

# Placement for Profit: Menu Item Arrangement on Customer-Activated Computer Screens

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*Can profitable menu items be placed on a computer screen where they will be selected more readily than other items? The author examines whether printed menu theories and techniques can be applied, with the same results, to a computer menu screen.*

The menu is the primary marketing tool of a restaurant. However artistically pleasing, the menu's number one job is to sell a product. By highlighting the most profitable items, the menu becomes critical to the success of the restaurant's operation.

According to Miller, "The menu will be the ultimate controlling factor as the profit center, customer attractor, and 'theme determiner'."<sup>1</sup> The menu dictates not only food selection, but the concept, type of personnel to hire, and, ultimately, the success or failure of the business. Also describing the importance of the menu, Seaburg maintains that "The menu reflects all of the decisions concerning what to serve, how to serve it, and what to charge for it."<sup>2</sup> Menu design then becomes an important issue for the success of any restaurant.

All menu items should first be analyzed to determine their popularity and profitability. Once menu items are arranged in the proper popularity and profitability categories, strategies for marketing and menu design can be developed. Throughout this process, however, the design of the menu should serve one purpose—to direct the guest's attention to those items which the restaurant wishes to sell.

Traditionally, restaurant menus have been printed on paper and presented to the guest. But today another format is being tested, the customer activated terminal (CAT). With this system, the customer makes food selections from a touch-sensitive computer screen. In the

particular system studied here, the screen displayed full-color photographs of the food items. The question was then in making the leap from printed page to computer screen could some of the tried and true printed menu design strategies be employed with the same success on the electronic menu?

Although CATs have not been studied extensively, automated teller machines (ATMs) have. The use of ATMs may be related to the use of a CAT in a restaurant. Citibank found five categories of ATM users:

- those who understand technology, like it, and will use a computer
- those who understand technology, like it, and will use a computer only if the benefits are clear
- those who understand technology, do not like it, but will use a computer if the benefits are overwhelming
- those who do not understand anything technical and might use it if it is very easy
- those who will never use technology of any kind<sup>3</sup>

The guest in a restaurant today is a discretionary computer user who judges a system on the basis of expected effort versus results gained. Like any other restaurant decision, if the benefits outweigh the costs, the decision will be made favoring the computer. The impact on the computer user must be considered.

Today's quick service restaurant (QSR) must evaluate the use of computers and touch screen menus in light of the benefits to it as well as the customers. If the benefits are great, perhaps fine tuning the computer screen menu to sell products is the next step.

### **Menu Design is Critical**

According to Miller, "No matter what the format, the objective of the menu remains the same: to present to the customer the items you want them to buy in a manner that will cause them to take action."<sup>4</sup> Causing the customer to take action is the key. Menu designers over the years have come to some conclusions on how to stimulate this action to take place.

One of the most widely used menu design principles is the reliance on eye movement, or eye-gaze motion, to direct the reader's attention to certain items on the menu. Miller states

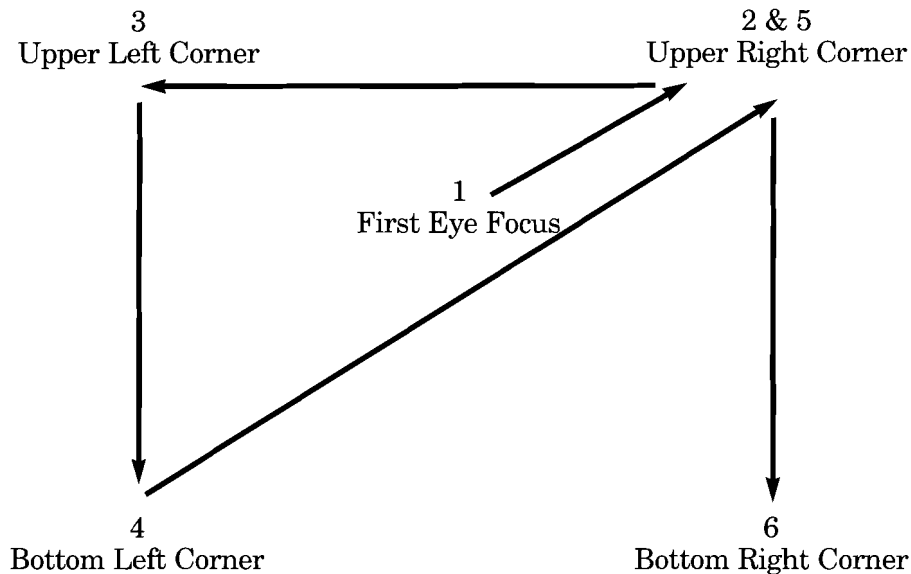
Although there is *no reliable scientific* study of eye movement that suggests where the eye first focuses and then moves on a menu, it is generally understood by researchers as well as menu writers that the eye focuses on and travels over a menu in a more or less predictable way.<sup>5</sup>

These "generally understood" printed menu practices are shown in Figure 1. It is believed that some of these menu design practices

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**Figure 1**  
**A Threefold Menu, Showing Eye Movement across the Menu**

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have been lifted from other disciplines regarding eye movement and the printed word or scene perception. Specifically, the area of psychophysiology talks about the use of physiological measures in regard to consumer research. Whether the case can be made that menu design sprang from this area of research is difficult to tell, but anything that might give a menu the “edge” over competition should be considered.

In the literature regarding how the eye moves over the printed page, two major drawbacks have limited the research and its applicability. The first obstacle has been high cost. Eye movement tracking equipment itself is expensive and accessory equipment increases this cost even more. A second problem is that such equipment is large and usually requires that all data be collected in a laboratory. Even though software and hardware have become smaller and faster, it is still prohibitive for most researchers.

Bagozzi discusses the area of psychophysiology in relation to consumer behavior this way:

The cycle typically begins with high hopes that physiological procedures will constitute universal and potentially infallible methods for assessing the efficacy of alternative marketing stimuli. The cycle ends, tem-

porarily, in frustration and disillusionment when it is learned how difficult it is to apply physiological instrumentation and how complex it is to interpret the resulting data. The love/hate relationship with physiological measures resumes when a new generation of researchers come to see physiological procedures as an *elixir vitae* for its measurement problems.<sup>6</sup>

Furthermore, and more cynically, Hopkins maintains that “only providers of commercial marketing research seem able to maintain a high level of enthusiasm for, and use of, physiological measurements.”<sup>7</sup> Be that as it may, menu designers seem to take stock in the fact that the restaurant guest’s eyes move in more or less predictable ways over a menu and design menus based on that movement. Two specific areas of psychophysiological consumer research which may have been referred to by menu designers are pupillography, the study of the dilation and constriction of the eye, and electrooculography, the measurement of eye movement. Breaking the latter down further, the two forms of eye movement usually referred to are fixations, the period of time when our eyes are relatively still, and saccades, or jumps to new locations. The literature mentions these areas in studying reading, and it may be a stretch to apply this research directly to reading a menu, but the guest’s focus on a menu is probably near the middle of the page. If this true, then the restaurateur should place the most profitable item in that central position. This is especially true since the reading time of a menu is very short. Gallup, in surveying menu readers, found that it takes less than two minutes to “read” a menu.<sup>8</sup> If this information is true, “correct” menu design becomes even more critical.

### **Computer Menu Design Is a New Area**

If the menu design strategies found in Figure 1 can be applied with some success to the printed menu, and if item placement can impact sales of items in those positions, can placement of menu items on a computer screen also result in differences in sales and profitability? Can placement of an individual menu item on a CAT significantly effect the number of that item sold?

Since electronic menus are so new, very little research has been done on any aspect other than computer acceptability from customers. With the limited research that does exist, the CAT has been shown to decrease labor and increase sales and profits of food items in certain quick service restaurants.<sup>9</sup> It is hoped that refinement of computer screen design will result in increases in sales percentages necessary for improved profitability. With the dawn of new technology, the human/computer interface is extremely important in designing a screen which, in this case, can sell a product. These new display techniques and interactions with customers are found in the literature regarding Graphical User Interface or GUI.

## Graphics Interface with the Customer

Computer graphics have revolutionized screen design and the way users interface with it. Galitz lists the following advantages of a graphical system:<sup>10</sup>

- faster recognition than text<sup>11</sup>
- faster learning
- faster use and problem solving
- easier remembering
- graphics are thought to be more “natural” and closer to innate human capabilities
- fewer errors
- increased feeling of control
- icons are universal
- low typing requirements

In organizing screens to be clear and meaningful, Galitz states that “eyeball fixation studies indicate that in looking at displays of information, usually one’s eyes move first to the upper-left center of the display, then quickly move through the display in a clockwise direction.”<sup>12</sup> Streveler and Wasserman 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.<sup>13</sup> Again, the research tells us that in Western cultures at least, the obvious starting point is upper-left, with left-to-right, top-to-bottom scanning of a screen.

Turnbull and Baird, referring to printed material, state these facts through laboratory research:

- The eye tends, after leaving the initial fixation, to move to the left and upward.
- The exploratory coverage of the space is from this point in a clockwise direction.
- The eye prefers horizontal movement.
- The left position is preferred to the right and the top position is preferred to the bottom.<sup>14</sup>

The important point these researchers make is “the fact that these have been labeled tendencies means that this is not necessarily the path the eye will follow. The designer can influence the direction by the proper placement of elements.”<sup>15</sup>

It would therefore seem that the upper-left quadrant would be the best location for selling the menu item that a restaurateur wanted. Additionally, based on the combined research of printed page and GUI, this would seem to be the prime location as well.

## Menu Items Are Rotated in Test

A Quick Service Restaurant (QSR) was used as the test site. The QSR had been testing the CAT for about a year. The researchers could

manipulate the layout of the terminal screens, chosen because each screen displayed like items. The price variable was controlled for and should not have influenced the item choice.

Each screen had six menu items displayed in two rows of three items each. On the first of each month, beginning with March 1994, two different items were rotated. By August 1994, all items had the opportunity to be in the top left corner for one month. This rotation occurred on each of the three separate screens.

The only item that moved each month was the item that originally started in the top left hand corner. This item was switched each month with a different item and took the place of that item which, in turn, was moved to the top left corner.

The top left corner was chosen based on the limited empirical research available and the untested folklore of menu item placement. During the six-month trial period, the media promotions run by the company focused on the total menu, and did not identify any specific products.

On the first of each month, sales figures were collected from the QSR and compared to the prior year, and to each month from March to August. Each item's sales figures were compared for the three screens.

The results of this test were similar, with some variation, across the three menu screens. P-values from the ANOVA procedure indicated no significant influences of position or month. There was a small amount of evidence for decreased percent of total sales of the item first placed in the top left position and then moved to each of the other positions when unprotected pairwise comparisons were completed in two menu screens ( $p=0.03$  and  $p=0.01$ ). (See Table 1.)

No evidence of increased or decreased percentage of category total sales was noted for products first placed in a position other than the top left and subsequently placed in the top left position for one month. When square root transformation was used to lessen skewness of variances observed from residuals, p-values were 0.0561 and 0.0254. No significant values were found for the third screen. The drop occurring with the item in screen C most likely was due to the addition of a new product during the second month when the item was in the top-middle position. The researchers had no control over the introduction of this new item.

Among items, significant differences were observed. This was to be expected since some items were more popular than others. The percent for all items ranged from 3 to 30 percent of total sales within respective categories.

No evidence was found for influence of a monthly factor when analyzing the Type III (adjusted) ANOVA results for month by position. Thus the replication error was minimized.

### **Some Limitations Were Evident**

Although some variables were controlled during the data gathering period (advertisements) and others statistically (influence of

**Table 1**  
**Percent of Sales for Items Beginning in Top Left Position and Moving to Each of the Other Positions on a Monthly Basis**

Screen A	Screen B	Screen C
27 <sup>a</sup> 24 27	25 23 24	23 <sup>a</sup> 15 <sup>b</sup> 20
25 26 27	27 24 22	17 18 19

<sup>a</sup> Significantly higher ( $p < 0.05$ ) than the average of the other positions  
<sup>b</sup> New item added during second month

**Table 2**  
**Comparison of Mean Number of Items Sold per Month by Screen**

Screen <sup>a</sup>	Mean Item Sales	SD	ANOVA	Months Differing (LSD <sup>b</sup> $p < 0.05$ )
A	1112	235	ns ns	
B	348	86	p<0.05	July > April, August March > April, August
C	282	88	ns	March > April, May, June, August
D	291	86	ns	March > April, May, June, August

<sup>a</sup> Screens A, B, and C each contained 6 menu items. Screen D was the same as Screen C except the new product added during the second month of the study was included in the analysis bringing the menu item count to seven for five months.

<sup>b</sup> Least Squared Differences  
 ns = not significant

month), limitations to the study still existed since the investigation was fairly exploratory in nature. One such limitation was that the actual length of a month was uncertain since that was controlled at the QSR unit. Sometimes item placement on the CAT screens was changed on the first of the month, while other times, the change occurred several days into the month. This may have been reflected in the analysis of variance and pairwise comparisons of mean number of items sold across months which have been summarized in Table 2.

Although total item sales in each of screens B, C, and D were found to be significantly different between some months, the only screen with protected significant differences ( $p < 0.05$ ) was screen B. Thus, the limitation was minimized somewhat. A fourth screen, D, had to be

added to look at the data from screen C with a new food item added during the second month of the study.

A second limitation was having only one item that moved in position over the six months. Although some indication of a drop in sales when not in the upper left was observed, these results were confounded when considering that no significant changes were seen with other products moving into the upper left corner.

Other limitations included the fact that only one menu item on each screen had the opportunity to be placed in each of the six positions. Additionally, this research was only conducted at one restaurant for a six-month period of time and, beginning with the second month, an additional item was added on a separate menu screen. This may have influenced choice slightly.

Since this study was exploratory in nature, the choice was made to move only one item. The next step will be to gather and analyze data using the Latin Square technique.<sup>16</sup>

It was obvious that menu screen placement did not have a significant effect on item selection. Also, there was no significant difference in the number of times an item in the top left corner was selected over placement in any other position on the menu screen.

This exploratory study was undertaken to determine if the "principles" associated with printed menu design were transferable to computer screen menus. Though limited in scope, this study did break ground in computer screen menu design and is a starting point for future studies.

The next appropriate step would be to conduct a six-month test using a Latin Square design on the same three menu categories. This design would allow each item to be randomly placed in every position within its price category. In addition, a control restaurant and a test restaurant in the same geographic area should be used for the study.

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<sup>11</sup>J. G. Ells and R. E. Dewar, "Rapid Comprehension of Verbal and Symbolic Traffic Sign Messages," *Human Factors* 21 (1979): 161-168.

<sup>12</sup>Galitz, 60.

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<sup>15</sup>*Ibid.*, 267.

<sup>16</sup>R. Powers, *Data Analysis in Social Sciences* (Madison, Wisc.: University of Wisconsin, Department of Agricultural Journalism, 1994), 163-180.

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