SCSD2613
System Analysis and Design

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

PART V
Output, Input and User Interface Design

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update: August 2019 (sharinhh)

OBJECTIVES

- Understand the objectives for the effective input/output design and user interface design.
- Design functional input forms for different users of business systems.
- Relate output content to output methods inside and outside the organization.
- Design useful input forms and display output for people interacting on the web (variety of user interfaces).

MAJOR TOPICS

OUTPUT DESIGN	• Output classification • Reports • Output screen design
INPUT DESIGN	• Input methods • Design guidelines
USER INTERFACE DESIGN	• Guidelines for user interface design

INTRODUCTION

- Output and user interface design is the first task in the systems design phase of the SDLC

OUTPUT DESIGN focuses on **user needs for screen and printed forms of output**, while **USER INTERFACE DESIGN** stresses **user interaction with the computer**, including **INPUT DESIGN** and procedures

MAJOR TOPICS

OUTPUT DESIGN

- Output classification
- Reports
- Output screen design

OUTPUT DESIGN

- Before designing output, ask yourself several questions:

What is the purpose of the output?

Who wants the information, why it is it needed, and how will it be used?

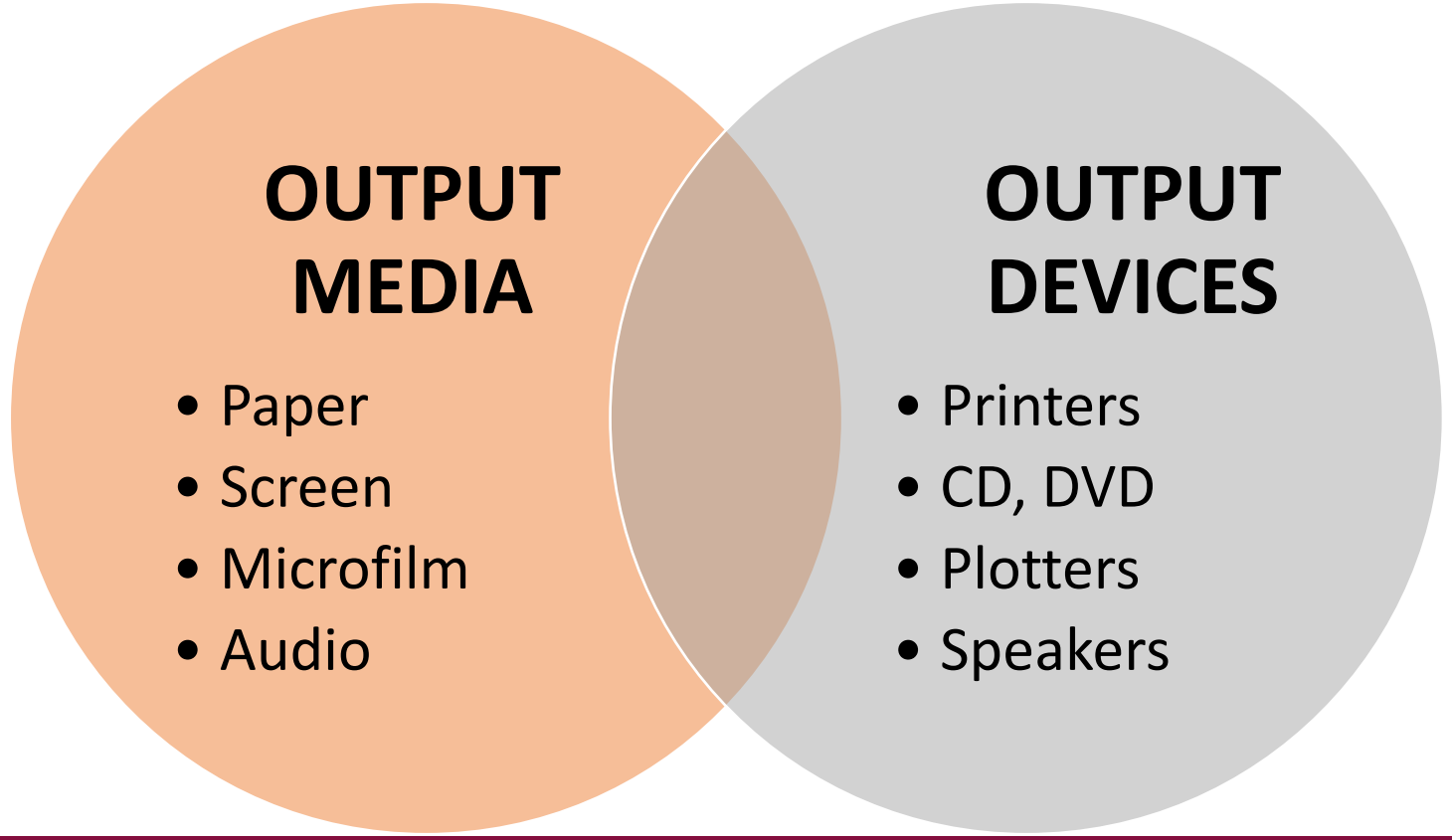
What specific information will be included?

Will the output be printed, viewed on-screen, or both? What type of device will the output go to?

Note:
Your answers to these questions will affect your output design strategies

- The quality of system input will determines the quality of system output.
- Output can be in many forms such as printout, reports, display audio, CD's, e-mail or webpages.

OUTPUT: MEDIA AND DEVICES



Output technologies differ in their:

- Speed
- Cost
- Portability
- Flexibility
- Storage and retrieval possibilities

OUTPUT CLASSIFICATIONS

INTERNAL OUTPUT

- used within the corporation
- example: all types of report for manager.

NICHOLVILLE TELEPHONE COMPANY, INC.
P.O. Box 122, Nicholville, New York 12965-0122
(315) 328-4411

BILLING DATE	TELEPHONE NUMBER
MAR 1, 2002	315/328-5555
DELINQUENT AFTER	ACCOUNT NUMBER
MAR 20, 2002	1000 / 7

PAGE 1 OF 6

AMOUNT DUE $54.93
AMOUNT PAID $

JOE SMITH
104 WINDY HILL RD.
NICHOLVILLE NY 12965-0104

PLEASE SEND PAYMENT TO
NICHOLVILLE TELEPHONE COMPANY, INC.
P.O. Box 122
Nicholville, New York 12965-0122

Please Detach at Perforation and Return This Portion With Your Payment

TELEPHONE NUMBER	ACCOUNT NUMBER
315/328-5555	1000

SMITH JOE K

PAGE 1 OF 6

PAYMENTS RECEIVED AFTER FEB 28 ARE NOT INCLUDED

BILLING DATE	DELINQUENT AFTER
MAR 1, 2002	MAR 20, 2002

PREVIOUS BALANCE	PREVIOUS PAYMENTS	BALANCE FORWARD	CURRENT CHARGES	AMOUNT DUE
$53.04	$53.04	$.00	$54.93	$54.93

CUSTOMER DETAIL

NICHOLVILLE TELEPHONE COMPANY CURRENT CHARGES

MONTHLY SERVICE FROM MAR 1 THRU MAR 31	31.30
OTHER CHARGES/CREDITS	1.26
AT&T 00288	20.56
VERIZON 00698	1.81
TOTAL CURRENT CHARGES	54.93
TOTAL AMOUNT DUE - PLEASE PAY THIS AMOUNT	$54.93

EXTERNAL OUTPUT

- used outside the organization
- example: pay-checks, annual reports, utility bills, advertisements
- should differs from internal output in its design and appearance.

November 7, 2002 Course Summary Report Pg 1 0f 28
Fall Semester 2002

CourseID	Course Name	Units	Total Sects	Total Enroll	Avg. Enroll /Sect
Act102	Accounting Prin.	3	4	300	75
....	.....	...	...	...	...
Bio101	Into to Biology	3	6	600	100
...	...	...	...	...	...
Chm109	Organic Chem	3	2	90	45
...	...	...	...	...	....
Mkt114	Prin. Of Marketing	3	2	110	55

TURNAROUND DOCUMENT

- a document that is sent out and then returned;
- some external output is designed to serve double duty as a turnaround document
- example: utility bills, warranty cards, etc

MARS
BIO-MED PROCESSES INC

TECH.:	
CONTACT #:	
BRANCH:	

WARRANTY REGISTRATION CARD

Please complete and return all the information below to info@marsbiomed.com or fax to 905-723-9610 to activate your *Liberty*BOSS' Warranty.

INSTALL DATE:			SERIAL #:	OLD:	New:
COMPANY:			CONTACT:		
ADDRESS:			TELEPHONE #:		
CITY/STATE.:			FAX #:		
ZIP CODE:			EMAIL ADDRESS:		

PRACTICE: (Check one)	PART TIME	AVERAGE	BUSY	TOTAL # OF CHAIRS:	# OF OPS:	# OF HYGIENE ONLY:
# OF DOCTORS		FULL TIME	PART TIME	# OF HYGIENISTS:	FULL TIME	PART TIME

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HOURS OF OPERATION (Times):	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	
CLOSED AT LUNCH:	YES	NO	TIME:			WEBSITE:		

www.marsbiomed.com 1-866-594-3648
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PRINTED REPORT DESIGN

- Report Design Conventions : WYSIWYG
- Paper Quality, Type and Size
- Design Consideration
  - Functional attributes (heading, page number, date, column heading, grouping data, control breaks)
- Reports fall into 3 categories:
  - Detail
  - Exception
  - Summary

DETAIL REPORT

- Can be quite lengthy, better alternative is to produce an exception report

EMPLOYEE HOURS
WEEK ENDING DATE: 6/24/05

PAGE 1

STORE NUMBER	POSITION	EMPLOYEE NAME	REGULAR HOURS	OVERTIME HOURS	TOTAL HOURS
8		Andres, Marguerite	20.0		20.0
		Bogema, Michelle	12.5		12.5
	Asst Mgr	Davenport, Kim	40.0	5.0	45.0
		Lemka, Susan	32.7		32.7
		Ramirez, Rudy	40.0		48.5
	Manager	Ullery, Ruth	20.0	8.5	20.0
			165.2		178.7
		STORE 8 TOTALS:		13.5	
		De Martini, Jennifer	40.0		48.4
17		Haff, Lisa	40.0	8.4	40.0
	Manager	Rittenbery, Sandra	40.0		51.0
		Wyer, Elizabeth	20.0	11.0	20.0
		Zeigler, Cecille	32.0	—	32.0
			172.0		191.4
		STORE 17 TOTALS:		19.4	
			337.2		370.1
		GRAND TOTALS:		32.9	

EXCEPTION REPORT

- Useful when the user wants information only on records that might require action.

OVERTIME REPORT
WEEK ENDING DATE: 6/24/05

PAGE 1

STORE NUMBER	POSITION	EMPLOYEE NAME	OVERTIME HOURS
8	Asst Mgr	Davenport, Kim	5.0
	Manager	Ramirez, Rudy	8.5
		STORE 8 TOTALS:	13.5
11	Manager	Gadzinski, Barbara	10.0
	Clerk	Stites, Carol	12.0
	Asst Mgr	Thompson, Mary Kay	1.5
		STORE 11 TOTALS:	23.5
17	Clerk	De Martini, Jennifer	8.4
	Clerk	Rittenbery, Sandra	11.0
		STORE 17 TOTALS:	19.4
		GRAND TOTAL:	56.4

SUMMARY REPORT

- Reports used by individuals at higher levels in the organization include less detail than reports used by lower-level employees

EMPLOYEE HOURS SUMMARY PAGE 1
WEEK ENDING DATE: 6/24/05

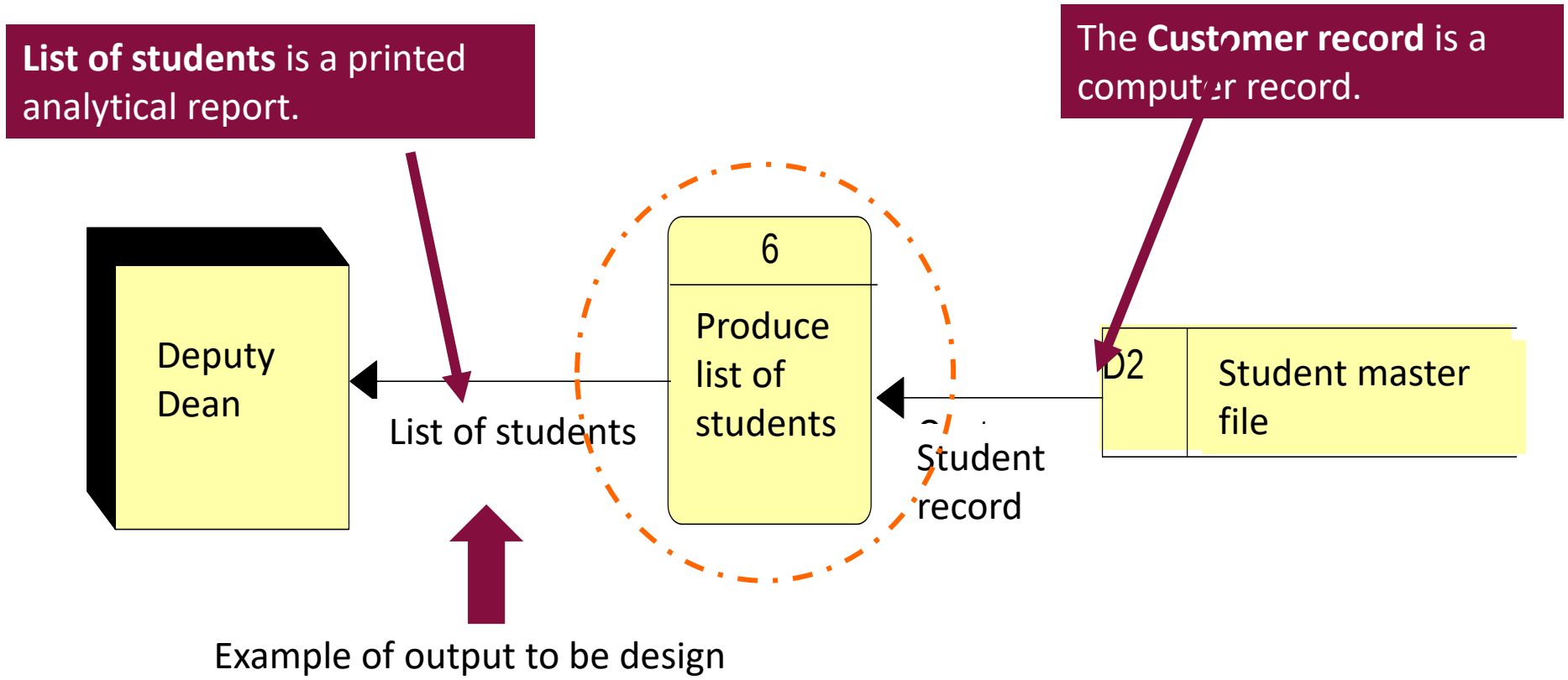
STORE NUMBER	REGULAR HOURS	OVERTIME HOURS	TOTAL HOURS
8	181.2	13.5	194.7
11	184.8	23.5	208.3
17	172.0	19.4	191.4
TOTALS:	538.0	56.4	594.4

OUTPUT SCREEN DESIGN

1. Keep the screen simple.
2. Keep the screen presentation consistent.
3. Facilitate user movement among screens.
4. Create an attractive screen.

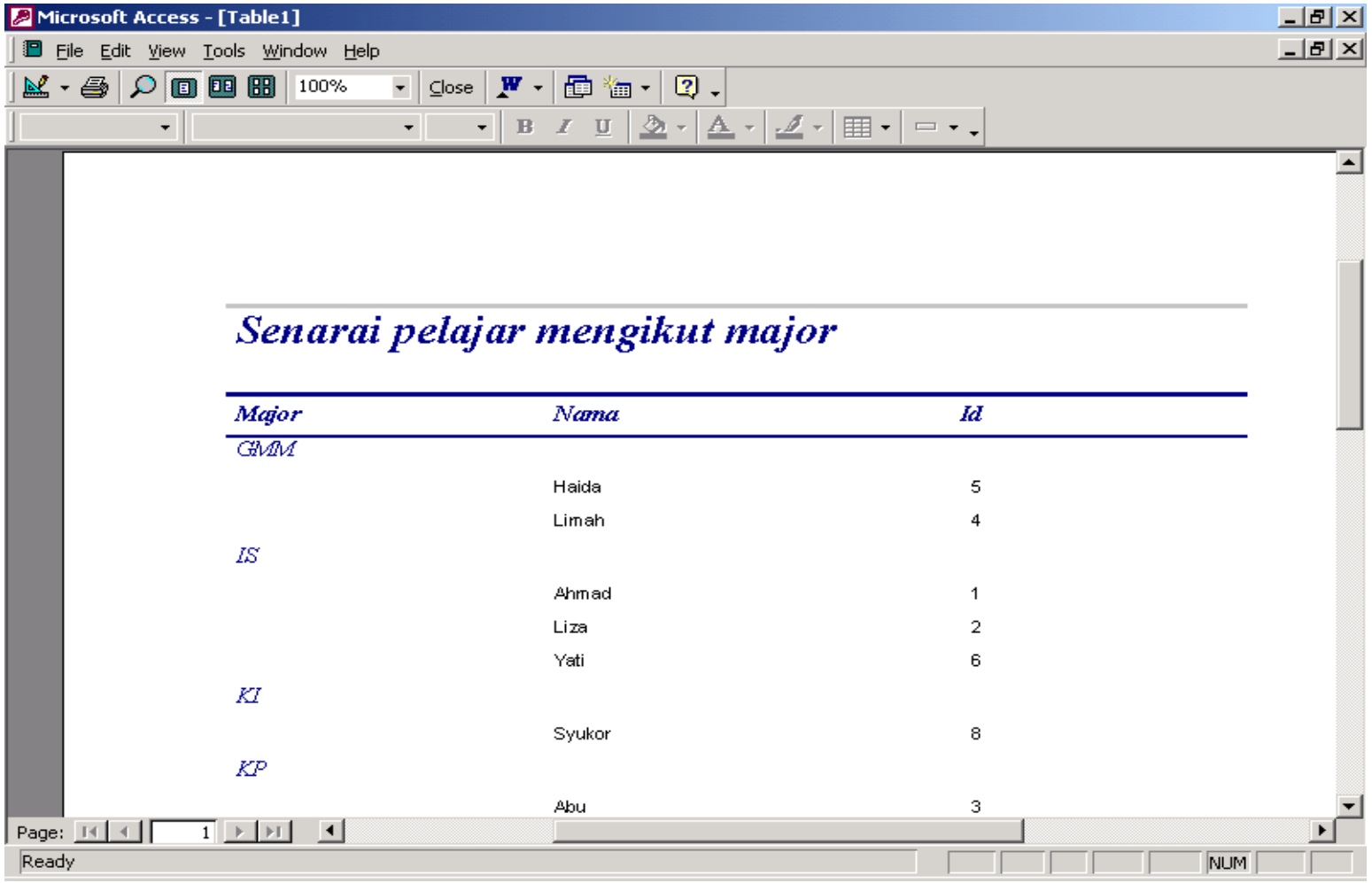
FROM DFD TO OUTPUT DESIGN

Process 6 produce letters to customers:



FROM DFD TO OUTPUT DESIGN

Example of report from Process 6



MAJOR TOPICS

OUTPUT DESIGN

- Input methods
- Design guidelines

INPUT DESIGN

- The quality of system input determines the quality of system output.

- Well-designed input forms, displays, and interactive Web fill-in forms should meet the objectives of :
  - effectiveness, accuracy, ease of use, consistency, simplicity, and attractiveness.

INPUT METHODS

ADVANTAGES

1.Batch

- offline, by trained personnel, processing- quickly, non-peak times.

2.On-line

- by its owner, as close to their origination as possible, immediate feedback, immediately update.

DISADVANTAGES

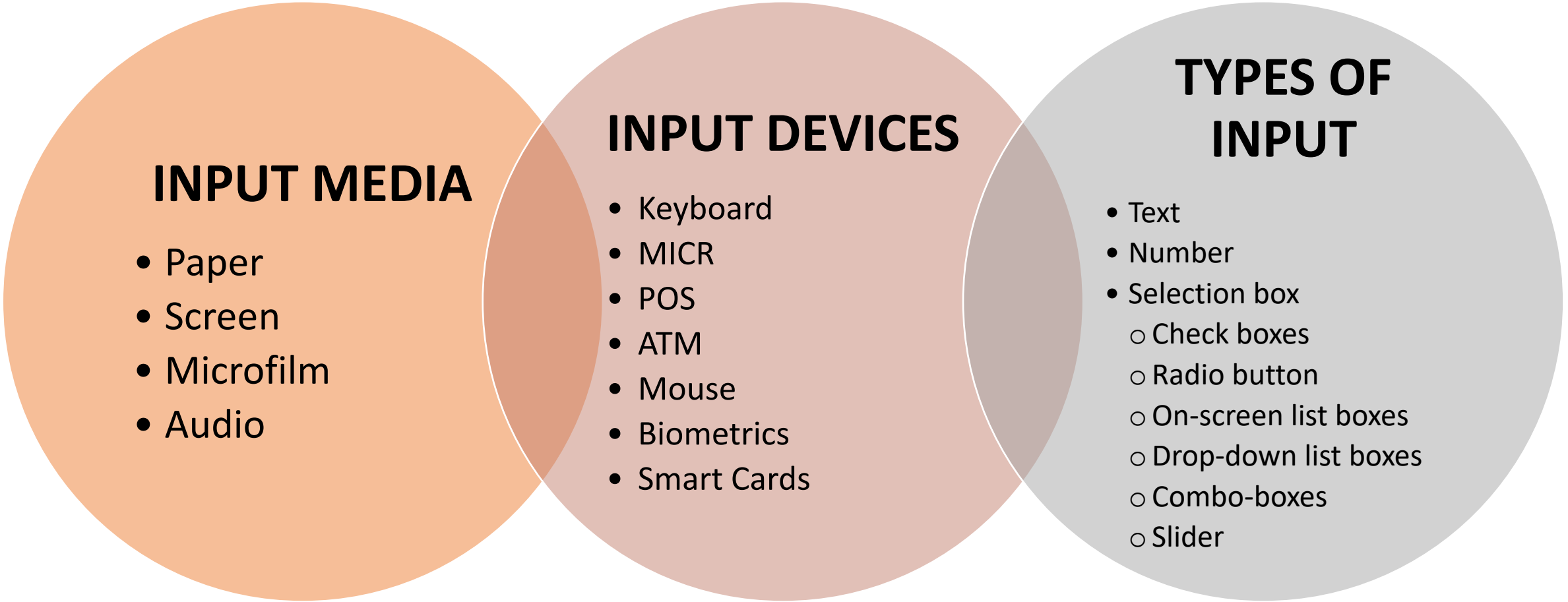
1.Batch

- centralized activity, by specially trained personnel, processing- is delayed, delayed input error detected, on-call SA or programmer needed.

2.On-line

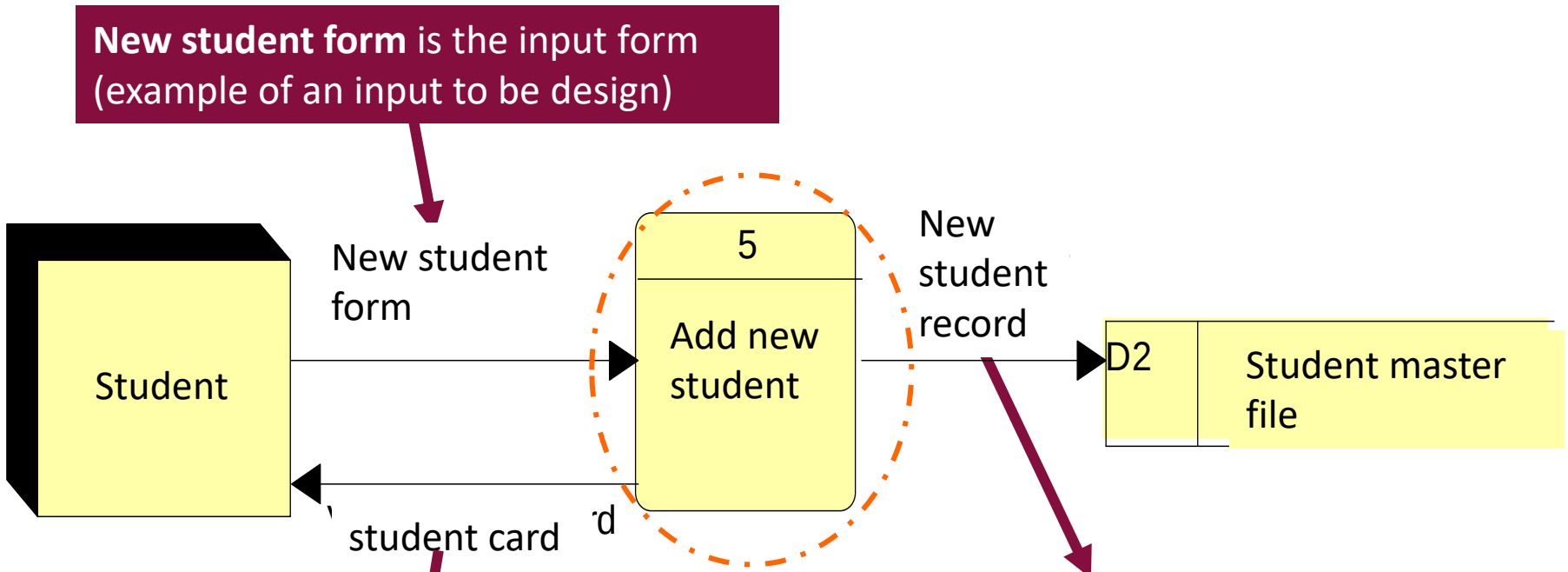
- costly, user not well trained, data entry procedure may be lacking, additional control by software, computer loading, slower data

INPUT: MEDIA AND DEVICES



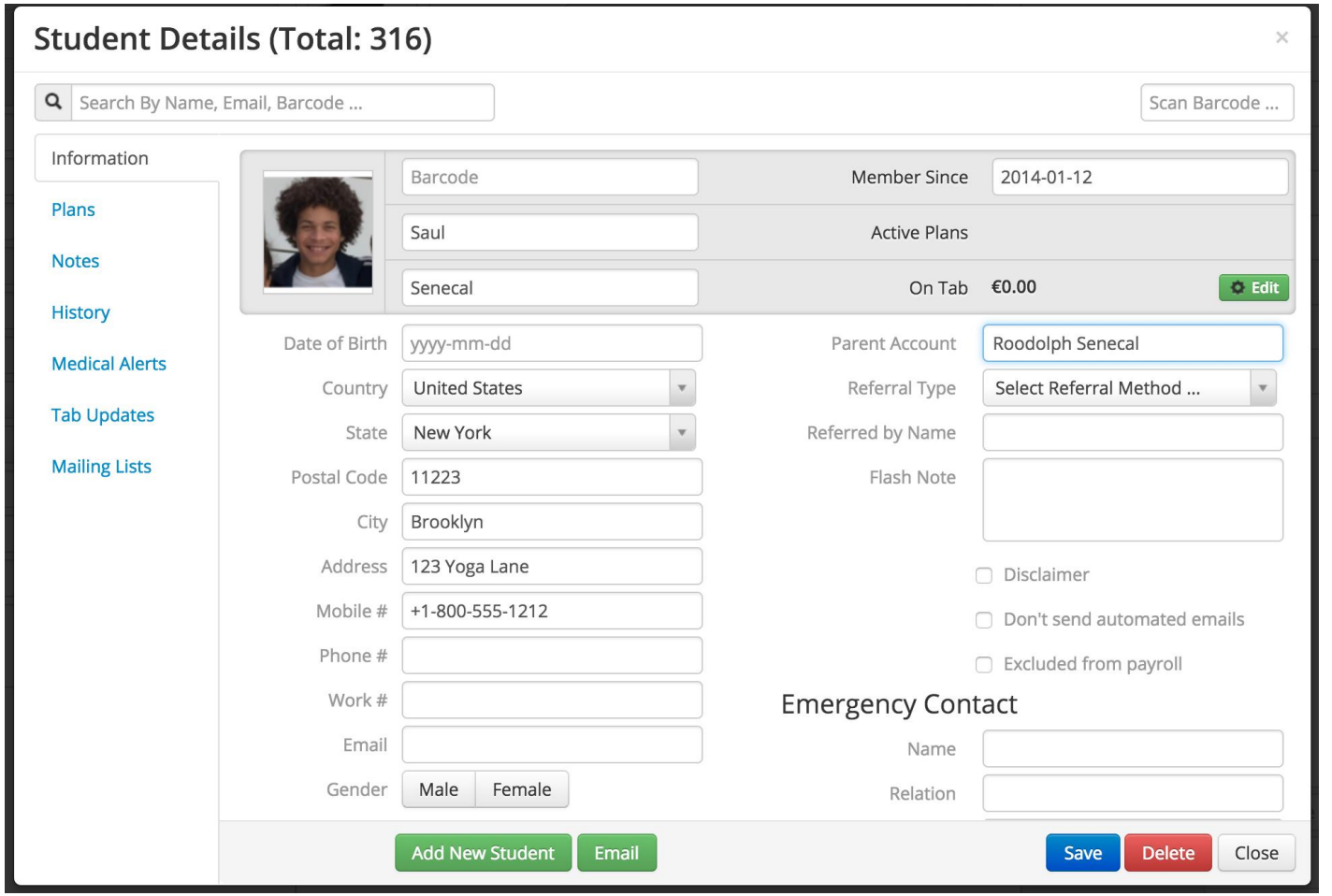
FROM DFD TO INPUT DESIGN

Process 5 must contain a user interface, an input screen in this example.



FROM DFD TO INPUT DESIGN

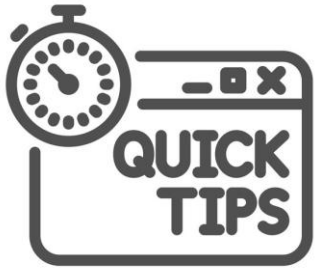
Example of user interface (input screen) for Process 5



INPUT FORM DESIGN GUIDELINES

- What system analyst should do to have a good form design?

- To design a good form,
  - Make forms easy to fill out
  - Ensure that forms meet the purpose for which they are designed
  - Design forms to assure accurate completion
  - ıs attractive



Check out cool input design from this website : Medium.com

INPUT FORM DESIGN GUIDELINES

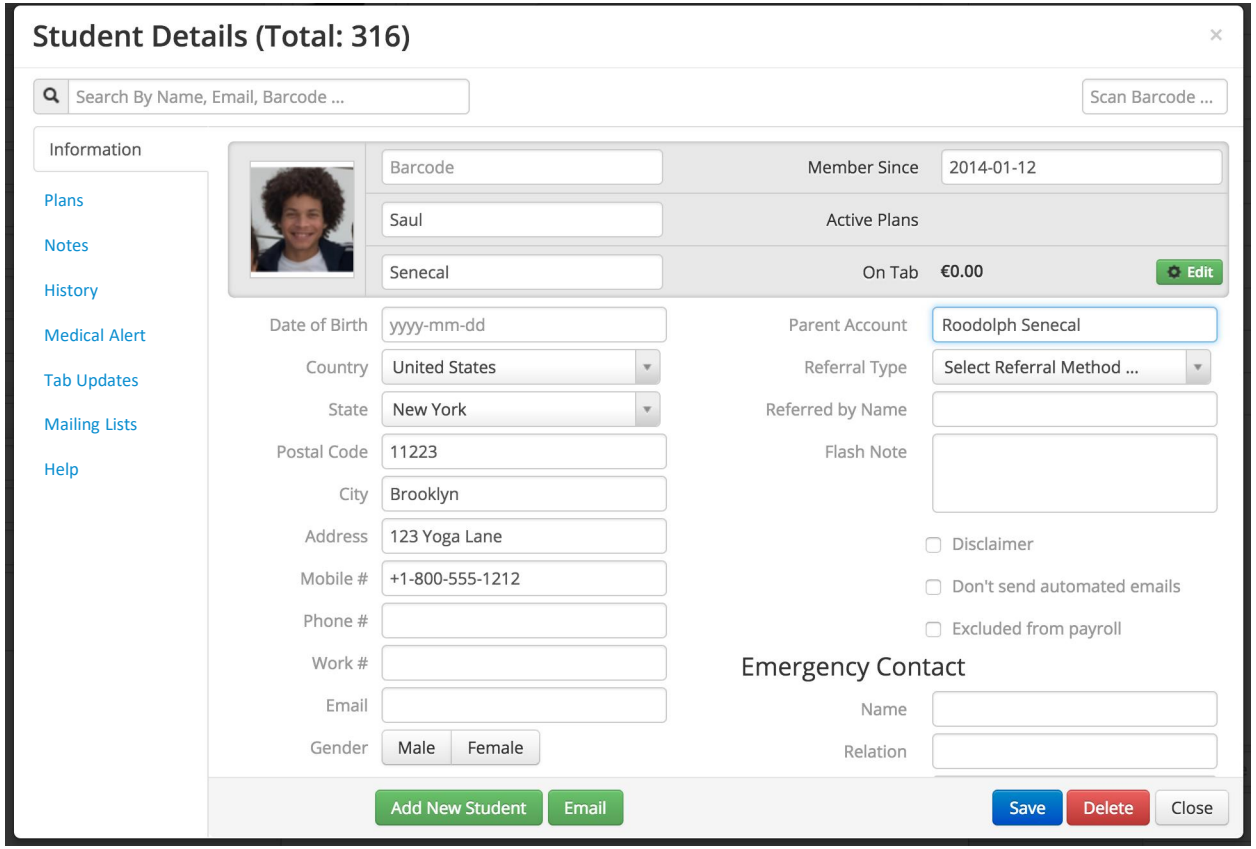
- To make forms easy to fill out, the following techniques are used:

1. Design forms with proper flow, from left to right and top to bottom.

2. Group information logically: heading, identification and access, instructions, body, signature and verification, totals, and comments.

3. Provide people with clear captions.

   Captions tell the person completing the form what to put on a blank line, space, or box.



INPUT FORM DESIGN GUIDELINES

- How to reduce error rate?
  - To reduce error rates associated with data collection, the forms should be designed to assure accurate completion.
  - In other words, design forms to make people do the right thing with the form.
  - Reduce input details/volume to be entered

- How to encourage people to complete form?
  - Systems analysts should keep forms attractive.
  - To be more attractive, forms should look uncluttered, and elicit information in the expected order.
  - Aesthetic forms or usage of different fonts within the same form can help make it more attractive.

GUIDELINES TO DESIGN A GOOD DISPLAY SCREEN

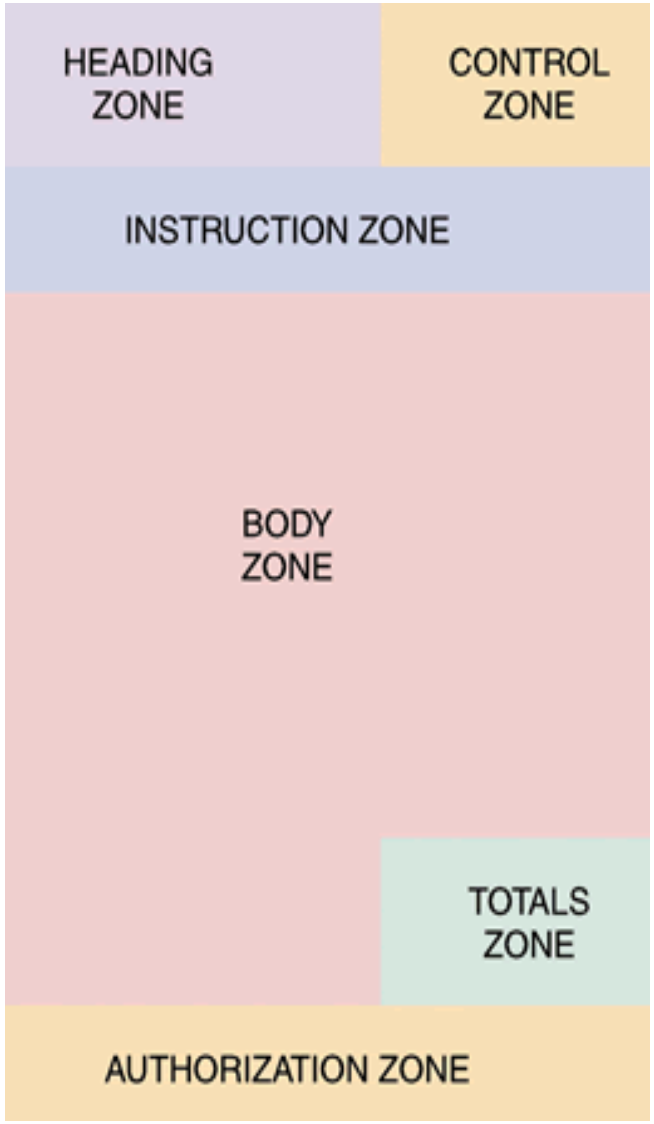
- To design a good display screen, systems analysts need to keep the following guidelines in mind:

  - keep the display simple.
  - keep the display presentation consistent.
  - facilitate user movement among display screens.
  - create an attractive display screens and pages.

DIVIDE THE SCREEN

To keep display screens simple:

1. Systems analysts may divide the screen into 3 sections:
   - Heading
   - Body
   - Comments and instructions.
2. Displaying a few necessary basic commands using windows or hyperlinks
3. For the occasional user, only 50% of the screen should contain useful information.



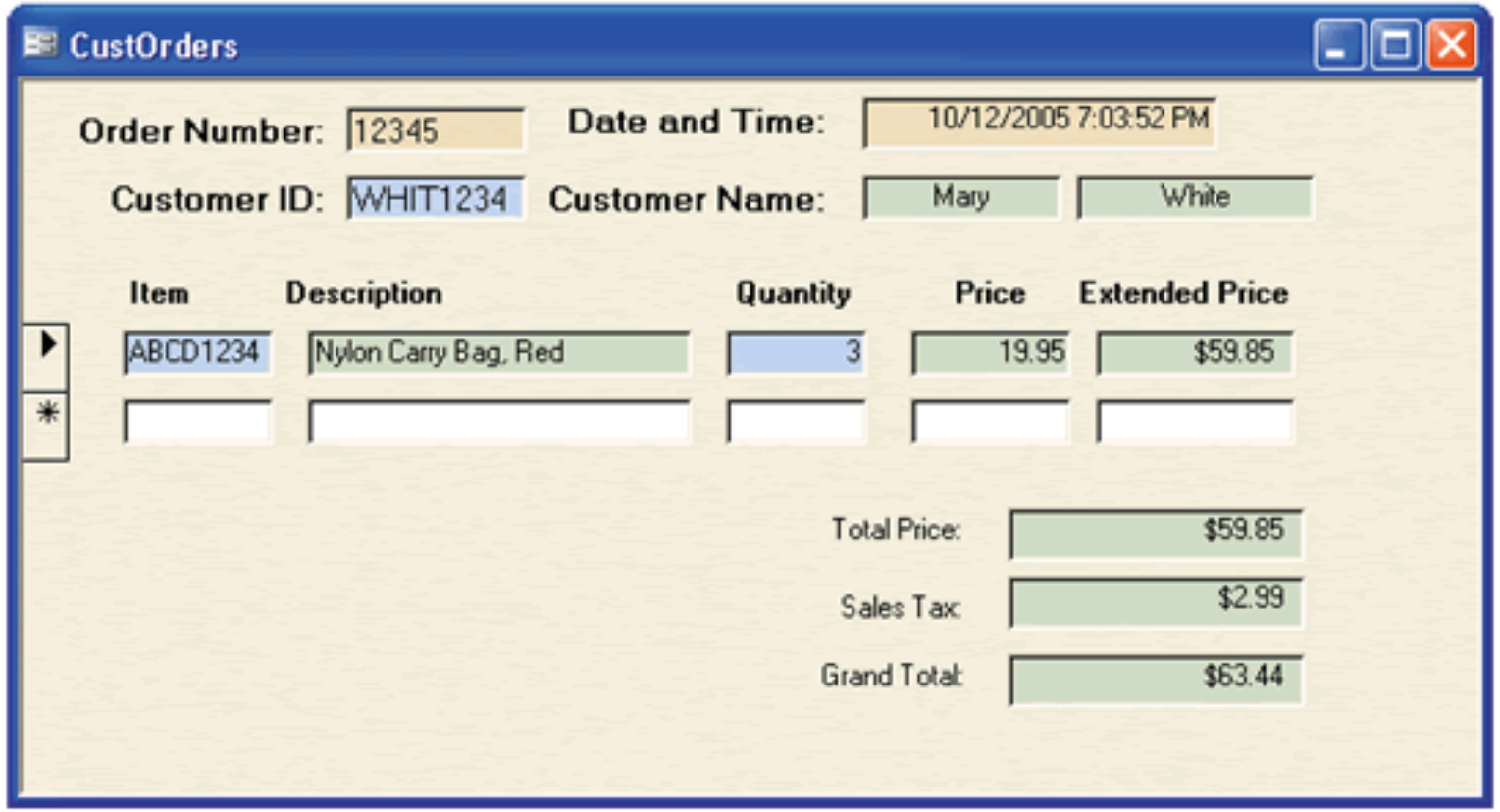
Guideline Zone

SAMPLE INPUT FORM

Generated by the system

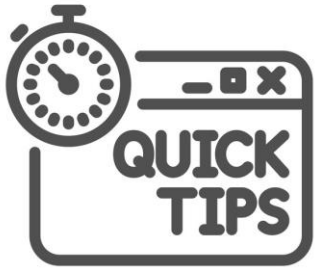
Entered by the user

Retrieved or calculated by the system



HOW TO MAKE SCREENS MORE ATTACTIVE?

- Systems analysts may use
  - different thicknesses of separation lines between subcategories, blinking cursors, pictorial icons, on-screen representations symbolizing computer actions, different combinations of colors, and different type fonts.
- Icons are used in graphical screens to run programs and execute commands.
- Graphical User Interfaces (GUI) are used in conjunction with a mouse for making selections and entering data.



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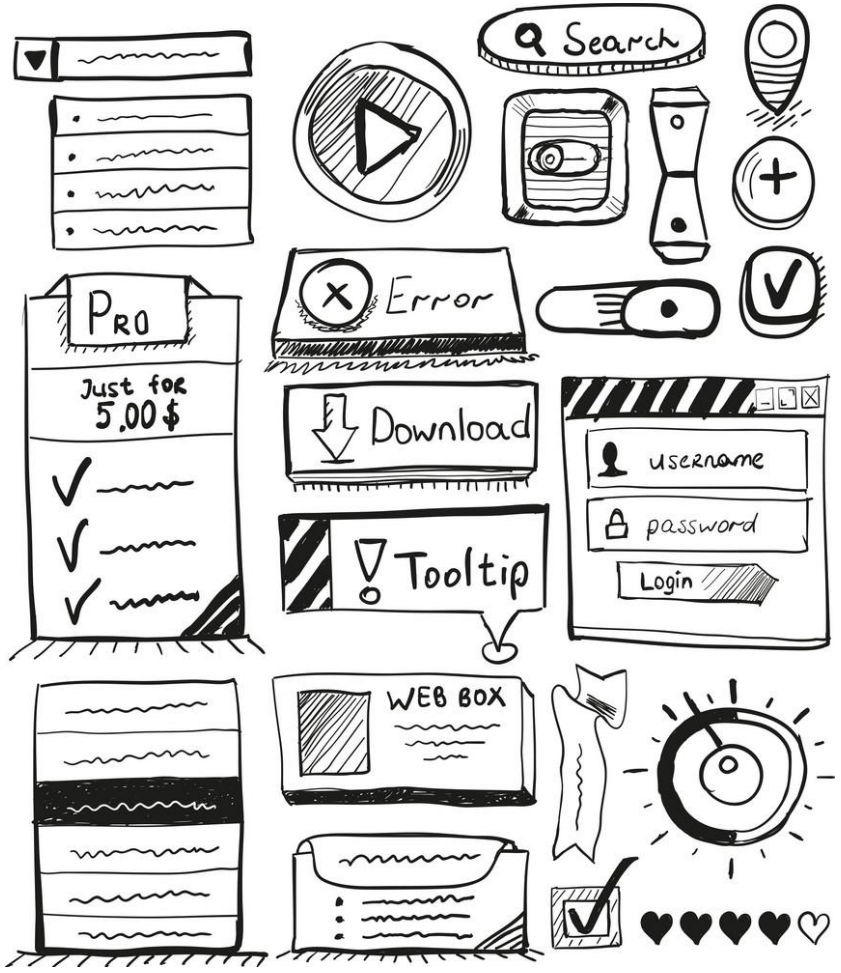
MAJOR TOPICS

USER INTERFACE DESIGN

- Output classification
- Reports
- Output screen design

USER INTERFACE DESIGN

- Output design is an integral part of a larger concept called a **USER INTERFACE (UI)**
- Consists of all the hardware, software, screens, menus, functions, and features that affect two-way communications between the user and the computer



GUIDELINES TO UI DESIGN

1. Focus on basic objectives
2. Build an interface that is easy to learn and use
3. Provide features that promote efficiency
4. Make it easy for users to obtain help or correct errors
5. Minimize input data problems
6. Provide feedback to users
7. Create an attractive layout and design
8. Use familiar terms and images

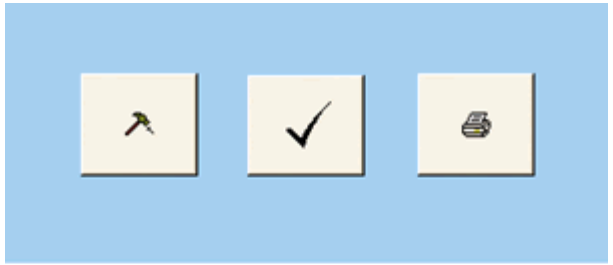
Good user interface design is based on a combination of **ERGONOMICS**, **AESTHETICS**, and **INTERFACE TECHNOLOGY**.

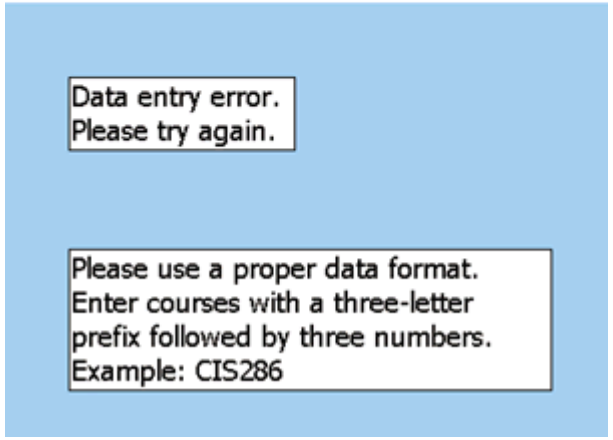
1. FOCUS ON BASIC OBJECTIVES

- Facilitate the system design objectives, rather than calling attention to the interface
- Create a design that is easy to learn and remember
- Design the interface to improve user efficiency and productivity
- Write commands, actions, and system responses that are consistent and predictable

2. Build an interface that is easy to learn and use

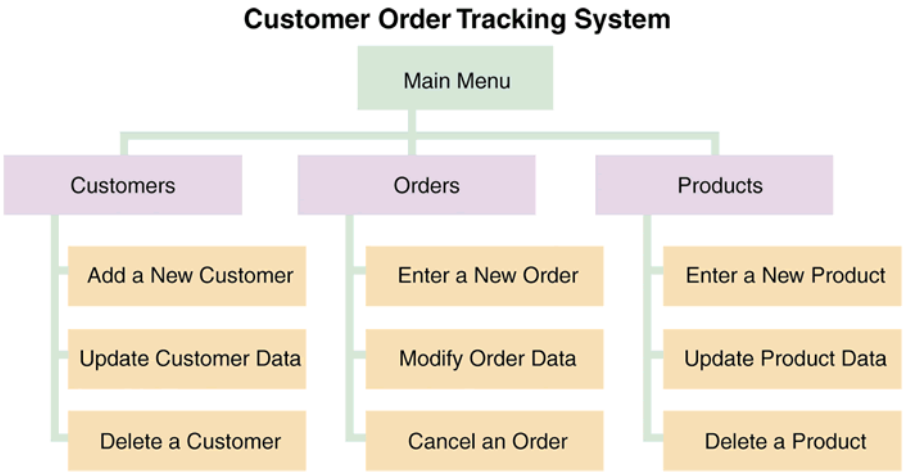
- Label clearly all controls, buttons, and icons
- Select only those images that a user can understand easily
- Show all commands in a list of menu items
- Make it easy to navigate or return to any level in the menu structure





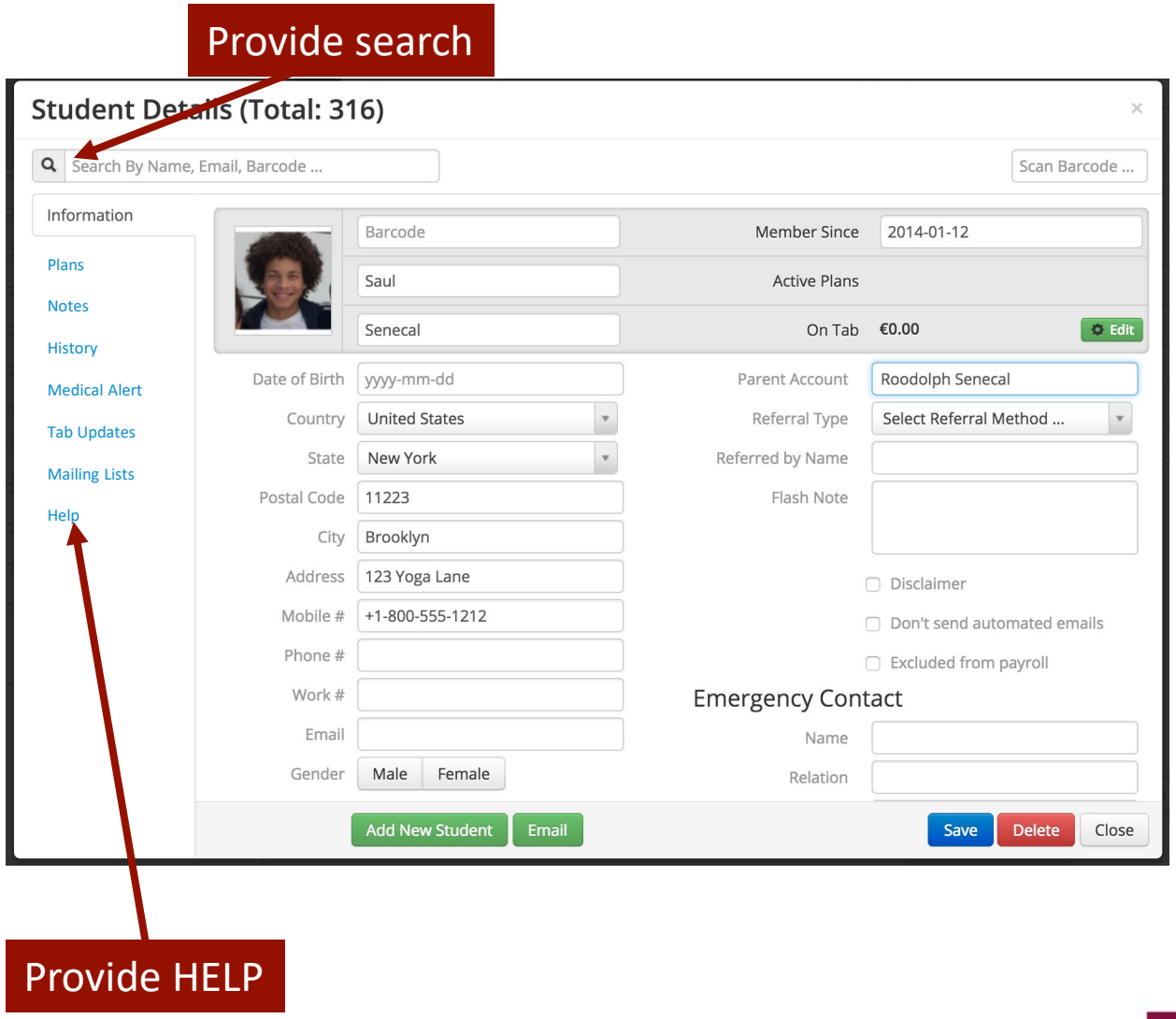
3. PROVIDE FEATURES THAT PROMOTE EFFICIENCY

- Organize tasks, commands, and functions in groups that resemble actual business operations
- Create alphabetical menu lists
- Provide shortcuts so experienced users can avoid multiple menu levels
- Use default values if the majority of values in a field are the same



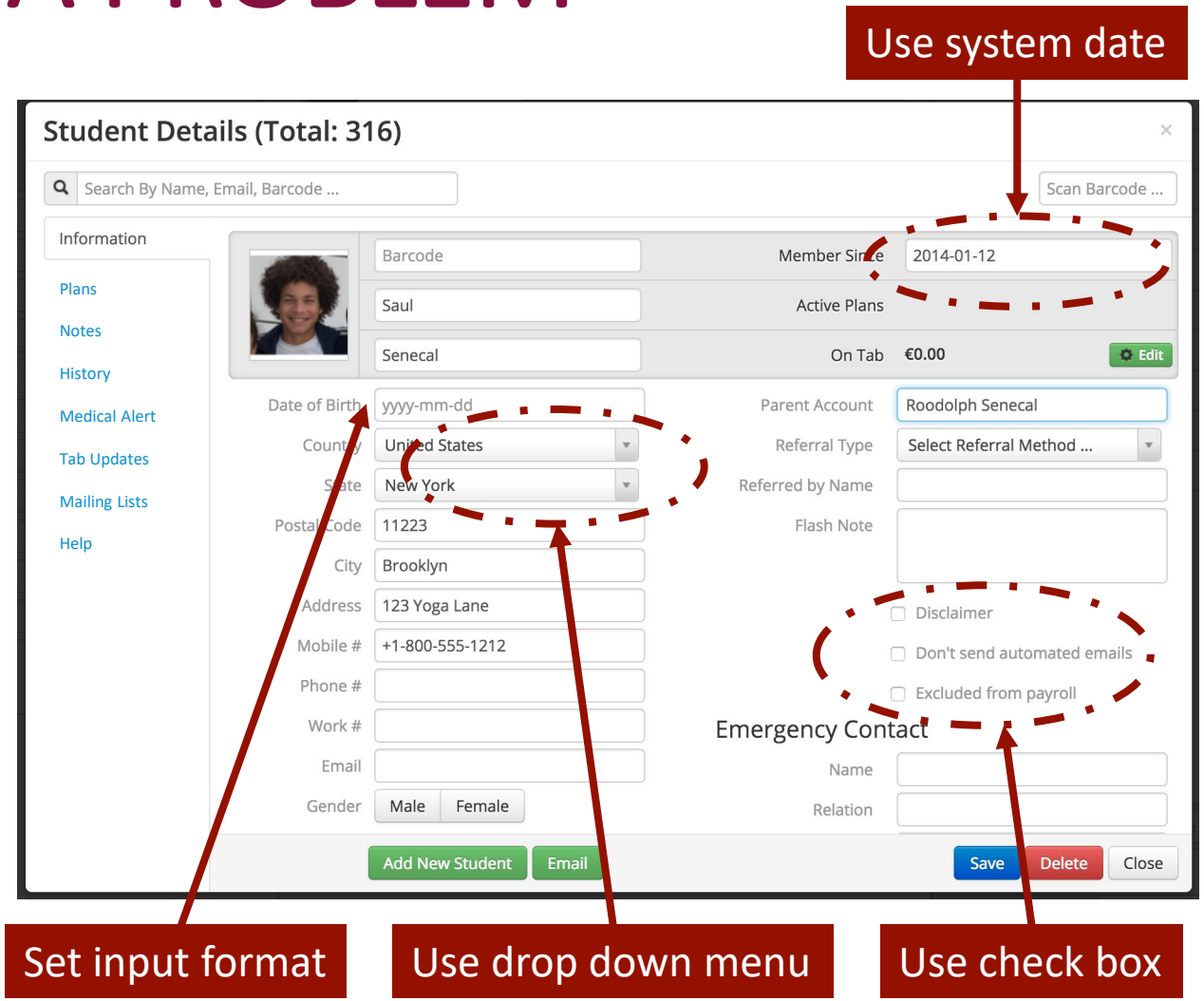
4. MAKE IT EASY FOR USERS

- Ensure that Help is always available
- Provide user-selected Help and context-sensitive Help
- Provide a direct route for users to return to the point from where Help was requested
- Include contact information



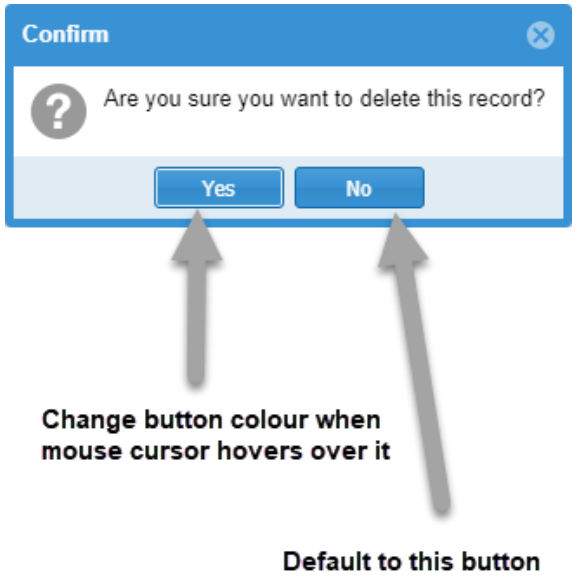
5. MINIMIZE INPUT DATA PROBLEM

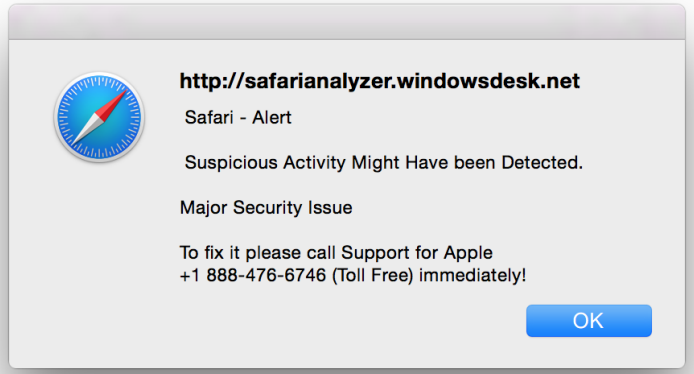
- Provide data validation checks
- Display event-driven messages and reminders
- Establish a list of predefined values that users can click to select
- Build in rules that enforce data integrity
- Use input masks



6. PROVIDE FEEDBACK TO USERS

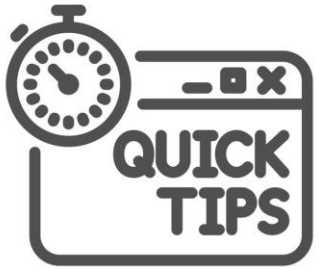
- Display messages at a logical place on the screen
- Alert users to lengthy processing times or delays
- Allow messages to remain on the screen long enough for users to read them
- Let the user know whether the task or operation was successful or not





7. CREATE ATTRACTIVE LAYOUT AND DESIGN

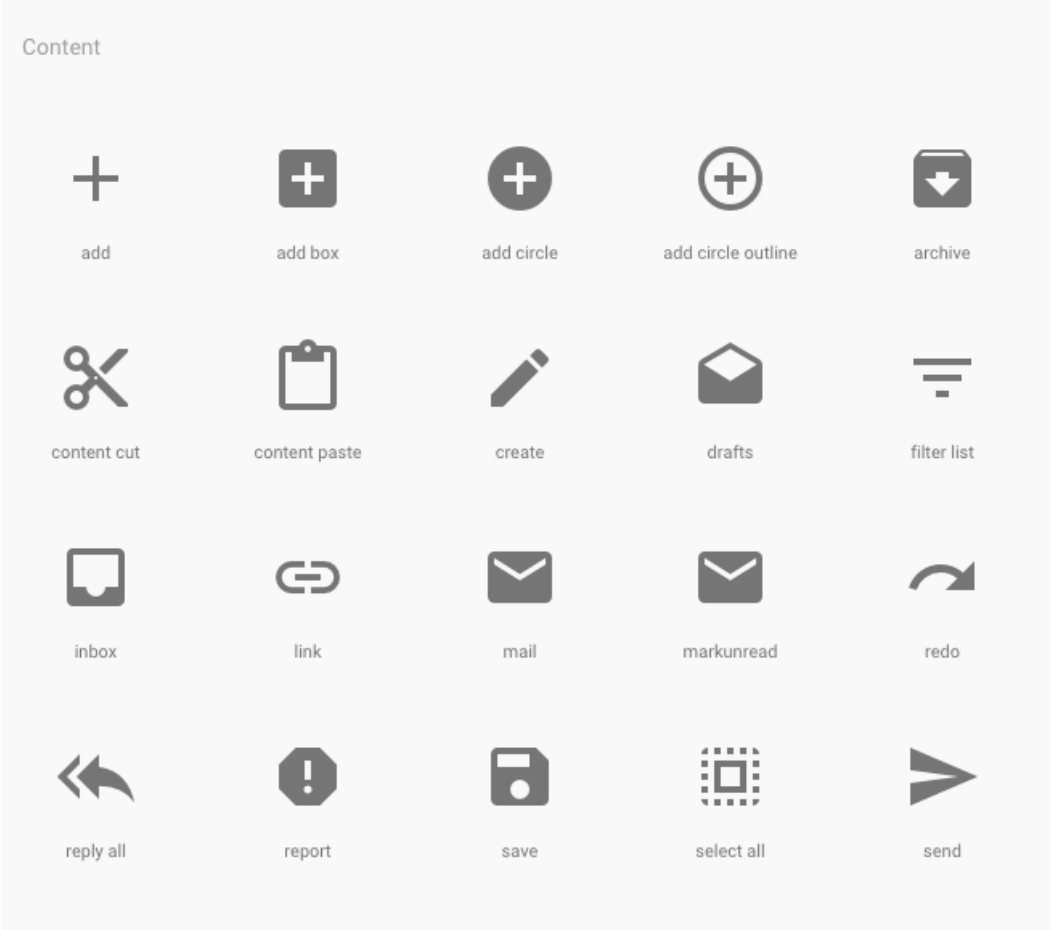
- Use appropriate colors to highlight different areas of the screen
- Use special effects sparingly
- Use hyperlinks that allow users to jump to related topics
- Group related objects and information



See the list of Websites of Really Awesome UI Design

8. USE FAMILIAR TERM AND IMAGES

- Remember that users are accustomed to a pattern of **RED** is **STOP**, **YELLOW** is **CAUTION**, and **GREEN** is **GO**.
- Provide a keystroke alternative for each menu command
- Use familiar commands
- Provide a Windows look and feel in your interface design if users are familiar with Windows-based applications

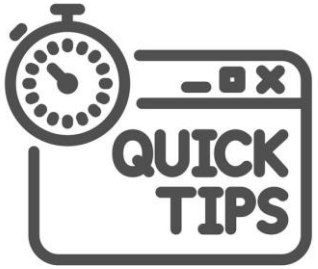


USER INTERFACE CONTROL

Do you know any of these??

Menu bar	Toolbar	Command button	Dialog box
Text box	Toggle button	List box – scroll bar	Drop-down list box
Option button, or radio button	Check box	Calendar control	Switchboard

UI DESIGN TIPS



Check out tips for good UI design: 8 Tips for great UI & Using Light, Color & Contrast

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Thank You

update: August 2019 (sharinhh)

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