



Unit 3



Design of Input and Control

# Introduction of Input Design

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- Design interface is first step of System Design of SDLC.
- Designing interface (User Interface) is very important because End Users wants system that is easy to use.
- Input determines which data enters the system for processing and thus is responsible for producing either reliable information or wrong information.
- It also determines whether the user can interact efficiently with the system.



## Objectives of Input Design

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### (I) Controlling the amount of input

The input phase (done by people) is a slow process compared to the processing phase (done by computer) and hence lower quantity of data will speed up the whole process.



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- Example: Registration Form – (Add required information at the time of registration.)

**Registration**

Create your account. It's free and takes just a minute.

First Name

Last Name

Email

Password

Confirm Password

You agree to the [Terms & Conditions](#).



## 2) Avoiding Delay

- A processing delay resulting from data preparation or data entry operations is called a bottleneck.
- One of the ways of avoiding delay is to use turn around documents output documents prepared such that they can be used as input documents thus making data entry faster. (Example : MICR cheque)

BANK LOGO 245272327 SB No. 7683173

BANK NAME Date: D D M M Y Y Y Y

Pay To \_\_\_\_\_ Or Bearer

The Sum of Taka \_\_\_\_\_ Tk.

ACCOUNT NUMBER

⑈ 7683 173 ⑈ 245272327 ⑈ 00 1 2 1000 24874 ⑈ 10

CHEQUE NUMBER ROUTING NUMBER ACCOUNT NUMBER TRANSACTION CODE

### (3) Avoiding errors

Errors will normally be related to the amount of data entered.

Errors can be avoided by doing **input validation** also.

The form contains the following fields and messages:

- Name:** Input field with "jQueryScript.Net". Message: "That name is not original enough." (red)
- Age:** Input field with "32". Message: "Ahh, 32, a wise age." (green)
- Birth Date:** Input field with "YYYY-MM-DD".
- Email:** Empty input field. Message: "Email is required." (red)
- Continent:** Dropdown menu with "— Please Select —". Message: "Continent is required." (red)
- Are You Cool?:** Radio buttons for "Yes" and "No". Message: "Are you cool? is required." (red)
- What 2 colors do you like?:** Text area with "Red", "Orange", "Yellow", "Green". Message: "Colors is required." (red)
- What Do You Like?:** Checkboxes for "CodeIgniter", "Fuel", "Kohana", "Laravel", "Zend". Message: "What do you like? is required." (red)

Submit button



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## (4) Avoiding extra steps

Sometimes it is not possible to reduce the amount of data preparation and data entry (Example SSC/ HSC result in admission process).

If possible reducing one step will result in considerable saving in overall processing time.



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## (5) Keeping the process simple

- Too many validation and controls will slow down the overall process.
- So keep it as simple as possible so that the users accept it willingly.





# Coding methods

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- In coding methods **conditions, words, ideas, or relationships** are expressed by a code to reduce input, control errors and speed up the entire process.
- Five types of coding methods :
  1. Classification
  2. Function
  3. Sequence
  4. Significant digit
  5. Mnemonic code



## I) Classification codes :

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- Classification codes provide group identification.
- It provide separate entities such as events, people, or objects into groups called classes and a code is used to distinguish one class from another.
- Example : Course identification of INDUS
  - Class 8383 is for IMSc course
  - Class 8282 is for IMCA course



## 2) Function codes :

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- Function codes state the activities or work to be performed without spelling out all the details.
  - Example:
  - For Add (1 or A)
    - **A** would require all the details of the record to be added
  - For Delete (2 or D)
    - **D** would require only the key field of the record to be deleted
  - Update (3 or U)
    - **U** would require the key field, the field to be changed and its new value.
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### 3) Sequence codes :

- Sequence codes are numbers (index) or letters assigned in series to convey the order in which events have occurred so that processing can be done correctly.

### 4) Significant digit :

- In this method the code is divided into subsets or sub-codes and then it can be useful in number of different ways.
- Example : Enrollment number of Indus Students

I	U	1	8	8	3	8	3	0	0	0	1
University initials (Mnemonic)		Admission Year		Course				Unique Number (Sequence codes)			

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## 5) Mnemonic codes:

- Mnemonic codes means a system such as a pattern of letters, ideas, or associations which assists in remembering something.
- Example : TV-CL-21, TV-BW-14, IU1882820001



# Capturing data for Input

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- There are three important aspects in input design.
  1. Data capture guideline
  2. Design of source documents
  3. Validation of input data.



# 1. Data capture guidelines

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- What data to capture for processing will depend on the type of application and the type of organization.
- But, there are some general guidelines that help you in input design.
- For example:
  - Display suggestion value so users can press the ENTER key to accept the suggested value.
  - Provide meaningful error message.



## 2. Design of source document

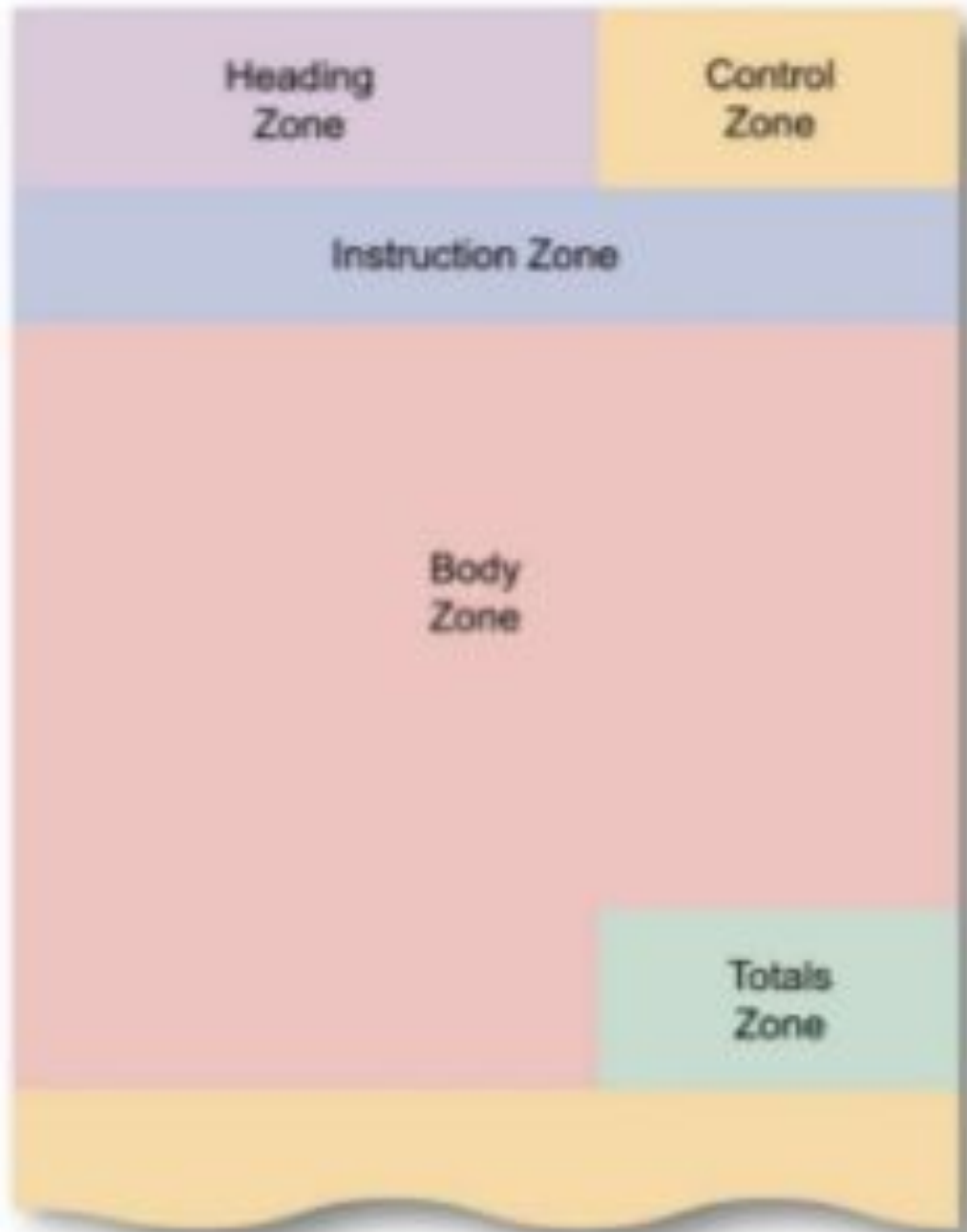
### Layout of source document

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- Should go from left to right, top to bottom.
  - Should have form zones.
  - The sequence should be natural : Name, street address, area, city, state, country, pin code then telephone / fax number etc.
  - Should also consider whether the information is going to be typed or filled manually.
  - Manually filled information requires more space.
  - Should have brief but easily understandable captions with proper instructions e.g. Date of birth (dd/mm/yyyy).
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HEADING ZONE	CONTROL ZONE
IDENTIFICATION ZONE	
DETAIL ZONE	
MESSAGE ZONE	TOTAL ZONE

### **3. Validation of input data**

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- We need to specify methods for validating data when developing input procedures.
- There are four validation methods :
  1. Existence test
  2. Limit and range test
  3. Combination test
  4. Duplicate processing



## □ **Existence Tests:**

- It examine those fields which are not to be left blank (you have to give not null as property).

## □ **Limit and Range Tests:**

- It verify the reasonableness of the transaction data. Limit tests verify either minimum or maximum value.
- Range tests verify both minimum and maximum value. Marks obtained by a student will have to be range tested between zero and maximum marks.

## □ **Combination Tests:**

- It validate that several data items jointly have acceptable values; that is the value for one element of data determines whether other data values are correct.
- For example Primary Key Field EMP01, IUI783830001

## □ **Duplicate Processing:**

- It is done when security is required. The results are then compared for agreement and accuracy.



# Design of Control

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- The systems analyst must assume that mistakes will be made in entering data or in requesting the performance of certain functions.
- Input control provides ways to
  - (1) Ensure that only authorized users access the system,
  - (2) Guarantee that transactions are acceptable,
  - (3) Necessary data have been omitted.



# Design of Computer Output

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- One of the most important features of an information system for users is the output it produces.
- Putting it the other way, outputs are for people.
- Without quality output, the entire system may appear to be so unnecessary that users will avoid using it, possibly causing it to fail.



## Output Objectives

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- ▣ **Convey** information about past activities, current status or projections of the future.
- ▣ **Signal** important events, opportunities, problems or warnings.
- ▣ **Trigger** an action.
- ▣ **Confirm** an action.



# **How to present Information (Output Design)**

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- Tabular Format
- Graphic Format
- Use of Icons
- Color Presentation



# Standards in design of Tabular Format

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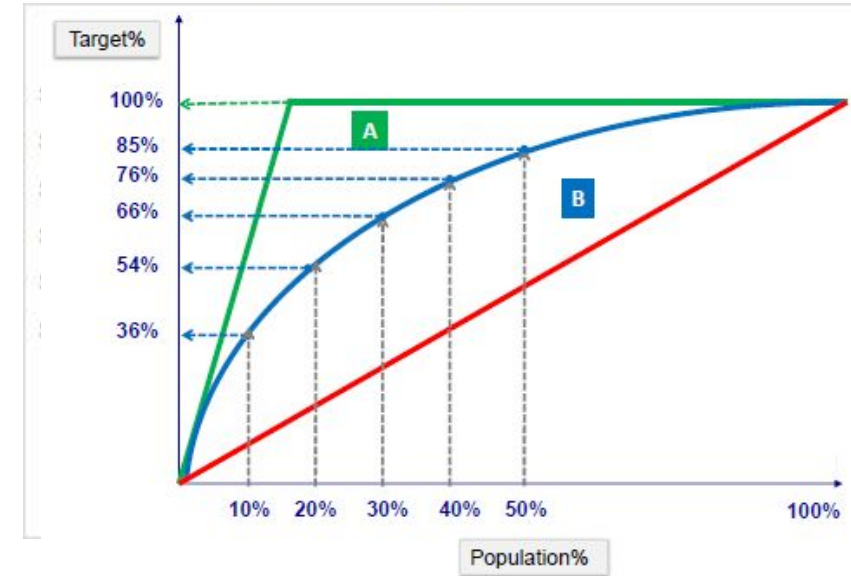
- Certain information in a tabular format is more important and should be more visible than the other information.
  - Major categories, Summaries of major categories, Unique identification information, Time dependent entities
- Details should be listed in a meaningful order (roll no wise, alphabetically, project group wise)
- Only necessary details should be kept.
- There should be subtotals on change of category.





# Graphic Format

- Graphic format means use of charts, graphs, maps and icons etc. It is not simply converting tabular data into graphical form.
- There are different types of business graphics:
  - Pie charts
  - Area charts
  - Curve charts
  - Step and bar charts
  - Maps



## Use of Icons

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- Icons are pictorial representations of entities described by the data.
  - Properly selected icons communicate information immediately since they duplicate images that users are already familiar with.
  - In country like India where there are lot of illiterate people icons are the only means of conveying information.
  - Icons eliminate the necessity for users to learn abbreviations, notations or special terminology.
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## Color Presentation

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- Colors also can be used effectively in both printed as well as displayed or textual and graphical presentations.
  - However, improper use of color can obstruct the user and management productivity.
  - Color should improve, not replace good output design.
  - A good output should be designed first without considering color and then color should be added to improve it.
  - Generally four or fewer colors should be used on a screen or a page. There should be consistency in use of colors between different pages, screens and reports.
  - **Red** for exceptions, **blue** or **green** for normal conditions, brightest colors to highlight important information.
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