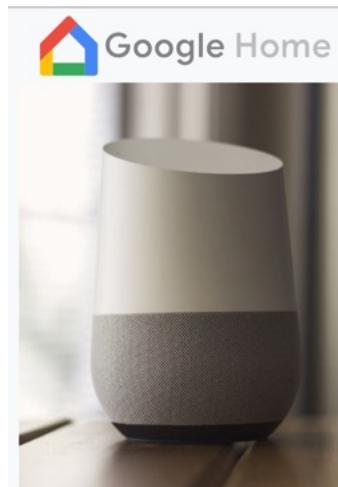
Cortana
Software



Google Assistant



Amazon Alexa



Apple HomePod



Different Types on VUI

- **Command-and-Control**
 - Users explicitly indicate when they want to speak
 - Example Siri, Google, Amazon
- **Conversational**
 - Natural turn-taking
 - Chatbot, game, avatar



Conversational

- **Give your information about what they can do**
- **Limit the amount of information**
 - Do not list more than three different options for an interaction
- **Use visual feedback**



Example 1

- *USER*
- **Ok Google. Who was the 16th President of the United States?**
- *GOOGLE*
- **Abraham Lincoln was the 16th President of the United States.**
- *USER*
- **How old was he when he died?**
- *GOOGLE*
- **Abraham Lincoln died at the age of 56.**
- *USER*
- **Where was he born?**
- *GOOGLE*
- **Hodgenville, KY**
- *USER*
- **What is the best restaurant there?**
- *google*
- **Here is Paula's Hot Biscuit:**



Avatars

- Storytelling
- Video Games





Speech Recognition Technology

- **Engine**
- **Barge in**
 - Allow user to interrupt the system
- **Timeout**
 - End-of-speech Timeout
 - No Speech Timeout
 - Too much Speed
- **N-Best List**
 - The list of what user might have said



Speech Recognition Issues

- **Noise**
- **Multiple Speakers**
- **Children Speech**
- **Name, Spelling, and Alphanumeric**
- **Data Privacy**
- **Security**

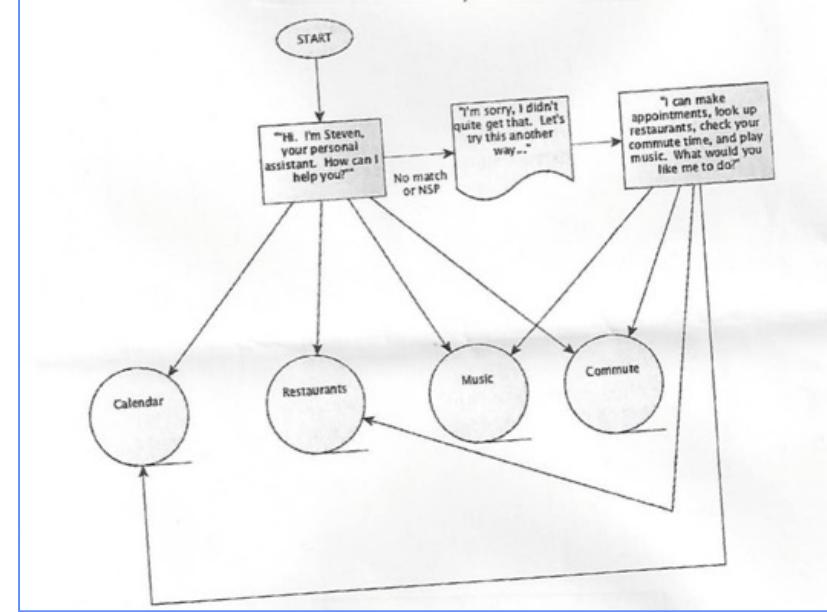
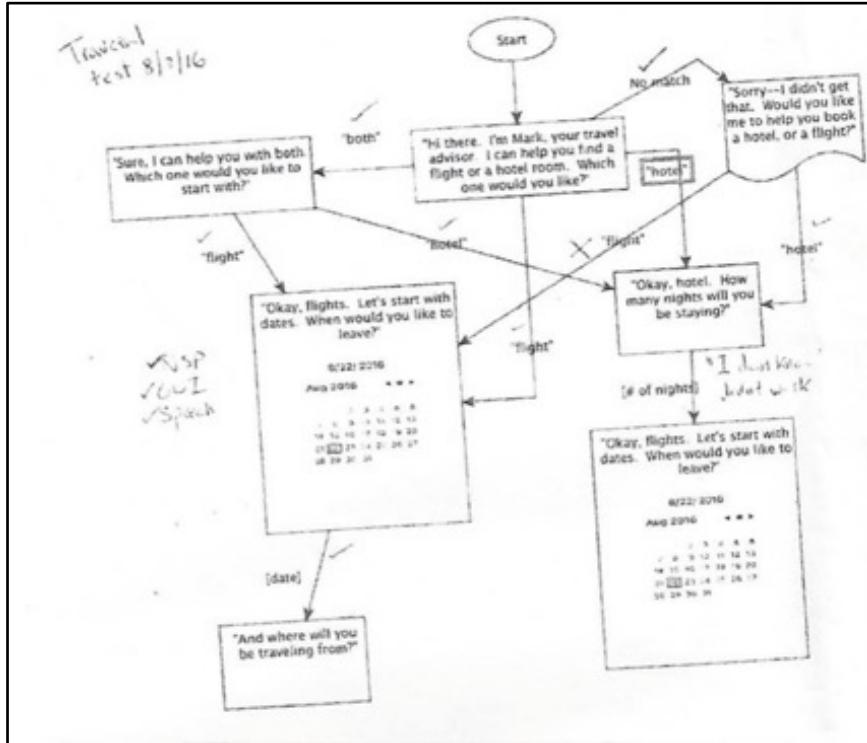


Error Handling

- No Speech Detected
- Speech Detected but nothing recognized
- Something was recognized correctly, but the system does the wrong thing with it
- Something was recognized incorrectly



Prototyping VUI





User Testing VUI

- Tasks
- Participants
- Questions



Tools

Amazon Lex

<https://aws.amazon.com/lex/?nc=sn&loc=0>



Actions on Google

<https://developers.google.com/actions/>



<https://botsociety.io/?ref=conversationaluitools>



<https://flow.ai/?ref=conversationaluitools>



<https://www.adobe.com/products/xd.html?ref=conversationaluitools>

ChatBot

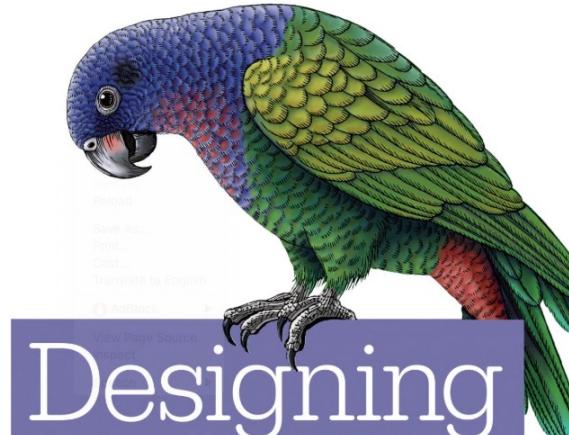
<https://www.chatbot.com/?ref=conversationaluitools>





Resources

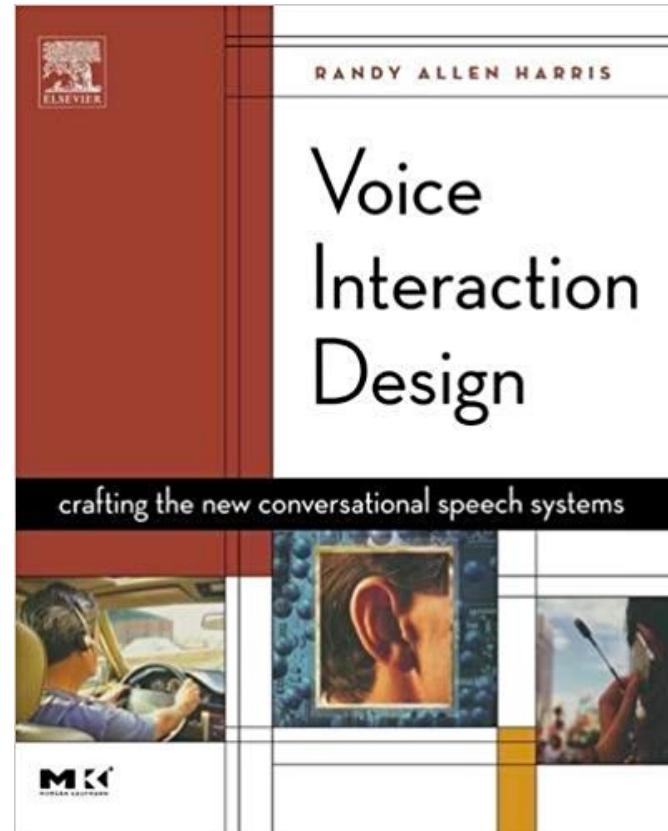
O'REILLY®



Designing Voice User Interfaces

PRINCIPLES OF CONVERSATIONAL EXPERIENCES

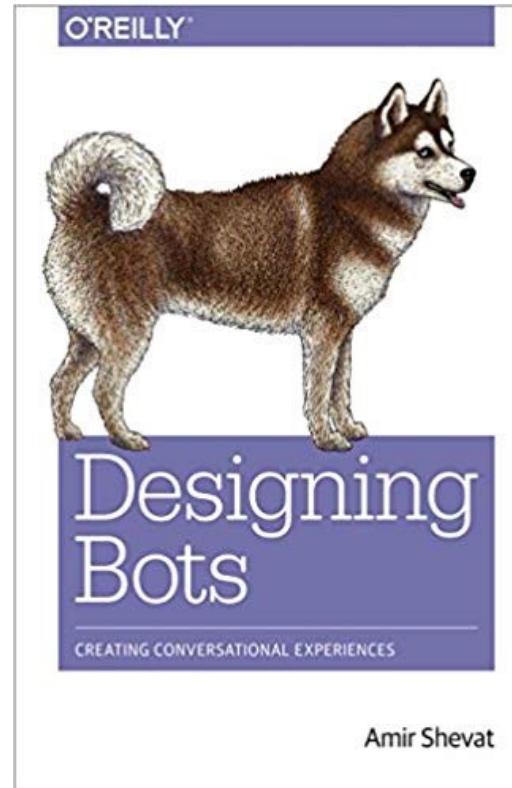
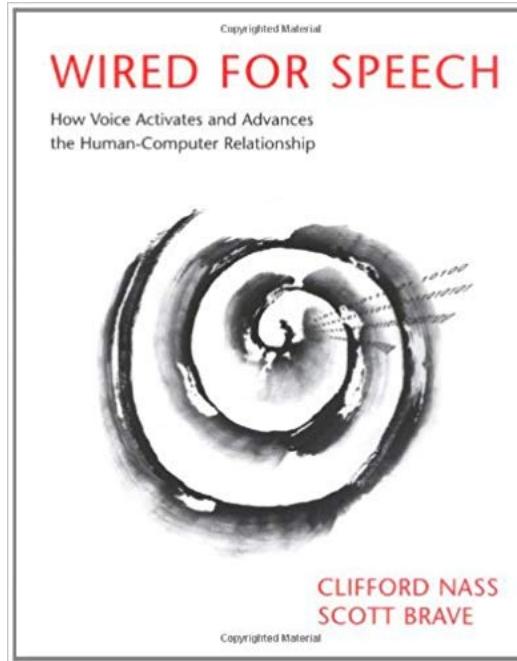
Designing Voice User Interfaces: Principles of Conversational Experiences, By Cathy Pearl



Randy Allen Harris, Voice Interaction Design



Resources





Questions



A wide-angle photograph of a desert landscape. In the foreground, there are low, scrub-covered hills. Beyond them, the terrain rises into more prominent mesas and buttes, creating a layered effect. The sky above is a clear, pale blue, dotted with wispy white clouds.

Thank You For Your Participation

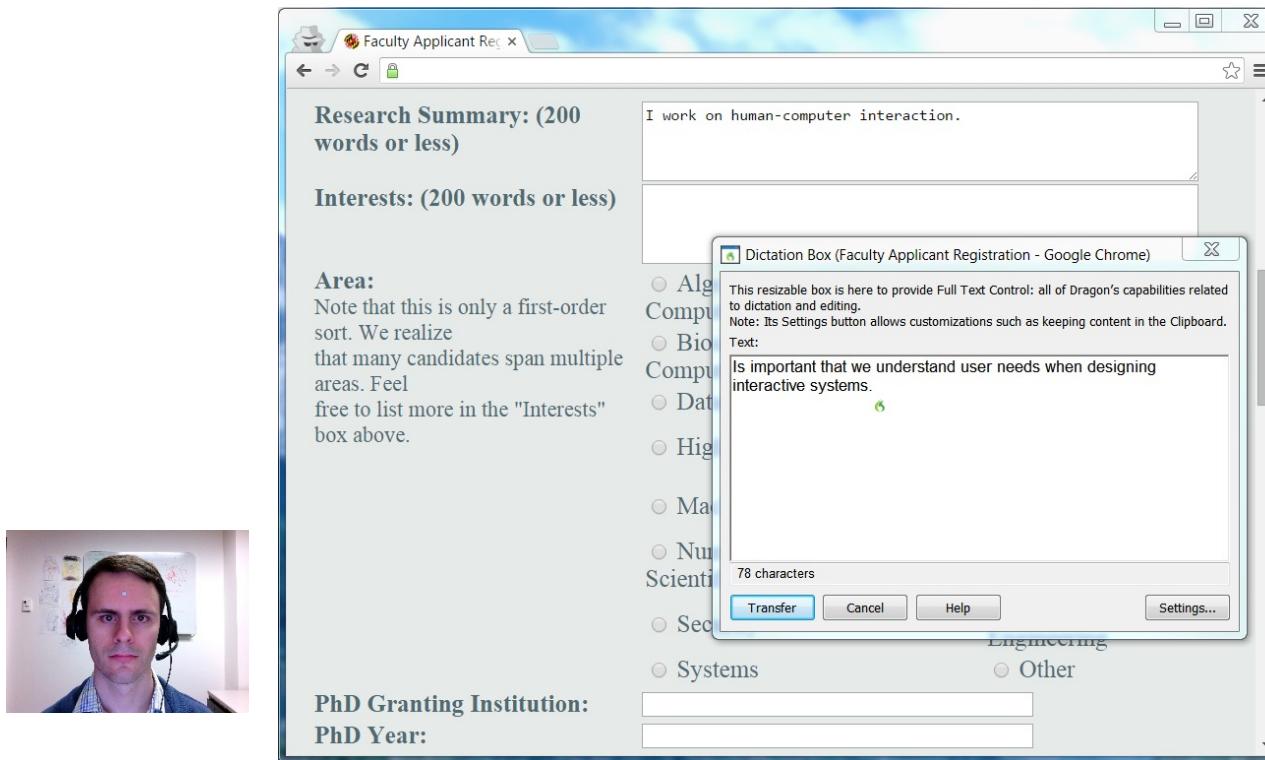


Speech Recognition and Generation: Obstacles to Speech Recognition

- Interference from noisy environments and poor-quality microphones
- Commands need to be learned and remembered
- Recognition may be challenged by strong accents or unusual vocabulary
- Talking is not always acceptable (e.g. in shared office, during meetings)
- Error correction can be time consuming
- Increased cognitive load compared to typing or pointing
- Math or programming difficult without extreme customization



Spoken Interaction



- Using Nuance Dragon™ speech dictation and a head mouse (as made visible by the little silver dot on his forehead), a computer scientist is able to overcome a temporary hand disability
(<http://www.nuance.com/dragon/index.htm>)



Speech Recognition and Generation: Obstacles to Speech Production

- Slow pace of speech output when compared to visual displays
- Ephemeral nature of speech
- Not socially acceptable in public spaces (also privacy issues)
- Difficulty in scanning/searching spoken messages

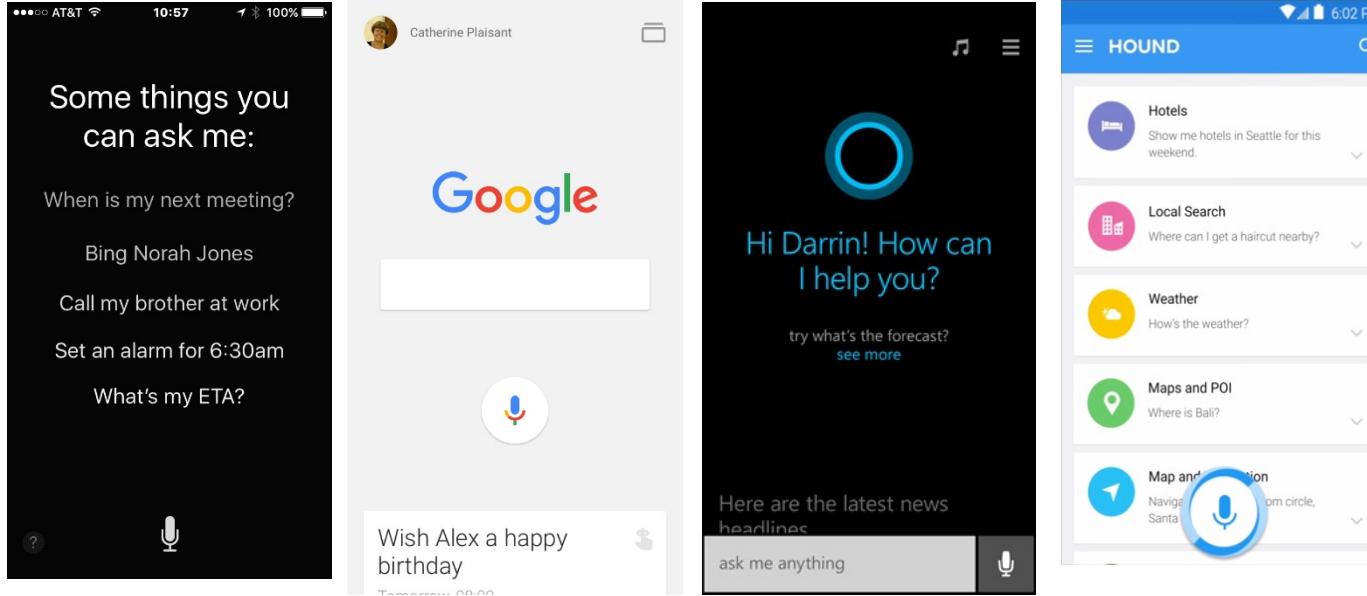


Designing Spoken Interaction

- Initiation
- Knowing what to say
- Recognition errors
- Correcting errors
- Mapping to possible actions
- Feedback and dialogs



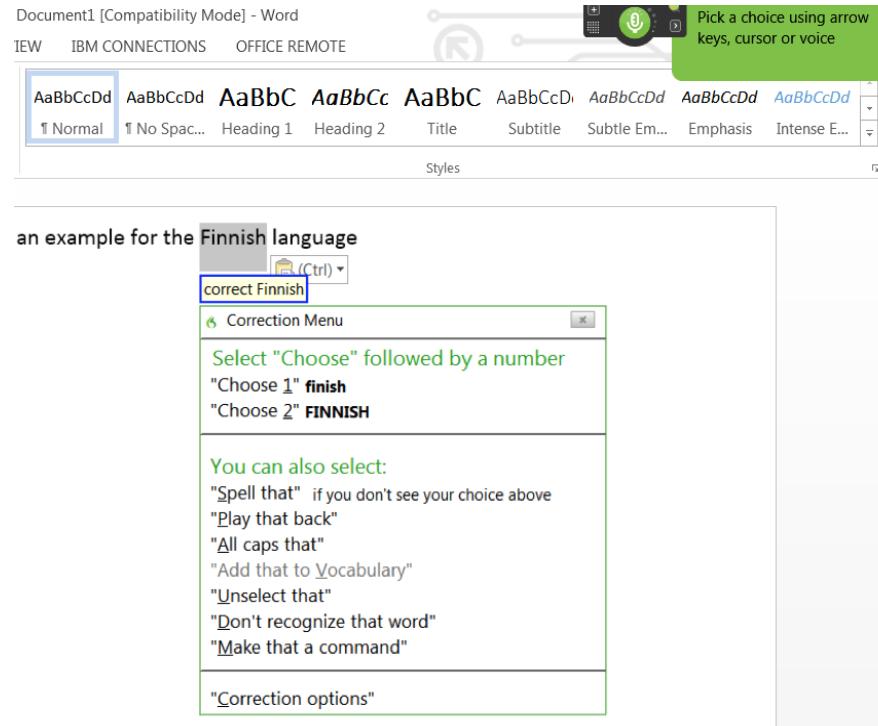
Designing Spoken Interaction



- Mobile devices assistants (from left to right: Siri, GoogleNow, Cortana and Hound) all have similar microphone buttons, but different ways of presenting suggestions



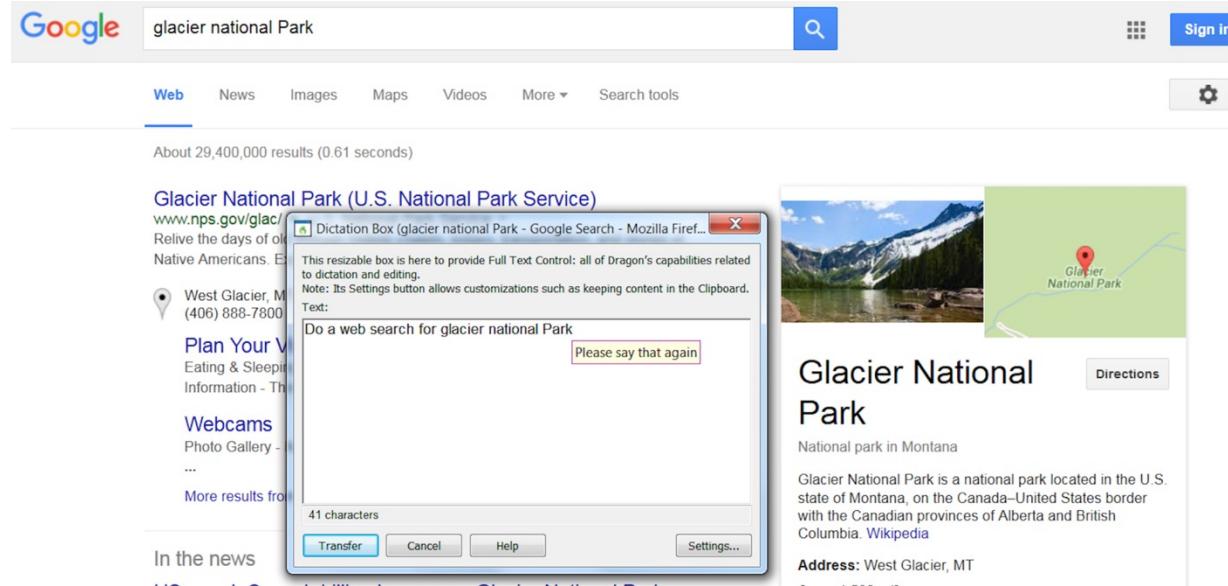
Designing Spoken Interaction



- Correcting a word during dictation using Nuance Dragon™.
- After saying “Correct finnish” the word is selected and possible corrections are displayed in a menu, along with additional commands such as “Spell that”
- Users can use the cursor, arrow keys, or voice to specify their choice



Designing Spoken Interaction)



- It can be difficult to remember what exact command will accomplish the task
- In this example when the user said “Search the web for Glacier National Park” a Google search was launched and a search executed with the correct terms, but when the user said “Do a web search for Glacier National Park” the text was indeed accurately recognized but not as a command, so the text was placed in the Nuance Dragon™ dictation box



Designing Spoken Interaction

```
give me help
give me help on commands
[ (go | move) ]( ( back | backward | backwards ) | ( forward | forwards ) ) | ( up | down ) ) ( one | a ) line
[ (go | move) ]( ( back | backward | backwards ) | ( forward | forwards ) ) | ( up | down ) ) ( twenty | ... ) lines
( go | move ) ... [ ( ( one | one ) | ( twenty | ... ) ) ]
[ ( go | move ) ]( ( left | right ) | ( ( back | backward | backwards ) | ( forward | forwards ) ) ) ( one | a ) character
[ ( go | move ) ]( ( left | right ) | ( ( back | backward | backwards ) | ( forward | forwards ) ) ) ( twenty | ... ) characters
( go | move ) to [ the ] ( bottom | end )
( go | move ) to [ the ] ( bottom | end ) of [ the ] ( line | document )
( go | move ) to [ the ] ( start | top | beginning )
( go | move ) to [ the ] ( start | top | beginning ) of [ the ] ( line | document )
go to sleep
go_to_sleep
help me
```

- A small subset of the rich set of commands used in the Nuance Dragon™ speech recognition system
- Synonyms are included and used consistently



Human Language Technology

- **Machines that understand natural language**
- **Natural language interaction (NLI)**
 - Series of exchanges or “dialog” is difficult to design and build, on even a single topic
 - Current successes often rely on statistical methods based on the analysis of vast textual or spoken data from millions of users
- **Example applications and methods include:**
 - Question answering strategies
 - Extraction and tagging, e.g. gathering data from a database of medical records
 - Human language text generation
 - Instructional systems
 - Language translators, e.g. Google Translate



Human Language Technology



- Using the Immersive Naval Officer Training System (INOTS) new navy officers can practice their counseling skills in a virtual reality environment
- Officers listen to an avatar and respond using spoken language, loosely following suggestions from multi-choice prompts presented on the screen and designed to match the learning objectives
- The interaction is constrained but assessment is facilitated
(Dyke, 2013; www.netc.navy.mil/nstc/news_page_2012_02_24_2.asp)



Human Language Technology

The screenshot shows the Google Translate interface. A French sentence "Dur de traduire ces drôles de phrases" is highlighted in blue. The English translation is "Hard to translate these funny sentences". A tooltip for "funny" lists alternative translations: "these strange" (with a cursor icon) and "those weird". Below the main interface, there are sections for "Definitions of drôle" and "Translations of drôle".

Definitions of drôle

adjective
Amusant, comique.
"Ce comédien est très drôle."
Bizarre.
"C'est drôle, on n'a pas entendu parler de lui depuis longtemps."

Translations of drôle

adjective

funny	drôle, amusant, marrant, bizarre, comique, étrange
amusing	amusant, drôle, plaisant
comical	comique, cocasse, drôle, bouffon, risible
comic	comique, drôle, bouffon, cocasse, risible
droll	drôle, comique, bizarre
rum	drôle, bizarre, étrange, biscomu

See also
histoire drôle, C'est drôle.

Turn off instant translation About Google Translate Mobile Community Privacy & Terms Help Send feedback

- Google Translate, showing a French sentence translated in English

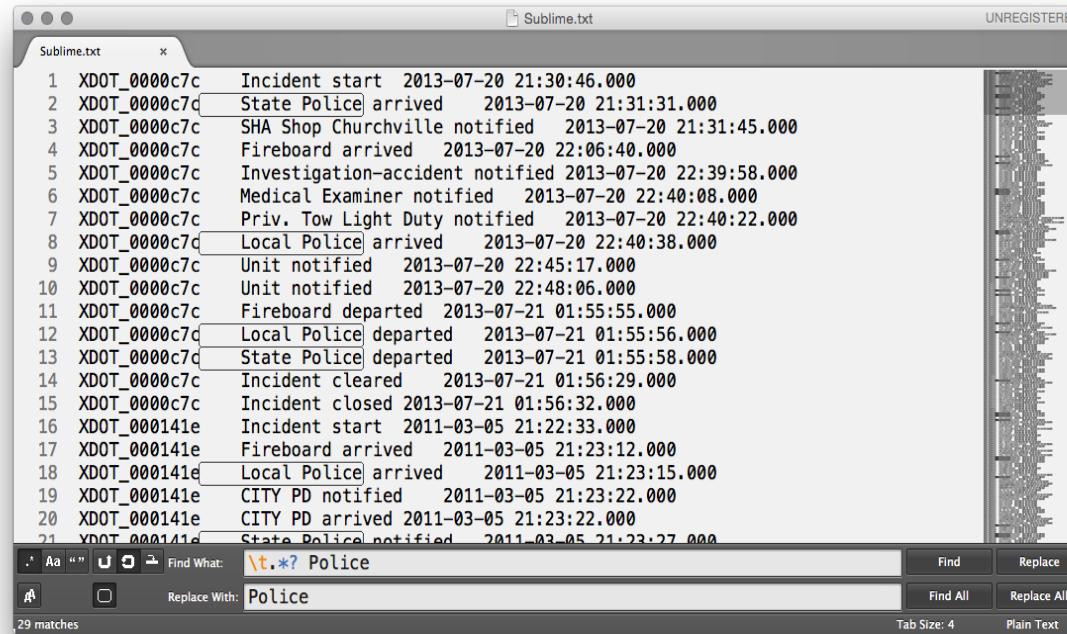


Command Languages

- **Command languages are often preferred by expert users who do not want to drag and drop items for repeated steps.**
- **A command language example is the Unix command used to delete blank lines from a file**
 - `grep -v ^$ filea > fileb`
- **Casual users favor GUIs but both styles of interface can be made available successfully**
- **Other examples that behave like command languages:**
 - Web addresses (URLs) can be seen as a form of command language
 - Twitter addresses
 - Database query languages



Command Languages



- Using the Sublime text editor a user is doing a search and replace in a data table using regular expressions
 - Typing “\t.*? Police” in the search box searches for a tab followed by zero or more character, a space, and then by “Police”
 - The patterns found in the document are highlighted with a thin black line in the document, showing that both “local police” and “state police” have been found and selected
 - An overview of the entire document is visible on the right, revealing the presence of many other matches that can now be replaced all at once.



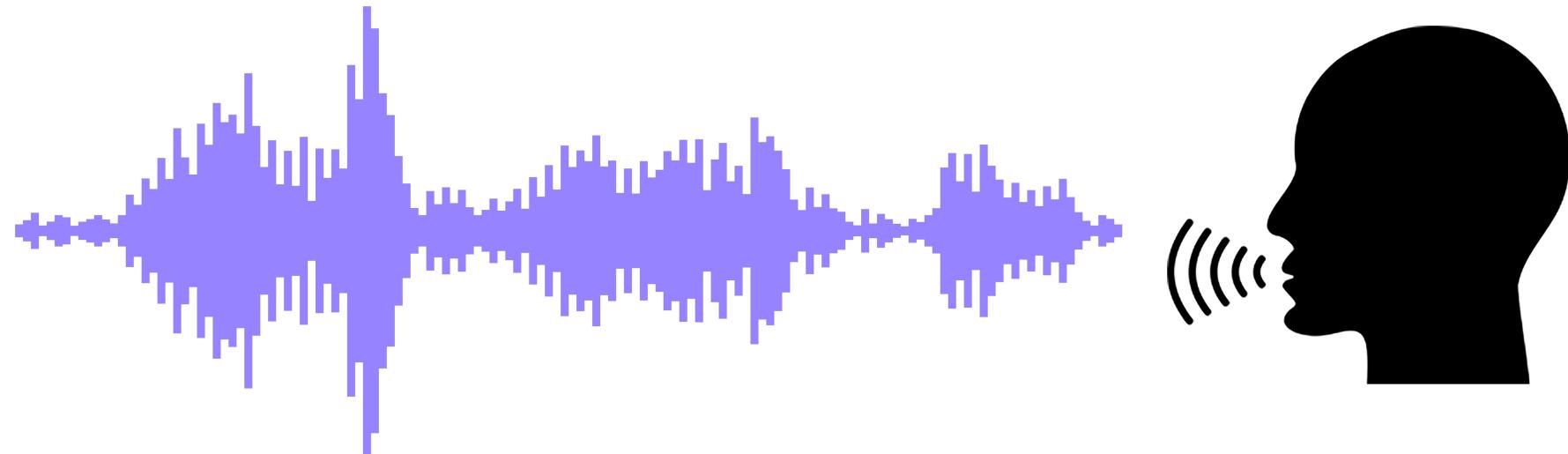
Expressive Human and Command Languages

- 1. Speech recognition**
- 2. Speech production**
- 3. Human language technology**
- 4. Traditional command languages Introduction**



Speech Recognition

- The place for spoken interaction
- Speech recognition applications
- Designing spoken interaction
- Spoken prompts and commands





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Horseshoe Bend, Colorado River

Session 7

UI standards and Guidelines

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Why Do We Have Standards and Design Guidelines

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Make product more user friendly



Transfer information across the company



Facilitate development



Create consistency across product lines



Facilitate Prototyping

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Standards

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- Set by national or international bodies to ensure compliance by a large community of designers
standards require sound underlying theory and slowly changing technology
- Hardware standards more common than software high authority and low level of detail
- ISO 9241 defines usability as effectiveness, efficiency and satisfaction with which users accomplish tasks

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Guidelines

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- More suggestive and general
- Many textbooks and reports full of guidelines
- Abstract guidelines (principles) applicable during early life cycle activities
- Detailed guidelines (style guides) applicable during later life cycle activities
- Understanding justification for guidelines aids in resolving conflicts

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Golden rules and heuristics

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- “Broad brush” design rules
- Useful check list for good design
- Better design using these than using nothing!
- Different collections e.g.
 - Nielsen’s 10 Heuristics (see Chapter 9)
 - Shneiderman’s 8 Golden Rules
 - Norman’s 7 Principles

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Shneiderman's 8 Golden Rules

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- 1. Strive for consistency
- 2. Enable frequent users to use shortcuts
- 3. Offer informative feedback
- 4. Design dialogs to yield closure
- 5. Offer error prevention and simple error handling
- 6. Permit easy reversal of actions
- 7. Support internal locus of control
- 8. Reduce short-term memory load

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Norman's 7 Principles

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- 1. Use both knowledge in the world and knowledge in the head.
- 2. Simplify the structure of tasks.
- 3. Make things visible: bridge the gulfs of Execution and Evaluation.
- 4. Get the mappings right.
- 5. Exploit the power of constraints, both natural and artificial.
- 6. Design for error.
- 7. When all else fails, standardize

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HCI Design Patterns

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- An approach to reusing knowledge about successful design solutions
- Originated in architecture: Alexander
- A pattern is an invariant solution to a recurrent problem within a specific context.
- Examples
- Light on Two Sides of Every Room (architecture)
- Go back to a safe place (HCI)
- Patterns do not exist in isolation but are linked to other patterns in languages which enable complete designs to be generated

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HCI Design Patterns (cont.)

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- Characteristics of patterns
- capture design practice not theory
- capture the essential common properties of good examples of design
- represent design knowledge at varying levels: social, organisational, conceptual, detailed
- embody values and can express what is humane in interface design
- are intuitive and readable and can therefore be used for communication between all stakeholders
- a pattern language should be generative and assist in the development of complete designs.

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Objects Having High Impact on Usability

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Labels

Grids

Check boxes

Fields

Radio buttons

Buttons

List boxes

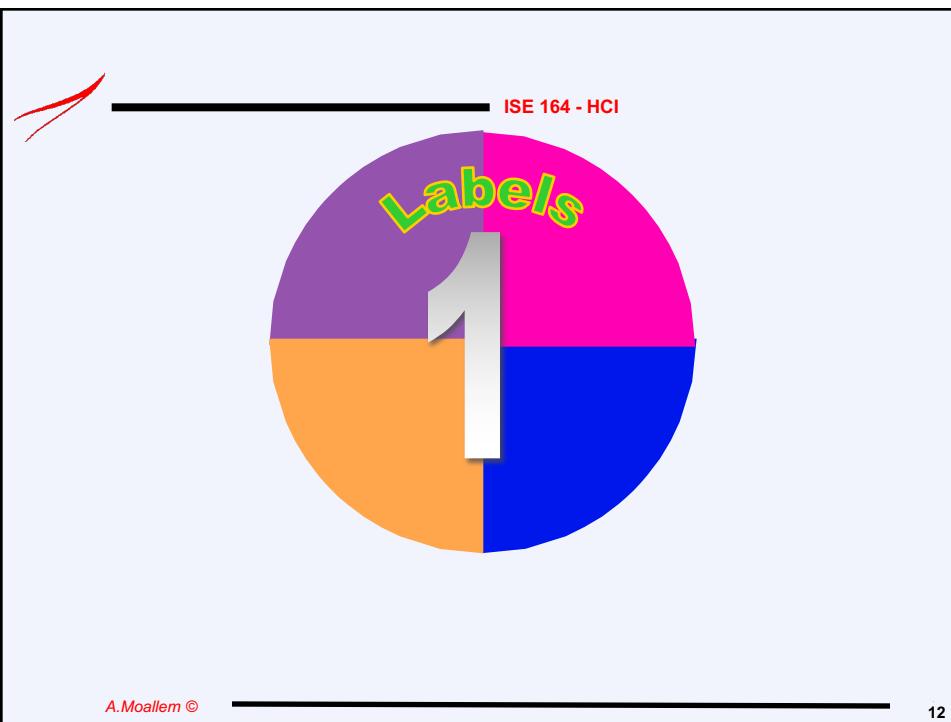
Messages

Instructional text

Enter your phone numbers below and indicate your primary contact phone number by checking the Primary Phone checkbox.

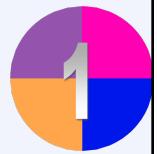
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Labels

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- **Labels are essential for user success in using applications. If users do not understand a label, they will be unable to perform the tasks that they need to accomplish.**

All of us have probably experienced problems with confusing labels.

Issues such as redundancy & repetition inconsistency

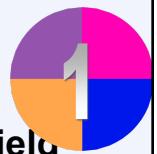
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Example

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What is the difference between these field labels?

- “Find” and another field labeled “Search”.



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Example

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What is the difference between these field labels?

- “Save” , “Submit” and “Apply”



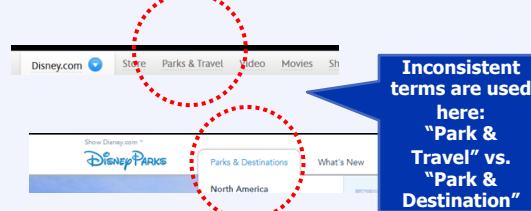
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Example

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Example

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This is a Disney site therefore repeating "Disney" so many times is not needed.

Inconsistent terms "Search" & "Find"

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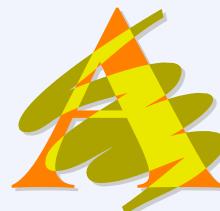
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Labeling Principles

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- Communicate meaning, content, action, or state
- Essential for user success in interaction with application
- Label must be:
 - Clearly written in the user's language
 - Distinctive so that the user will not confuse one with another
 - Brief
 - Consistent across the product



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Additional Guidelines for Labels

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- Remember:
- Abbreviations:
 - Should be avoided for field labels
- Control terminology:
 - Before making a new label, ask yourself if users really need another label
- Evaluate:
 - Set up a diversified group to evaluate and approve a label

 Sign-in & security

>

COMPOSE

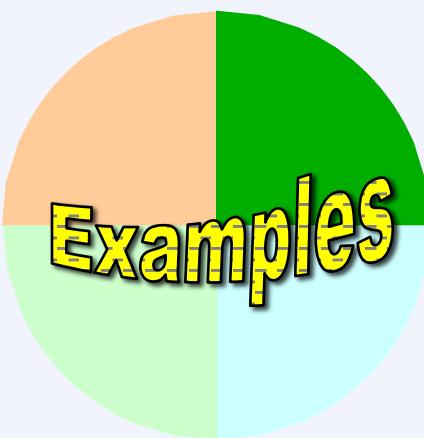
Download browser add-on

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Examples

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Example 1

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TRENDNET For Business For Home Buy Support

PRODUCT WARRANTY REGISTRATION
Please fill out the form to register your product. All fields are required. If you have an existing account, please [LOGIN HERE](#). View product warranty policy.

Contact Information

First Name:	<input type="text"/>
Last Name:	<input type="text"/>
Country:	<input type="text" value="United States of America"/>
Email Address:	<input type="text"/>
Re-enter Email:	<input type="text"/>

A temporary password will be emailed to you.

Product Info

Model Number:	<input type="text" value="<select>"/>
Serial Number:	<input type="text"/>
Date Of Purchase:	<input type="text"/>
Place of Purchase:	<input type="text" value="<select>"/>

Yes, please send me information about TRENDnet news, products and promotions.

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Example 2

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Run Control ID: 0000

SetID: SHARE Specification ID: SPEC1

Description:

*From:

To Date:

Adjustments

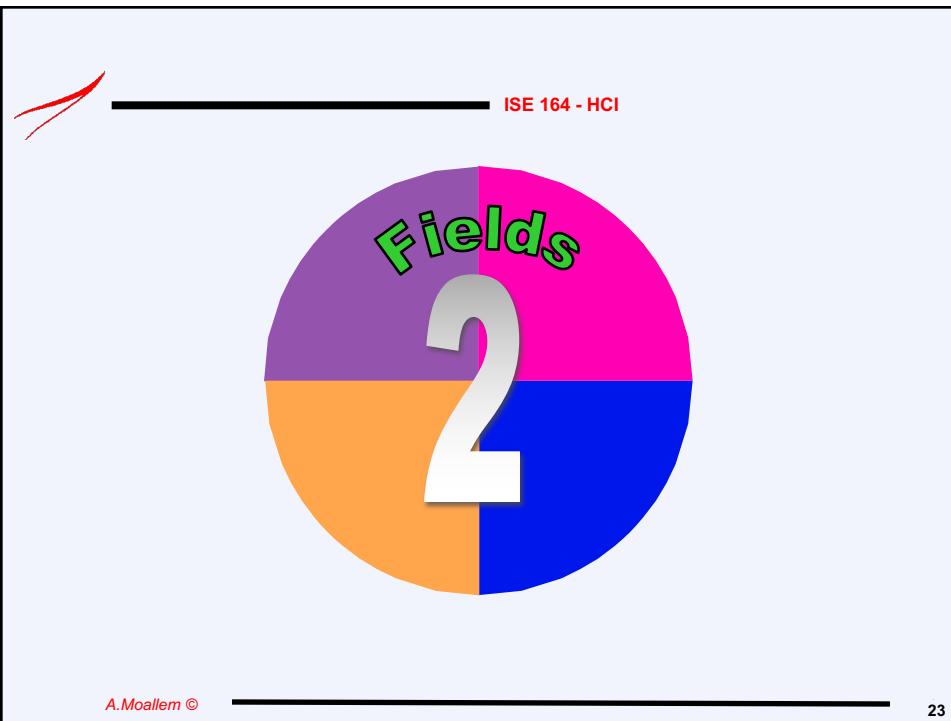
Reason Code:

Comment:

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Field Guidelines

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- All Fields must have Labels
- Align label on the left or right but be consistent
- Avoid blue, red, and purple text
- Avoid small and large font sizes in body text
- Avoid all capital letters
- Reserve bold for important Information
- Keep text lines six to eight words long

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Information Hierarchy -Page Layout

The screenshot shows the 'Web Form Editor' interface with the title 'New Web Form'. The 'Layout' section is highlighted with a red oval. It contains fields for 'Title' and 'Save Button Text'. To the right, there are settings for 'Background Color' (#FFFFFF) and 'Text Color' (#000000). Below the layout section is a table titled 'Fields for Company Resource'.

Label	Type	Req.	Label	Type	Req	Hid	Width	Value	Order
Already Connected	PICKLIST								
EDI Messaging Protocol	PICKLIST								
Email of EDI tech contact for invo	EMAIL								
Email of business contact for invoices	EMAIL								
Free text message	TEXTAREA								
Number of Invoices per Month	PICKLIST								
ODETTEID (SFIID) for Prod. Invoices	STRING								
ODETTEID (SFIID) for Test Invoices	STRING								
ODETTEID (SFIID) pw for Prod. Invoices	STRING								
ODETTEID (SFIID) pw for Test Invoices	STRING								

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Examples

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Example

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Patient Input Nurse Input Physician

Health Vitals

Weight lbs ozs

Temp °C

BP

Systolic mmHg

Diastolic mmHg

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Buttons

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- Start actions
- Change properties
- Display pop-up menus
- Reserved for frequently used actions:
 - Causes something to happen immediately
 - Displays another window
 - Displays a menu option
 - Sets a mode
- A button comes in three styles:
 - Command button
 - Button bar or toolbar
 - A symbol button



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Command Buttons Guidelines

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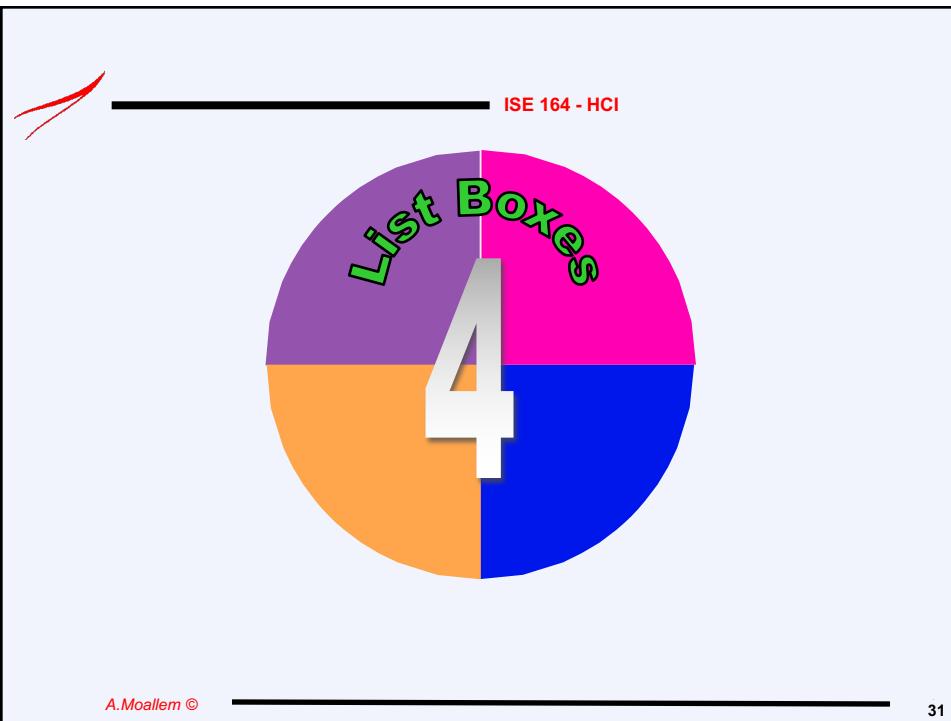
- Buttons and other controls must be organized and appear in predictable position
- Use standard button labels
- Provide meaningful description of the action that will be performed
- Use single word labels when possible
- Use mixed-case letter with the first letter of each word in the label capitalized.
- Provide consistency in button labeling across products
- Restrict the number of buttons on a page to six or fewer
- Separate potentially destructive buttons from frequently chosen selections

Search Members:

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List Boxes

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- A displayed box-shaped control containing a list of attributes or object from which:
 - A single selection is made
- Selection made by using a mouse to point and click
- Can scroll or type text to find a value
- No text entry field exists in which to type text

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List Box General Guidelines

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- Clearly describe the choices
- Left-align into columns
- Use mixed-case letters
- Do not list more than 50 items
- Present all available alternatives
- Use radio buttons when there are fewer than six choices and there is adequate screen real estate
- Order in a logical meaningful way to permit easy browsing

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Check Boxes

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- Allow multiple selection
- Set attribute, properties, or value
- For nonexclusive choices
- Where adequate screen space is available
- Most useful for data and choices that are:
 - Discrete
 - Small and fix in number
 - Not easily remembered
 - Never changed in content
 - Can be used to affect other controls



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Check Box General Guidelines

ISE 164 - HCI

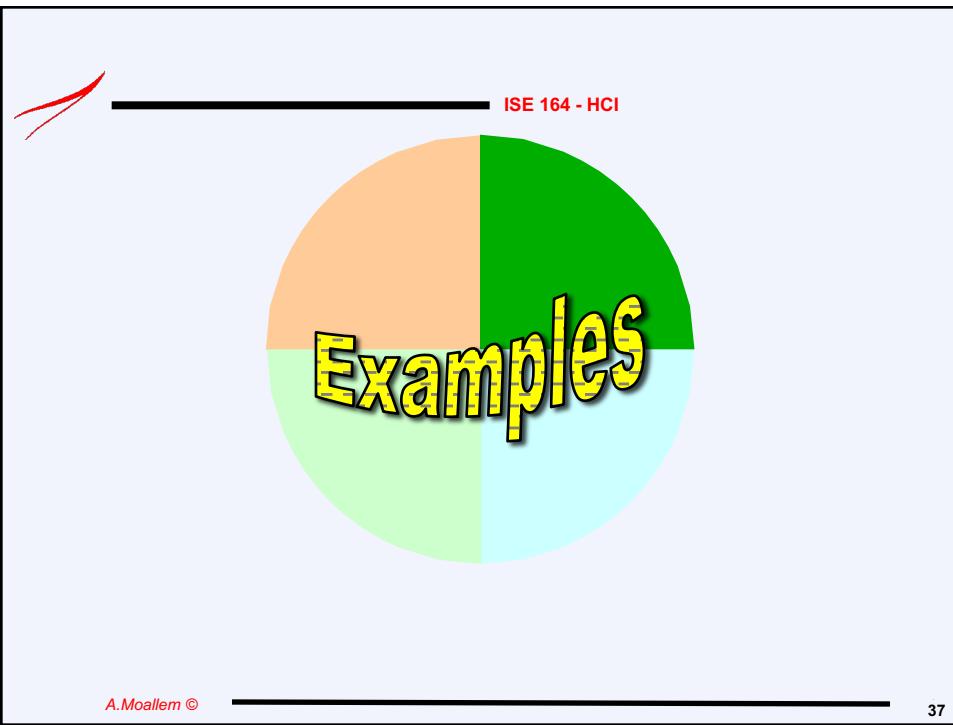
- Provide meaningful, fully spelled out choice labels
- Display in a single line of text
- Display using mixed-case letters with each significant word capitalized
- Position the label to the right of the checkbox.
- Use for short, static lists
- Align vertically
- Show a minimum of one choice, a maximum of eight in a grouping



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Food Truck

Personalize Home Page C

Choose Content: Simply check the boxes below to add items to your home page. Click on the text of any item to edit it. Remember to press "Save" when you're done.

Do these check boxes follow the guidelines?

Grocery News

- Organics
- Sale Items
- Coupon Items
- Seasonal Items

Cooking at Home

- Recipes
- Measurement Conversions
- Ingredient Substitutes

Media

- Television Programs
- Radio Programs
- Newspaper Sections

Health Calorie Counter BMR Calculator Food Storage

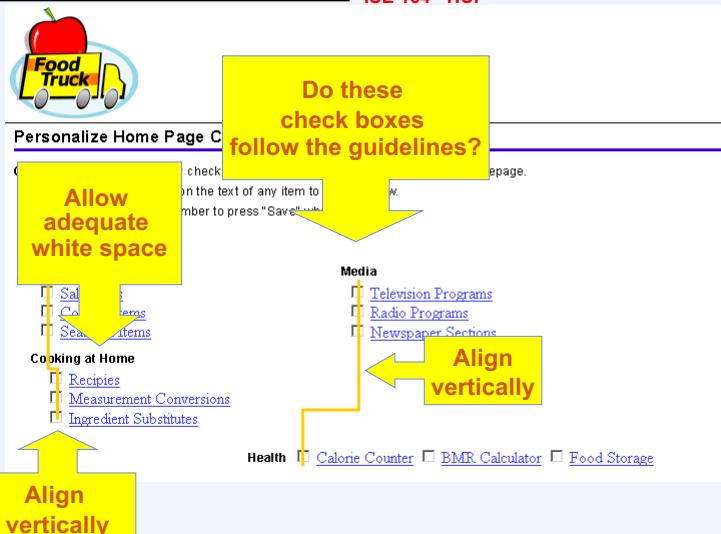
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Example

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Check Box

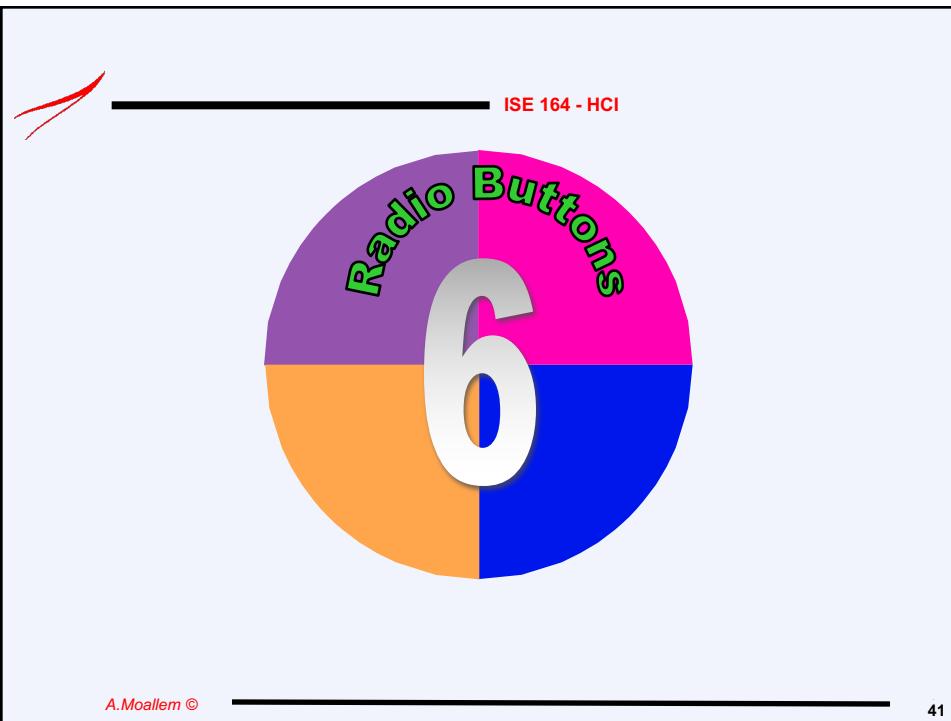
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Item	Group 1	Group 2
Item 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Item 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Item 3	<input type="checkbox"/>	<input type="checkbox"/>
Item 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Item 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Item 6	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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Radio Button

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- Setting attribute, properties, or value
- For mutually exclusive choices
- Where adequate screen space is available
- Most useful for data and choices that are:
 - Discrete
 - Small and fix in number
 - Not easily remembered
 - Never changed in content
 - Can be used to affect other controls
- Do not use:
 - For commands
 - To directly initiate a process, database update, or navigation

Option 1
 Option 2

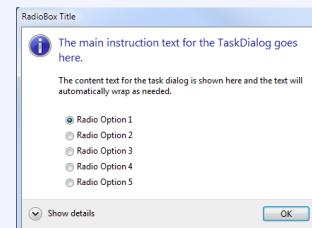
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Radio Button General Guidelines

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- Provide meaningful descriptions
- Display in a single line of text
- Display using mixed-case letters with each significant word capitalized
- Do not use question marks in labels
- Each radio button should have a label to the right
- Show a minimum of two choices, a maximum of eight
- Arrange selections in expected order

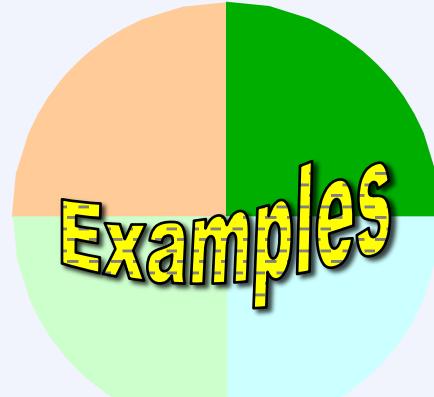


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Example

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- radio one radio one radio one
- radio two radio two radio two
- radio three radio three radio three

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Grids

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- Grids are tables consisting of navigation bars, columns, column headings, rows, and row headings. Using a grid can consolidate a scroll area (which can take up the whole screen) into multi-row sets of data.

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Grids

ISE 164 - HCI

- Grids are tables consisting of navigation bars, columns, column headings, rows, and row headings.
- Give users the ability to see rows of data all at once.
- Facilitate comparing values across rows and columns.
- Present more data in less space than does a scroll area.
- Show essential information and allows for clicking to view details, if necessary.

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Number of Rows to Display in a Grid

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- Display-only grids
- Editable grids

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Grid Column Headings Guidelines

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Type of Field	Label Alignment
Pushbuttons	Left align
Hyperlinks	Left align
Character	Left align
Numeric display	Right align
Numeric: Editable (HTML limitation--all editable fields are left aligned)	Left align
Check boxes	Center align

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Grids

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Example

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The screenshot shows a grid editing interface with a header row containing columns for ProductName, Unit Price, Units In Stock, and Discontinued. Below the header, there are seven data rows representing different products. Each row includes a 'DELETE' button. A green arrow points from the word 'Header' to the top row, and another green arrow points from the word 'Body' to the second row. The word 'Columns' is written in blue over the 'Units In Stock' column header. The table has a dark blue header bar with buttons for '+ ADD NEW RECORD', 'SAVE CHANGES', and 'CANCEL CHANGES'.

ProductName	Unit Price	Units In Stock	Discontinued	
Chai	\$18.00	31	false	X DELETE
Chang	\$19.00	1	false	X DELETE
Aniseed Syrup	\$10.00	13	false	X DELETE
Chef Anton's Cajun Seasoning	\$22.00	53	false	X DELETE
Chef Anton's Gumbo Mix	\$21.35	0	true	X DELETE
Grandma's Boysenberry Spread	\$25.00	120	false	X DELETE
Uncle Bob's Organic	\$30.00	15	false	X DELETE

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Example

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PROJECT NAME	BIDS	FREELANCER	AWARDED BID	TIME	STATUS	ACTION
Error Fixes on Previous Works	1	HytShz	\$20 USD	6 months ago	<input type="button" value="Select"/>	
English Language Technical Document Editing	14	-	-	10 months ago	Cancelled	<input type="button" value="Select"/>
Proof Of Concept In HTLM5	1	DeZinerDeN	\$150 USD / hour	10 months ago	<input type="button" value="Select"/>	
Portfolio Site	27	DeZinerDeN	\$100 USD	1 year ago	<input type="button" value="Select"/>	
Recreating the UX site from HTMLPHP to WordPress	1	tunerstech	\$110 USD	2 years ago	<input type="button" value="Select"/>	
Creation of a News Website Using Joomla 2.5	36	tunerstech	\$150 USD	3 years ago	<input type="button" value="Select"/>	
Existing website minor update and enhancement	13	itdv	\$75 USD	3 years ago	<input type="button" value="Select"/>	
Existing Web Site Adjustment -New Joomla Site -	10	webdesign927	\$100 USD	3 years ago	<input type="button" value="Select"/>	
Existing Web Site Adjustment -New Joomla Site -	10	auriclesoft09	\$150 USD	3 years ago	<input type="button" value="Select"/>	
Existing Web Site Adjustment -New Joomla Site -	10	GoranUsiljebrka	\$100 USD	3 years ago	<input type="button" value="Select"/>	
Existing Web Site Adjustment -New Joomla Site -	10	GoranUsiljebrka	\$100 USD	3 years ago	<input type="button" value="Select"/>	
Consulting website	23	netcommservices2	\$70 USD	4 years ago	<input type="button" value="Select"/>	

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Grid

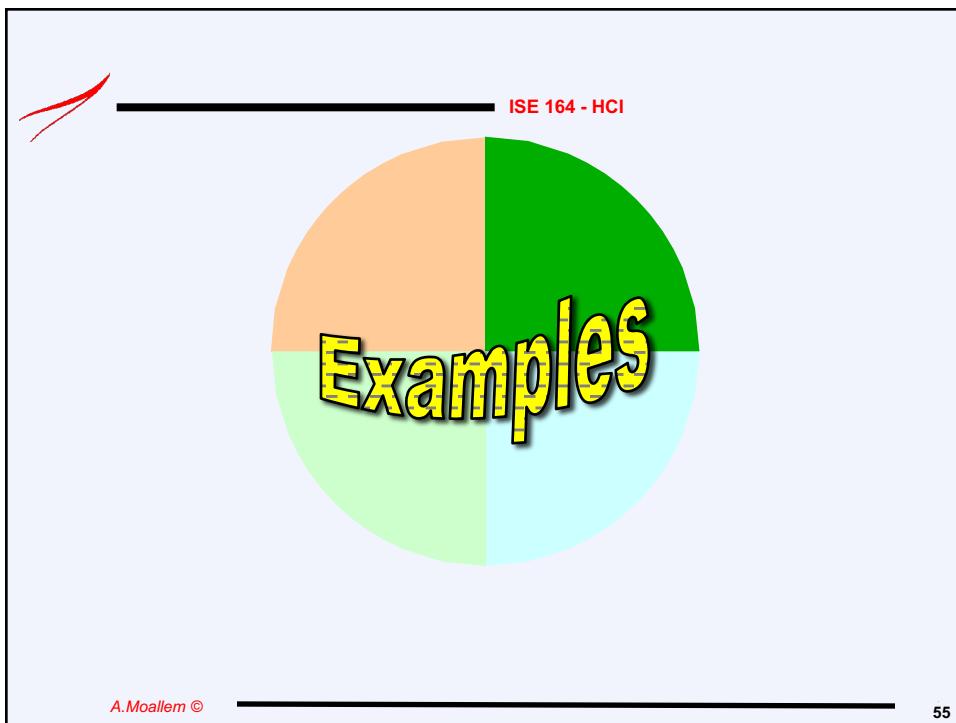
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Datasheet				
Description	Date	File Size	Download	
Datasheet (English) Filename: EN_datasheet_TUC-ETG_(v1.0R).pdf	10/5/2016	738Kb		
Datasheet (Français) Filename: FR_datasheet_TUC-ETG_(v1.0R)	10/5/2016	748Kb		
Datasheet (Deutsch) Filename: GE_datasheet_TUC-ETG_(v1.0R).pdf	10/5/2016	761Kb		
Datasheet (Português) Filename: PO_datasheet_TUC-ETG_(v1.0R).pdf	10/5/2016	736Kb		
Datasheet (Español) Filename: SP_datasheet_TUC-ETG_(v1.0R).pdf	10/5/2016	738Kb		
Datasheet (Italiano) Filename: IT_datasheet_TUC-ETG_(v1.0R).pdf	10/5/2016	720Kb		

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Example

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Vital Signs	Symbol	Result	Unit	Low	High	Date
BSA		1.91	sq.m			5/1/2014 10:59
Diastolic						
Diastolic	H	110	mm(Hg)	65.0	90.0	5/1/2014 10:59
Fatigue Assessment						
Fatigue Assess...		1		0.0	10.0	5/1/2014 10:59
Pain Assessment						
Pain Assessment		5		0.0	10.0	5/1/2014 10:59
Pulse						
Pulse		75	/min	60.0	100.0	5/1/2014 10:59
Pulse Ox (O2 Sat)						
Pulse Ox (O2 S...		95	%	90.0	100.0	5/1/2014 10:59
Respiration						
Respiration		15	/min	12.0	20.0	5/1/2014 10:59
Systolic						
Systolic	H	150	mm(Hg)	90.0	140.0	5/1/2014 10:59
Temperature						
Temperature		98.6	Fahrenheit	98.4	98.8	5/1/2014 10:59
Height						
Height		65	inches			5/1/2014 10:59
Weight						
Weight		68	kg			5/1/2014 10:59
BMI						
BMI		24.947		16.0	30.0	5/1/2014 10:59

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Columns Heading

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All grid columns should have labels (excluding columns with buttons or links).

Reputation Score	Reputation Description	Applied Policy	Edit
██████	Known spammers; known senders of malicious code	Block Permanently	
██████	Sources with a high probability of sending spam	Block Permanently	
██████	Sources with a medium probability of sending spam	Block Temporary	
██████	Sources with a low probability of sending spam	Throttle	
██████	Sources with an unknown reputation	Allow	
██	Sources with a known good reputation	Accept: Bypass Relay Policies	

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Instructional Text

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- Use when there are unique requirements or a particularly complex situation.
- Instructional text should aid the user in accomplishing a task.
- Don't state the obvious
 - Example: *Below is a list of your options.*

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Commonly Used Words

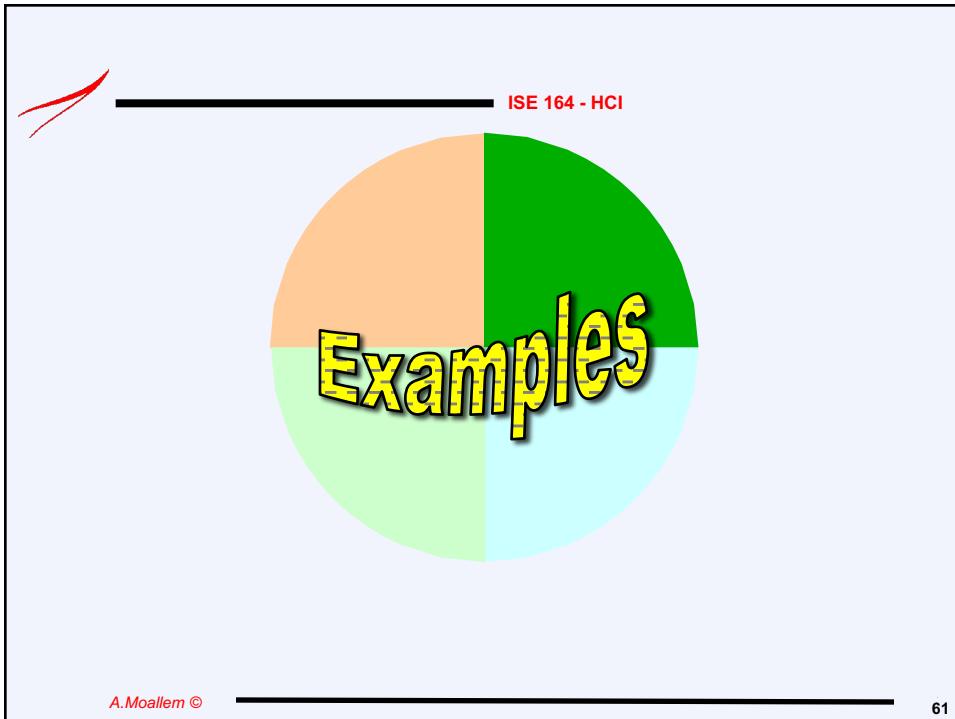
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Word or Phrase	Usage
Check box	Two words. We select and clear check boxes.
Select	Do not use <i>choose</i> . Say <i>select</i> .
Clear	Use <i>clear</i> for check boxes; do not use <i>turn off</i> , <i>unmark</i> , or <i>unchecked</i> .
Click	Do not use <i>click on</i> . You <i>click</i> a button or option list.
Drilldown (n), drill down (v)	Do not use to refer to following a path to its files or to further analysis. It is slang.
ID	Capitalize both the <i>I</i> and <i>D</i> . Do not initial cap the word that precedes ID, unless it is a page control. Example: customer ID.
Press	<i>Press</i> a key on a keyboard but <i>click</i> a button on a screen.
Do not use “Please”	Do not use the word <i>please</i> in your instructions. Incorrect: Please select the bill that you want to view. Correct: Select the bill that you want to view.
Text buttons	Delete any text next to buttons that describes the function of a button.

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Example

BANKING

Customer service
Call toll free:
1-800-374-9700
(TTY: 1-800-788-0002)

To apply online...

You must be:
A U.S. citizen or resident alien, at least 18 years or older

You must have:
A U.S. address, a social security number, and a driver's license or state issued ID

To switch to Citibank...

The Citibank Switch Kit has

Select Your Residential State

Please select your state

Product offerings may differ among geographic locations. By selecting your state of residence, you'll be shown the specific terms and rates that will apply to your new account.

Please note: If you choose to cancel this process, you may be redirected to a page other than the one you requested.

Select a State

Cancel SELECT

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Example

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Instructional text should not state the obvious.

Expense Report

Receipt Itemization

Kenneth Schumacher

Please add or edit an expense for this receipt by filling in the fields in the upper left hand section of this page. The right hand side shows expenses that have been itemized for this receipt. Please also reconcile the nominal receipt 'Total Amount' on the left with the 'Current Total' on the right.

Edit Transaction		Current Expenses	
Expense Type:	Automobile Rental	Date	Type
Trans Date:	08/09/2000	08/09/00	Automobile
Amount:	60.00	60.00	Rental
Conversion Rate:	1.00000000	Rate Detail	
Reimbursement Amt:	60.00	USD	
<input type="button" value="Add"/>		Current Total: 60.00 USD	

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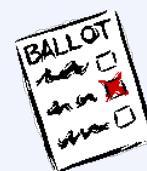
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Grouping Related Information

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- Use group boxes to arrange related fields.
- If there are too many group boxes, use a horizontal rule and vary the spacing (vertical and horizontal) as an alternative method of grouping.



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Example

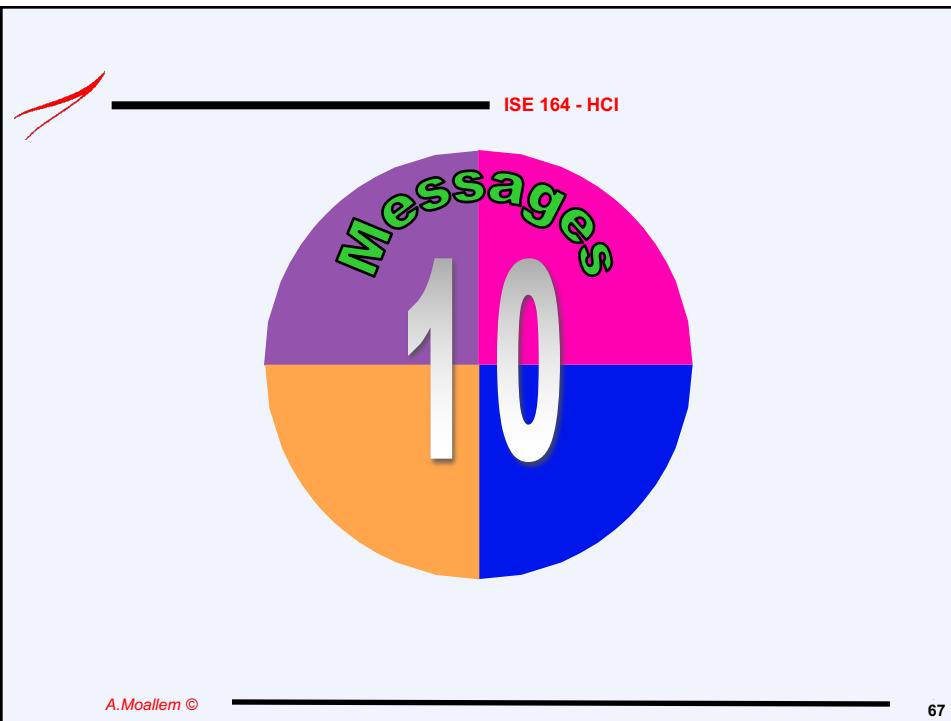
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The screenshot shows the Freelancer.com dashboard. At the top, there's a navigation bar with links for 'Hire Freelancers', 'Work', 'My Projects', 'Help', and a search bar. Below the navigation is a promotional banner for 'Business Builders' with a 'Request' button. The main content area is divided into several sections: 'Recent Projects' (listing two projects: 'Redesign Website' and 'Document Editing and Proof reading'), 'Newsfeed' (a feed of articles from the world's leading Internet marketers), and 'My Funds' (showing USD \$15.00). A sidebar on the right offers a 'Free Member' upgrade and a 'Setup your account' progress bar at 77%.

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Designing Messages

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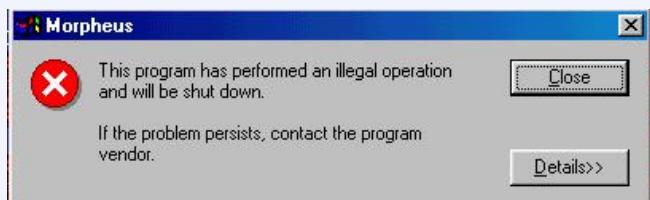
- A message displays information in response to a user action or change in system status
- Messages can be unfriendly because they:
 - Have clumsy wording
 - Offer incorrect information
 - Can be too technical

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Example

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Design Criteria for A Message

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- Define message category:
 - Informative
 - Warning
 - Error
- Define message display:
 - How it appears on the user's screen
- Wording of a message:
 - Reusable, context specific, helpful to users
- Test message:
 - Verify that the correct message appears at the proper time

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Messages

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- **Informative messages:**
 - Provides adequate feedback about what is happening—the process and status of the job
- **Warning messages:**
 - Warns users that something bad might happen if the error is not addressed. Messages should provide the following information:
 - What happened?
 - What is the system's current action?
 - When or under what circumstance may I correct the error?
 - Who can correct it?
 - How are corrections made, or where can such information be found?

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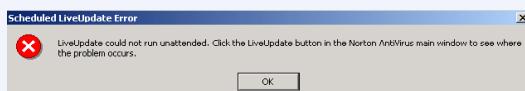
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Error Messages

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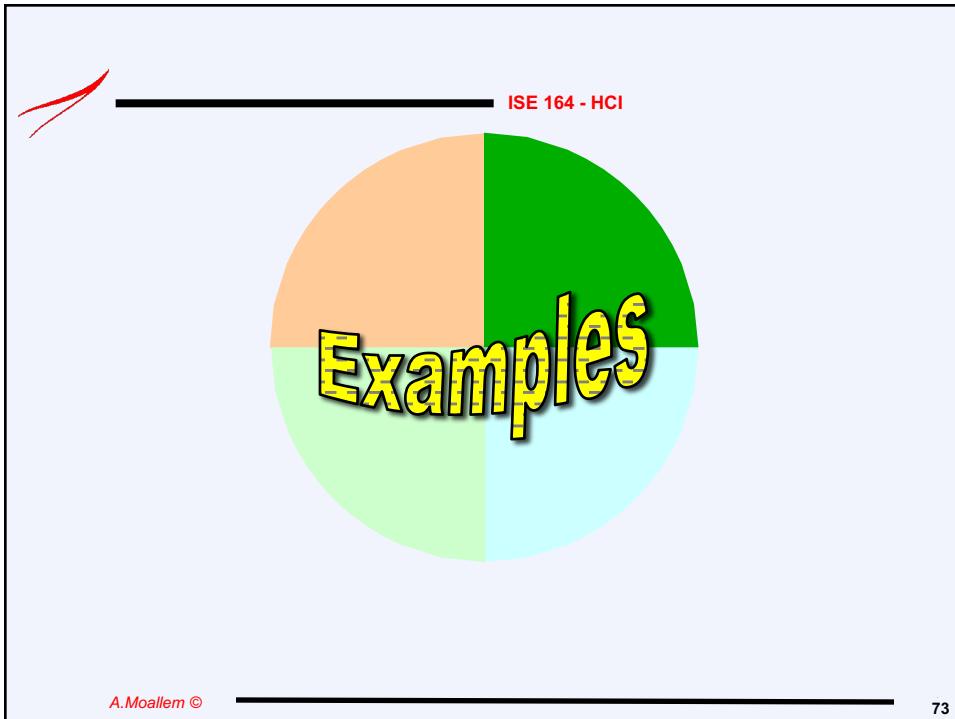
- Indicates an error and asks for required actions
- When an error message appears, users should get answers to the following questions:
 - What happened?
 - Why did it happen?
 - What is the system's current action?
 - What can or should be done to correct it?
 - Who can correct it?
 - How are corrections made, or where can such information be found?



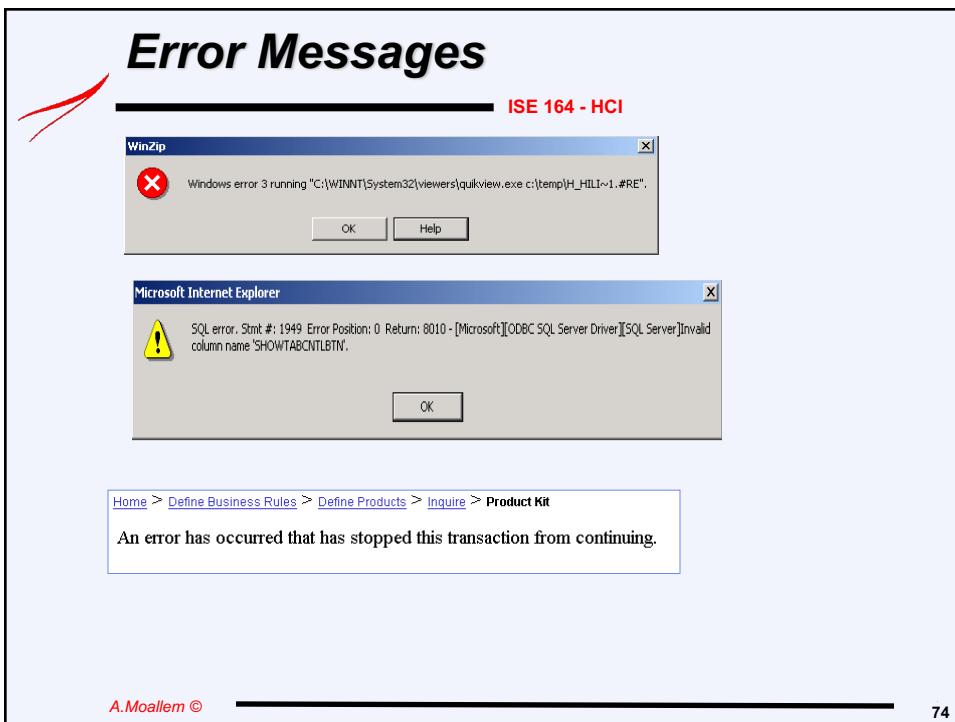
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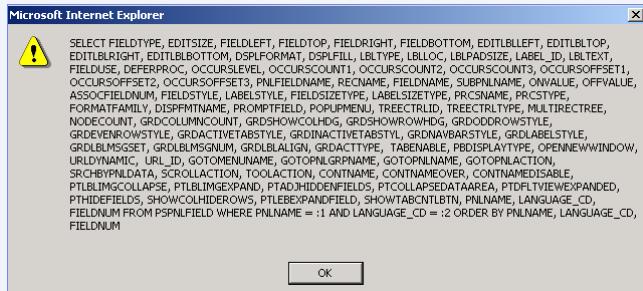
73



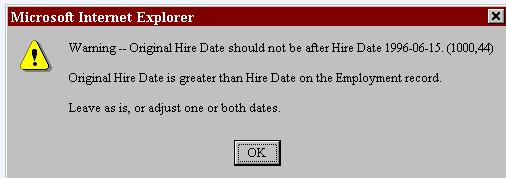
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Warning Messages

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OK



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Warning Messages

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Example

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Hotels Flights Cars Packages Cruises More

Search and Save on Hotels

For even deeper discounts on hotels,
[Search Express Deals »](#)

Where are you going?

City, Airport, Point of Interest, Hotel Name or U.S. Zip Code

Please enter your City, Airport, Point of Interest, Hotel Name or U.S. Zip Code

Check-in Check-out Rooms

Choose Date Choose Date 1 Room **Search Hotels**

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Example

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The password you entered is not valid
Please note that the password must respect the following rules:
• It must contain between 8 and 32 characters. Use any characters from the following set: [A-Z a-z ! @ # \$ % ^ & _ - / \] 1234567890 + - * + ! @ # \$ % ^ & _ - / \] abcde@imspunkinmeat ()
• It must contain at least one uppercase character (A-Z)
• It must contain at least one lowercase character (a-z)
• It must contain at least one digit (0-9)
• It must contain at least one special character (! @ # \$ % ^ & _ - / \)
• It must not contain any user name
• It must not contain any password
• It must not contain any date
• It must not contain any name

New User Registration

Please take a few moments to register. You will need this information to access your account in the future.

Your User Name must be at least four characters in length and may be any combination of letters and numbers. Special characters and spaces are not allowed.

Your Password must be at least eight characters in length and must contain at least one uppercase letter, one lowercase letter, one number and two special characters. Passwords must not contain your first name, last name, user name or email address. More than three consecutive characters in your password are not allowed.

Mandatory fields are marked with an asterisk.

User Name *

UserName

*Password

Re-enter Password

Email Address

Re-enter Email Address

Register | Cancel

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Conclusion

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- User Interface Design Affects



Productivity



Efficiency



Reliability

And Ultimately raises



Customer satisfaction

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Questions

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See You Next Week

Thank You For Your Participation