HOW THE USER VIEWS VISUAL DISPLAYS

S. Alenka Brown-VanHoozer, CHFP

Argonne National Laboratory
P.O. Box 2528, MS 6000
Idaho Falls, ID 83403

Submitted for Presentation to the

Human Factors and Ergonomics Society
39th Annual Meeting
San Diego, California

October 9-13, 1995

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Abstract

Most designers are not schooled in the area of human-interaction psychology and therefore tend to rely on the traditional ergonomic aspects of human factors when designing complex human-interactive workstations.

> "*In fact, an experienced system designer is deeply embedded in their own context and very often will treat their current requirement as an update or modification of prior designs. ...The creative phases of expert designers' work depend very much on intuition and experience.* (Rasmussen, Pejtersen, and Goodstein)

Unfortunately, by ignoring the importance of the integration of the user interface at the psychophysiological level, the result can be ineffective use of a system leading to an inherently error- and failure-prone system. Therefore, to minimize or eliminate failures in a human-interactive system, it is essential that designers understand how each user's processing characteristics affect how the user gathers and processes information. By understanding the significant processing characteristics of the user, designers can implement practical and effective visual displays (or any other type of system) that are more desirable to all users.

The material presented in this paper is based on a general study that involved users' perspective views of how visual displays should be designed for effective use. The methodology used was Neuro-Linguistic Programming (NLP), because of its applicability in expanding design choices from the users' "model of the world." The findings of the study have provided a beginning in the development of user comfort parameters and visual displays.

Reference

Rasmussen, J., Pejtersen, A. M. , and Goodstein, L. P., "Cognitive Systems Engineering," New York: John Wiley & Sons, (1994).

*Work Supported by U.S. Dept. of Energy, Nuclear Energy Programs, under Contract W-31-109-ENG-38.

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Summary Abstract

Introduction

Most designers are not schooled in the area of human-interaction psychology and therefore tend to rely on the traditional ergonomic aspects of human factors when designing complex human-interactive workstations.

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The material presented in this paper is based on a study that involved users' perspective views of how visual displays should be designed for effective use. The methodology used was Neuro-Linguistic Programming (NLP), because of its applicability in expanding design choices from the users' "model of the world." What follows is a brief outline of the study and a general conclusion.

Neuro-Linguistic Programming

NLP is a methodology which entails applying a set of specific, easy-to-learn techniques in gathering precise information, assimilating that information into useful patterns, and then using the information toward completion of explicit outcomes or goals.

> "*When NLP was first used to study subjective experience, the structure of meaning was found to occur in the specific sequence of the representational systems a person used to process information. These representational system sequences are called* ***strategies*** " [Bandler and MacDonald, 1988].

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For example, seeing and hearing sounds in pictures, or hearing a voice from within a crowd and associating a feeling with the voice are abilities exercised based on processing or enacting specific strategies. The representational systems of: *visual, auditory and kinesthetic* are the modalities of the enacted strategies which we use to access and process the information around us internally. By knowing a person's strategy, we understand some of how a person builds his or her model of the world, and we can utilize this to begin to realize the needs and comfort parameters of the users to obtain optimum reliability and user performance in the design of visual displays.

Once general patterns can be detected, then more explicit distinctions can be generated which reveal strategies that are outside the normal, conscious awareness of the subject. These strategies can then be utilized in assessing a variety of necessary categories of information with respect to the user's total experience of the system, and can go a long way toward designs of other types of systems.

Study

A general research study was conducted that focused on eliciting general comfort parameters of users in the design of visual displays. These comfort parameters were determined by how the participants accessed and processed information based upon their favored representational systems (FRS): *visual, auditory or kinesthetic.*

The study tested 38 subjects whose FRS were determined through video-taped interviews and calibrated against both a written instrument and this researcher's visual examination of the tapes. The focus of the examination was the establishment of individual-specific eye accessing patterns associated with other non-verbal cues and linguistic patterns (predicates). The subjects were asked to evaluate six different visual displays from which their comments were correlated with their FRS. The survey used provided a crude profile of the person and a basis for design speculation from the information that was obtained. The results revealed areas that overlapped between the three modalities and areas that were distinct.

Findings

Discoveries of the study showed that the representational systems overlapped in several areas. Some of the areas included; (a) color contrast, standardized color coding and iconic coding, (b) consistency in and between displays regarding color, symbols, text sizes and fonts, and (c) layout of information that is easily accessed, scanned and interpreted.

Areas that were distinct included such attributes as; (a) the amount of alphanumeric data shown, (b) the number of color combinations and background colors used per display, (c) the simplicity of the system being displayed, and (d) the implementation of sound and tactile feedback responses.

Conclusion

In developing visual displays (or other types of system), the designer would do well to be aware of the different impacts the three basic neurological inputs have on the ways people process information around them. Based on the conclusions of the research study, one method in the design of visual displays would be to incorporate the comfort parameters that overlap from each of the representation systems; then combine in areas that are distinct . For example, a visual display could be designed using a pictorial layout of the system with minimal alphanumeric text and greater pictorial-icon selections, saturated earthtone colors (allowing for no more than five colors per display), and providing for speech and tactile feedback (touch screen). Another method would be to include all the comfort parameters that overlap from each of the representation systems, then allow each individual the means by which to select their choice of further comfort parameters.

Nevertheless, it is important to realize; (a) that the human error factor will be minimized, (b) that by using the users' comfort parameters, more positive outcomes will be attained in the area of shorter learning curves in the use of newly developed visual displays, (c) less frustration and resistance by the user in accessing and utilizing the display, and (d) realization of the elimination of (or less emphasis on) ***forced adaptability*** from the user will guarantee that the designer will obtain more reliable and precise information from the user at the conceptual stage of the design model.

Therefore, a key in the design of successful visual displays (system models, workstations, etc.) is to provide the designer with an effective means of communicating with the user that will allow the designer to "characterize" or "map the design territory" based on the user's model of the system. This will identify and minimize problems and operator errors at the outset of the initial design and thereby remedy deleterious design in a cost-effective manner.

References

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