



UI for Input Design

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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

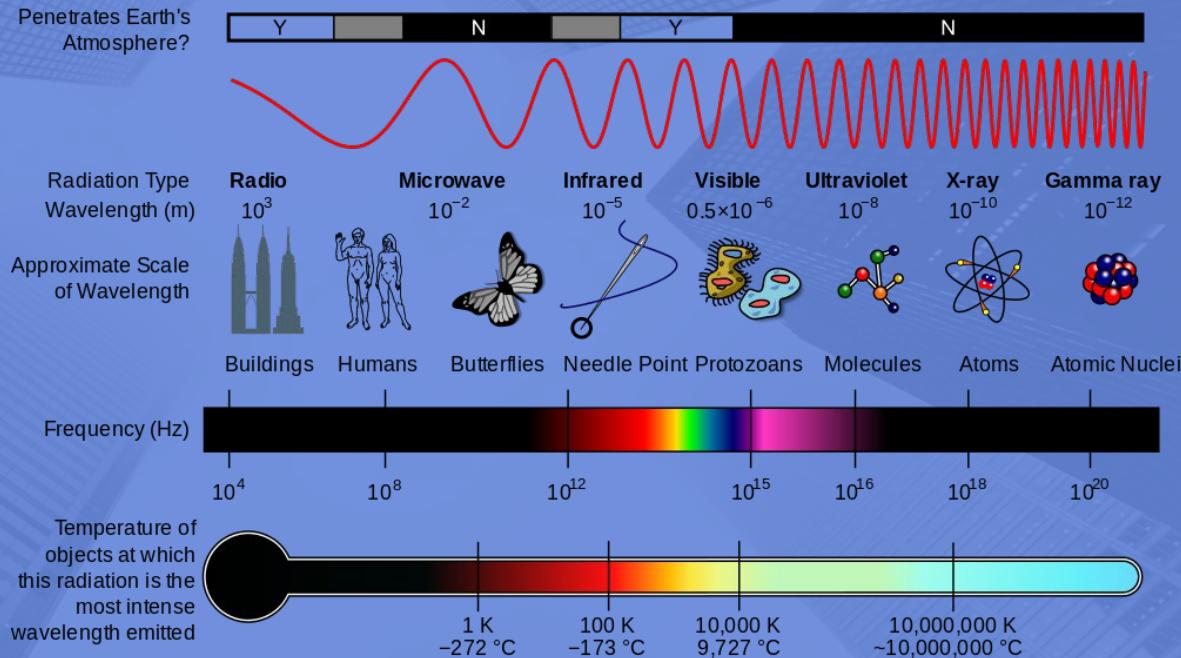
Magnetic Ink



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

Keyboard

—

Mouse

-Data is usually captured on business form

→ **Source Document**

Touch screen

-Real-time

Data Capture

Data Entry

Data Processing

-Most common input but also most prone to errors

-“pointing” device for a screen

-Either touch commands and data choices or data using handwriting recognition

-Collected into batch files
-Processed as soon as it has been keyed

-Same with keyboard
-Associated with online and real-time processing

-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	<ul style="list-style-type: none">-Pre-recorded on forms (customer)	<ul style="list-style-type: none">-Reads the magnetized data-Additional info must use other input method	<ul style="list-style-type: none">-almost always processed as a batch
Electro-magnetic	<ul style="list-style-type: none">-Recorded directly on the object	<ul style="list-style-type: none">-Transmitted by radio frequency	<ul style="list-style-type: none">-Almost always processed immediately
Smart Card	<ul style="list-style-type: none">-Same with electromagnetic but always carried by the user	<ul style="list-style-type: none">-Transmitted by smart card readers	
Bio-metric	<ul style="list-style-type: none">-Unique human characteristics	<ul style="list-style-type: none">-Read by sensors-Primary apps are security & medical monitoring	<ul style="list-style-type: none">-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

The image shows two side-by-side user interface snippets illustrating input design guidelines, particularly the grouping of related information.

Left Snippet (Incorrect Design):

- Personal Information:** A large block of fields including First Name, Last Name, Email (with a note: "Your email address will be your username"), Re-type Email, Password (with a note: "Min. 8 characters, 1 number, case-sensitive"), Re-type Password, Address, City, State (dropdown: "Choose a state"), Zip Code (with an "Optional" link), Phone (with a note: "No spaces or dashes"), Date of Birth (dropdowns for Month, Day, Year), Gender (dropdown: "Choose a gender"), Security Question (dropdown: "Choose a security question"), and Security Answer (with a note: "(Not case-sensitive)").
- A red circular button with a white "X" is positioned at the bottom center of this section.

Right Snippet (Correct Design):

- Personal Information:** Similar to the left snippet but organized into sections. It includes First Name, Last Name, Date of Birth (dropdowns for Month, Day, Year), and Gender (dropdown: "Choose a gender").
- Account Information:** Includes Email (with a note: "Your email address will be your username"), Re-type Email, Password (with a note: "Min. 8 characters, 1 number, case-sensitive"), Re-type Password, Security Question (dropdown: "Choose a security question"), and Security Answer (with a note: "(Not case-sensitive)").
- Contact Information:** Includes Address, City, State (dropdown: "Choose a state"), Zip Code (with an "Optional" link), Phone (with a note: "No spaces or dashes"), and a green circular button with a white checkmark.

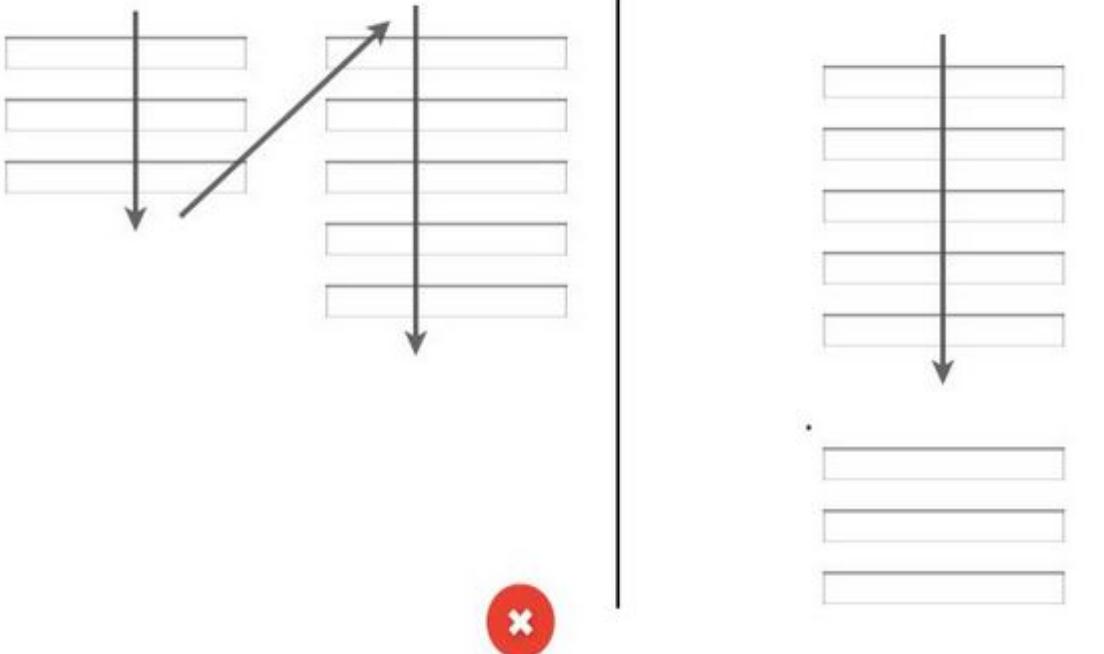
Input Design Guidelines

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

The image shows two side-by-side input field designs. The left design is complex and segmented, while the right design is simplified and combined into a single field.

Left (Complex Design):

- FIRST NAME: Text input field
- LAST NAME: Text input field
- EMAIL ADDRESS: Text input field
- SEX:
 - Male (radio button)
 - Female (radio button)
- DATE OF BIRTH:
 - Day dropdown
 - Month dropdown
 - Year dropdown
- TIME OF ARRIVAL:
 - AM/PM dropdown
 - Hours dropdown
 - Minutes dropdown

A large red circle with a white 'X' is centered below the left form.

Right (Simplified Design):

- FULL NAME: Large text input field
- EMAIL ADDRESS:
 - Text input field containing "Example: john@gmail.com"
- SEX:
 - Male (radio button)
 - Female (radio button)
- DATE OF BIRTH: Text input field showing "--"
- TIME OF ARRIVAL: Text input field showing "Please select"

A green circle with a white checkmark is centered below the right form.

Below the forms is the text: "Combine multiple fields in one easy-to-fill field."

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

★ indicates required

Email Address

First Name

Last Name

Subscribe

Mailchimp subscribe to mailing list form.

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

Billing Address

Country *

Australia

First Name *

Last Name *

Intelligently pre-selected country in the checkout form.

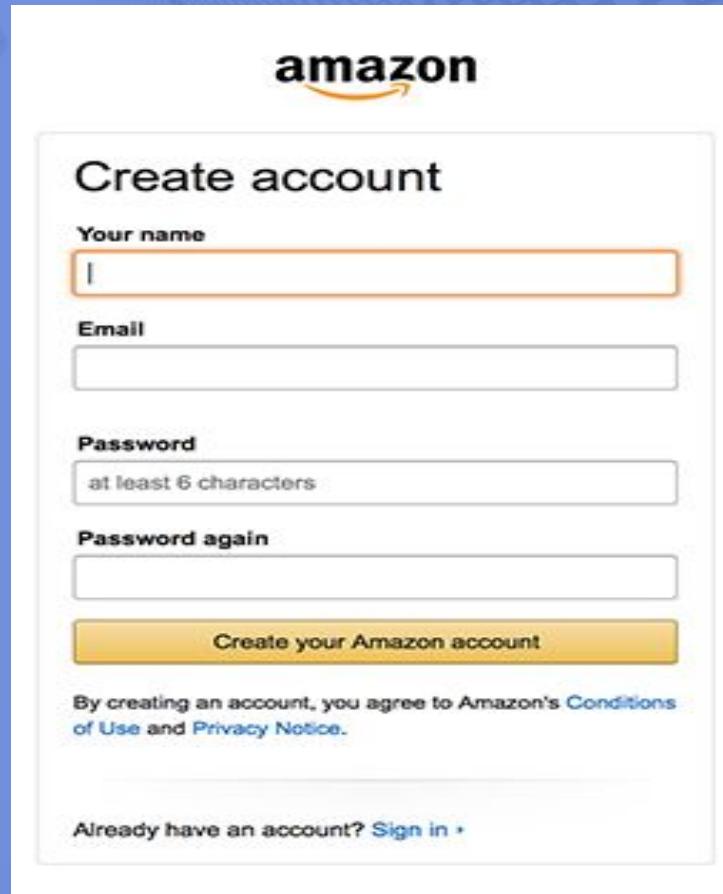
Input Design Guidelines

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



The image shows the 'Create account' form from the Amazon website. At the top is the Amazon logo. Below it, the title 'Create account' is centered. There are four input fields: 'Your name' (highlighted with an orange border), 'Email' (empty), 'Password' (containing placeholder text 'at least 6 characters'), and 'Password again' (empty). Below these is a large yellow button labeled 'Create your Amazon account'. At the bottom, a note states 'By creating an account, you agree to Amazon's [Conditions of Use](#) and [Privacy Notice](#)'. At the very bottom, there is a link 'Already have an account? [Sign in](#)'.

amazon

Create account

Your name

Email

Password

at least 6 characters

Password again

Create your Amazon account

By creating an account, you agree to Amazon's [Conditions of Use](#) and [Privacy Notice](#).

Already have an account? [Sign in](#)

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

amazon.com

[Your Account](#) | [Help](#)

Registration
New to Amazon.com? Register Below.

My name is:

My e-mail address is:

Type it again:

My mobile phone number is: (Optional)
[Learn more](#)

Protect your information with a password
This will be your only Amazon.com password.

Enter a new password:

Type it again:

Create account

[Conditions of Use](#) [Privacy Notice](#) © 1996-2011, Amazon.com, Inc. or its affiliates

amazon

Create account

Your name

Email

Password at least 6 characters

Password again

Create your Amazon account

By creating an account, you agree to Amazon's [Conditions of Use](#) and [Privacy Notice](#).

Already have an account? [Sign in](#) +

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

Upload a package

This will create a new **staging** deployment.

DEPLOYMENT NAME

PACKAGE

BROWSE YOUR COMPUTER !

CONFIGURATION

BROWSE YOUR COMPUTER !

Deploy even if one or more roles contain a single **instance** ?

"All Caps" labels are very hard to read.

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

The image displays three separate wireframe diagrams of user interface forms, each featuring several input fields and their corresponding labels. The labels are represented by blue circles containing numbers, and the input fields are green rectangles.

- Left-aligned labels:** This diagram shows labels positioned to the left of their respective input fields. Examples include "Your address" (label 1) above a text input, "Your city" (label 12) above a dropdown menu, and "Company you work for" (label 22) above a text input. The input fields are aligned to the right of the labels.
- Right-aligned labels:** This diagram shows labels positioned to the right of their respective input fields. Examples include "Your address" (label 6) to the right of a text input, "Your city" (label 8) to the right of a dropdown menu, and "Company you work for" (label 11) to the right of a text input. The input fields are aligned to the left of the labels.
- Top labels:** This diagram shows labels positioned directly above their respective input fields. Examples include "Name" (label 43) above a text input, "Surname" (label 51) above a dropdown menu, and "City" (label 18) above a text input. The input fields are aligned below the labels.

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

Name

 First Last

Date

 MM / DD / YYYY 

Phone

 (###) ## ####

Web Site

Email

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

Name

 First Last

Date

 MM / DD / YYYY 

Phone

 (###) ## ####

Web Site

LEFT ALIGNED

- REQUIRE LESS VERTICAL SPACE
- REQUIRES MORE ATTENTION FROM USERS
- REQUIRES MORE HORIZONTAL SPACE
- SLOWEST COMPLETION RATES
- POOR MULTI-LANGUAGE SUPPORT

Name

 First Last

Date

 MM / DD / YYYY 

Phone

 (###) ## ####

Web Site

Email

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](#)

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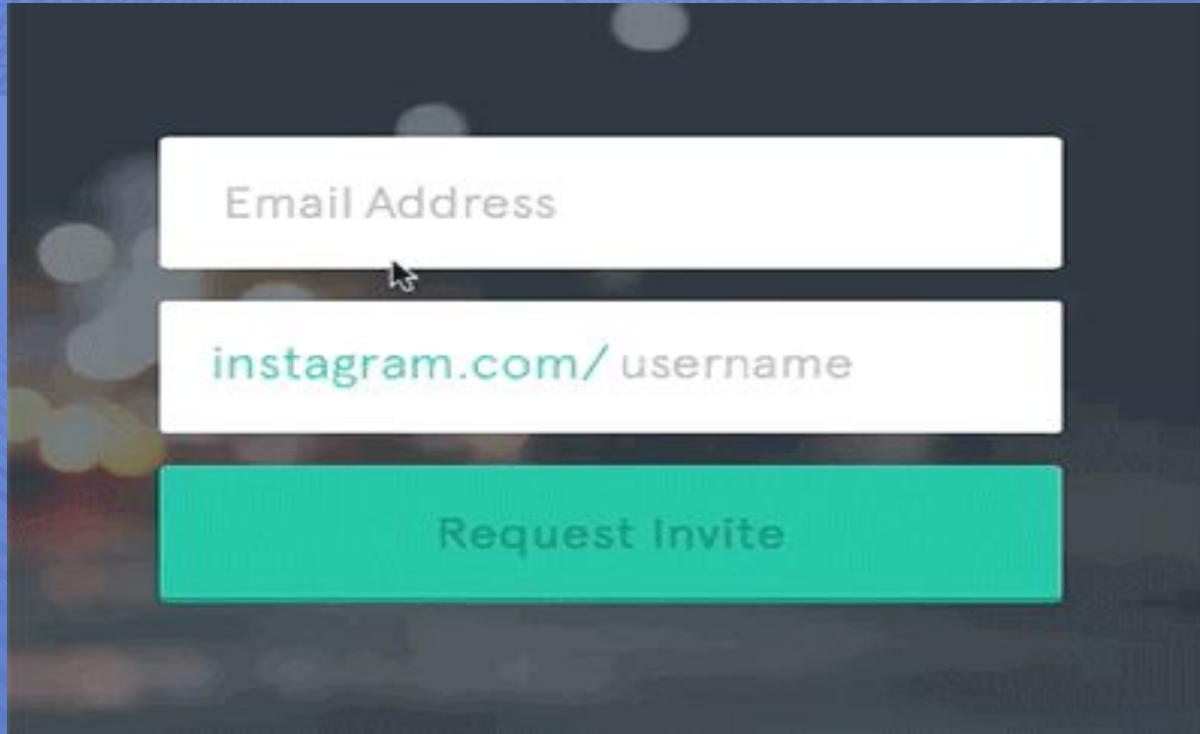
Input Design Guidelines

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.

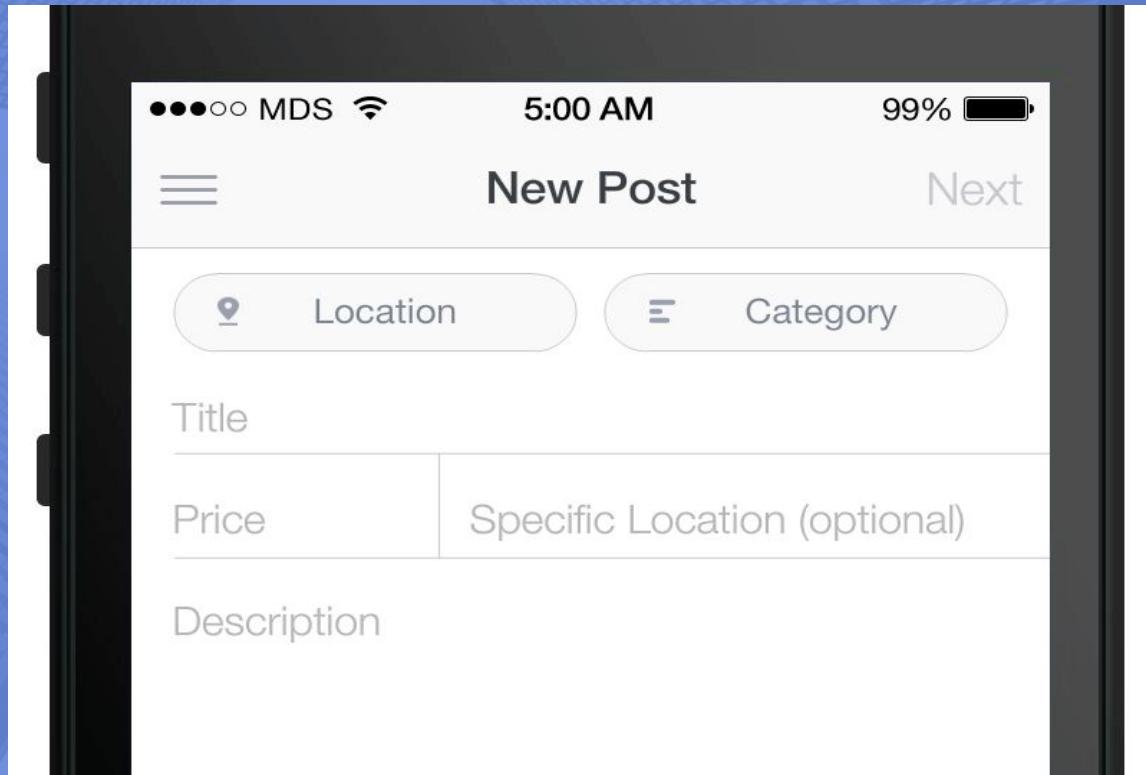
Input Design Guidelines

Field Labels



Input Design Guidelines

Field Labels



Input Design Guidelines

Action Buttons

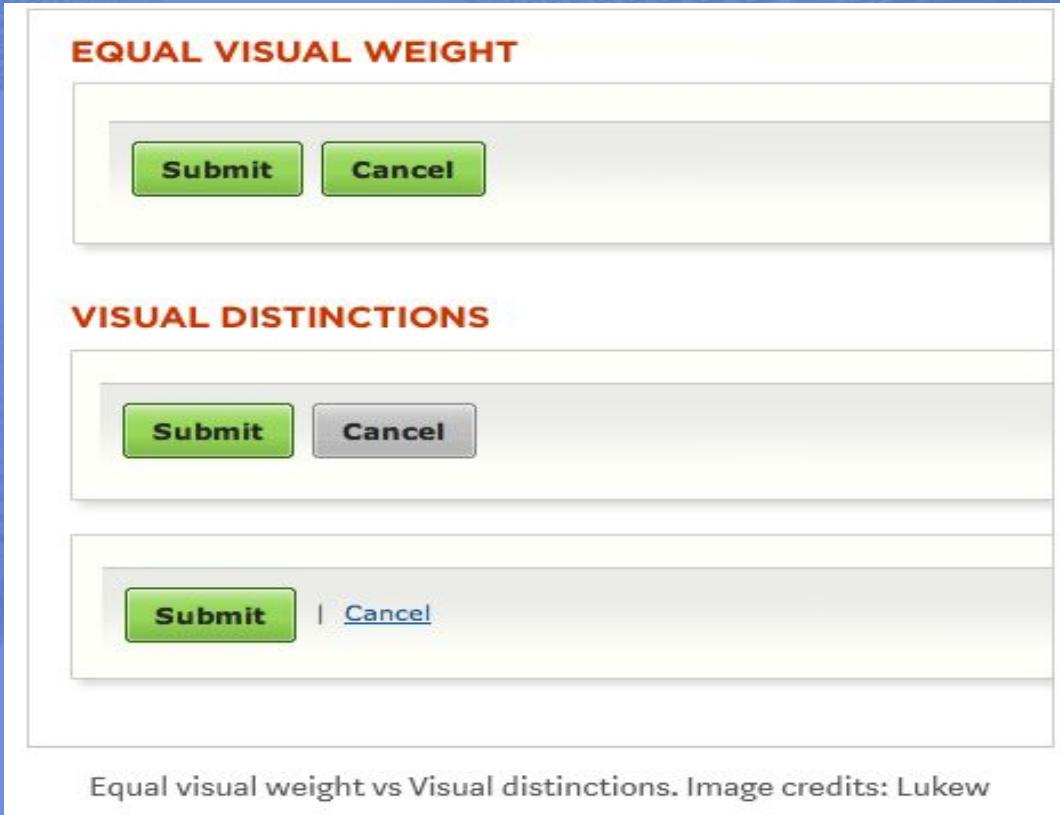
Input Design Guidelines

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



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

Order for myself
We have filled in your address (and/or where necessary). Please complete the details below
Fields marked * must be filled in:

Address*

Town/City* LEIGHTON BUZZARD

County Beds

Postcode

Title*

Other title

First name*

Last name*

Gender*

(b) Personal Identifier (if known)

Date of birth (DD MM YYYY)

Daytime phone number

Evening phone number

Mobile phone number

Email Address

Which of these subject areas are you most interested in studying with the Open University?

Which of these best describes your reason for enquiring about study with the Open University?

When would you like to start studying with the Open University?

How did you find out about us? Please tell us how you found out about our website
If the promotion code you have is a response code please enter it here (e.g. UNIOPEN11)

If you do not have this response code or other promotional code do you care not promote?

Order for myself
We have filled in your address (and/or where necessary). Please complete the details below
Fields marked * must be filled in:

Address*

Town/City* LEIGHTON BUZZARD

County Beds

Postcode

Title*

Other title

First name*

Last name*

Gender*

(b) Personal Identifier (if known)

Date of birth (DD MM YYYY)

Daytime phone number

Evening phone number

Mobile phone number

Email Address

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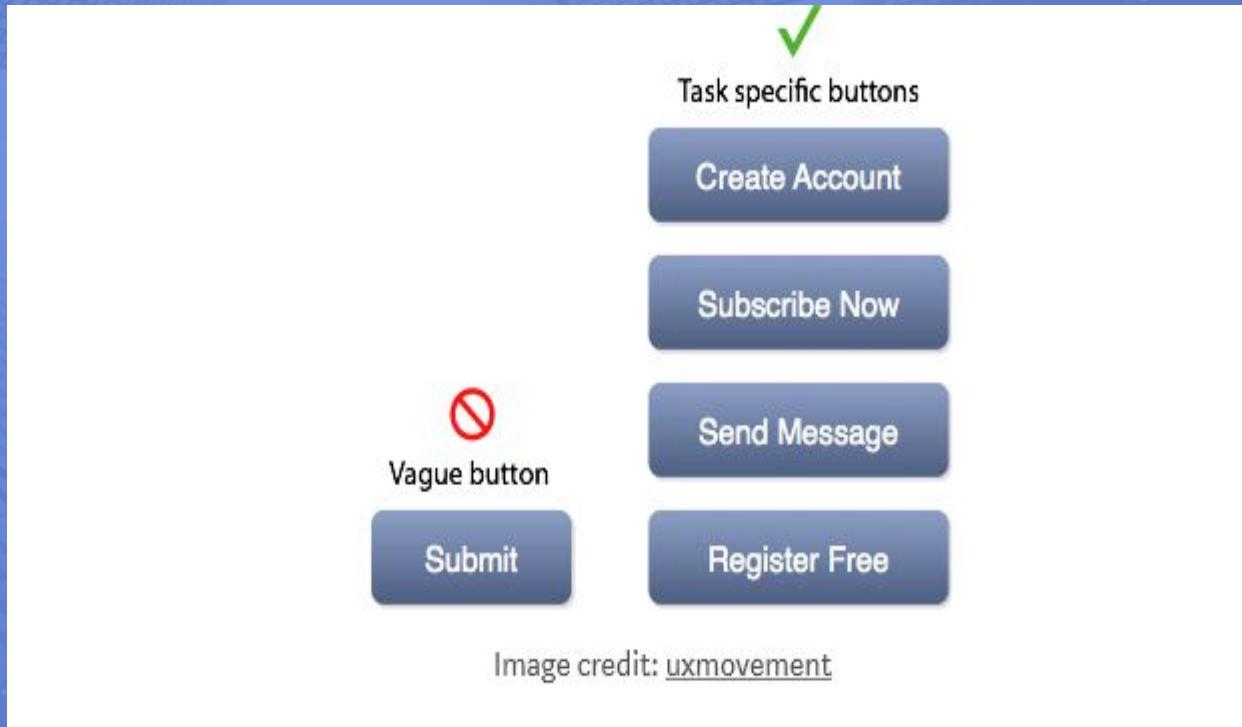
Input Design Guidelines

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

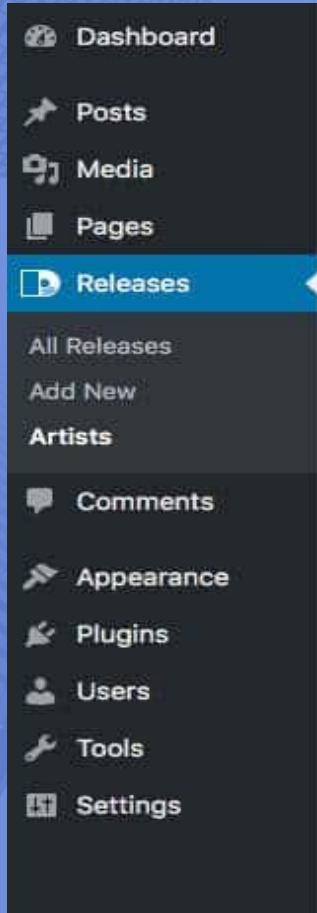
Input Design Guidelines

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



The screenshot shows a dark-themed WordPress admin sidebar on the left and a main content area on the right. The sidebar has a vertical list of menu items: Dashboard, Posts, Media, Pages, Releases (which is highlighted with a blue background), All Releases, Add New, Artists, Comments, Appearance, Plugins, Users, Tools, and Settings. The main content area is titled 'Artists' and contains a form for adding a new artist. The 'Name' field is labeled 'The name is how it appears on your site.' Below it is a 'Slug' field with a descriptive note: 'The "slug" is the URL-friendly version of the name. It is usually all lowercase and contains only letters, numbers, and hyphens.' At the bottom is a 'Description' field with a note: 'The description is not prominent by default; however, some themes may show it.' A blue 'Add New Artist' button is at the bottom of the form.

Artists

Add New Artist

Name

The name is how it appears on your site.

Slug

The "slug" is the URL-friendly version of the name. It is usually all lowercase and contains only letters, numbers, and hyphens.

Description

The description is not prominent by default; however, some themes may show it.

Add New Artist

Input Design Guidelines

Feedback

Email

john@johndoe.com



There is already an account with this email

Password

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

(b) BAD FLOW

Bad Entry Layout

Applicant Information:

Social Security #: Salutation: Current Date: Other Information:

First Name: Last Name: State:

Middle Name: Telephone: Zip Code:

City: Address Line 1: Address Line 2:

The diagram illustrates a user interface for 'Applicant Information' with various input fields. A large number of red arrows highlight problematic data flow and visual clutter. Arrows point from 'Social Security #' to 'Salutation' and 'Current Date'. From 'First Name' and 'Middle Name', arrows point to 'Last Name'. From 'Telephone', an arrow points to 'Address Line 1'. From 'Address Line 1', an arrow points to 'Address Line 2'. From 'Address Line 2', an arrow points back to 'City'. Additionally, arrows point from 'State' to 'Zip Code' and from 'Zip Code' to 'Other Information'. The 'Other Information' field is a large empty box on the right side of the form.

Good Flow in a Form

Good Entry Layout

Applicant Information:

Social Security #: Salutation: Current Date:

First Name: Middle Name: Last Name:

Address Line 1: Telephone: Other Information:

Address Line 2:

City: State: Zip Code:

(a) GOOD FLOW

The diagram illustrates a good form layout with clear logical flow between fields. It starts with 'Social Security #' and 'Salutation' at the top, followed by 'Current Date'. Below that is a group of three fields: 'First Name', 'Middle Name', and 'Last Name'. The flow continues to 'Address Line 1', 'Telephone', and 'Other Information'. Then it moves to 'Address Line 2'. Finally, it goes to 'City', 'State', and 'Zip Code'. Arrows indicate the flow from one field to the next, with a final arrow pointing to an empty vertical box on the right.

Metaphoric Design

Order Tickets

Ticket Order Form

Customer: Tony Polar

Event No.: 1 Men's Track and Field Tickets: 4

Method of Payment: VISA Credit Card Number: 7705 5707 8235 8241 Expiration Date: 11/30/02

Amount Paid: \$ 20.00

Payment Notes: First credit card was declined. Second credit card was accepted.

Order Number: 9 Browse Monday, February 21, 2000

Input Controls

Input Controls

Button

Buttons are used to trigger an event.

Ex. Submit, Cancel, Undo, etc.

Input Controls

Button

SUBMIT



Cancel

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.

The image displays three distinct examples of single-line text input fields, each with a unique design and purpose:

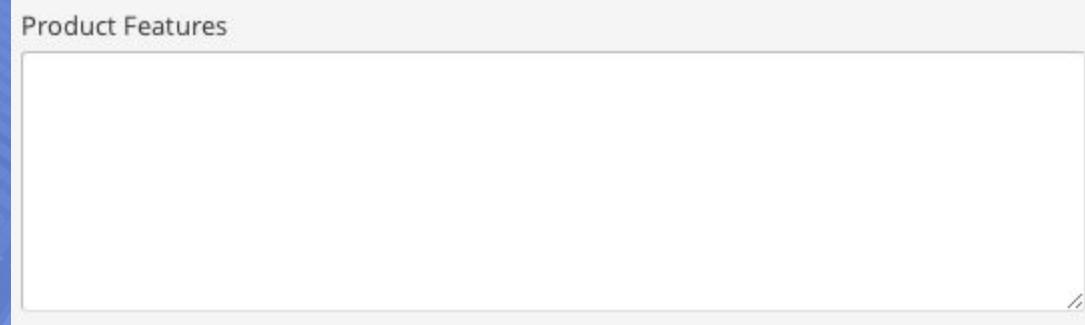
- Search Bar:** A horizontal input field featuring a magnifying glass icon on the left side, used for quick queries or lookups.
- Placeholder Text:** A horizontal input field containing the placeholder text "You can type here...", intended to guide the user on what to enter.
- Text Input with Placeholder:** A horizontal input field with a small downward-pointing arrow icon on the right side, often used for dropdown menus or lists.

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

Fruit:

Fruit:

- Banana
- Orange
- Peach

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

Select a size for pizza

Small

Medium

Large

CANCEL

OK

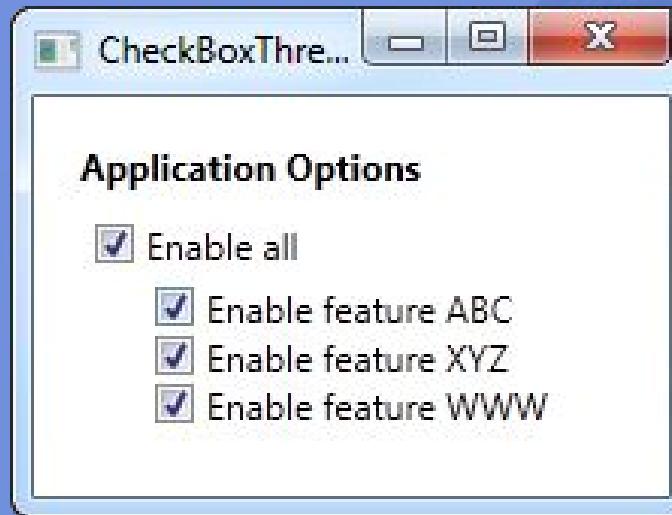
Input Controls

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

Bootstrap style button 1

File selection

Bootstrap style button 2

Open

Bootstrap style button 3

Select a File

Input Controls

Drop Down Calendar

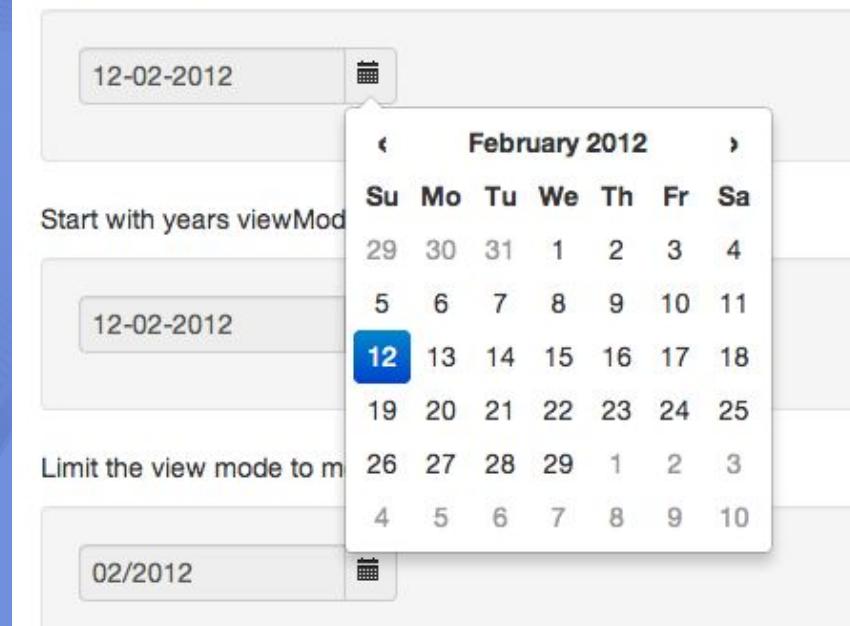
Used as an alternative when entering dates.

A calendar drops down and users can interact with it.

Input Controls

Drop Down Calendar

As component.



Input Controls

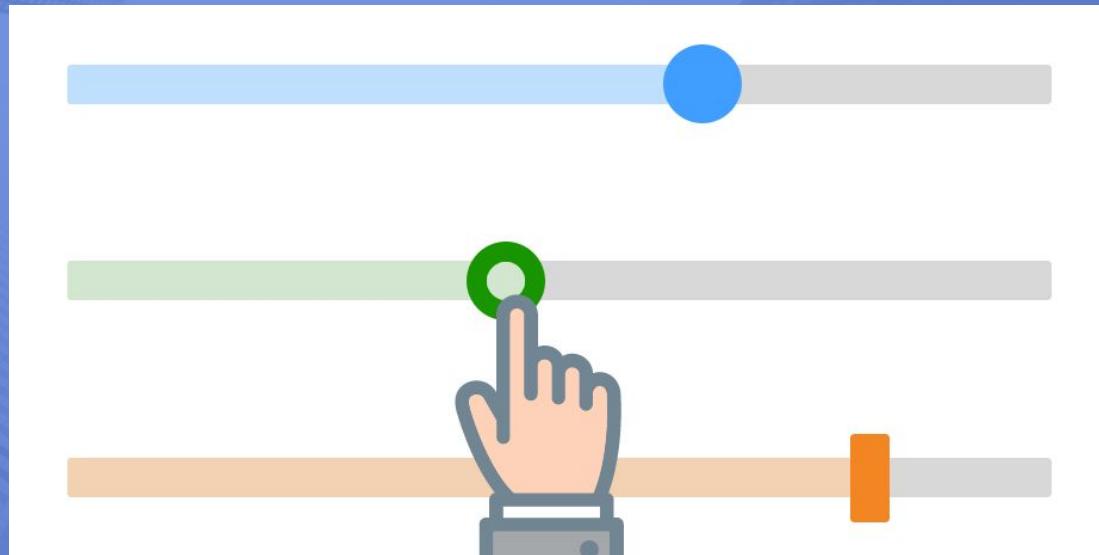
Sliders

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



The screenshot shows a software interface with several input controls. At the top, there are three tabs: "Plantilla", "Pagina", and "View". The "View" tab is currently selected. Below the tabs, there are two sets of spin buttons labeled "Margenes". The first set, under "Superior" and "Inferior", has spin buttons with up and down arrows. The second set, under "Izquierdo" and "Derecho", also has spin buttons with up and down arrows. To the right of these, there is a dropdown menu labeled "Carta". Further down, there are two more sets of spin buttons labeled "Ancho" and "Alto", each with its own dropdown menu. The entire interface is contained within a light gray box.

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](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>

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