

UNIT-III

SCREEN DESIGNING

Topics covered

- Screen and Web Page Meaning and Purpose,
- organizing screen elements,
- ordering of screen data and content,
- screen navigation and flow,
- visually pleasing composition,
- Presenting information simply and meaningfully.

How to Distract the Screen User

- Barnett (1993) has compiled a list of factors that, when poorly designed, hinder the use of paper forms. These factors certainly apply to electronic forms and screens as well, and include:
- Unclear captions and badly worded questions. These cause hesitation, and rereading, in order to determine what is needed or must be provided. They may also be interpreted incorrectly, causing errors.
- Improper type and graphic emphasis. Important elements are hidden. Emphasis is drawn away from what is important to that which is not important.
- Misleading headings. These also create confusion and inhibit one's ability to see existing relationships.
- Information requests perceived to be irrelevant or unnecessary. The value of what one is doing is questioned, as is the value of the system.
- Information requests that require one to backtrack and rethink a previous answer, or look ahead to determine possible context. Inefficiency results, and mistakes increase.
- Cluttered, cramped layout. Poor layout creates a bad initial impact and leads to more errors. It may easily cause system rejection.
- Poor quality of presentation, legibility, appearance, and arrangement. Again, this degrades performance, slowing the user down and causing more errors.

Howlett (1995) based upon her experiences at Microsoft suggests the most common problems in visual interface design are:

- Visual inconsistency in screen detail presentation and with the operating system.
- Lack of restraint in the use of design features and elements.
- Overuse of three-dimensional presentations.
- Overuse of too many bright colours.
- Poorly designed icons.
- Bad typography
- Metaphors that are either overbearing or too cute, or too literal thereby restricting design options.
- These kinds of problems, she concludes, lead to screens that can be chaotic, confusing, disorganized, distracting, or just plain ugly.
- Web screens, as were recently described, also present to the user a variety of distractions.
- Summarized below, these distractions include:
- Numerous visual and auditory interruptions.
- Extensive visual clutter.
- Poor information readability.
- Incomprehensible screen components.
- Confusing and inefficient navigation.
- Inefficient operations and extensive waste of user time.
- Excessive or inefficient page scrolling.

- Information overload.
- Design inconsistency.
- Outdated information.
- Stale design caused by emulation of printed documents and past systems.
- Poor design is not a new phenomenon. It has existed since people began interacting with media used for presenting and collecting information. Some of the distractions have been around a long time; others are fairly new, the byproduct of technological advances.
- Interface distractions cause a person to think about things they shouldn't have to think about, and divert one's attention from performing a task or satisfying a need.
- All distractions must be eliminated in design

What Screen Users Want

What are people looking for in the design of screens? One organization asked a group of screen users and got the following responses:

- An orderly, clean, clutter-free appearance.
- An obvious indication of what is being shown and what should be done with it.
- Expected information located where it *should* be.
- A clear indication of what relates to what, including options, headings, captions, data, and so forth.
- Plain, simple English.
- A simple way of finding out what is in a system and how to get it out.
- A clear indication of when an action can make a permanent change in the data or system.

The desired direction is toward simplicity, clarity, and understandability—quality lacking in many of today's screens.

What Screen Users Do

When interacting with a computer, a person:

Identifies a task to be performed or need to be fulfilled. The task may be very structured, including activities such as: enter this data from this form into the system, answer a specific question regarding the status of an order, or collect the necessary information from a customer to make a reservation. Alternatively, the task may have some structure but also include more free-form activities, including answering questions such as: what is the best local rehabilitation program in which to enroll my client, or what are my customer's exact needs and then which of our products features are best suited for him or her.

Finally, the need may be very general or even vague. Where should I take an exotic vacation near a beautiful beach? Where can I get the best price on a new PC?

Decides how the task will be completed or the need fulfilled.

For a structured or semi-structured task, a set of transaction screens will be available. The proper transaction is identified and the relevant screen series retrieved. To satisfy a general or vague need will require browsing or searching through screens that might possibly have relevance.

Manipulates the computer's controls. To perform the task or satisfy the need, the keyboard, mouse, and other similar devices are used to select choices from lists, choose commands to be performed, key data into text boxes, and so forth.

Gathers the necessary data. Using structured and semi-structured transaction screens information is collected from its source: a form, a coworker, or a customer. This information is identified on the screen, or placed on the screen, through control manipulation. To satisfy a general or vague need may require following Web site links down many paths. Path activities may also require other kinds of control manipulation as well.

5. Forms judgments resulting in decisions relevant to the task or need. Structured transactions will require minimal decision-making. Has all the data been collected and is the data valid? Has the transaction been successfully accepted by the system? If not accepted, why not? Semi-structured transactions, in addition, may require decisions such as: Which set of screens, from all available, should I use to complete this process? How much information is needed to complete the sale of this particular product, make a reservation in this hotel, or complete the enrolment process for a specific program? To satisfy a general or vague need will require decisions like: Where should I look to get my answer? Which link should I follow? Is this all the information I need? How do I order it?

Interface Design Goals

To make an interface easy and pleasant to use, then, the goal in design is to:

- Reduce visual work
- Reduce intellectual work
- Reduce memory work
- Reduce mentor work
- Eliminate burdens or instructions
- The result will always be improved user productivity and increased satisfaction

Screen meaning and purpose

- Each screen element. . .
- Every control
- All text
- Screen organization
- All emphasis
- Each color
- Every graphic
- All screen animation
- All forms of feedback
- Must Have meaning to screen users
- Serve a purpose in performing tasks

All elements of a screen must have meaning to users and serve a purpose in performing tasks or fulfilling needs. If an element does not have meaning, do not include it on the screen because it is noise.

Organizing screen elements.

Visual clarity is achieved when the display elements are organized and presented in meaningful and understandable ways.

A clear and clean organization makes it easier to recognize screen's essential elements and to ignore its secondary information when appropriate.

Clarity is influenced by a multitude of factors: consistency in design, a visually pleasing composition, a logical and sequential ordering, the presentation of the proper amount of information, groupings, and alignment of screen items.

Consistency

Provide real world consistency.

Reflect a person's experiences, work conventions, and cultural conventions Provide internal consistency. Observe the same conventions and rules for all aspects of an interface screen, and all applications or web site screens, including:

- operational and navigational procedures
- visual identity or theme
- Component
- Follow the same conventions
- Deviate only when there is clear benefit to user

Ordering of screen data and content

- Divide information into units that are logical, meaningful and sensible.
- Organize by interrelationships between data or information.
- Provide an ordering of screen units of elements depending on priority.
- Possible ordering schemes include
 - Conventional
 - Sequence of use
 - Frequency of use
 - Function
 - Importance
 - General to specific
- Form groups that cover all possibilities.
- Ensure that information is visible.
- Ensure that only information relative to task is presented on screen.
- Organizational scheme is to minimize number of information variables

An organizational scheme's goal is to keep to a minimum the number of information variables the user must retain in short term memory. A logical, meaningful, and sensible arrangement of screen data and content will lower this memory requirement. In ordering screens or pages, units of information and screen elements should be prioritized according to the user's needs and expectations. People develop expectations on how to accomplish certain tasks and find different types of information.

A meaningful organization permits faster graphical system or Web site learning. In Web site design it is also easier to develop a clear navigation system if the site is meaningfully organized. Clear organization also makes it easier for Web users to find what they need, and to predict where a navigation link will take them.

The nature of the information should suggest ways to divide and organize information. A technique to aid in organizing Web sites is that of Card Sorting described in Step 2 "Understand the Business Function." Common information ordering schemes include the following

Conventional. Through convention and custom, some ordering schemes have evolved for certain elements. Examples are by days of the week, by months of the year, by one's name and address, or along a timeline. These elements should always be ordered in the customary way.

Sequence of use. Sequence of use grouping involves arranging information items in the order in which they are commonly received or transmitted, or in natural groups. An address, for example, is normally given by street, city, state, and zip code. Another example of natural grouping is the league standings of football teams, appearing in order of best to worst records.

Frequency of use. Frequency of use is a design technique based on the principle that information items used most frequently should be grouped at the beginning, the second most frequently used items grouped next, and so forth.

Function or category. Information items are grouped according to their purpose or by some common parameter. All items pertaining to insurance coverage, for example, may be placed in one location. Transportation vehicles may be grouped within the categories of planes, trains, and automobiles. Such grouping also allows convenient group identification using headings for the user. Sub-categories with sub-headings may also be established.

Importance. Importance grouping is based on the information's importance to the user's task or need. Important items are placed first or in the most prominent position. Items may be organized from best to worst or largest to smallest.

General to specific. If some data is more general than others, the general elements should precede the specific elements. This will usually occur when there is a hierarchical relation

Upper -Left Starting Point

Provide an obvious starting point in the screen's upper left corner.

Eyeball fixation studies indicate that in looking at displays of information, usually one's eyes move first to the upper-left centre of the display, and then quickly move through the display in a clockwise direction.

Streveler and Wasserman (1984) found that visual targets located in the upper-left quadrant of a screen were found fastest and those located in the lower-right quadrant took longest to find. Provide an obvious starting point in the upper-left corner of the screen.

This is near the location where visual scanning begins and will permit a left-to-right, top-to-bottom reading of information or text as is common in Western cultures.

Screen navigation and flow,

- Provide an ordering of screen information and elements that:
- Is rhythmic guiding a person's eye through display encourages natural movement sequences. Minimizes pointer and eye movement distances.
- Locate the most important and most frequently used elements or controls at top left. Maintain top to bottom, left to right flow.

Assist in navigation through a screen by

- Aligning elements
- Grouping elements
- Use of line borders

Through focus and emphasis, sequentially, direct attention to items that are

1. Critical
2. Important
3. Secondary
4. Peripheral

Tab through window in logical order of displayed information. locate command button at the end of the tabbing order sequence,

- when groups of related information must be broken and displayed on separate screens, provide breaks at logical or natural points in the information flow.
- In establishing eye movement through a screen, also consider that the eye trends to move sequentially, for example – From dark areas to light areas From big objects to little objects from unusual shapes to common shapes.
- From highly saturated colors to unsaturated colors. These techniques can be initially used to focus a person's attention to one area of the screen and then direct it elsewhere.
- Maintain top to bottom, left to right through the screen. This top to bottom orientation is recommended for information entry for the following reasons – Eye movements between items will be shorter. Control movements between items will be shorter.
- Groupings are more obvious perceptually. When one's eyes moves away from the screen and then back, it returns to about same place it left, even if it is seeking next item in sequence.
- Most product style guides recommend a left to right orientation. Our earliest display screens reflected this left to right entry orientation.
- Top to bottom orientation is also recommended for presenting displays of read only information that must be scanned.

Describe the role of Screen Navigation in Screen design. Explain

Screen navigation should be obvious and easy to accomplish. Navigation can be made obvious by grouping and aligning screen controls, and judiciously using line borders to guide the eye. Sequentially, direct a person's attention to elements in terms of their importance. Using the various display techniques, focus attention on the most important parts of a screen. Always tab through a screen in the logical order of the information displayed, and locate command buttons at the end of the tab order sequence. Guidelines for accomplishing all of these general objectives will be found in subsequent pages. The direction of movement between screen items should be obvious, consistent, and rhythmic. The eye, or pointer, should not be forced or caused to wander long distances about the display seeking the next item. The eye can be guided through the screen with lines formed through use of white space and display elements. More complex movements may require the aid of display contrasts.

- Is rhythmic, guiding a person's eye through the display.
- Encourages natural movement sequences.
- Minimizes pointer and eye movement distances.
- Locate the most important and most frequently used elements or controls at the top left.
- Maintain a top-to-bottom, left-to-right flow.
- Assist in navigation through a screen by:
 - Aligning elements.
 - Grouping elements.
 - Using of line borders.

- Through focus and emphasis, sequentially, direct attention to items that are:
 1. Critical.
 2. Important.
 3. Secondary.
 4. Peripheral.
- Tab through window in logical order of displayed information.
- Locate command buttons at end of the tabbing order sequence.
- When groups of related information must be broken and displayed on separate screens, provide breaks at logical or natural points in the information flow.

Visually pleasing composition

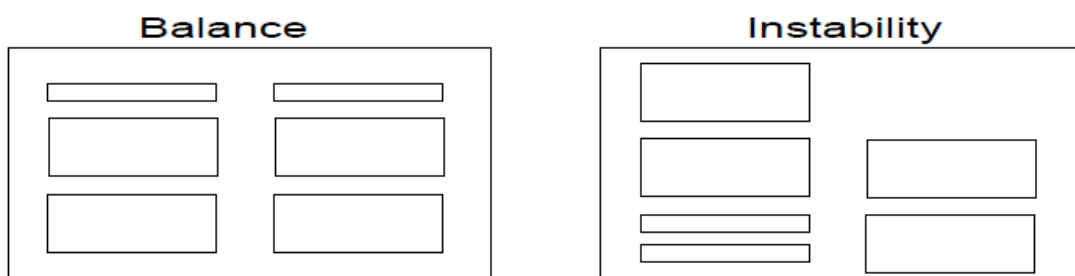
Provide visually pleasing composition with the following qualities –

- Balance
- Symmetry
- Regularity
- Predictability
- Sequentiality
- Economy
- Unity
- proportion
- Simplicity
- Grouping

BALANCE:

Create Screen Balance by providing an equal weight of screen elements, left to right & top to bottom.

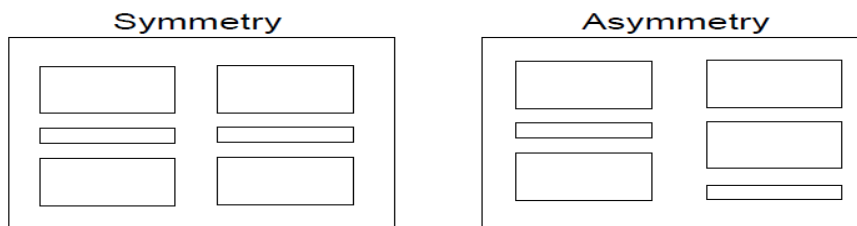
- Balance is stabilization or equilibrium, a midway centre of suspension. The opposite of balance is instability; the design elements seemingly ready to topple over.



SYMMETRY:

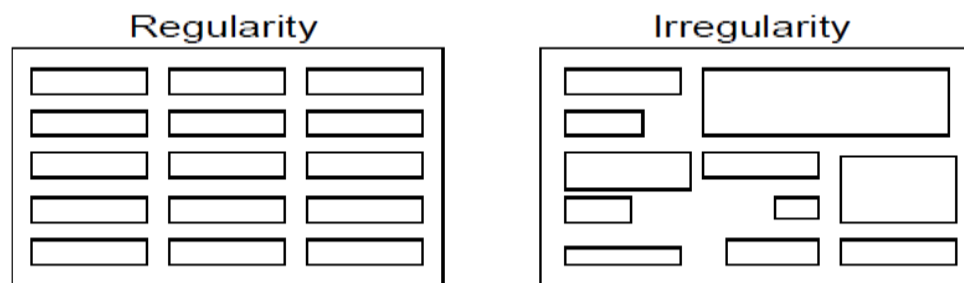
- Create symmetry by replicating elements left & right of the screen centre line. It is axial duplication. A unit on one side of the centre line is exactly replicated on the other side. This exact replication creates formal balance, but the difference is that balance can be achieved without symmetry.

- Symmetry's opposite is asymmetry. Our eye tends to perceive something as more compressed or compact when it is symmetric. Asymmetric arrays are perceived as larger.



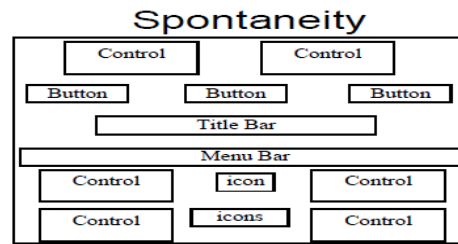
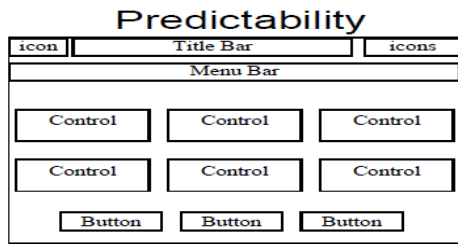
REGULARITY:

- Create regularity by establishing standard & consistently spaced horizontal and vertical alignment positions. Also, use similar element sizes, shapes, colours & spacing.
- It is uniformity of elements based on some principle or plan. Regularity in screen design is achieved by establishing standard & consistently spaced column & row starting points for screen elements.
- The opposite of regularity, irregularity, exists when no such plan or principle is apparent. A critical element on a screen will stand out better, however, if it is not regularized.



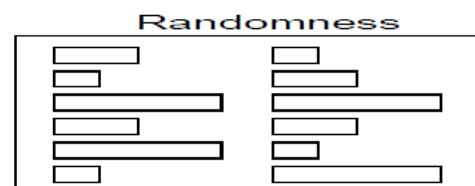
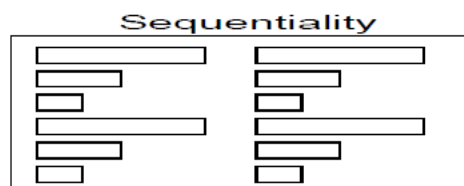
PREDICTABILITY:

- Create predictability by being consistent and following conventional orders or arrangements.
- It suggests a highly conventional order or plan. Viewing part of a screen enables one to predict how the rest of the screen will look.
- The opposite of predictability – spontaneity suggests no plan and thus an inability to predict the structure of the remainder of a screen or the structure of other screens. In screen design predictability is also enhanced through design consistency.



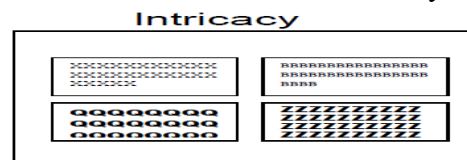
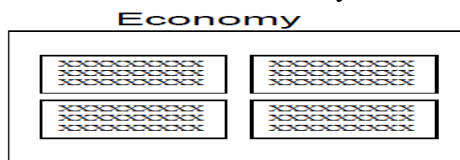
SEQUENTIALITY:

- Provide sequentiality by arranging elements to guide the eye through the screen in an obvious, logical, rhythmic & efficient manner.
- The eyes tends to be attracted to:
 - A brighter element before one less bright.
 - Isolated elements before elements in a group.
 - A unusual shape before a usual one / Big objects before little objects. The opposite of sequentiality is randomness, whereby an arrangement and flow cannot be detected.



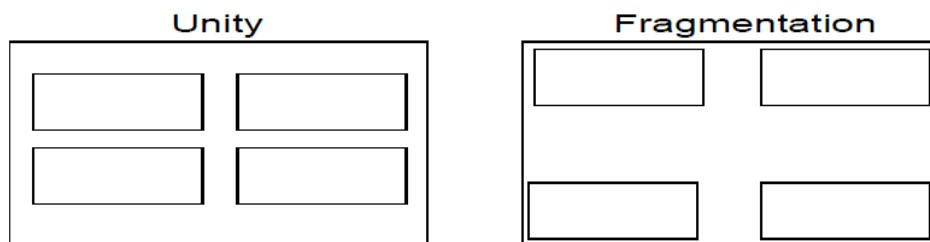
ECONOMY:

- Provide economy by using a few styles, display techniques & colours as possible.
- Economy is the frugal and judicious use of display elements to get the message across as simply as possible.
- The opposite is intricacy, the use of many elements just because they exist. The effect of intricacy is ornamentation which often detracts from clarity.

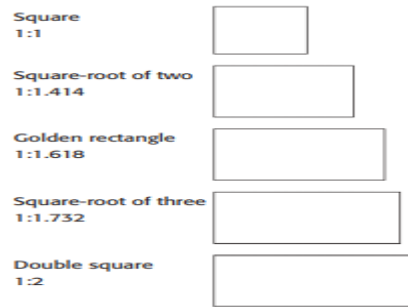


UNITY:

- Create unity by using similar sizes, shapes or colours for related information. Also by leaving less space between elements of a screen than the space left in the margins.
- It is coherence, a totality of elements that is visually all one piece. With unity, the elements seems to belong together, to dovetail so completely that they are seeing as one thing. The opposite of unity is fragmentation, each piece retaining its own character.

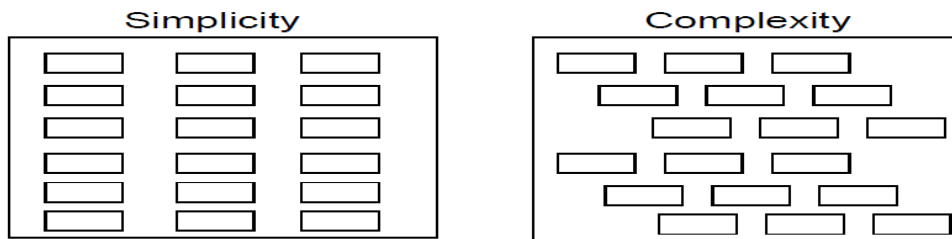
**PROPORTION:**

- Create windows & groupings of data & text with aesthetically pleasing proportions.
- Square (1:1): The simplest of proportions, it has an attention-getting quality and suggests stability and permanence. When rotated it becomes a dynamic diamond, expressing movement and tension.
- Square root of two (1:1.414): A divisible rectangle yielding two pleasing proportional shapes. When divided equally in two along its length, the two smaller shapes that result are also both square roots of two rectangles.
- Golden Rectangle (1:1.618): This “divine division of a line” results when a line is divided such that the smaller part is to the greater part as the greater part is to the whole. The golden rectangle also has another unique property.
- Square Root of three (1:1.732): Used less frequently than the other proportions, its narrowness gives it a distinctive shape.



SIMPLICITY (COMPLEXITY):

- Optimize the number of elements on the screen, within limits of clarity.
- Minimize the alignment points, especially horizontal or columnar.



GROUPINGS:

- Create spatial groupings as closely as possible to five degrees of visual angle
- Evenly space controls within a grouping, allowing 1/8 to 1/4 inch between each.
- Visually reinforce groupings: — Provide adequate separation between groupings through liberal use of white space. — Provide line borders around groups.
- Provide meaningful titles for each grouping.

Presenting Information Simply and Meaningfully

- Provide legibility: Information is noticeable and distinguishable.
- Provide readability: Information is identifiable, interpretable, and attractive.
- Present information in usable form: Translations, transpositions, and references to documentation should not be required to interpret and understand information.
- Utilize contrasting display features: To attract and call attention to different screen elements.
- Create visual lines: Implicit and explicit, to guide the eye.
- Be consistent.: In appearance and procedural usage.

Following are guidelines for presenting information on screens. The fundamental goals are clarity and simplicity in form, comprehensibility in organization, efficient information assimilation, and pleasantness in tone.

Legibility. Legibility is distinguishableness. Is the type of the proper kind and of adequate size and clarity for viewers of all ages? Is the contrast between text and its background adequate? In general, the legibility of screen text still does not match that of text presented on paper.

Readability. Is the information written at an understandable level for all users? Is it direct, simple, and easy to comprehend? Is visual interference minimized? When we read, we use the shape of a word as a strong aid in comprehension; often we do not read individual letters but recognize word shapes. Words are given more distinctive shapes by letter “ascenders” and “descenders.” A lowercase letter’s height is called its “x” height (the height of the letter x). Other letters are identical in height to the “x,” such as the “e,” “a,” and “n” in the word “explain.” Ascenders are letter strokes that rise above the x—the tops of the “l” and “i” in “explain,” for example. Descenders are letter strokes that drop below the x—the bottom of the “p” in “explain.” Research indicates that in the reading process the top half of a letter is the most important part of a word in comprehension. The top halves of letters are more distinctive than their bottom halves.

Usability. Screen information should be presented in a directly usable form. Reference to documentation or other extra steps for interpretation should never be required. In graphical system design, content consisting of words and text is much faster to comprehend and use than content in a graphical form.

Contrasting display features. Use contrasting display features to call attention to different screen components, items being operated upon, or urgent items. Usable features include such things as letter style, size, and color. Features chosen should provide perceptual cues to aid in screen component identification so that attention may be quickly and accurately focused. Perceptual cues clarify structure and relationships, and give hints to the reader. Good readers make great use of the typographic and semantic cues found in well-presented text.

Visual lines. The eye should be guided vertically or horizontally implicitly through the screen through the use of white space and content, typefaces, and control alignments. In situations where a large amount of information must be presented on one screen, eye movement direction may also be communicated to the viewer explicitly, through the drawing of actual vertical or horizontal rules. Purposeless, unfettered wandering of the eye should be discouraged.

Consistency. Methods chosen to present information must, of course, always be consistent in visual appearance and procedural usage.