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# **Visual Communication for Forms Design**

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# Visual Communication For Forms Design

## Introduction

*“Beauty is in the eye of the beholder”*

Margaret Wolfe Hungerford (under the pseudonym “Duchess”) penned this line in the short story “Molly Brawn”, published in 1878. What Ms. Hungerford was referring to was the tendency the human animal has to assign certain values, both positive and negative, to visuals through the **cognitive process**. This is the process by which we acquire, store, process and use information. Information is input through various sources (the senses) and stored along with the circumstances (positive and negative) that prevailed at the time of input. When the information is called forward for use, the prevailing circumstances usually “tag along” and influence the meaning of the information. So what Ms. Hungerford actually meant was that ...*Beauty is in the mind of the beholder...*

This process also affects forms designers. The visual elements we see on paper or screen (in this case, text and graphics) are not processed by the eye. The eye is just the medium that transmits light energy to the brain. The brain does all the work; the eye is only a conveyance. An example of this would be:

Imagine a friend standing a few feet from you. Picture their height, as they stand close. Now visualize that same person standing across the street. Your eyes tell you that your friend is now one-half the size they were when face-to-face; but your brain tells you that they are the same size, just at a distance.

Because we place a certain value to visuals it is important to understand the cognitive values we normally place on text and graphics. This helps us understand why the established forms design principles work and can help us utilize them properly in our form designs. This applies to both paper and electronic form designs.

This paper is presented in two parts. Part 1 - Textual Aspects of Design, discusses the design applications of text. Part 2 - Graphic Design Considerations, deals with the design applications of line art. A final topic of concern discusses the arrangement, grouping, and sequencing of information on forms. Each application above will be made with reference to the seven principles of design.

## The Seven Principles of Design

To create a “user friendly” form the designer/analyst strives for **legibility** and **readability**. Legibility is the dominant consideration in use of type and line art. Legibility is not the same as readability. Readability is a measure of ability to understand the written message. It deals with grammar, structure, and usage. Readability is normally associated with Plain Language. Legibility on the other hand is how the type is presented, and how easily we can recognize and identify a symbol (letter) or a group of symbols (words). Legibility can also extend to how easily we can recognize and identify the intended use of a graphic. Without becoming too technical, this ability to recognize and identify is a product of the cognitive process. To explain the essence of this statement as simply as possible consider that the human mind works best on a “familiarity breeds content” basis. The familiar is accepted readily while the unfamiliar is excepted.

We can achieve this user friendliness by applying the seven principles of design: **contrast, balance, proportion, harmony, rhythm, movement, and unity**.

**Contrast** is the basis for various information. Without cold there would be no hot, without rough there would be no smooth. Contrast deals with physical (or physically perceived) polarities (opposites). In design we must consider polarities of size, shape, textures, tone, and direction. Contrast is used to attract and to emphasize.

**Balance** is dividing space into equal or understandable parts. Our constant exposure to the balanced patterns of nature allows us to accept this principle as part of the cognitive process.

**Proportion** is the relationship of visual elements, one to another and to the whole. We consider this particularly in relations of size, shape, color and quantity. Proportion can cause contrast.

**Rhythm** is the use of shape, color and other visual elements in regular and repetitive patterns.

**Harmony**, the opposite of contrast, implies simplicity of design. Harmony does not interrupt, but allows for a smooth and even flow.

**Movement** directs the eye (the mind) through logical, coherent and acceptable arrangement.

**Unity** is a condition or quality of design that is achieved when individual elements are in agreement. Unlike harmony unity is active.

Along with the seven principles, the concepts of **attraction** and **attention** are important. Attraction is that visual reference which draws the eye to it immediately. Attraction does not indicate an assignment of meaning, only a nervous energy stimulation. Attention, however does imply an assignment of meaning. Attention requires long-term memory, while attraction requires only short term or immediate memory.

## Part 1 - Textual Aspects of Design

The textual aspects of design involve the characteristics of type, how we identify letters and words, and how we read. Type characteristics refer to the individual type symbols (letters or characters). Beside letters this grouping includes numerals, punctuation marks, and other symbols such as dollar signs, cent signs, ampersands (&), fractions and so on. For the sake of simplicity only the two type styles which should normally appear on forms will be discussed - - **Serif** and **San-Serif**.

### Serif Type

The small leader bar at the end of the letter stroke identifies Serif type. This type style also has a variation in the width of the letter stroke.

Figure 1



Serif type tends to be easier to read. The reasons are:

- This is the style used in the old Dick and Jane reader from which we learned to read.
- This style structurally imitates our own hand writing, and adds a recognizable proportion to the characters. This to a degree adds a rhythm to legibility.
- The leader bar at the end of the stroke assists our eyes in the left-to-right movement.

Because serif type is more “user friendly” it should be used for large blocks of text which require long term memory, such as instructions, direction or statements.

### San-serif Type

San-serif type does not have the cross bar at the end of the stroke and shows no variation in width.

Figure 2

Both handwritten and machine generated San-serif type style offers a contrast to the way in which words and letters are most familiar to us.

- As stated above, san-serif characters lack the variation of stroke seen in serif type. This creates a negative proportion that causes contrast.
- The boxy shape and absence of leader bars hinder the left-to-right eye movement, which in turn reduces the rhythmic flow.

San-serif type is best used for those elements of the form that require short-term memory, such as titles, captions, or the form number.

### Bold and Reversed Type

In any type style, characters set in bold, italic or reversed image create a contrast that evokes attraction, and should generally be used only for that purpose.

Bold and reversed type creates a negative energy that affects rhythm and balance.

Figure 3

**BOLD**

Reverse

Italic type is in contrast by movement.

Figure 4

*Italic*

### How We Identify Letters and Words

Reading begins with our ability to recognize and identify type symbols (letters). Next, we identify and assign a specific meaning to a combination of letters (words). Actually to say that we “recognize the letters” is not entirely accurate. What we really “see” is the reflection of the white space around and within the letter as shown in figure 5. In other words, we really see the outline of the letter.

Figure 5



This principle also applies to word recognition. We see the outline produced around a group of letters and immediately recognize them as one of the five or six hundred words that we have committed to memory. This recognition factor is based on lower case, and cap and lower case outlines.

Figure 6



Because we recognize words by outline, do not to use all caps when writing text. This is because it makes it more difficult for the reader to recognize the words and forces them to look at each letter. Figure 7 below illustrates this fact. Using all caps can be used for attraction, but never for attention.

Figure 7 IT IS MUCH MORE DIFFICULT TO DISTINGUISH WORDS WHEN THEY ARE WRITTEN IN ALL CAPS. ALL CAPS DO NOT PRESENT A RECOGNIZABLE OUTLINE AND CAN SLOW READING SPEED AN AVERAGE OF 17%.

Also, consistency in font style and size must be maintained for legibility. The text shown in Figure 8 is very difficult to read.

Figure 8 It is much more difficult to distinguish word outlines when type style does not remain constant throughout body text. Changing type size also has and adverse affect on one's ability to distinguish word outlines.

## How We Read

The next step in making type more user friendly is to know more about how we read. When we read a line of text we mentally break it down into recognizable phrases or segments.

Figure 9

*when your eyes read:*

You are invited to come to my party tomorrow.

*your brain sees:*

You are invited to come to my party tomorrow.

The mind can assimilate only so much at one time (short term memory). Because of this the mind reads in short jumps called saccades. These saccades are usually grammatically based: subject and modifiers, predicate and modifiers, prepositional phrases, adverbial phrases, etc. Your mind views a sentence sort of like you would diagram the same sentence. The mind reads a phrase and holds in short term memory. It then reads the next phrase and after committing it to short term memory, compares it to the previous phrase to establish a logical relationship. [The rests or stops between phrases (saccades) are called fixations.] While this saccade and fixation information is a principle of readability, it has a direct impact on legibility also.

The length of a line must be limited for legibility. This is what is commonly known as the **alphabet and a half theory**. This theory holds that a line of type should be no shorter than one alphabet (twenty six characters), and no longer than two and one-half alphabets (sixty five characters). The reason is that if a line is too short (see Figure 10) we do not have enough information (or saccades) to make a coherent thought. If the line is too long (see Figure 11) we have too much information to process and when we try to start the next line we cannot easily make the transition. It is important to know that the alphabet and a half theory has as many variations as it has proponents. Different theorists have differing ideas about how long a line should be, the rule of thumb: if the audience is highly literate use a longer length line than for an audience which is less literate.

Figure 10

Go placidly among  
the noise and haste,  
and remember what  
peace there is in  
silence. As far as  
possible without  
surrender, be on  
good terms with all  
persons. Speak your  
truth quietly and  
clearly and listen to  
others, even the dull  
and ignorant; they  
too have their story.  
Avoid loud and  
aggressive persons;  
they are vexatious to  
the spirit. If you  
compare yourself to  
others, you may

Figure 11

Go placidly among the noise and haste, and remember what peace there is in silence. As far as possible without surrender, be on good terms with all persons. Speak your truth quietly and clearly and listen to others, even the dull and ignorant; they too have their story. Avoid loud and aggressive persons; they are vexatious to the spirit. If you compare yourself to others, you may become vain or bitter - there will always be greater and lesser persons than yourself.

Additionally, certain typesetting practices can decrease legibility. The insertion of extra white space between letters (see Figure 12) will lessen our ability to recognize the individual word outline. The addition of extra leading or white space between lines of text (see Figure 13) makes it difficult to find the start point for the next line of text. This will cause the reader to re-read the same line several times over. This practice is called regression.

Figure 12

The addition of extra letter spacing makes the outline of a word harder to recognize than those words without extra space.

Figure 13

The addition of extra leading (white space between lines of text) make it difficult for the reader to find the beginning of the next line.

## Graphic Design Considerations

### Rules

A rule is simply a line and can be solid or have white space in between (leaders). The weight of a rule is the thickness of the line and these weights vary from very thin (hairline) to very thick (bold.)

Leader lines cause movement that leads the eye from one element to another. A leader line is an attraction devise. Leader lines are often used in the vertical as an accounting devise to separate dollars from cents. However, leader lines should not be used simply as a graphic embellishment because the mind can see this broken rule as a cut line or might lead the eye from nothing to nothing.

Figure 14

<p>-----</p>	<p>\$ 231   23</p>
<p>Pie ----- \$1.25</p>	<p>\$ 349   00</p>

The thickness of lines (rule weight) has a subtle psychological affects on us, usually because of contrast. As we view the rules (in boxes or stand alone) there is a movement to them, and this movement lends to unity and rhythm. We complete an area and move on (left to right, from top to bottom). But when a bolder line “pops up” the contrast causes a cession of that prior movement, unity and rhythm. The contrast creates a nervous energy in the brain that tells us to stop whatever we are doing and prepare to do something else. Thus, we use lighter rules to direct and guide the eye, medium weight and double lines to attract the eye, and bolder rules to indicate the end of a particular information segment.

### Bleeds

A bleed is a graphic element that extends to either edge of the sheet after both edges of the sheet have been trimmed. If the graphic causes movement, a bleed will lead the eye off the sheet thereby destroying unity and rhythm. Bleeds are not recommended for forms.

## Box or Upper Left Caption (ULC) Design

Three primary styles have been used to display captions on forms. First came the “on the line” or “open caption” style, followed in the 1930’s by “under the line” style, and currently designers use the “box or upper left caption” style.

The **open caption** style (see Figure 15) violates movement when data is entered on the form and does not allow for a common vertical alignment. This means that both the reader and individual extracting the information, has to constantly scan, line after line, to find where the caption (question) begins and where the entry items begin. Because the captions take up entry space, which causes the rules to be of different lengths, it is difficult to gauge exactly how much room is available for inputting information. This proportion problem can interrupt the reading rhythm of both the persons inputting or extracting information.

One other major problem with the open caption style is that it is difficult to complete the form by typewriter. When the form is aligned (on the line), the typist is usually unable to read the caption. This is because the platen guide covers the caption and the typist either has to remember the question or has to move the platen guide to re-read it.

Figure 15

Name \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone: Home \_\_\_\_\_ Business \_\_\_\_\_

The second style called **under the line** (Figure 16) was developed to allow more room for the entry of information and it offers a common vertical on the left edge of the form. However, the reader has a difficult time referencing between the caption and the input line. Because the reader’s eye has to make a zigzag movement between the caption and the beginning of the answer line all rhythm and unity are destroyed.

This lack of rhythm and unity stems from the fact that we learned to read left to right, top to bottom; for this process we have to read from lower center, to upper left and then to the right. Proportion is usually violated in this style because rarely are the answer lines of a uniform length. There are further problems with movement and rhythm in that the placement of the caption occasionally leads the responder to begin entering information on the wrong line.

Figure 16

\_\_\_\_\_  
Name \_\_\_\_\_ Age \_\_\_\_\_

\_\_\_\_\_  
Address \_\_\_\_\_

\_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

The **box or upper left caption** style, often referred to as Box or ULC design, is the optimum style used for the capture of information. It offers movement from left to right, top to bottom. The common verticals set a pattern and rhythm in reading the form because it offers the ability to have a common, easily found start point for both the responder and the person extracting information. Rhythm is also sustained because the responder can easily reference between the caption and the entry area. This style offers a proportion, and demands discipline requiring the responder to input information into a defined space. This also offers balance and unity caused by the ability to sequence or group like units.

Figure 17

Name (Last ,First, M.I.)		Date of Birth (mm, dd, yy)	
Address			
City		State	Zip +4
Business Phone ( )	Home Business ( )	Fax ( )	

There is one problem with any “conventional” design style. Most paper forms are printed with black ink on white stock, and completed with dark (usually black) ink or in pencil. This practice offers little contrast between the input information and the preprinted areas of the form. This makes it difficult to identify the input information, which will need to be extracted. To solve this problem many designers use halftone screens (backgrounds) and color matching systems, first developed by the Pantone Inc., called Pantone Matching System (PMS) formula inks. This will offer the contrast needed to separate static from variable information. This design style is often used for electronic forms.

Figure 18

Name		Date of Birth
<input type="text"/>		<input type="text"/>
Home Phone	Office Phone	Fax No.
<input type="text"/>	<input type="text"/>	<input type="text"/>

### Column Design

Column design is an extension of the ULC style of design. Column design is used when the caption or question asked will receive multiple answers. This design feature offers the same movement, rhythm, proportion, balance, and unity that ULC offers. The only difference is that it accommodates multiple entries.

Figure 19

Student Name	Class Call Number	Point Grade	Remarks

Like ULC, column design can be made more effective by introducing halftone screens into the design. Once again this is to help movement, unity, and rhythm through the use of contrast.

## Ballot Box

The ballot box feature has many of the same characteristics of ULC and column design, it offers movement, rhythm, proportion, balance, and unity. However, ballot box features do not have the same constant format structure as ULC and column design. For example, the ballot box can be arranged either on the horizontal or vertical (see Figure 20). The method of input determines which direction the ballot boxes are to be arranged. If input is made by typewriter the ballot boxes and captions should be set horizontally. This is because, if the configuration were vertical the responder would not be able to read the complete list and respond properly without moving the platen up and down. This would disrupt movement and rhythm, and to a degree harmony. A vertical configuration is acceptable for input by hand. The left common vertical start points, most resembles the way we read. This promotes movement, rhythm, and balance.

Figure 20

Vertical	Horizontal
<input type="checkbox"/> Now	
<input type="checkbox"/> Then	<input type="checkbox"/> Me <input type="checkbox"/> You <input type="checkbox"/> Them
<input type="checkbox"/> Always	
<input type="checkbox"/> Never	

Proper space between the caption and the ballot box will increase legibility. When arranging ballot boxes and captions we must regard the box the same as an individual word or character. If a caption is too close to its box, the reader will take the box into the outline of the word. This can make the word difficult to distinguish as shown in Figures 21 and 22. Ballot boxes and caption sets must be properly separated to establish each as an individual element. If the caption and boxes are crowded together, one is never sure which box goes with which caption.

Figure 21



Figure 22

<input type="checkbox"/> Red	<input type="checkbox"/> Blue	<input type="checkbox"/> Black	<input type="checkbox"/> Green
<input type="checkbox"/> Red	<input type="checkbox"/> Blue	<input type="checkbox"/> Black	<input type="checkbox"/> Green

Finally, the ballot box should always go to the left of the caption. This will help reduce regression and will make it easier for the eye to reference the caption and box at the same time. This cannot be done as easily with the box to the right of the caption. Left placement increases rhythm because of the ease of eye movement and allows for a constant proportion.

Figure 23

Right	Wrong
<input type="checkbox"/> Single	Single <input type="checkbox"/>
<input type="checkbox"/> Single, head of house	Single, head of house <input type="checkbox"/>
<input type="checkbox"/> Married, with children	Married, with children <input type="checkbox"/>
<input type="checkbox"/> Married no children	Married no children <input type="checkbox"/>

## Arranging, Grouping, and Sequencing

The final topic concerns the arrangement, grouping, and sequencing of information on forms.

**Arranging** information correctly reduces errors and wasted motion during fill-in. Information items should be arranged so that the flow (movement) of entry is left to right and top to bottom. As much as possible all entry should be kept on a single plane, this would create a rhythm of reading and make the form easier to complete. Also, items should be arranged vertically (common verticals) to reduce the number of tabular, marginal, and visual stops. This reduction will bring a visual balance to the form and allow for mentally prearranged proportion of input space.

**Grouping** information entails establishing a logical relationship between the information elements in a given section of the form. Information can be grouped by several methods. First, it can be grouped by related subjects. For instance, all information concerning a student's grades could be grouped together. Second, information can be grouped by processing sequence. In this case all information to be input into a certain database could be grouped together. Finally, items used by a particular person or office can be grouped together. For example, all the items filled in by the applicant will be located in one area on the form. The grouping concept invokes a feeling of unity because the responder or processor will know that all elements in a given area of the form are in agreement. Thus the mind can settle in on that information and not have to worry about a change.

**Sequencing** information deals with the way information elements are formatted on a series of forms. Like information should be formatted in the same sequence from form to form and should always appear in the same location from form to form. Properly presented sequencing eliminates unnecessary fill-in motions and makes transcribing from one form to another easier. Sequencing creates an easy movement and unity from form to form.

## Conclusion

Those less knowledgeable in forms design often asked "why do I have to use the forms design standards?".

This paper was written for both seasoned design veterans as well as for rookies. It was developed more as a "why-to" than as a "how-to." Research for this paper involved reading several books about Cognitive and Gestalt psychologies. It would be most difficult to explain forms design in terms of these disciplines, as they encompass so much more than design related theory.

However, understanding these disciplines helps us better understand why the established forms design principles work, especially as it relates to the cognitive process. This in turn helps us utilize the design principals appropriately so that we can design efficient and effective forms.

"Why do I have to do it this way?" Hopefully, this paper will help answer this question.

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