UI for Input Design

Linga, Malijan, Mijares, Sarte

Basic Principles

Basic Principles

Data Capture

Input of data, not as a direct result of data entry but instead as a result of performing a different but related activity.

E.g. Barcode Readers

Basic Principles

Source Documents

A source document is the original record containing the details to substantiate a transaction entered in an accounting system.

E.g. Suppliers invoice

Basic Principles

Data Entry

Data entry means to operate equipment, often a keyboard, that is used to input data, which may be alphabetic, numeric, or symbolic, into a company's system.

E.g. Completing an Online form

Basic Principles

Data Processing

This is where the raw data that was inputted by users gets transformed into information.

E.g. Storing data in Database

Basic Principles

Batch Processing

Batch processing is the processing transactions in a group or batch. No user interaction is required once batch processing is underway.

E.g. Monthly Bills for Utilities

Basic Principles

Online Processing

A method of using a terminal remote from a company mainframe or an interface to the Internet like an e-commerce website for taking product orders and dealing with payments

Basic Principles

Remote Batch Processing

Batch processing in which an input device is located at a distance from the main installation and has access to a computer through a communication link.

Input Implementation Methods

Input Implementation Methods

- Keyboard
- Mouse
- Touch Screen
- POS Terminals (Cashier)
- Sound & Speech (Voice Recorder)
- Automatic Data Capture

Input Implementation Methods

Keyboard

Most common input device.

Inputs letters, numbers, and symbols by pressing buttons.

Input Implementation Methods

Keyboard

Input Implementation Methods

Mouse

Usually paired with a keyboard

Point and click device to select and interact with UI elements.

Input Implementation Methods

Mouse

Input Implementation Methods

Touch Screen

Users can interact with UI elements by using their fingers.

An alternative to the keyboard and mouse.

Input Implementation Methods

Touch Screen

Input Implementation Methods

POS Terminals

An input device built to handle retail transactions.

Transfers funds from the customer to the company.

Records transactions.

Input Implementation Methods

POS Terminals

Input Implementation Methods

Sound & Speech

Computers identify words and letters uttered by the user to capture inputs.

Input Implementation Methods

Sound & Speech

Input Implementation Methods

Automatic Data Capture

Inputs are captured automatically by using equipments.

No need for typing, clicking, or button-pushing.

Input Implementation Methods

Automatic Data Capture

Optical Mark Recognition

Input Implementation Methods

Automatic Data Capture

Barcodes

Input Implementation Methods

Automatic Data Capture

Optical Character Recognition

Input Implementation Methods

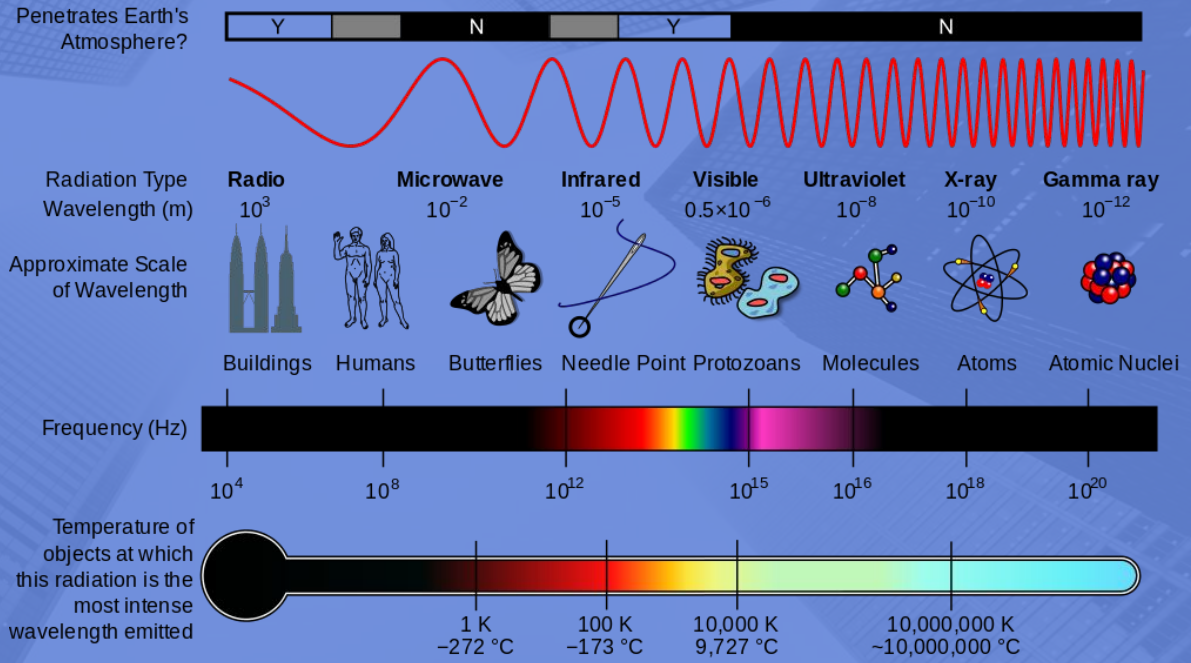
Automatic Data Capture

Magnetic Ink

Input
Implementation
Methods

Automatic Data Capture

Electromagnetic Transmission



Input Implementation Methods

Automatic Data Capture

Smart Cards

Input Implementation Methods

Automatic Data Capture

Biometrics

Taxonomy for Computer Inputs

Process Method	Data Capture	Data Entry	Data Processing
Keyboard	-Data is usually captured on business form → **Source Document** -Real-time	-Most common input but also most prone to errors	-Collected into batch files -Processed as soon as it has been keyed
—			
Mouse		-“pointing” device for a screen	-Same with keyboard -Associated with online and real-time processing
Touch screen		-Either touch commands and data choices or data using handwriting recognition	-For PC: same with the others -For handheld computers: sorted for later processing as remote batch

Process Method	Data Capture	Data Entry	Data Processing
Point of Sale	-as close to the point of sale as humanly possible -NO source documents	-by the customer -Employee **interacting** with the customer	-Almost always processed **immediately** as transaction/inquiry
Sound	-Same with POS -Customers in remote areas	-using touch-tones (telephone) -Rigid commands -Limited input options	
Speech		-Spoken -Less reliable -common	
Optical Mark	-Recorded in optical scan sheets as marks or precisely letter, numbers & punctuation	-No data entry	-Almost always processed as a batch

Process Method	Data Capture	Data Entry	Data Processing
Magnetic Ink	-**Pre-recorded** on forms (customer)	-Reads the magnetized data -Additional info must use other input method	-almost always processed as a **batch**
Electro-magnetic	-Recorded **directly** on the object	-Transmitted by radio frequency	-Almost always processed **immediately**
Smart Card	-Same with electromagnetic but always carried by the user	-Transmitted by smart card readers	
Bio-metric	-Unique human characteristics	-Read by sensors -Primary apps are security & medical monitoring	-Processed **immediately**

Input Design Guidelines

Thank you uxplanet.org and uxdesign.cc

A form is a conversation. And like in any conversation, it should be presented by a logical communication between two parties - your user, and your app.

- uxplanet.org

Input Design Guidelines

Components of a Form

- Structure
- Input Fields
- Field Labels
- Action Buttons
- Feedback
- *Validation*
- *Assistance*

Input Design Guidelines

Structure

Input Design Guidelines

Form Structure

- **Only Ask what is required** - Every field you put on your form will affect the conversion rate.

Input Design Guidelines

Form Structure

- **Order the form logically** - Details should be asked from a user's perspective, not the application or database logic.

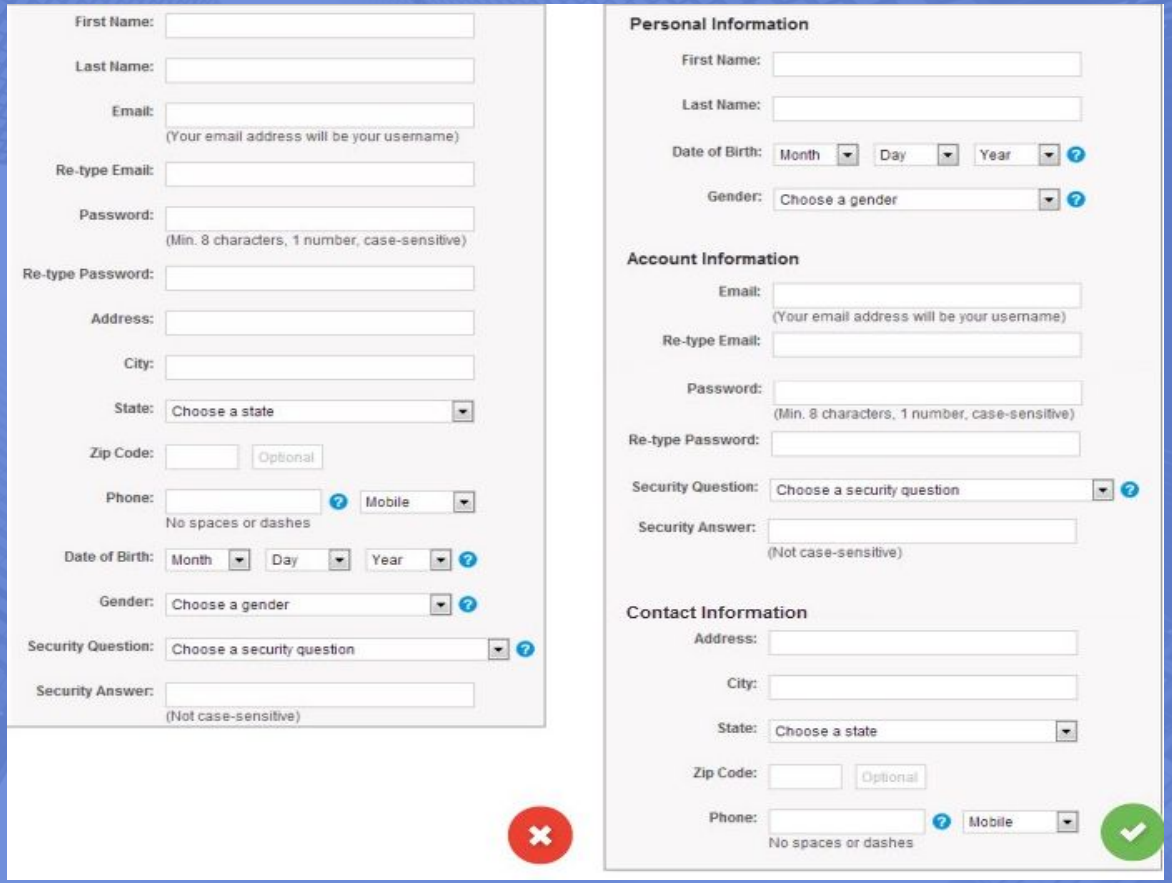
Input Design Guidelines

Form Structure

- **Grouping Related Information**
- Group information in blocks or sets to help them understand the sense of the form

Input Design Guidelines

Grouping Related Information Example



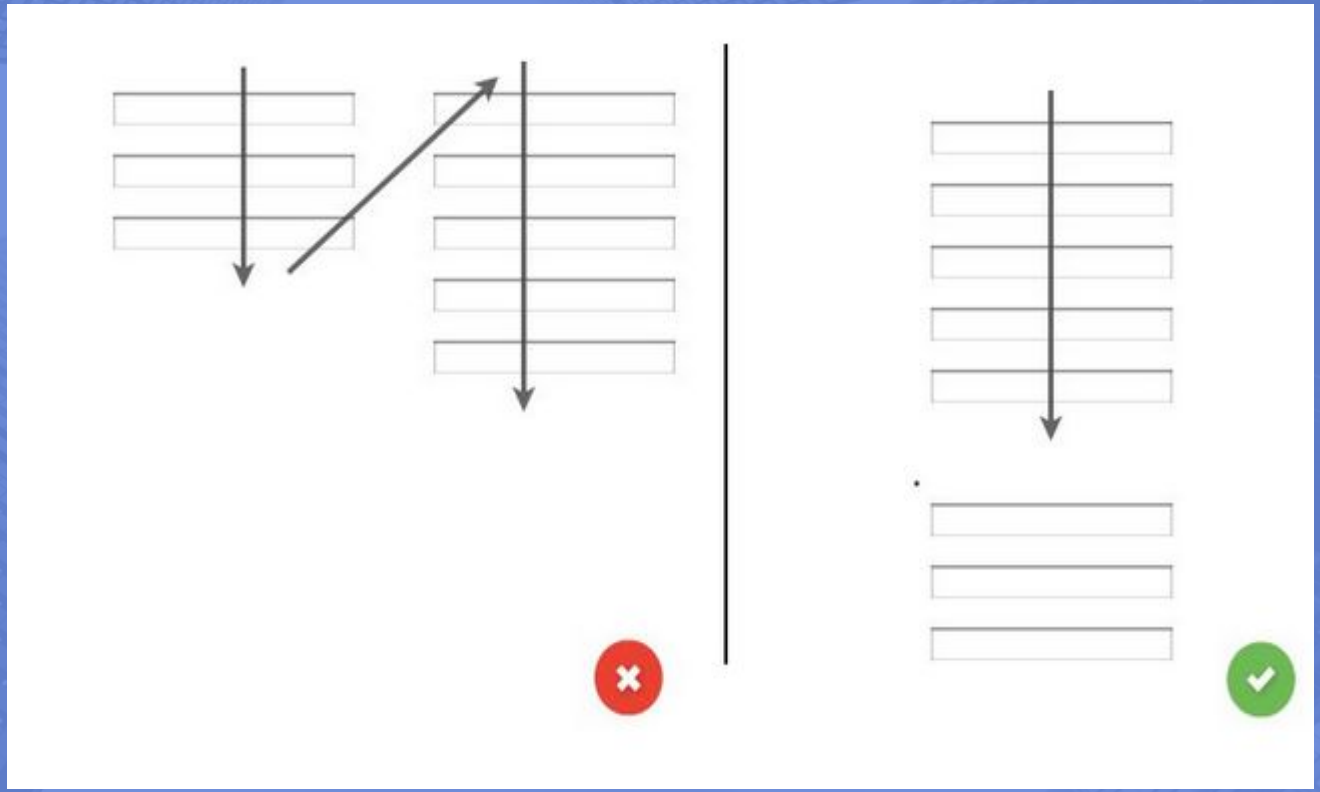
Input Design Guidelines

Form Structure

- **Strictly One Column Only**.
- Users have will get confused on how to interpret your forms

Input Design Guidelines

Only One Column Example



Input Design Guidelines

Input Fields

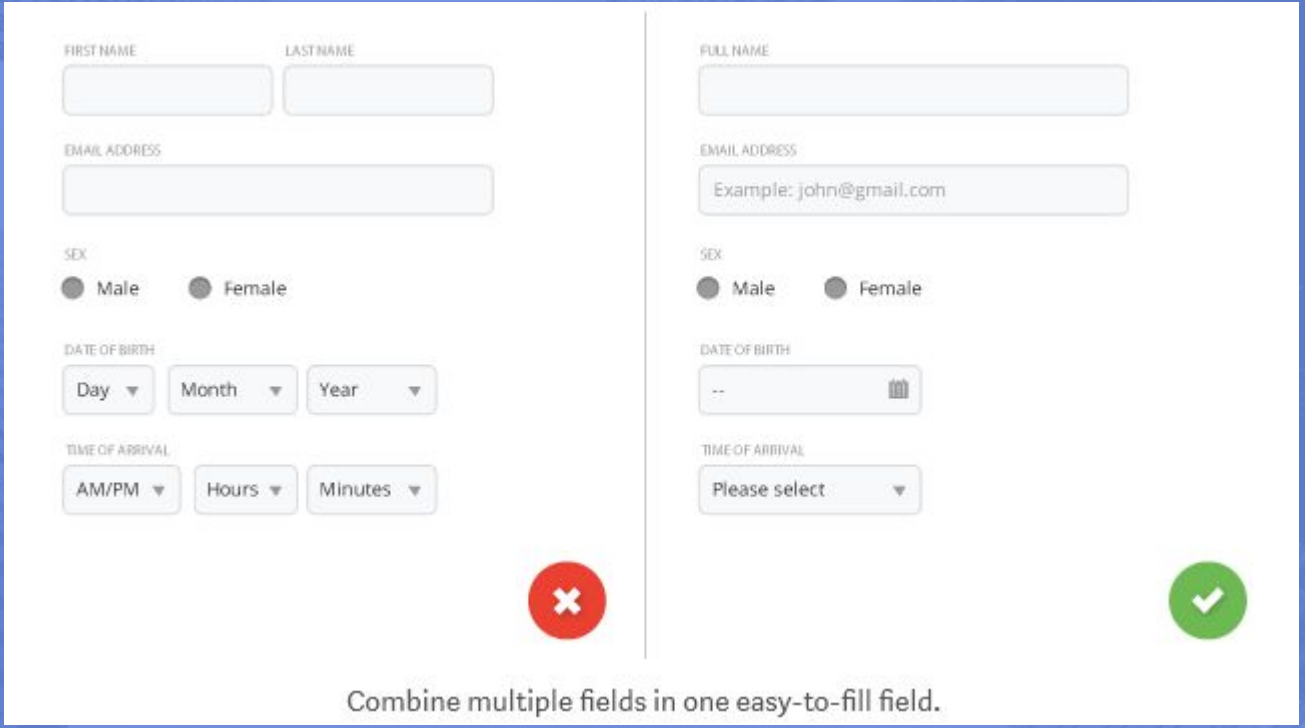
Input Design Guidelines

Input Fields

- **Number of Fields** - This makes your form less loaded, especially when you request a lot of information from the users.

Input Design Guidelines

Input Fields



Input Design Guidelines

Input Fields

- **Make users fill out mandatory values** - Makes it easier for you to input data in the database without having to worry about an error.

Input Design Guidelines

Input Fields

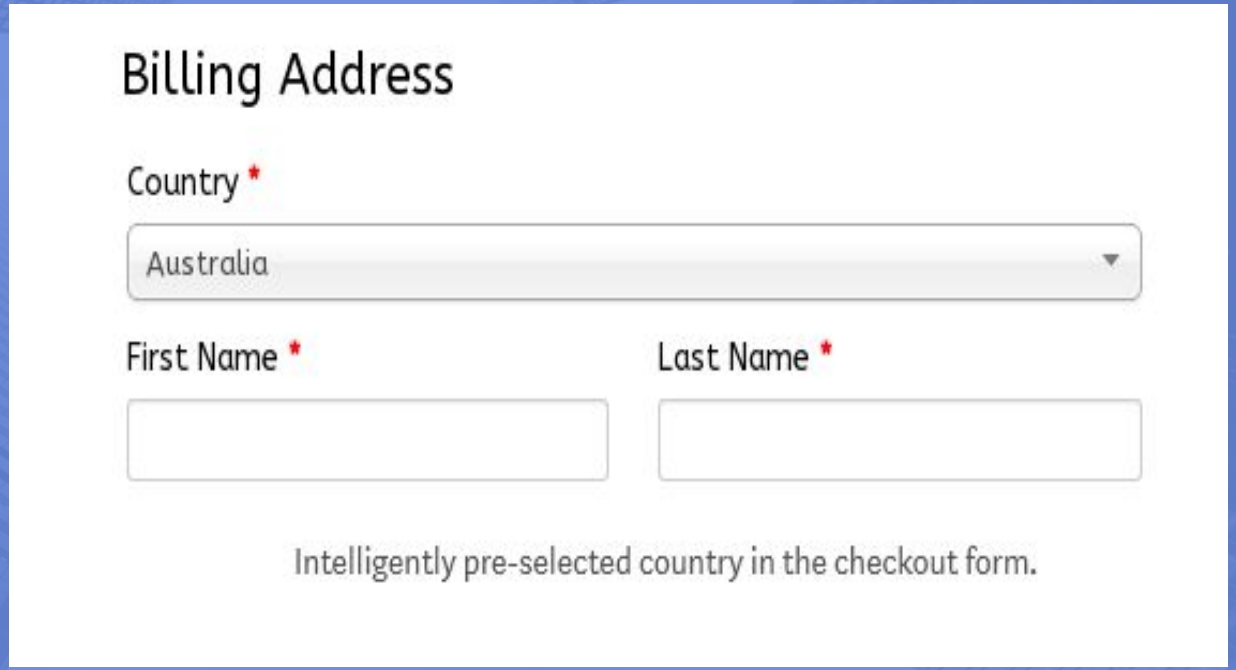
Input Design Guidelines

Input Fields

- **Set Default Values** - Don't assume that they will take time to parse through all the choices.
- **Use Smart Default** to reduce the User's time to fill out forms.

Input Design Guidelines

Input Fields



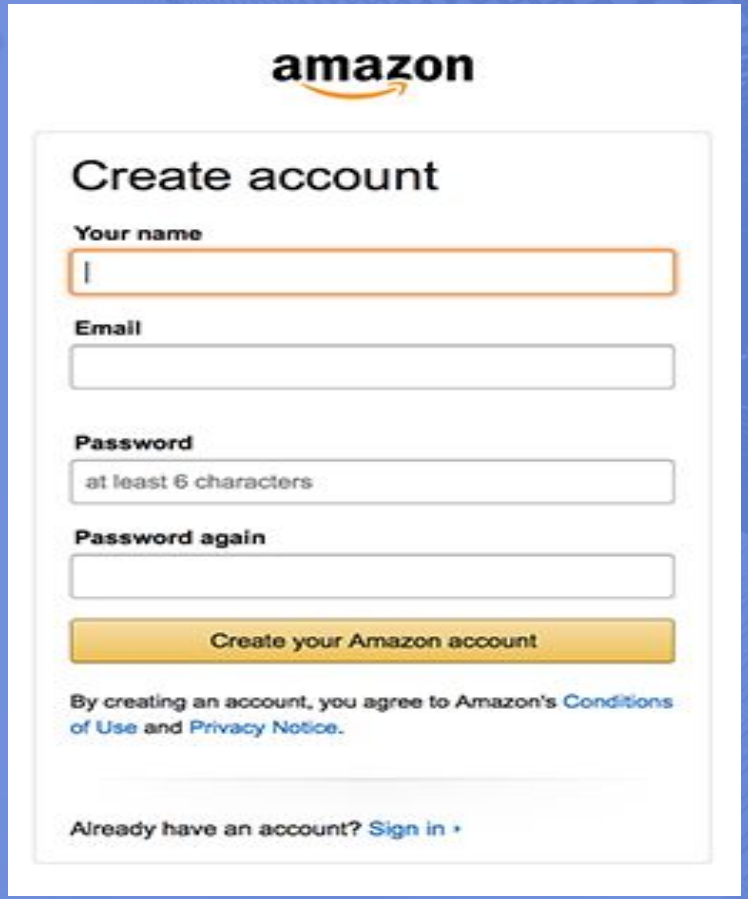
Input Design Guidelines

Input Fields

- **Autofocus for input field** - It provides the user a clear visual notification that this is where they should be inputting their data.

Input Design Guidelines

Input Fields



Input Design Guidelines

Field Labels

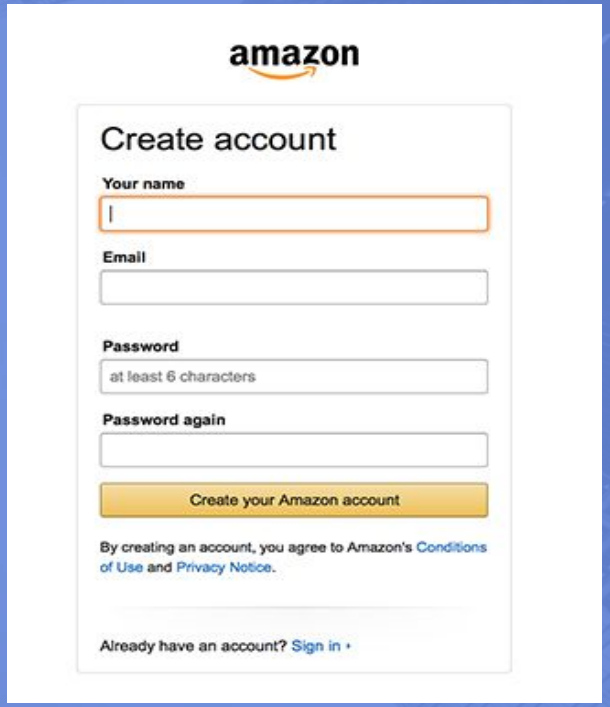
Input Design Guidelines

Field Labels

- **Number of Words per label-** Remember that labels are not help texts, that's what the taxonomy is for.
- Use short and descriptive labels
- 1 - 2 Words per label.

Input Design Guidelines

Field Labels



Input Design Guidelines

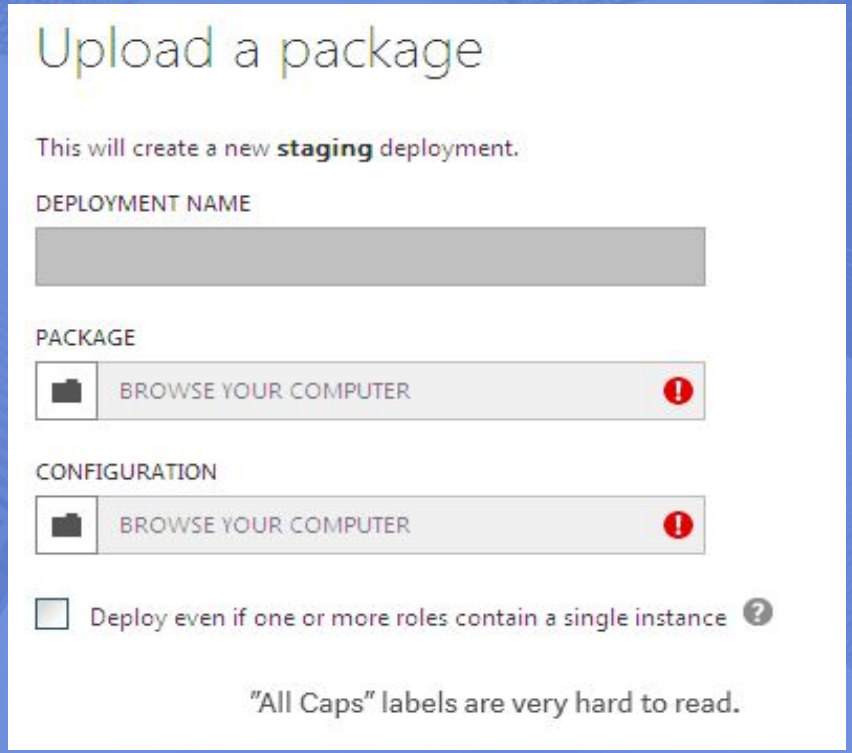
Field Labels

- **Use Sentence Case -** It helps the user read the labels faster as there is a difference in the height letters.

- **NEVER USE ALL CAPS IN LABELS**

Input Design Guidelines

Field Labels



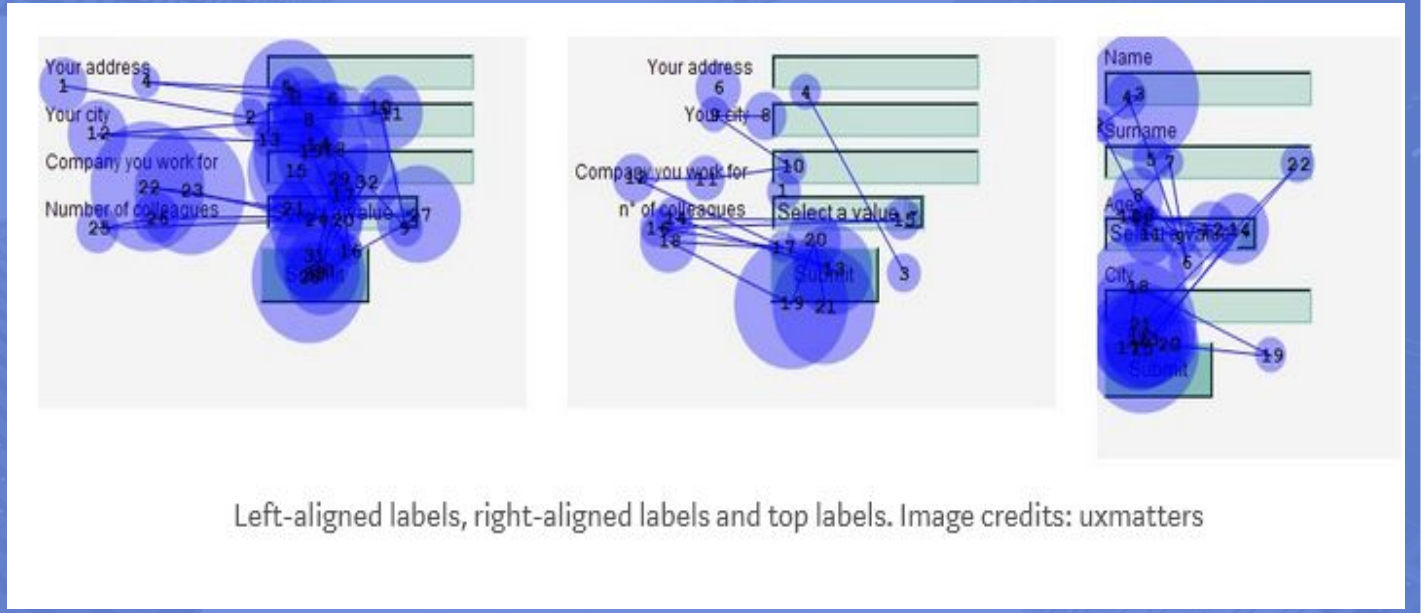
Input Design Guidelines

Field Labels

- **Choose your Label Alignments carefully -** The standard and usual format is usually top aligned labels as they have the fastest completion rates.
- There are different formats, but its upto your discretion to use them

Input Design Guidelines

Field Labels



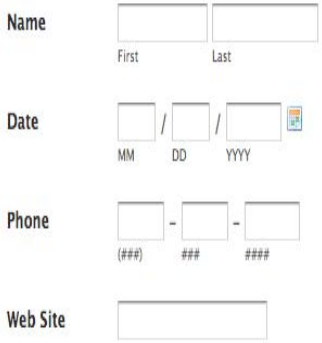
Left-aligned labels, right-aligned labels and top labels. Image credits: uxmatters

TOP ALIGNED

- BEST COMPLETION RATES
- EASIEST FOR USERS TO "PROCESS"
- BEST FOR MULTI-LANGUAGE SUPPORT

- REQUIRE THE MOST VERTICAL SPACE
- NOT IDEAL FOR VERY LONG FORMS

Image source: csstricks

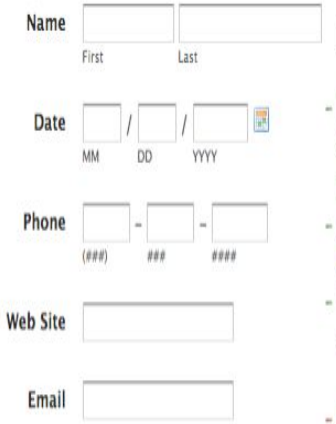


LEFT ALIGNED

- REQUIRE LESS VERTICAL SPACE
- REQUIRES MORE ATTENTION FROM USERS

- REQUIRES MORE HORIZONTAL SPACE
- SLOWEST COMPLETION RATES
- POOR MULTI-LANGUAGE SUPPORT

Image source: csstricks



RIGHT ALIGNED

- BEST VISUAL CONNECTION BETWEEN LABELS AND FORMS
- GOOD COMPLETION RATES ON SHORT FAMILIAR FORMS
- REQUIRES LESS VERTICAL SPACE

- HARDEST TO READ AND SCAN
- POOR MULTI-LANGUAGE SUPPORT

Image source: csstricks

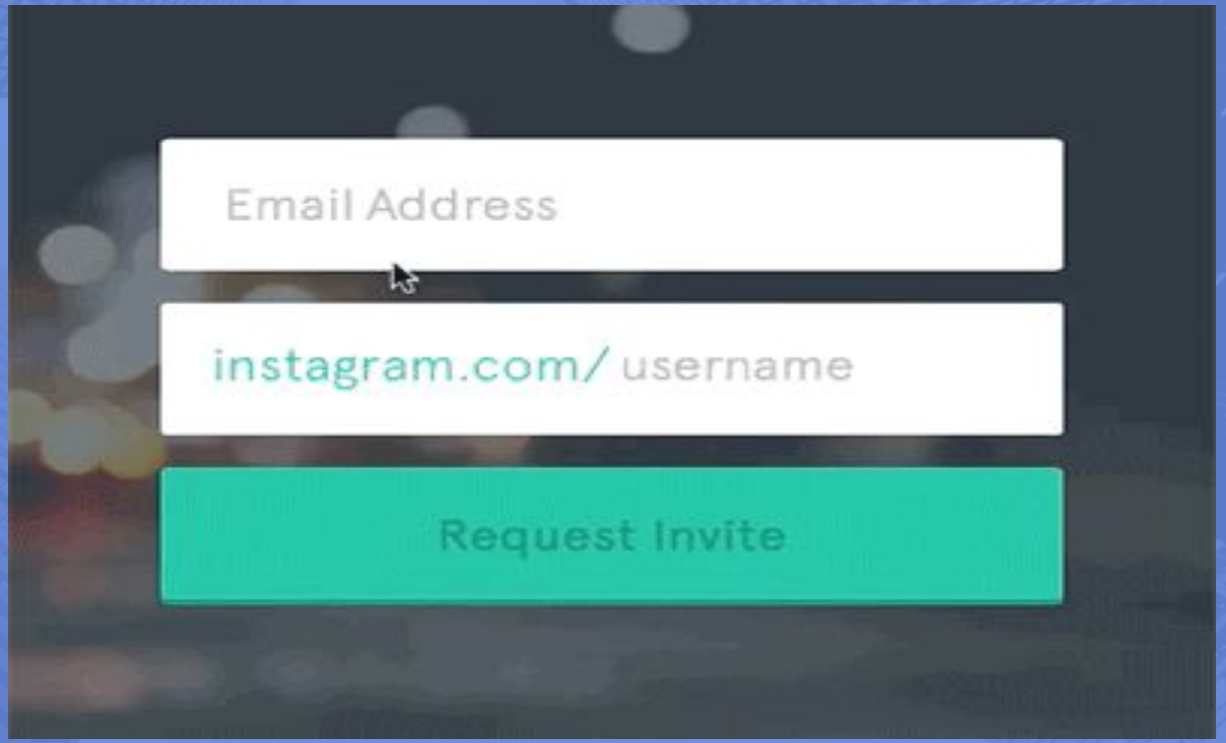
Input Design Guidelines

Field Labels

- **On Visual Labels-** It looks better and fits the modern era of forms.
- **Pros:** Looks nice and appealing.
- **Cons:** The label text can disappear, and can lead to confusion when users are filling up the field.

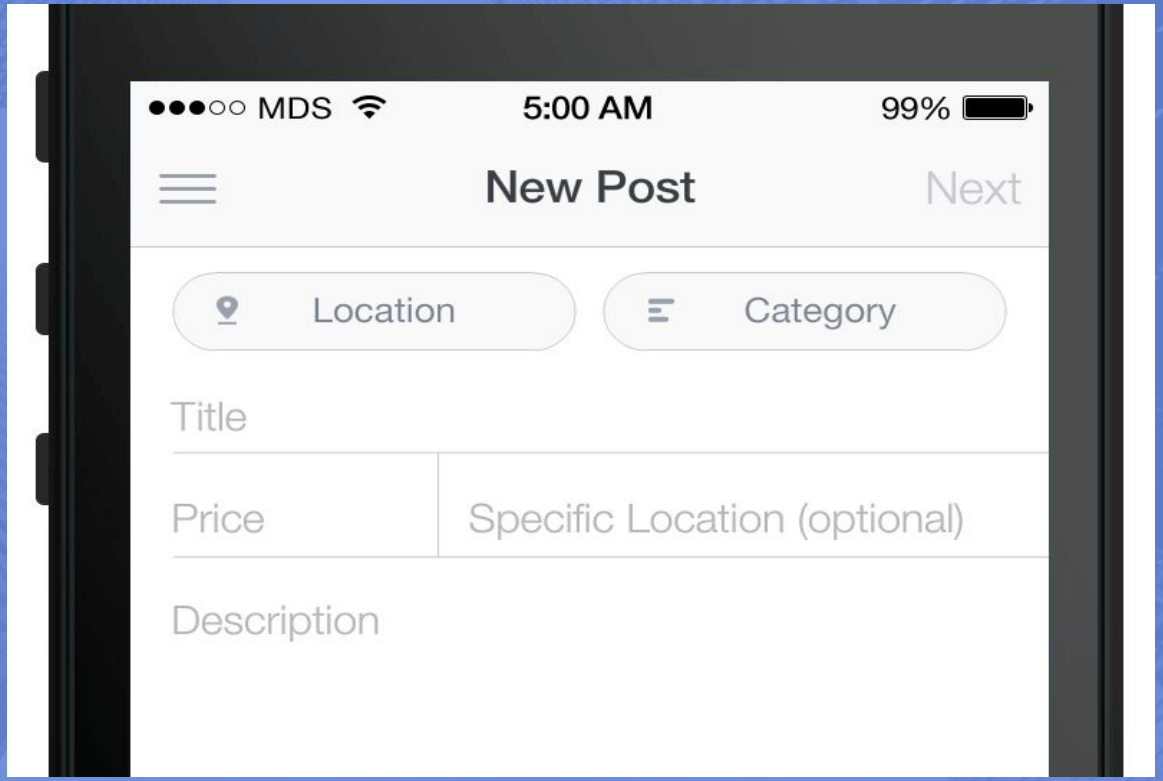
Input Design Guidelines

Field Labels



Input Design Guidelines

Field Labels



Input Design Guidelines

Action Buttons

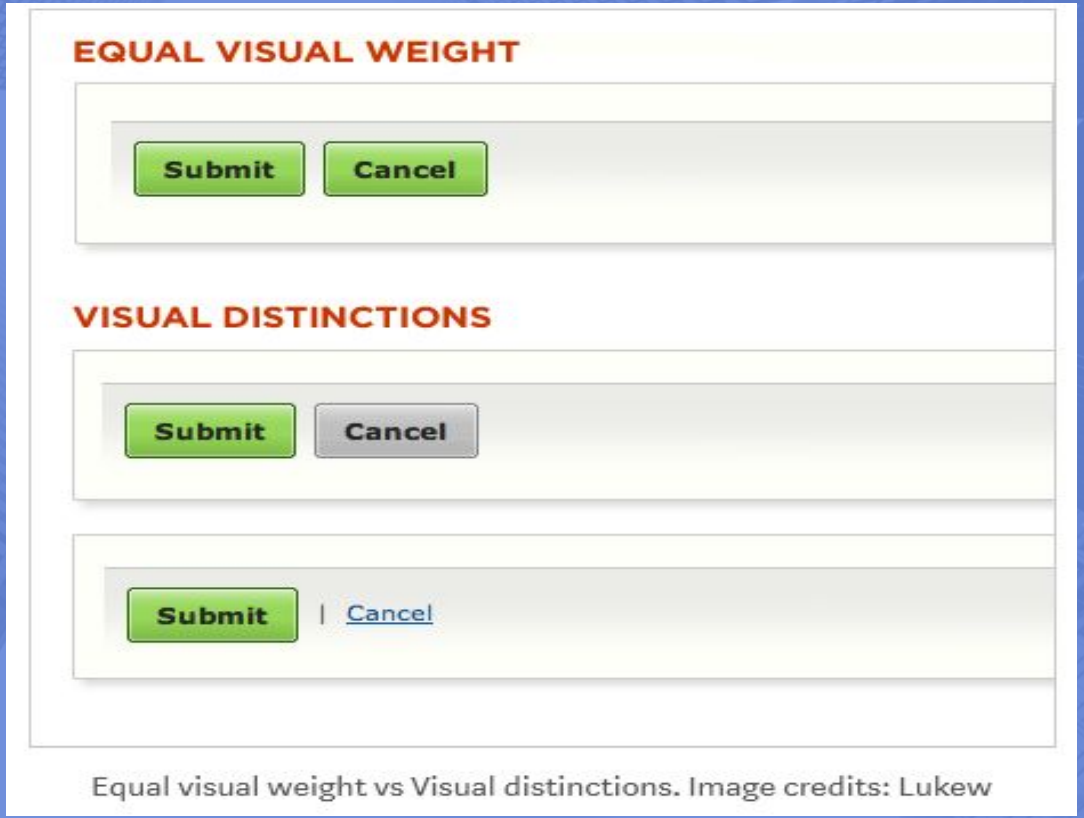
Input Design Guidelines

Action Buttons

- **Make a clear distinction on what button to press -** Lack of this distinction makes it confusing for the user, and can be prone to errors.

Input Design Guidelines

Field Labels



Equal visual weight vs Visual distinctions. Image credits: Lukew

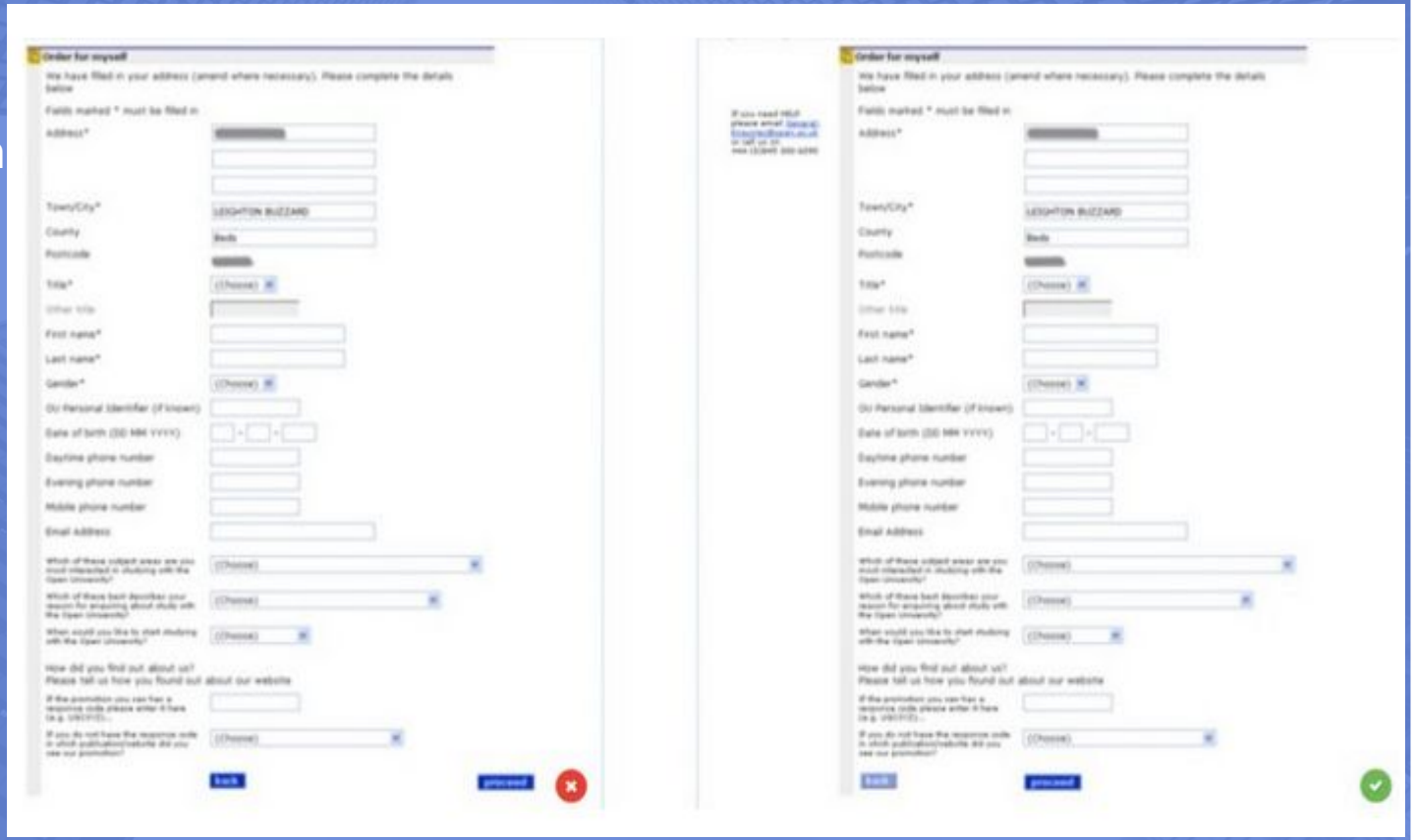
Input Design Guidelines

Action Buttons

- **Button Location -** When forms usually get longer it is better to segment these forms into parts, therefore, requiring a before and next button.
- **Be wary of the placement**, as users can mix between the back,next and submit.

Input Design Guidelines

Field Labels



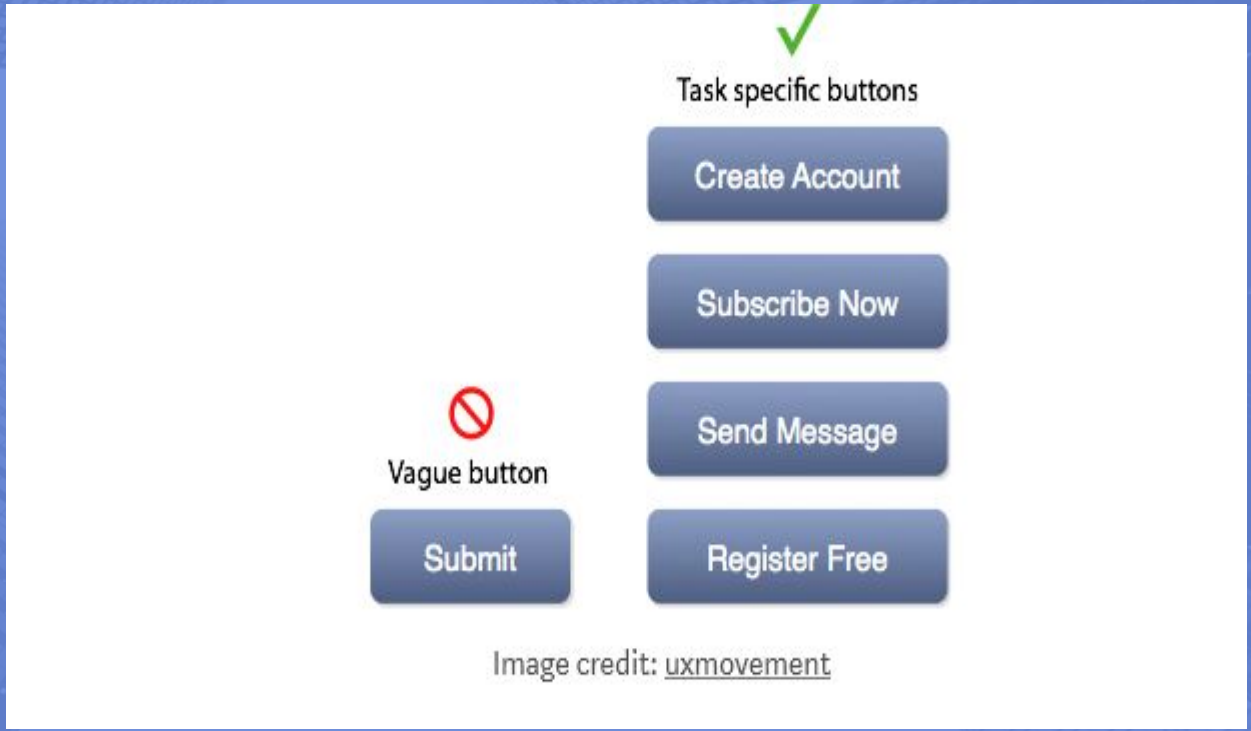
Input Design Guidelines

Action Buttons

- **Naming Conventions -** Do not confuse users with very vague “submit” Buttons, as it will give an impression that the form is generic

Input Design Guidelines

Field Labels



Input Design Guidelines

Feedback

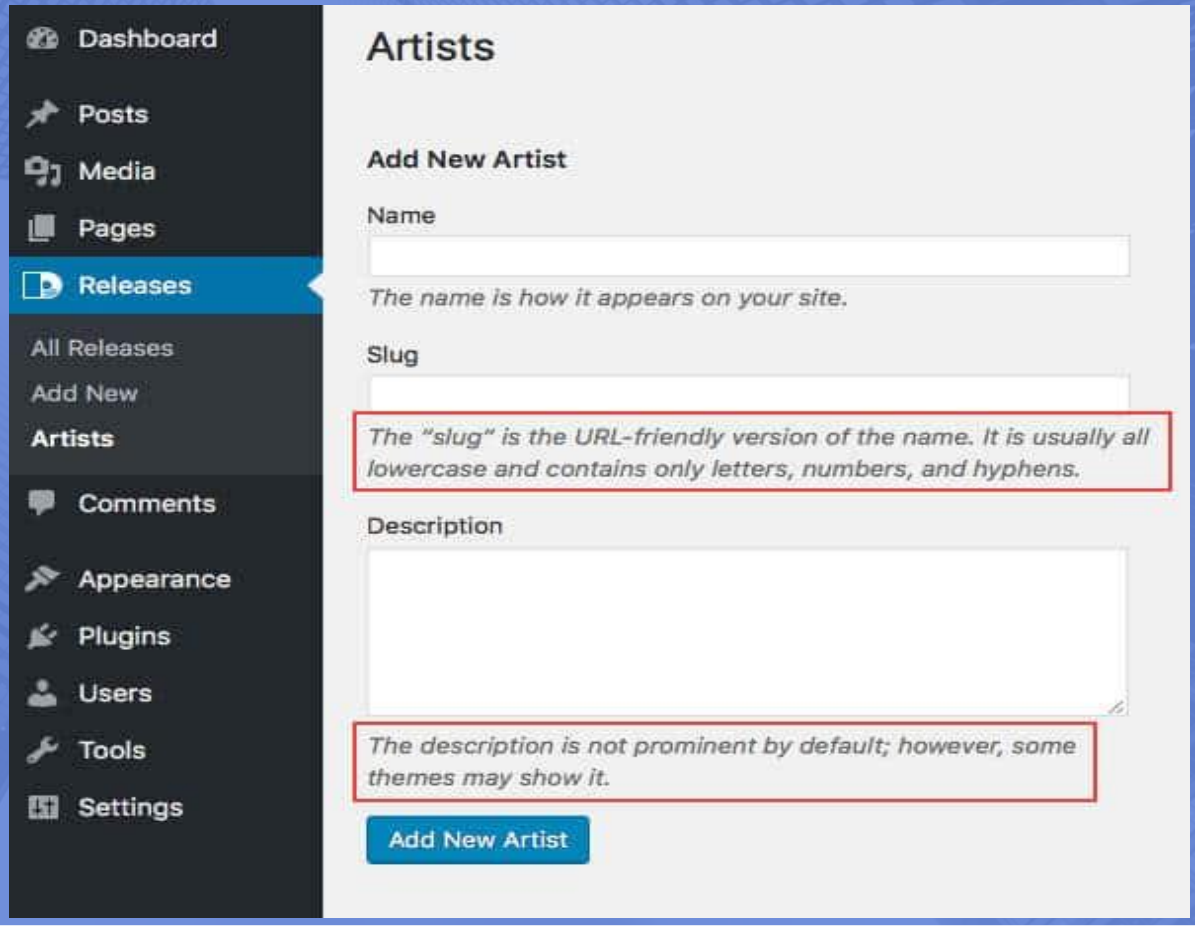
Input Design Guidelines

Feedback

- It is simply a guide for the users to understand what is this field about
- For example, a Textbox has a jargon that the user cannot understand. Under the textbox is a visible tip that explains what this field means.
- It can also tell the user what is wrong with their input.

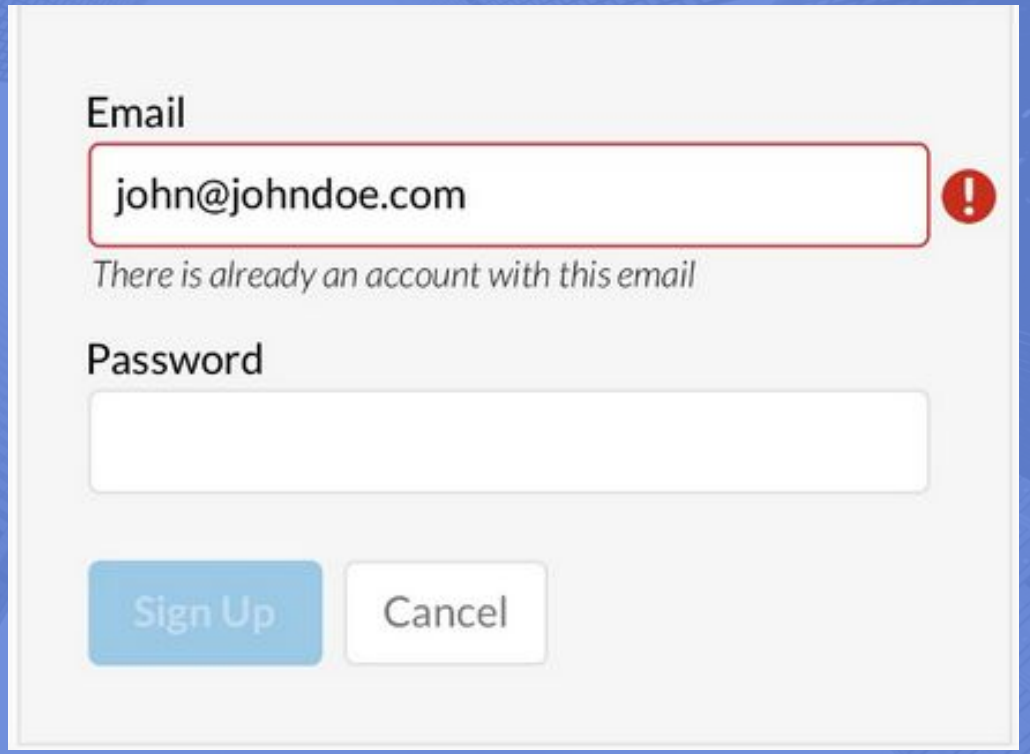
Input Design Guidelines

Feedback



Input Design Guidelines

Feedback

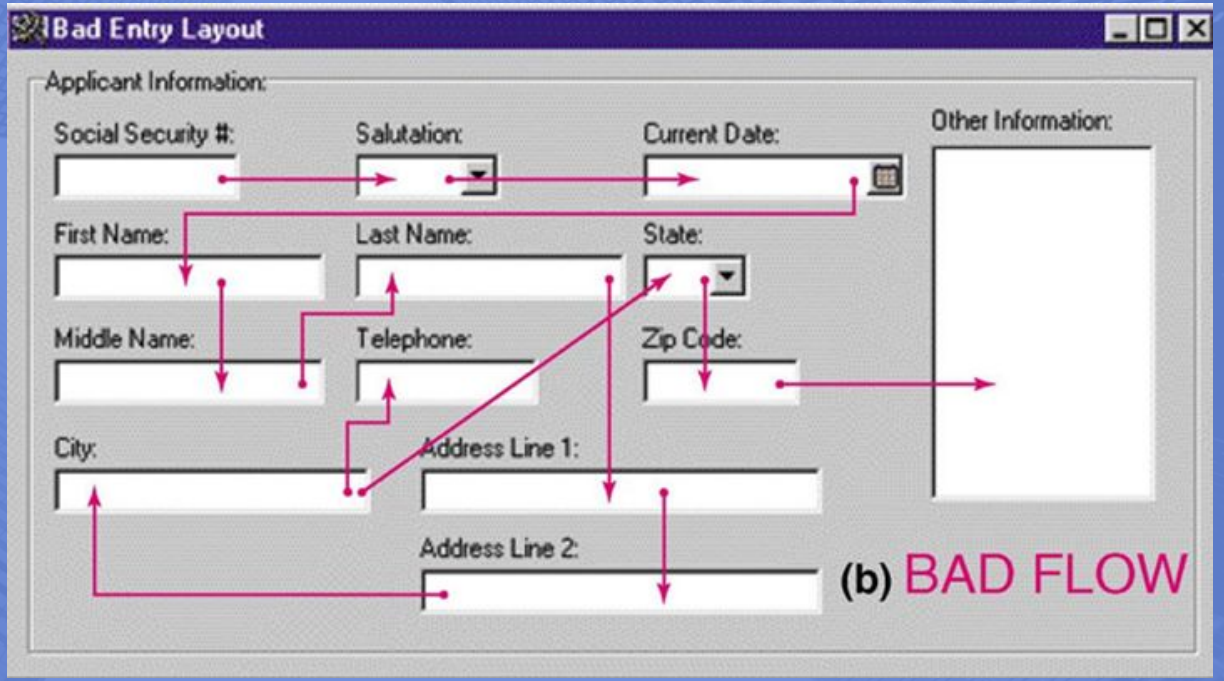


Source Document Form Design Guidelines

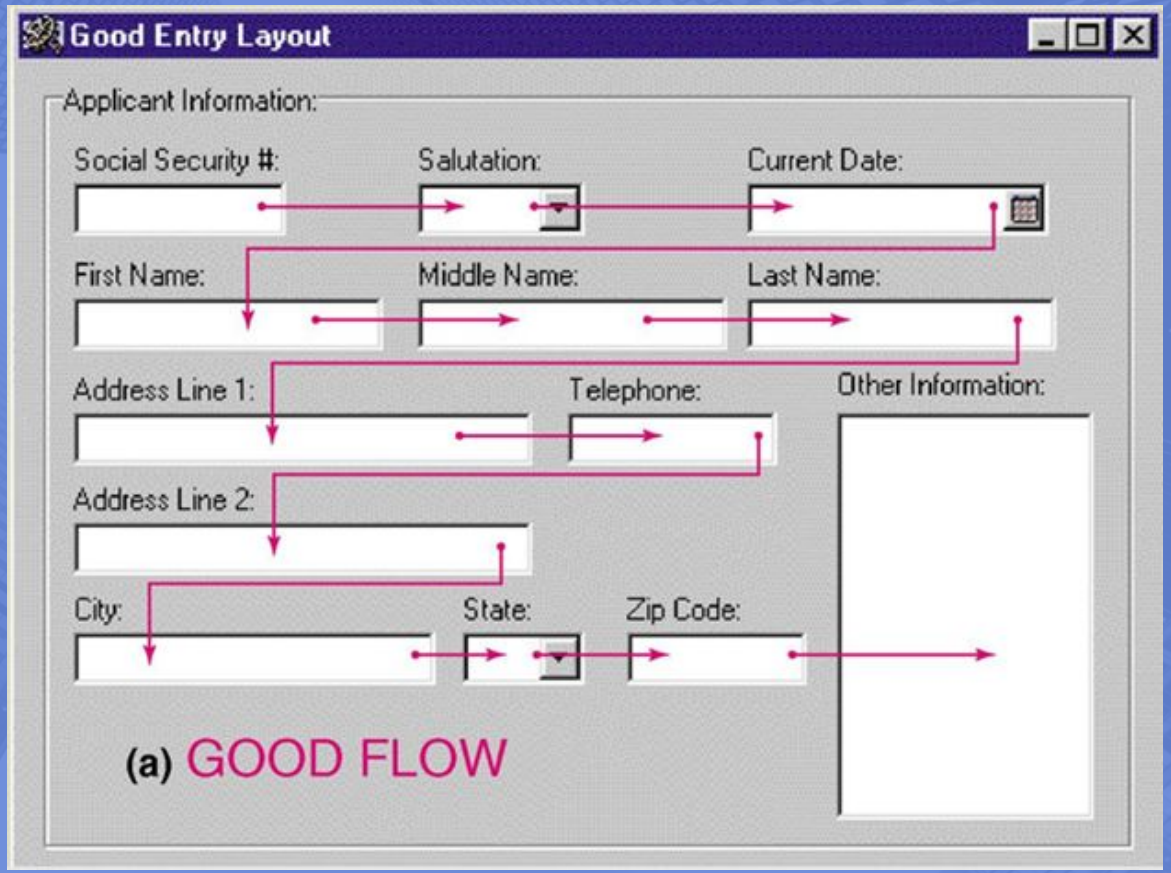
Source Document/Form Design Guidelines

- Include instructions for completing the form
- Minimize the amount of handwriting
- Data to be entered should be sequenced top-to-bottom and left-to-right
- When possible, use designs based on known metaphors

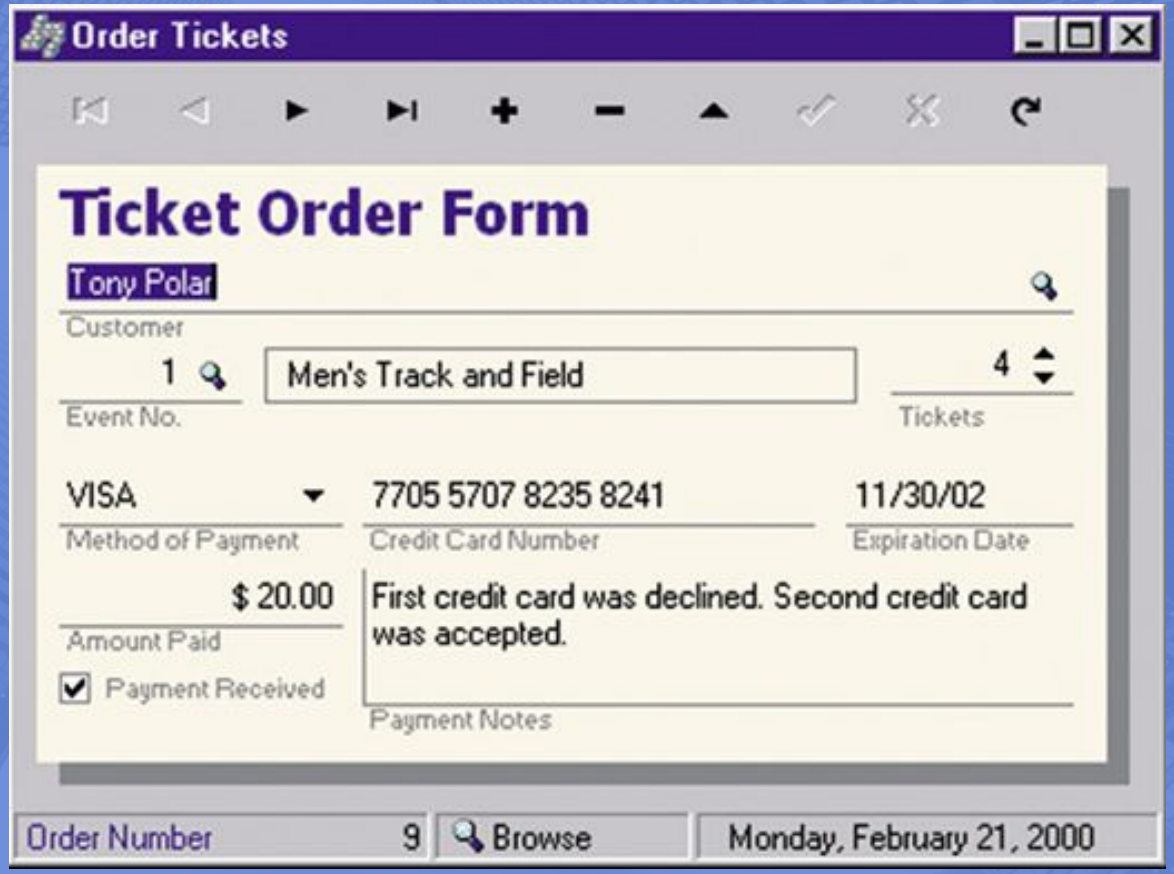
Bad Flow in a Form



Good Flow in a Form



Metaphoric Design



Input Controls

Input Controls

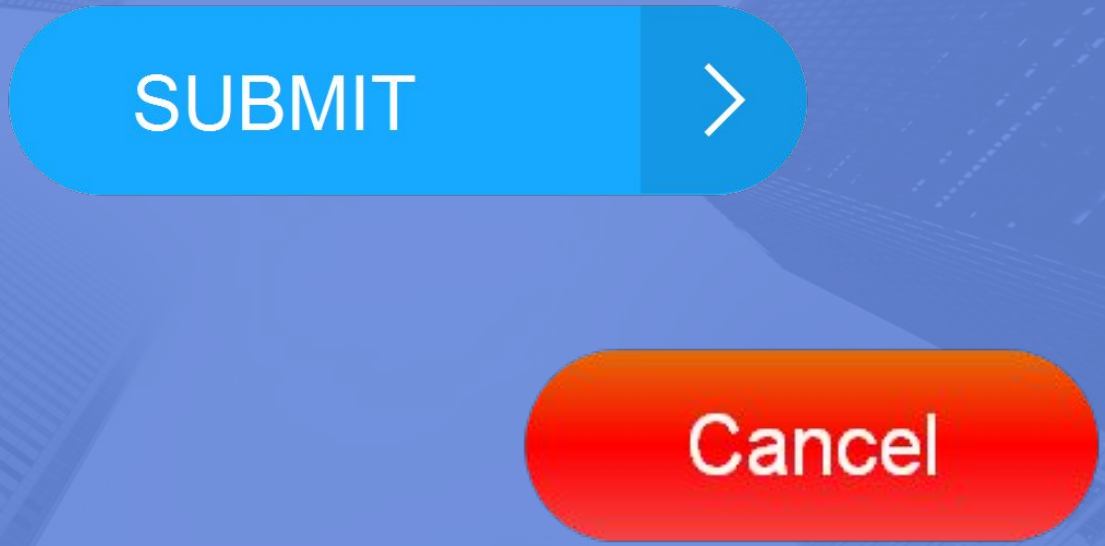
Button

Buttons are used to trigger an event.

Ex. Submit, Cancel, Undo, etc.

Input Controls

Button



Input Controls

Text Box

Enables user specified text to be captured.

Text boxes have two types.

Input Controls

Text Box

Single Line

Usually used for inputs with short lengths.

Input Controls

Text Box

Multiple Line

Usually used for lengthy inputs.

Input Controls

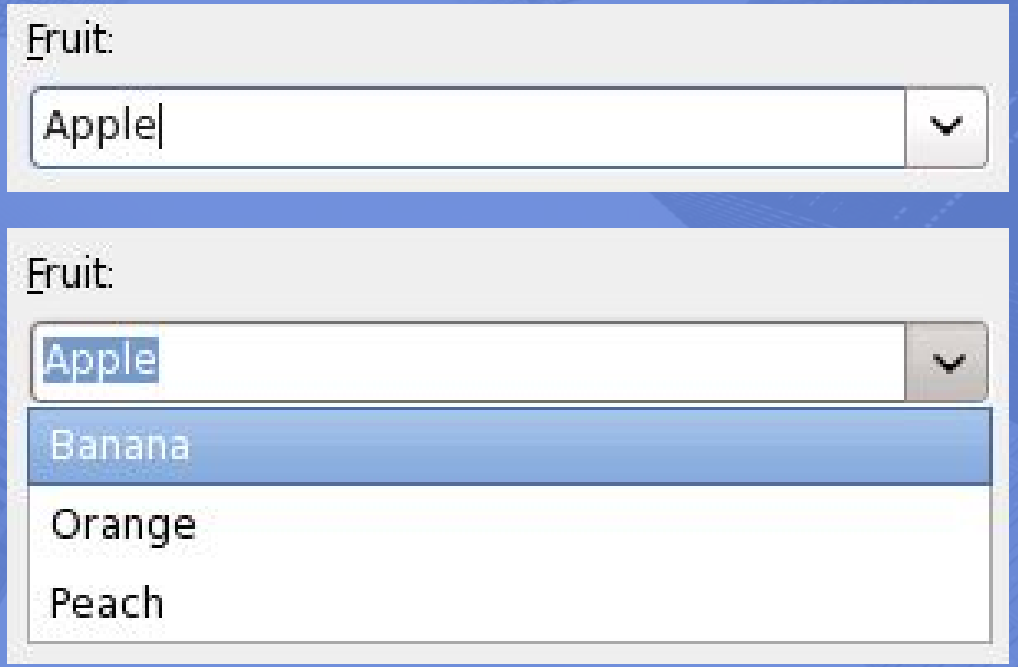
Drop-down Items

Drops down a list of values to be chosen by the user when clicked

Usually holds 3 or more values.

Input Controls

Drop-down Items



Input Controls

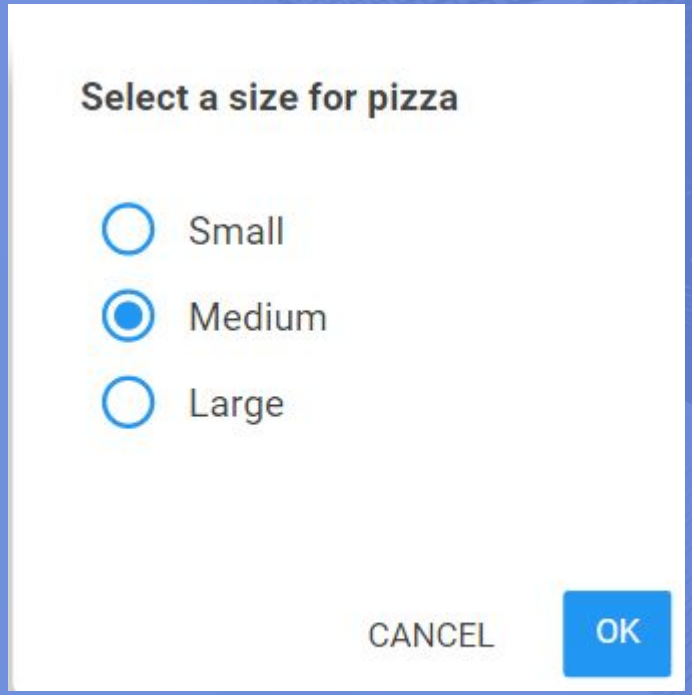
Radio Button

A list of items are displayed and only one of those can be selected.

Usually holds not more than 6 items to be chosen.

Input Controls

Radio Button



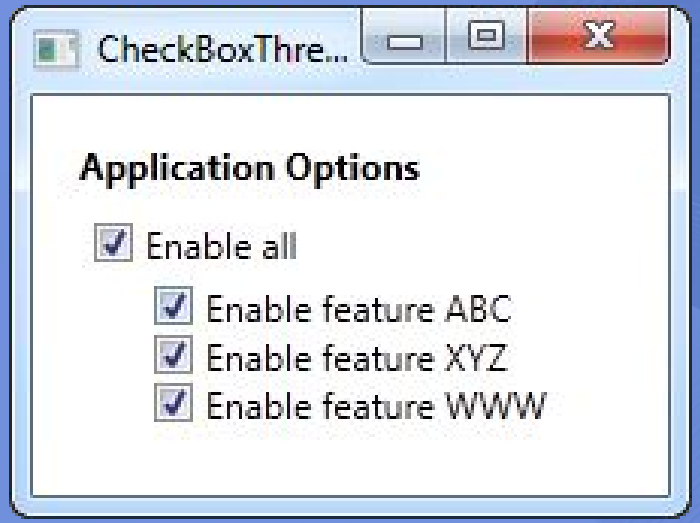
Input Controls

Check Box

Similar to radio buttons, but multiple items can be selected.

Input Controls

Check Box



Input Controls

File Input Box

Enables users to upload a file to the system.

File types are usually specified when uploading.

Input Controls

File Input Box

Input Controls

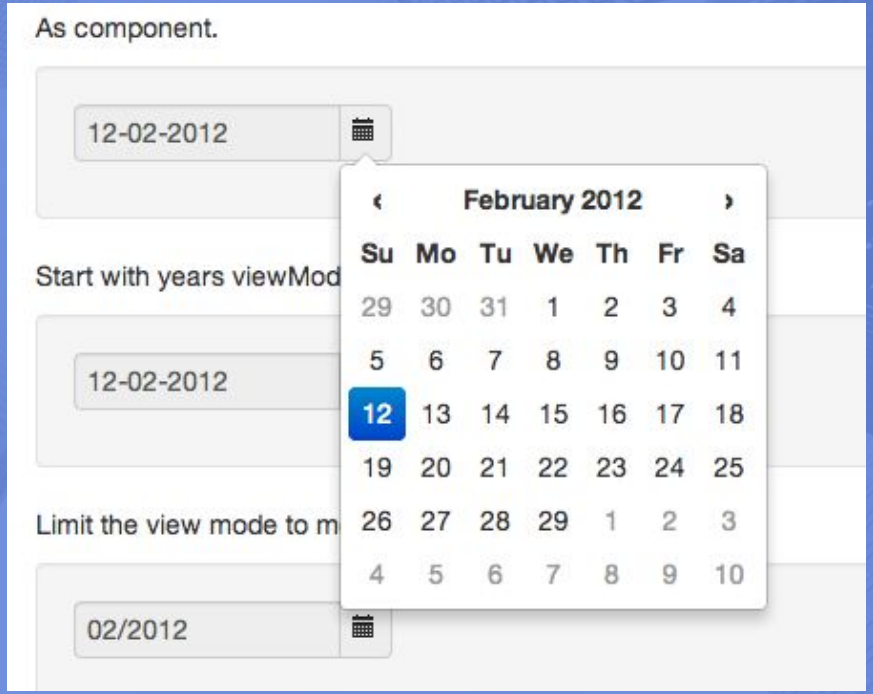
Drop Down Calendar

Used as an alternative when entering dates.

A calendar drops down and users can interact with it.

Input Controls

Drop Down Calendar



Input Controls

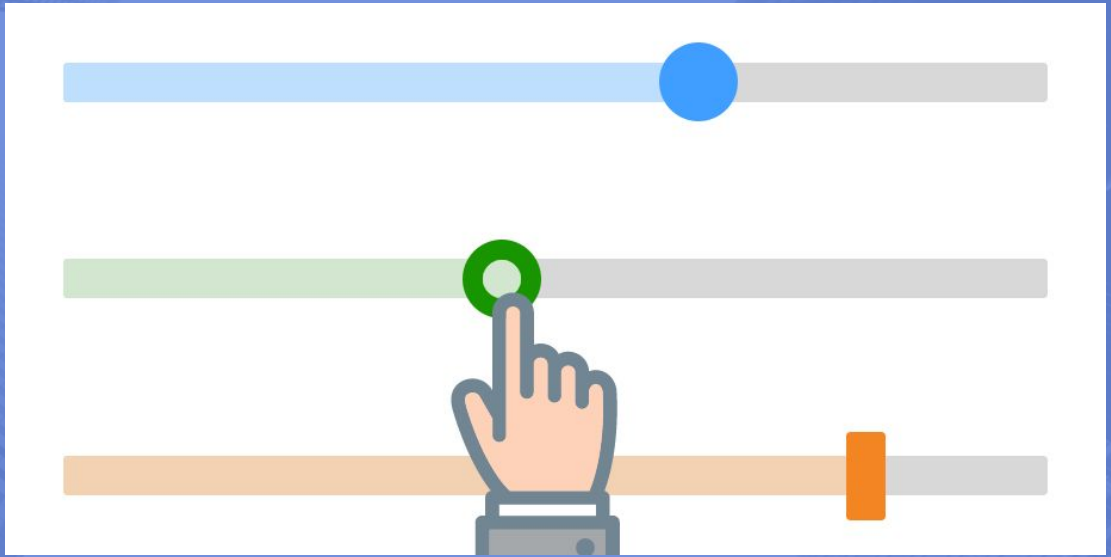
Sliders

Usually used for configurations.

Examples are audio and volume controls, brightness, and other game settings.

Input Controls

Sliders



Input Controls

Spin Button

Usually used to increase or decrease numerical values by clicking buttons.

Input Controls

Spin Button

Internal Controls for Inputs

- The number of inputs should be monitored (to minimize risk of lost transactions)
- For batch processing
  - Use batch control slips
  - Use one-for-one checks against post-processing detail reports

Internal Controls for Inputs

- For online systems
  - Log each transaction as it occurs it a separate audit file

Internal Controls for Inputs

- Validate all data
- Existence checks
- Data-type checks
- Domain checks
- Combination checks
- Self-checking digits
- Format checks

Input Design Considerations

Input Design Considerations

- Identify system inputs and review logical requirements
- Select appropriate GUI controls
- Design, validate and test inputs using some combination of:
  - Layout tools
  - Prototyping tools
  - As necessary design source documents

A Logical Data Structure for Input Requirements

Order = Order Number
- Order Date
- Customer Number
- Customer Name
- Customer Shipping Address = Address
- (Customer Shipping Address = Address)
- 1 { Product Number + Quantity Ordered } n
- (Default Credit Card Number)

A Logical Data Structure for Input Requirements

Address = (Post Office Box Number)

- Street Address
- City
- State
- Postal Zone

Activity

Access it using this link:

http://tinyurl.com/SYSTIMP-INPUT

References

https://www.tutorialspoint.com/system_analysis_and_design/system_analysis_and_design_input_output_forms.htm

https://docs.microsoft.com/en-us/windows/uwp/input-and-devices/multiple-input-design-guidelines

https://wordpress.org/support/topic/change-default-taxonomy-input-description/

https://uxplanet.org/designing-more-efficient-forms-structure-inputs-labels-and-actions-e3a47007114f

https://uxdesign.cc/design-better-forms-96fadca0f49c

https://support.office.com/en-us/article/Overview-of-forms-Form-controls-and-ActiveX-controls-on-a-worksheet-15BA7E28-8D7F-42AB-9470-FFB9AB94E7C2

http://highered.mheducation.com/sites/0073052337/student_view0/chapter16/powerpoint_presentations.html

References

https://www.computerhope.com/jargon/t/toucscre.htm

https://www.techopedia.com/definition/26649/point-of-sale-terminal-pos-terminal

http://searchcrm.techtarget.com/definition/speech-recognition

http://www.businessdictionary.com/definition/automatic-data-capture.html