Chapter III: Entering and controlling information

Collecting information is one of the four essential tasks that must be carried out by an information system. Consequently, this collected information must be entered on the company's various media (documents, hard drive, server, etc.) and subsequently checked to verify their accuracy and compliance with work requirements.

1. Entering information

According to LAROUSSE [19], the capture of information is the recording of the latter with a view to its processing or storage in a computer system. It is generally carried out by typing on an alphanumeric keyboard connected to a display and control screen.

In the purely computer vision, this operation consists of manually integrating (generally with specialized input operators) into the memory of an electronic device (generally a database) data from another origin [20].

1.1. Types of data to enter

The input operation consists of manipulating different types of data to know:

- Character or text type data.
- Digital data.
- Monetary data.
- Date and time data.
- Formulas.

1.2. Input Types
1.2.1. Manual entry

Operation which consists of entering data into a computer using the keyboard.

1.2.2. Autocomplete

Autocomplete is an operation that takes partial input from the user and predicts the final result. This allows for various types of efficiencies and faster use of various technologies.

1.2.3. Autocomplete

Autofill is a feature of some computer applications, usually containing forms, that automatically fills in fields based on information the user has previously used.

2. Information control

The information that circulates in an organization occurs throughout its life cycle, in numerous manipulations and must respond to very specific business needs and business objectives. Therefore, it is very important to control it to avoid all kinds of errors and anomalies, which can cause dysfunctions within this organization.

Controlling information consists of verifying that it is fair, complete, valid and complies with the organization's requirements.

3. Main types of controls

3.1. Direct controls

These are controls which are carried out on the information itself without taking into account other information manipulated by the information system. There are several types of direct control, namely:

3.1.1. Presence and non-presence checks:

Their goal is to verify the existence of information if the latter must exist, or the non-presence of information if the latter must not exist.

Example:

- When issuing a student card, it must already be registered in our information system (presence check)
- When registering a new student, they must not already exist in our information system (non-presence check)

3.1.2. Syntactic checks:

These checks generally make it possible to detect errors related to the syntax of the information such as:

a) Type errors (format)

A type error, sometimes called a format error, is a discrepancy between the data and its specified type.

Example: Weight: 12x3 → type error (the weight must be numeric and not alphanumeric)

b) Formatting error

A formatting error is an entry that does not match a given pattern.

Example: the date 05/31/2022 constitutes poorly formatted data compared to our adopted formatting which is DD/MM/YYYY

c) Irregularity errors

An irregularity error occurs when data is not represented in a regular manner, following the same pattern, the same logical sequence of writing.

Example

City	Temperature
M'sila	31°C
Setif	29°C
Alger	28°C
Biskra	**93.2°F**

3.2. Indirect controls

Their objective is to check the conformity of information in relation to other existing information in the system. These checks make it possible to detect errors which are generally linked to the semantics of the data such as:

3.2.1. Contradiction or consistency errors

The contradiction in the data can be internal or external

a) Internal contradiction

It involves checking the accuracy of one part of the information against other parts of the same information. Checking for an internal contradiction generally applies in juxtaposed codes.

Example:

Or the date 02/31/2022. The internal consistency or contradiction check detects an error because the month of February contains a maximum of 29 days.

b) External contradiction

This involves checking the accuracy of information against other information.

Example:

Date of birth: 04/27/2000.

Recruitment date: 08/12/2011

The external consistency or contradiction check detects an error, because the age of this employee when recruited is 11 years old!!!!

3.2.2. Errors related to violating integrity constraints

These are errors that violate data schema integrity rules.

Example:

Check if age is greater than 0.

Check the uniqueness of a student's registration number.

3.2.3. Invalid data errors (likelihood)

These are entries which are said to be invalid but which are not detectable by setting up constraints. The data must be possible and conceivable according to its meaning. Typically, these are errors that are domain specific.

Example:

First and last name	Size
Nadir Ahmed	1.75
Mokhtar Ali	**3.5**

The plausibility check detects an error linked to the height of Mokhtar Ali, because it is not conceivable to find a man with a height of 3.5 meters.

4. Some techniques to reduce input errors

Errors during input are unavoidable and we cannot eliminate them completely. However, the best solution is to reduce them by using assistive techniques while typing. These techniques can guide the user or take care of the typing task altogether in some cases. For this we propose some techniques which can strengthen the input task by reducing the latter's errors.

4.1. Accept all input formats (uppercase/lowercase)

For text fields, it is best to free the user from the hassle of using upper- and lower-case formats. In this case, all formats must be accepted and then proceed with the necessary harmonization of these formats.

4.2. Avoid entering deduced and calculated fields

In some cases, we find ourselves faced with data that can be deduced or calculated from other already existing data. In this case, it is better to exempt the user from entering these fields and give control to our system to deduce or calculate them automatically.

4.3. Using the Right GUI Components

In computing, there are several graphical interface components that can help reduce input errors and guide the user towards good practices. among these components we can cite:

4.3.1. Combobox (combined box)
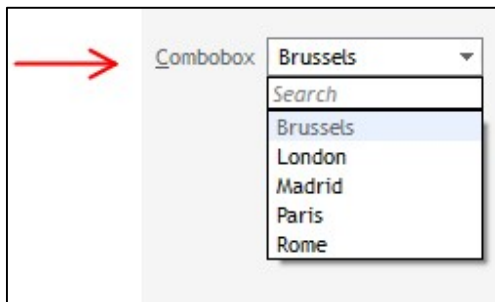
In computer science, a combined box (in English combo-box or combo box) is an element of graphic interface which brings together a text zone and an dropdown. This element is commonly used by Web sites and software.

4.3.2. Radio buttons

A radio button (in English radio button) is a visual element of graphical interfaces always used in groups (two radio buttons at least). The user must choose one, and only one, option from several possible ones.

4.3.3. Checkbox (checkbox)
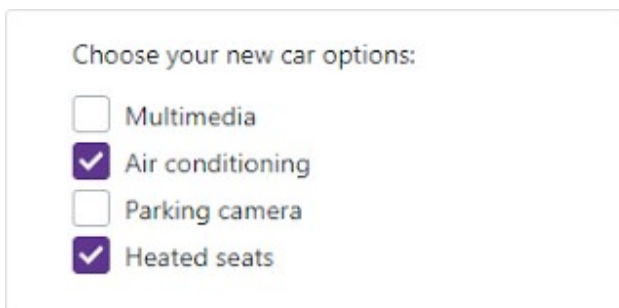
The checkbox component contains elements that are displayed as checkboxes and are checked when activated. They allow you to select one or more values in a form.

4.3.4. Message box (dialog box)

Displays a message window, also called a dialog box that displays a message to the user. This is a modal window, blocking other actions in the application until the user closes it. AMessageBoxmay contain text, buttons and symbols that provide information and instructions to the user.

4.3.5. Hint text
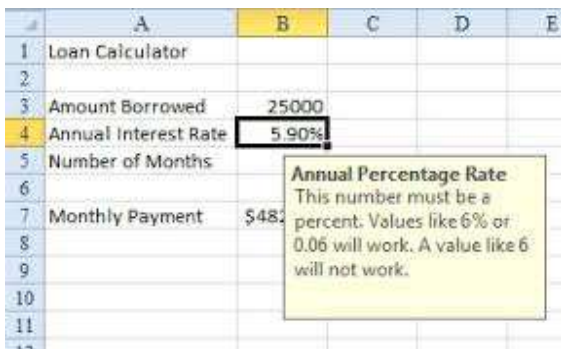
Hint text is the recommended method for displaying contextual help for forms, controls, and other screen objects. Such context-sensitive help about screen objects is also known as "What is this?" help.

4.3.6. Label
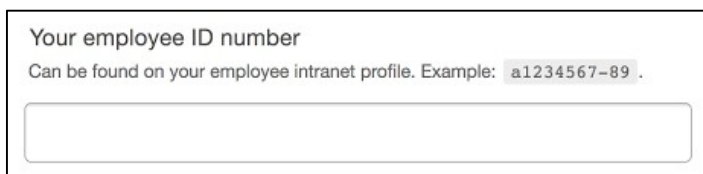
In computing, a label is a graphical interface component (widget) that displays text. The label is generally a static component, that is to say without interactivity. The label can provide assistance to the user by displaying short text which guides them in their work.