Unit 7 Screen Designing – II

Structure:

7.1 Introduction

In the previous unit, you have studied about screen design goals, screen planning & purpose and also about organizing screen elements.

Visual design for user interfaces recognizes the importance of visual presentation to successful information access. In this unit, you are going to study about user considerations in visually pleasing composition and user considerations in amount of information on the screen.

Technical communicators must be visually literate in their role as information designers. Even when we have the luxury of working with professional graphic designers and artists as we produce information content, the more that technical communicators know about visual communication, the better will be the results of the collaboration

Objectives

After studying this unit, you should be able to:

- discuss the user considerations in visually pleasing screen design
- discuss the user considerations in amount of information in screen design

7.2 User Considerations

Even when visual communication isn't the primary focus of the UI design, its value is recognized. Graphics can more easily show the steps in a process

or the sequence of a flow of information or product than can words. Here, we are going to discuss about the visually pleasing composition and amount of information considerations in screen design.

7.2.1 Visually pleasing composition

We have a number of visual tools that suggest appropriate ways to read and interact with a screen or device. Few things are discussed here

Grouping and structure

If things logically belong together, then we should normally physically group them together. This may involve multiple levels of structure. For example, in figure 7.1, we can see a potential design for an ordering screen. Notice how the details for billing and delivery are grouped together spatially; also note how they are separated from the list of items actually ordered by a line as well as well as spatially.

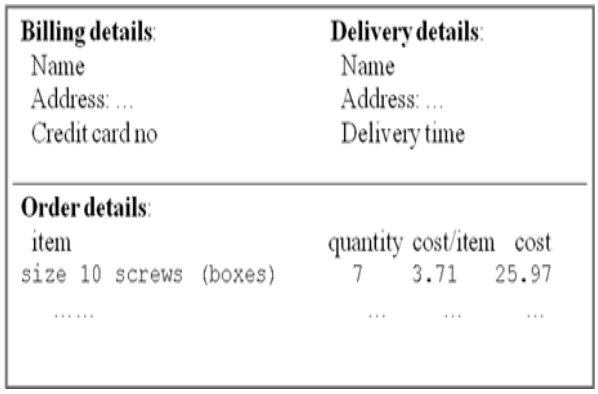

Fig. 7.1: Grouping related items in an order screen

If we look at figure 7.1, again we can see that the fact the screen seems to naturally suggest reading or filling in the billing details first, followed by the delivery details, followed by the individual order items. Is this the right order? In general we need to think: what is the natural order for the user? This should normally match the order on screen. For data entry forms or dialog boxes we should also set up the order in which the tab key moves between fields.

White space

In typography, the space between the letters is called the counter. In painting, this is also important and artists may focus as much on the space

between the fore ground elements such as figures and buildings as on the elements themselves. Often the shape of the counter is the most important part of the composition of a painting and in calligraphy and typography the balance of a word is determined by giving an even weight to the counters. If one ignores the 'content' of a screen and instead concentrates on the counter, the space between the elements, one can get an overall feel for the layout. If elements that are supposed to be related look separate when you focus on the counter, then something is wrong. Screwing up your eyes so that the screen becomes slightly blurred is another good technique for taking your attention away from the content and looking instead at the broad structure.

Accessibility design guidelines

Most operating systems now incorporate accessibility features, but many older users are unaware of their existence. Software that bypasses the standard protocols in the operating system cause particular problems because assistive devices will not operate correctly. Issues to keep in mind about users include:

- They may be in a situation where their eyes, ears or hands are busy (e.g. driving, loud environments).
- They may find it difficult to read or understand text.
- They may not have or be able to use a mouse or keyboard.
- They may have an old or different type of browser or operating system.
- They may have a slow connection or limited hardware.
- They may not be fluent in the language the document is written in.

Error messages and help manuals

Help manuals can be extremely important in improving accessibility. Instruction booklets should be produced in alternative media such as large print and audio tape, and they should be tested with a cross-section of potential users.

Error messages should be meaningful for the user so that they understand why it happened and what they need to do to rectify the situation, and they should not be timed out while correcting their errors.

Voice user interfaces (VUI)

For situations with poor viewing conditions, voice interfaces can provide another way of communicating information. However, VUIs can pose particular problems for deaf users and those with a cognitive impairment. For those using a text relay service, VUIs can be very difficult or impossible to use. Users must be given sufficient time to respond to instructions, because they can find it difficult to simultaneously listen and press keys while using a one-piece phone with an integrated keypad. The user should also be able to request a repeat of the voice prompts. VUIs are also inappropriate when there is a large amount of background noise. The volume of the voice interface and the multiple sources of auditory input can be stressful and confusing, thereby reducing information processing.

Following are the guidelines for VUIs:

- Allow for users who need extra time to respond to prompts.
- Provide a means of access to a human operator.
- Provide a recovery route from error.
- Provide different audio feedback for valid and invalid key presses.
- Provide a consistent and predictable user interface.
- Use consistent terminology.
- Keep user IDs to no more than 8 digits.
- Do not require the same information to be entered more than once.
- Provide users with the facility to repeat the audio output.
- Provide context-sensitive help.

The following points mentioned below give the Obstacles in the development path and Common usability problems in voice user interfaces

Obstacles and pitfalls in development path in voice user interfaces

- Nobody ever gets it right for the first time
- Development is chock full of surprises.
- Good design requires living in a sea of changes.
- Designers need good tools.
- Performance design goals
- People may make mistakes while using a good system also

Common usability problems in VUI

- Ambiguous menus and icons.

- Languages that permit only single direction movement through a system.
- Input and direct manipulation limits.
- Complex linkage.
- Inadequate feedback.
- Lack of system anticipation.
- Inadequate error messages.

Self Assessment Questions

1. In typography, the space between the letters is called _____.
2. _____ can pose particular problems for deaf users and those with a cognitive impairment.

7.2.2 Amount of information

Many designers create a screen with a very limited amount of information with a strong emphasis on design and visual appeal. In this section we are going to discuss on various techniques which make design more appealing by having control over the amount of information.

User action and control-entering information

Some of the most complicated and difficult screen layouts are found in forms based Interfaces and dialog boxes. In each case the screen consists not only of information presented to the user, but also of places for the user to enter information or select options. Actually many of the same layout issues for data presentation also apply to fields for data entry. Alignment is still important. It is especially common to see the text entry boxes aligned in a jagged fashion because the field names are of different lengths. This is an occasion where right-justified text for the field labels maybe best or, alternatively, in a graphical interface a smaller font can be used for field labels and the labels placed just above and to the left of the field they refer to.

For both presenting and entering information a clear logical layout is important. The task analysis techniques can help in determining how to group screen items and also the order in which users are likely to want to read them or fill them in. Knowing also that users are likely to read from left to right and top to bottom (depending on their native language!) means that a screen can be designed so that users encounter items in an appropriate order for the task at hand.

Knowing what to do

Some elements of a screen are passive, simply giving you information; others a reactive, expecting you to fill them in, or do something to them. It is often not even clear which elements are active, let alone what the effect is likely to be when you interact with them! This is one of the reasons for platform and company style guides. If everyone designs buttons the same and menus the same, then users will be able to recognize them when they see them. However, this is not sufficient in itself. It is important that the labels and icons on menus are also clear. Again, standards can help for common actions such as save, delete or print. For more system-specific actions, one needs to follow broader principles. For example, a button says 'bold': does this represent the current *state* of a system or the *action* that will be performed if the button is pressed?

Affordances

These are especially difficult problems in multimedia applications where one may deliberately adopt a non-standard and avant-garde style. How are users supposed to know where to click? The psychological idea of *affordance* says that things may suggest by their shape and other attributes what you can do to them: a handle affords pulling or lifting; a button affords pushing. These affordances can be used when designing novel interaction elements. One can either mimic real-world objects directly, or try to emulate the critical aspects of those objects. What you must not do is depict a real-world object in a context where its normal affordances do not work! Note also that affordances are not intrinsic, but depend on the background and culture of users. Most computer-literate users will click on an icon. This is not because they go around pushing pictures in art galleries, but because they have learned that this is an affordance of such objects in a computer domain.

Self Assessment questions

3. The _____ analysis techniques can help in determining how to group screen items.
4. Some of the most complicated and difficult screen layouts are found in forms based Interfaces and _____.

7.2.3 Visual Variables: Scale, Contrast & Proportion

The subtle interrelationship of scale, contrast and proportion is evident in every harmonious design. The effectiveness of an interface depends as much on the relationships among the elements as it does on the elements themselves. Changing even a single attribute of one element in a complex composition can significantly impact the balance, unity and harmony of an entire interface, and hence its effectiveness in communication.

Scale describes the relative size of a given design element compared with other elements and the interface as a whole. Contrast determines the differences needed to establish balance of scale.

Contrast is a result of significant differences along a common visual dimension, such as shape, size, colour, texture, position, orientation and movement that can be observed between elements in a design. It provides the basis for visual distinctions essential to communicating meaning in a message. Although effective interface design consists of selecting the visual treatment that most effectively communicates a message, an interface is dull when its only concern is for communication efficiency. Scale and contrast need to be adjusted to produce the right balance between interesting visual dynamics and harmonious proportions.

Proportion deals in ratios rather than fixed sizes, and determines the balance and harmony of the relationship between elements. Classical systems such as the Golden Rectangle codify relationships known to be pleasing to the mind as well as the eye, although in practice, most graphic designers rely on a highly developed perceptual sensitivity gained through years of experience.

Scale and contrast can be used to:

- differentiate elements from one another
- emphasise important elements or areas
- add visual interest to a design and evoke a particular emotion
- lead the user's eye in a predictable sequence that can be used to support a particular communication goal.

Bert in described seven *retinal variables* that are perceived immediately and across the entire visual field, and provide the basis for all forms of visual coding. This automatic perceptual characteristic makes the visual variables

the fundamental units of visual communication. These variables are size, value, hue, orientation, texture; shape and position (see Fig.7.4). It is worth noting that the way in which these variables are used, significantly impact on interface design.

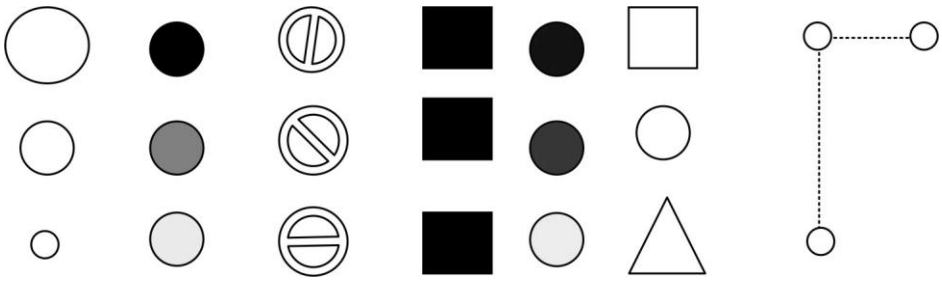

Fig. 7.4: Bertin's retinal variables.
From left to right: size, value, orientation, texture, hue, shape, position

Scale, contrast and proportion are some of the most subtle aspects of design and are difficult to grasp without extensive practice. To facilitate learning of these techniques, *squint test* can be performed to simulate early visual processes that form the basis for perceptual organisation across a display. The technique involves completely closing one eye, and squinting through the other eye to reduce light and disrupt focus. Features of interest in an interface are identified using only that eye. Anything that is not immediately apparent to the squinting eye will not be apparent at a glance in the final interface.

Three simple techniques are relevant to most interface design problems caused by incorrect use of visual variables: Layering, sharpening and integration

Layering: To apply this technique, communication goals must be thoroughly understood and the design's aesthetics cannot be considered in isolation from the it's intended purpose

1) Group each item of information into a small number for ex :(7? 2). A group must be established for any items that require independent processing, and each item must be assigned to at least one group.
2) Rank the various groups and reorganise them into an even smaller number of groups based on this ranking.

3) Create a layering effect by using appropriate visual variables. Size and value can establish clear hierarchies, while colour is most effective for non-hierarchical grouping.
4) Maximise perceptual difference between groups while minimising the difference within groups.
5) Use the squint test to ensure unity in elements of the same group, but that group itself can be visually separated from the rest of the display.

Sharpening: The technique sharpening ensures that the perceptual differences between two contrasting elements, or even groups, is large enough to be easily recognised

1) Rank the groups (see Layering, above).
2) Determine the range of variation of visual variables available and use as much of it as possible in the resulting code; eg. Minimum and maximum values or sizes, and number of colours.
3) Use nonlinear scaling across the visible range to ensure sufficient contrast. Doubling each successive level is usually sufficient.
4) Use the squint test to ensure that at least the first two or three most important groups can be easily recognised at a glance.

Integration: Effective integration ensures that the foreground and background reinforce rather than detract from each other. In a GUI, everything appears in a defined visual context, and the design must be suited to the context in which it appears. Usually, margins in a GUI should be more liberal than those used in print design

1) Determine the overall size of the foreground/background combination. If overall size is changed, critical internal relationships are changed. The size of either the foreground or background may be adjusted to produce the required scale relationships.
2) Use the squint test to equalise the visual weight of the foreground and background, and to check that neither positive nor negative (white) space dominates.
3) Provide enough space around the margins of the foreground to eliminate unnecessary visual tension.
4) Position the foreground correctly within the background. The foreground should usually be centred unless the communication requirements dictate otherwise.

7.2.4 Perceptual Organisation and Visual Structure

Organisation and visual structure provide the user with the visual pathways needed to experience a product in a systematic way. Without a coherent visual structure, a design becomes impossible to interpret and understand, resulting in loss of function as well as diminished aesthetic. The eye seeks to impose its own organisation onto a design whose structure is not immediately obvious. The designer thus loses control of the message, and its subsequent communication.

Organisation and visual structure are based on reliable methods that can be repeatedly applied to achieve predictable results. Organisation begins with classifying related elements into groups and establishing a hierarchy for both elements and groups. When this hierarchy is finalised, the interface itself can be structured to reflect the relationships between the elements and maintain a balanced design.

Techniques for perceptual organisation

Organisation and visual structure depend on careful planning and implementation. If the conceptual structure of the information being presented has been established, there are four essential techniques that can be applied to appropriately structure the interface

1. Symmetry: Symmetry is only one of several techniques that can be used to ensure a balanced design. It is inherently stable and is well suited for a user interface. Maintaining symmetry is a relatively straightforward process that can be used to ensure adequate balance in almost any design.

1) Identify the axes along which symmetry will be established. This usually means horizontal or vertical axes in interface design. Symmetry about the vertical axis is more common in human perception and is generally more useful.
2) Centre the information on the axis of symmetry by carefully balancing the amount of information on each side of the axis. The information doesn't need to form a literal mirror image as long as the scope is equalised.
3) Ensure the axis of symmetry is itself centred within the overall display context; i.e. the window or icon in question.
4) Use the squint test to verify the results.

2. Alignment: Alignment coordinates the visual activity of diverse elements, and ensures that all parts of a design work together, regardless of their individual roles. It almost always results in a significant improvement in the visual quality of the final product

1) Identify and enhance major boundaries in the existing layout, by aligning additional elements with them.
2) Identify elements and margins that almost, but not quite, align with one another and bring them into alignment.
3) Identify isolated elements and ensure that they are aligned with some other related element or margin in the design.
4) If an element cannot be related to anything else in the design, try to link it to the proportions of the design itself by positioning the element to correspond to a regular partition of the interface.

***3. Optical Adjustment* for human vision:** Optical illusions are inherent in most visual design problems, and have been mentioned previously in this study. Fig. 7.5 provides another example of this effect. Although there is no one way of determining the degree of optical adjustment required, a 3-step process can be applied at the basic level

1) Determine the true point of alignment required. Translate this into the normal margin that would be occupied by a rectangular element in the same position.
2) Extend elements beyond the margin according to the sharpness of their adjacent angle. The greater the acuteness of the angle, the farther it will need to extend beyond the normal margin.
3) Use the squint test only on the elements in question to validate alignment or visual equivalence with the intended margin or relevant interval.

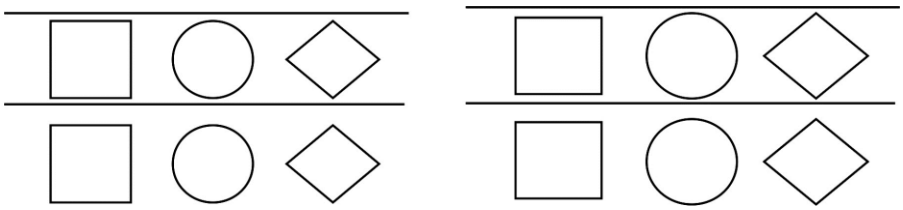

Fig. 7.5: Optical Illusions.

With physically equivalently scaling (left), rounded or acute forms appear too small relative to rectangular elements. Extending these elements slightly beyond the target dimension (right) produces optically equivalent scaling

4. White Space: White space is needed to correctly integrate foreground and background elements, as well as to effectively manipulate local design elements. White space is not wasted space, its role is to direct the viewer's attention to regions of critical information. The eye must be guided toward the information of interest, by allowing it to rapidly scan the cues that lead there. Careful allocation of white space is the most effective technique for achieving this goal.

1) Group and rank the design elements as described in previous techniques.
2) Ensure spatial separation of independent components by adding extra white space between groupings, even if explicit boundary delimiters are used.
3) Determine which elements require additional visual emphasis.
4) Increase the white space surrounding critical elements.

Self Assessment questions

5. To facilitate learning of scale, contrast and proportion techniques _____ can be performed.
6. The technique _____ ensures that the perceptual differences between two contrasting elements.
7. Organisation and visual structure depend on _____ and _____
8. _____ is needed to correctly integrate foreground and background elements.

7.4 Summary

In this unit, you learnt about user considerations in visually pleasing composition and user considerations in amount of information on the screen.

We have a number of visual tools that suggest appropriate ways to read and interact with a screen or device such as Grouping and structure, Accessibility design guidelines, Error messages and help manuals, Voice user interfaces (VUI).

Some of the most complicated and difficult screen layouts are found in forms based Interfaces and dialog boxes. In each case the screen consists not only of information presented to the user, but also of places for the user to enter information or select options. Actually many of the same layout issues for data presentation also apply to fields for data entry. Alignment is still important

Organisation and visual structure provide the user with the visual pathways needed to experience a product in a systematic way. Without a coherent visual structure, a design becomes impossible to interpret and understand, resulting in loss of function as well as diminished aesthetic.

7.5 Terminal Questions

1. Explain how Grouping and structure helps in good screen design.
2. Discuss on voice user interface
3. Explain three simple techniques for visual variables

7.6 Answers

Self Assessment Questions

1. The counter
2. VUIs
3. task
4. dialog boxes
5. *squint test*
6. sharpening
7. Careful planning, implementation.
8. White space

Terminal Questions

1. If things logically belong together, then we should normally physically group them together. This involve multiple levels of structure. (Refer section 7.2.1)
2. For situations with poor viewing conditions, voice interfaces can provide another way of communicating information. (Refer section 7.2.1)
3. Three simple techniques are relevant to most interface design problems caused by incorrect use of visual variables are: Layering, Sharpening, Integration. (Refer section 7.2.3)