Menu Analysis: Review and Evaluation

by
Lendal H. Kotschevar
Distinguished Professor
School of Hospitality Management
Florida International University

Various methods are used to evaluate menus. Some have quite different approaches and give different information. Even those using quite similar methods vary in the information they give. The author attempts to describe the most frequently used methods and to indicate their value. A correlation calculation is made to see how well certain of these methods agree in the information they give.

Menus are often examined visually through the evaluation of various factors. It is a subjective method but has the advantage of allowing scrutiny of a wide range of factors which other methods do not. The method is also highly flexible. Factors can be given a score value and scores summed to give a total for a menu. This allows comparison between menus. If the one making the evaluations knows menu values, it is a good method of judgment.

A favorite way of keeping cashiers busy was to have them keep a tally of menu items sold in addition to their taking cash. Often one would see a cashier taking counts of items from sales slips and tabulating them by placing marks after menu items. These were summed for each item to give management valued information on sales. It is an easy and simple way of getting good information on how well menu items are doing.

A popularity index can be made from a menu count by just summing all items sold of a group and calculating the percent the sales of each item are of this total. Thus, instead of a numerical count, a percentage is obtained which management can study to see how well various menu items are doing compared with each other. Thus if 10 of one item sold of a total of 50 overall items, the popularity index would be 20 percent (10/50).

Both menu counts and popularity indexes give information that is informative and valuable. Volume or number of items sold is an important factor in the successful operation of a food service, and, if other factors are also favorable, can indicate good patronage satisfaction and profitable operation. If records are maintained, one has a historical file which is helpful in indicating good menu items to offer.

A disadvantage of popularity index is that it is difficult to compare values between menus when the percent is based on a different number of items studied. If five items are studied one time and then eight the next, items among five have a better chance of having a higher index than

FIU Hospitality Review, Volume 5, Number 2, 1987
Copyright: Contents © 1987 by FIUHospitality Review. Thereproduction of any artwork, editorial, or other material is expressly prohibited without written permission from the publisher.

one in a group of eight. If the five are equally popular, their index is 20 percent, whereas if all eight are equally popular, their index is 12 1/2 percent.

Hurst's menu score[1] is a value obtained by multiplying the percent of patrons selecting items being studied of all similar items offered on the menu by the average gross profit of the items studied. Thus, if there were 340 patrons selecting entree items and 143 selected menu items being studied, the percent would be 42. If the average gross profit of these items was $4.90, then the menu score would be 2.06 (0.42 times $4.90). Hurst's method tests for the combined effect of items such as volume, selling price, food cost, and gross profit. It is highly flexible and sensitive to even slight changes in any factor. It lends itself well to simulation and checking ahead for possible beneficial or undesirable effect in price, food cost or other changes. It is not difficult to do and comes readily from quickly available data. The effect of changes in individual menu items is not available but it does test their effect on the whole which is an important consideration.

Kotschevar's Menu Factor Analysis[2] studies individual items, assigning them a numerical value which indicates how well they come up to management's expectations in food cost, gross profit, dollar sales, and volume. It lends itself to simulation. A factor is derived as follows: a menu item has a popularity index of 15 percent but management expects it to be 18 percent. A factor based on the actual percentage and the expected one is calculated by dividing the expected into the actual percentage (A/E), i.e., 15/18 = 0.83. Such a factor can also be calculated for dollar sales, gross profit, or food cost. Thus, if an item is 22 percent of dollar sales and management expects it to be 20 percent, the factor is 22/20 or 1.10. Any factor over 1.0 indicates a menu item is doing better than expected, while anything below 1.0 indicates it is not meeting management's expectations, except for food cost, where the opposite is true: over 1.0 being bad and under, good. It is possible by studying how various menu items come out when combined together to see the effect they have on each other and how well they compete with each other.

Break even is a tool which can be used to see how much income a menu must bring in before a profit is made. It can also be used to indicate how many items must be sold or patrons served before this occurs. It assumes a linearity in costs, pricing, etc., which may not always occur. It also does not analyze individual menu item performance but it can be helpful in setting goals.

Miller[3], Smith and Kasavana[4], and Pavesic[5] have developed menu analysis methods using matrix techniques. Miller studied the performance of menu items ranking most desirable as those having a (A) low dollar cost and (B) a high volume. Smith and Kasavana ranked them according to their (A) gross profit and (B) volume. Pavesic ranked items on a (A) food cost percent and (B) weighted gross profit.

Each established a standard based on the combined performance of the items studied and then ranked each item individually as to whether they were equal to, above, or below the standard.

The calculations for the standards used in these three matrix

FIU Hospitality Review, Volume 5, Number 2, 1987
Copyright: Contents © 1987 by FIUHospitality Review. Thereproduction of any artwork, editorial, or other material is expressly prohibited without written permission from the publisher.

methods are shown in Table 2. They are drawn from data given in Table 1. Table 3 indicates how these three matrix methods would evaluate the four menu items. The actual value minus the standard gives the menu item's rank value. One standard and item value have the same value and this is called "low" (L) or below standard and therefore not a particularly desirable item on the menu.

Table 1
Operating Data on Four Menu Items

Menu Item	# Sold	% Sold	Item $ Food Cost	Total Food Cost	Selling Price	Total Sales	% Food Cost	Item Gross Profit	Total Gross Profit
1 Steak	20	29	4.75	95.00	11.90	238.00	40	7.15	143.00
2 Chicken	24	35	1.75	42.00	6.95	166.80	25	5.20	124.80
3 Sole	9	13	3.65	32.85	8.70	78.30	42	5.05	45.45
4 Shrimp	16	23	2.60	41.60	7.50	120.00	35	4.90	78.40
TOTALS	69			$211.45		$603.10			$391.65

Table 2
Standard for Three Matrix Methods

Miller

A. $ Food cost = total $ food cost/total no. items sold
$ Food cost = $211.45/69 = $3.06

B. Volume = total items sold/no. of menu items
Volume = 69/4 = 17.25

Smith and Kasavana

A. Volume = 1/no. of items sold x 70%
Volume = 1/4 times .7 = 17.5

B. Gross profit = total gross profit/no. sold
Gross profit = $391.65/69 = $5.68

Pavesic

A. Food cost % = total $ food cost/total $ sales
Food cost % = $211.45/$603.10 = 35%

B. Gross profit = total $ gross profit/no. items
Gross profit = $391.65/4 = $97.91

FIU Hospitality Review, Volume 5, Number 2, 1987
Copyright: Contents © 1987 by FIUHospitality Review. Thereproduction of any artwork, editorial, or other material is expressly prohibited without written permission from the publisher.

Table 3
Results of Three Matrix Analyses of Four Menu Items

Miller	A.	Item $ Food Cost	B.	Volume
	(1)	$4.75 - $3.06 = 1.69 H	(1)	20 - 17.25 = 2.75 H
	(2)	$1.75 - $3.06 = -1.31 L	(2)	24 - 17.25 = 6.75 H
	(3)	$3.65 - $3.06 = 0.59 H	(3)	9 - 17.25 = -8.25 L
	(4)	$2.60 - $3.06 = -0.46 L	(4)	16 - 17.25 = -1.25 L
Smith and Kasavana	A.	Volume	B.	Gross Profit
	(1)	20 - 17.5 = 2.5 H	(1)	$7.15 - $5.68 = 1.47 H
	(2)	24 - 17.5 = 6.5 H	(2)	$5.20 - $5.68 = -0.48 L
	(3)	9 - 17.5 = -8.5 L	(3)	$5.05 - $5.68 = -0.63 L
	(4)	16 - 17.5 = -1.5 L	(4)	$4.90 - $5.68 = -0.78 L
Pavesic	A	% Food Cost	B.	Gross Profit
	(1)	40 - 35 = 5 H	(1)	$143.00 - $97.91 = 45.09 H
	(2)	25 - 35 = -10 L	(2)	$124.80 - $97.91 = 26.89 H
	(3)	42 - 35 = 7 H	(3)	$ 45.45 - $97.91 = -52.46 L
	(4)	35 - 35 = 0 L	(4)	$ 78.40 - $97.91 = -19.51 L

All three methods used terms such as "winner," "dog," or "standard" to indicate the standing of a menu item after analysis. The following table gives these names for the various values of each system:

Table 4
Terms Used to Indicate Values in Matrix Analysis

Miller	High volume (HV)	-Low food cost (LFC)	Winner
	High volume (HV)	-High food cost (HFC)	Marginal 1
	Low volume (LV)	-Low food cost (LFC)	Marginal 11
	Low volume (LV)	-High food cost (HFC)	Loser
Smith and Kasavana	High volume (HV)	-High gross profit (HGP)	Star
	High volume (HV)	-Low gross profit (LGP)	Plowhorse
	Low volume (LV)	-High gross profit (HGP)	Puzzle
	Low volume (LV)	-Low gross profit (LGP)	Dog
Pavesic	Low food cost (LFC)	-High gross profit (HGP)	Prime
	High food cost (HFC)	-High gross profit (HGP)	Standard
	Low food cost (LFC)	-Low gross profit (LGP)	Sleeper
	High food cost (HFC)	-Low gross profit (LGP)	Problem

The four menu items make every category in both Miller's and Pavesic's methods, but Smith and Kasavana find no puzzle. As one can see there is little agreement as to what some of these menu items are - good or bad. They agree on only one item and that is sole. It is bad.

Hayes and Huffman[6] developed a menu analysis method, Goal Value Analysis, which is designed to include more variables than possible in a two-way matrix method. It is largely a quantitative method of

FIU Hospitality Review, Volume 5, Number 2, 1987
Copyright: Contents © 1987 by FIUHospitality Review. Thereproduction of any artwork, editorial, or other material is expressly prohibited without written permission from the publisher.

Table 5
Menu Item Values in Three Matrix Analyses

Menu	Miller		Smith and Kasavana		Pavesic	
	Volume	Food Cost	Volume	Gross Profit	Food Cost	Gross Profit
1 Steak	H	H	H	H	H	H
	(Marginal 1)		(Star)		(Standard)	
2 Chicken	H	L	H	L	L	H
	(Winner)		(Plowhorse)		(Prime)	
3 Sole	L	H	L	L	H	L
	(Loser)		(Dog)		(Problem)	
4 Shrimp	L	L	L	L	L	L
	(Marginal 11)		(Dog)		(Sleeper)	

study. They establish a mathematical model: A times B times C times D = Goal Value; the following are assigned:

A = (1 - food cost %)
B = volume or number sold
C = selling price
D = (1 - variable cost % + food cost %).

They use consolidated data to arrive at a standard which is used as a measure to decide if a calculation using this same formula for individual menu items is equal to the standard, below it or above it. If above the standard, the menu is doing well; if below it, it is not. If it is equal to the standard, it is neither desirable or undesirable.

Using the data given in Table 1, an evaluation can be made on its four menu items with the Goal Value method. The following figures are used to calculate the standard:

Average food cost	211.45/603.10 = 35%
Average no. sold	69/4 = 17.25
Average selling price	603.10/69 = 8.74

A variable percent cost of 32 was selected. The calculation of the numerical standard follows:

A		B		C		D	Numerical Standard
(1 - .35)	times	17.25	times	8.74	times	(1 - [.32 + .35])	= 32.3

The same mathematical model is used to calculate the values for the individual four items. The results follow:

Menu Item	A	Times	B	Times	C	Times	D	Numerical Score
(1) Steak	(1-.40)		20		11.9		(1-[.32 + .40])	= 40.3 H
(2) Chicken	(1-.25)		24		6.95		(1-[.32 + .25])	= 53.8 H
(3) Sole	(1-.42)		9		8.7		(1-[.32 + .42])	= 11.8 L
(4) Shrimp	(1-.35)		16		7.5		(1-[.32 + .35])	= 25.7 L

FIU Hospitality Review, Volume 5, Number 2, 1987
Copyright: Contents © 1987 by FIUHospitality Review. Thereproduction of any artwork, editorial, or other material is expressly prohibited without written permission from the publisher.

The Goal Value method indicates that chicken is the best performer with a score of 53.8 compared with the standard of 32.3. Steak is also an approved item, while shrimp does poorly and sole very poorly.

The three matrix methods and Goal Value Analysis give somewhat similar information about the same menu items. All four methods agree only on one menu item and that is sole. If paired rank correlations are made, Miller and Hayes and Huffman have the highest correlation ($r = .7$). Kendall's test for coefficient of concordance was used to obtain a value to indicate whether there was any correlation between these four methods as a whole. A value of $w = .4$ was obtained. Spearman's rank correlation and a test by Friedman were also made to check against Kendall's. They both agreed with Kendall's finding which indicated some but not a high correlation. These tests would have been stronger had we been comparing more data.

It is readily seen in reviewing and evaluating these different methods for analyzing menus that they can yield a wide variety of valuable information to management. The kind depends upon which method is used. All these methods discussed here lend themselves to computerization, which can considerably simplify compilation of the information.

Menu analysis is a good way to focus management's attention on what menus or menu items are doing or should do; they force management to scrutinize, study, and evaluate menus or menu items. Numerical values can be developed that make possible comparisons which are helpful in making evaluations. They also can allow pretesting or simulation without actually running the menu.

Of these different methods of analysis one might wonder which is best. There is probably no best one because each gives rather specific and different information. Perhaps the best one is the one that suits the conditions and needs of the user. All have value.

Probably the preferred situation in using menu analysis is to use a combination of methods. Certainly any menu needs scrutiny by the subjective method. It is a good way to get at factors which one in no other way can check. Using the Hurst scoring method gives a numerical factor which can be used to compare menus given subjective evaluation. Various tests are available which give detailed information on individual menu items. All three matrix methods have their champions. However, the Hayes-Huffman seems preferable over these because it covers more variables. Combing several or more can certainly be helpful and revealing in indicating how well a menu is doing or should do, or how menu items are doing or should do. Certainly they are better than nothing.

FIU Hospitality Review, Volume 5, Number 2, 1987
Copyright: Contents © 1987 by FIUHospitality Review. Thereproduction of any artwork, editorial, or other material is expressly prohibited without written permission from the publisher.

References

[1]Lendal H. Kotschevar, *Management by Menu,* 2nd ed., (Dubuque, IA: Wm. C. Brown Publishers, 1986), pp. 182-88.

[2]*Ibid.,* pp. 179-82.

[3]Jack Miller, *Menu Pricing and Strategy,* 2nd ed., (New York: Van Nostrand Reinhold, 1986), pp. 185-193.

[4]D.I. Smith, and M.L. Kasavana, *Menu Engineering,* (Okemos, MI: Hospitality Publishers, 1982), pp. 142-158.

[5]D.V. Pavesic, "Prime Numbers: Finding Your Menu's Strengths," *Cornell Quarterly,* (November 1985), pp. 71-77.

[6]David K. Hayes, and Lynn Huffman, "Menu Analysis: A Better Way," *Cornell Quarterly,* (February 1985), pp. 65-69.

FIU Hospitality Review, Volume 5, Number 2, 1987
Copyright: Contents © 1987 by FIUHospitality Review. Thereproduction of any artwork, editorial, or other material is expressly prohibited without written permission from the publisher.