CHAPTER – IV

RESEARCH METHODOLOGY

For many years, research was not widely used in advertising and decisions were made on an intuitive basis. However, with increased competition, mass markets and mounting costs; more and more advertisers have come to rely on research as a basic management tool (Haskins & Kendrick, 1993). Much of research in advertising is applied research, which attempts to solve a specific problem and is not concerned with theorizing or generalizing to other situations. Advertising research does not involve any special techniques, but methods like laboratory, survey, field research, focus groups and content analysis are in common use, providing specific type of info. that meets the needs of the industry.

The three functional research areas in advertising are copy research, media research and campaign assessment research. Media research (the focus of this research) helps determine which advertising vehicles are the most efficient and what type of media schedule will have the greatest impact. Marketers/Advertisers have always been interested in discovering how effective their ads were in generating interest and new business. It is a truism that Advertisers follow consumers wherever they go (just like the famous puppy in the Hutch ad!). As more and more consumers are taking to the Web, advertisers can ill-afford to neglect/ignore this medium which has the fastest adoption rates among all media.

The Web offers a unique advantage over traditional media: the potential for directly measuring results. Advertisers have always had problems linking exposure to a given advertisement and a sale. With Web, however, things are different. In addition to simply viewing a banner ad on a website, consumers can also click on that ad and be given more specific info. about a product and can even buy it online. Not surprisingly, in addition to wanting to know how many times websites are visited, advertisers also want info. about what viewers did when they’re there.

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The first type of measurement that was used was a behavioural one, the "click-through" that measures the number of times a visitor clicks on a banner ad at the site. In addition, advertisers could also track how many actual sales resulted from these click-throughs. For many years, this was the industry standard and everybody seemed pleased. In the mid-1990s click-through rates for some banner ads were around 30%. In the past few years, however, as the novelty of banner ads has worn off and as more and more banner clutter website-pages, there has been a dramatic decline in click-through rates. A 2001 study revealed that the click-through rate had plummeted to only 0.3 percent (Green & Elgin, 2001)².

In response, Web Advertising has shifted from the traditional banner ads to new forms. These include the skyscraper ads (tall and skinny ads at the right and left side of a website), pop-up/pop-under ads (ads that appear when a web page is opened and have to be closed in order to view the content underneath) and larger square/rectangular ads that appear at various places in the website. Early research indicated these new forms were slightly more effective than banner ads.

Moreover, new methods of tracking have become available, like a system whereby a "cookie" is placed on a viewer's computer that tracks where people visit in the days or weeks after seeing an ad. Another method involves randomly selecting visitors to a website who are then given the opportunity to take a brief online survey about what ads they saw. Advertisers are also moving away from the behavioural measure, the click-through, to more cognitive and conative measures. Some companies aren't interested in selling their products online. Instead, they are using Web Communication/Advertising to build brand recognition. Many in the industry also realize that a person doesn't have to click on an ad for that ad to have an impact. Research firms are now reporting data about brand awareness, message recall and brand attitude as well as purchasing interest.

The Web poses special problems for audience measurement. Reliable data on who is looking at web pages and banner advertising are important because without such data advertisers are reluctant to spend money online. As in other

media, advertisers want to know who is visiting a website, how often they visit and whether the CPM (Cost per Thousand) is reasonable. Obtaining such data, however, is difficult. The first attempts to monitor web page traffic consisted of software programs that measured the no. of "hits"or the no. of times someone logs onto the page. These no.'s were unreliable because the programs measured hits in different ways, depending on the server. Moreover, there were programs available that called websites over and over and could be used to inflate the no. of hits. Advertisers preferred to have an independent organization count the numbers (Green, 1998)\(^3\) and it wasn’t long before Internet Rating companies came into existence. The two most visible organizations that measure the Internet audience are \textit{comScore Media Metrix} and \textit{Nielsen/Net Ratings} which provide its panel members with software that monitors online/offline activity and also collect demographic and bahavioural data. Both of these firms face a difficult problem in gathering accurate web data. Much web surfing is done at work and many businesses have been reluctant to allow rating co.’s install tracking software on office computers fearing the software might also be used to access confidential memos/sales data. As a result, all research firms probably underreport office use.

4.1 Justification of the Research

Although fewer than 10\% of Indians have access to the Net, that no. has been growing fast—especially on mobile devices. There are more than 800 million (80 crore) cellphone accounts in India. India has also established a thriving tech. industry that writes software& creates Web services primarily for Western clients.

Advertising on the Internet and the traditional media have their own advantages and disadvantages. There is a testimony of more than 40 years of research to show what the impact of an advertisement on Traditional Media like Television, Print and Radio etc. There has been a good deal of research on impact and effectiveness of Internet Advertising in the West, but in India since the Internet has made a relatively recent entry for majority of the population (the \textit{penetration is just 8\%} in the country, as per ITU, whereas the penetration of

mobile phone is eight times more at 67%, i.e. 800 million for a population of 1.2 billion). There has been little research on attitudes, media habits, usage patterns and motives of Internet users’ towards Web (Marketing) Communication/Advertising, especially in the Indian context. The recent rollout of 3G infrastructure by telecom operators throughout the country has given a tremendous fillip to the consumption of Internet through Portable Data Cards and Smart Phones. Workplaces and Educational Institutions are doing a yeoman’s service in providing free access to their employees and students. With rentals coming drastically down in comparison with yesteryears, more and more households with computers are aspiring to have an internet connection at home and it is becoming more of a necessity than a status symbol or luxury. With so much of explosive growth in the number of Internet users in recent times (out of nowhere, it seems!) and taking into view the proclivity of many of the Internet users to spend a substantial amount of their time online, it is high time Marketers/Advertisers start understanding about their existing or potential customers roaming the information super-highway. This research is hopefully expected to bring valuable contribution to the marketing and advertising community in the country towards better marketing and targeting.

4.2 Research Objectives

1. To explore the demographic and psychographic (lifestyles, activities, interests and opinions) profile of Internet users and their attitudes towards Web Communication/Advertising.

2. To find out how do Internet audience perceive Web Communication/Advertising to be different from Traditional Media (mainly TV, Print and Radio).

3. To find out how do Media Professionals perceive Web Communication/Advertising and the need for Online Presence of businesses.

4. To gain useful insights and suggest strategies for advertisers using the Web as a Marketing Communication/Promotion tool for effective Advertising results.
4.3 Research Design

Keeping into account the exploratory cum descriptive nature/scope of the research, firstly a pilot study was conducted among 25 media professionals to explore the relatively unchartered area of research about the peculiar attitudes, media habits, usage patterns and motives of Indian Internet users' towards Web Communication/Advertising and its relevance to Marketers, especially in the Indian context. Using the survey technique; separate samples of Internet users comprising the layman and specialized media professionals, best representing the characteristics of the population, were taken, using convenient sampling method.

4.4 Research tools

The research instruments administered to both the samples were different in nature and scope, keeping in view the diversity/heterogeneity in background, professional expertise/informed knowledge about the subject. A total of 47 statements describing the psychographic (lifestyles, activities, interests and opinions) profile of the users and their attitude about Web Communication/Advertising were taken in Questionnaire-I (Appendix-I), besides other demographic and media usage info. A 5-interval Likert scale from ‘strongly disagree’ to ‘strongly agree’ was employed to measure the response to each item. A valid sample of 474 respondents (more than ten times the no.of statements) was taken (from NCR) for the instrument. Questionnaire-II (Appendix-II) administered specifically to 127 media professionals (NCR and Sirsa) comprised of 25 statements related to their expert opinion of Web Communication/Advertising and perceived understanding of the need for Online Presence of businesses. The total sample taken was more than five times the no. of statements, enough for application of Factor Analysis.

4.4.1 Factor Analysis

Factor Analysis is a general name denoting a class of procedures primarily used for data reduction and summarization. In marketing research, there may be a large no. of variables, most of which are correlated and which must be
reduced to a manageable level. Relationships among sets of many interrelated variables are examined and represented in terms of a few underlying factors. In analysis of variance, multiple regression and discriminant analysis; one variable is considered as the dependent or criterion variable and others as independent or predictor variables. However, no such distinction is made in factor analysis. Rather factor analysis is an interdependence technique in that an entire set of interdependent relationships is examined.

Once it has been determined that factor analysis is suitable for analyzing the data (as is the case with both instruments Questionnaire- I & II), an appropriate method must be selected. The approach used to derive the weights or factor score coefficients differentiates the various methods of factor analysis. The two basic approaches are principles component analysis and common factor analysis. In principal components analysis (used in this research), the total variance in the data is considered. The diagonal of the correlation matrix consists of unities and full variance is brought into the factor matrix. Principal components analysis is recommended when the primary concern is to determine the minimum number of factors that will account for maximum variance in the data for use in subsequent multivariate analysis. The factors are called principal components.

In common factor analysis, the factors are estimated based on the common variance. Communalities (amount of variance a variable shares with all the other variables being considered which is also the proportion of variance explained by the common factors) are inserted in the diagonal of the correlation matrix. This method is appropriate when the primary concern is to identify the underlying dimensions and the common variance is of interest. This method is also known as principle axis factoring. For determining the no. of factors, only factors with eigenvalues representing the amount of variance associated with the factors) greater than 1.0 are retained; other factors are not included in the model, because factors with variance less than 1.0 are no better than a single variable.

An important output from factor analysis is the factor matrix, also called factor pattern matrix and contain the coefficients used to express the standardized
variables in terms of the factors. These coefficients, the factor loadings, represent
the correlations between the factors and the variables. A coefficient with a large
absolute value indicates that the factor and the variable are closely related. The
coefficients of the factor matrix can be used to interpret the factors.

Although the initial or unrotated factor matrix indicates the relationship
between the factors and individual variables, it seldom results in factors that can
be interpreted, because the factors are correlated with many variables. Therefore,
through rotation, the factor matrix is transformed into a simpler one that is easier
to interpret. In rotating the factors, we’d like each factor to have nonzero or
significant loadings or coefficients for only some of the coefficients. Likewise,
we’d like each variable to have nonzero or significant loadings with only a few
factors, if possible with only one. If several factors have high loadings with the
same variable, it is difficult to interpret them. Rotation does not affect the
communalities and the percentage of total variance explained. However, the
percentage of variance accounted for by each factor does change. The variance
explained by the individual factors is redistributed by rotation. Hence, different
methods of rotation may result in the identification of different factors.

The rotation is called orthogonal rotation if the axis are maintained at
right angles. The most commonly used method for rotation is the varimax
procedure (used in the analysis). This is an orthogonal method of rotation that
minimizes the number of variables with high loadings on a factor, thereby
enhancing the interpretability of the factors. Orthogonal rotation results in factors
that are uncorrelated. The rotation is called oblique rotation when the axis are
not maintained at right angles and the factors are correlated.

The final step in factor analysis involves the determination of model fit. A
basic assumption underlying factor analysis is that the observed correlation
variables can be attributed to common factors. Hence, correlations between the
variables can be deduced or reproduced from the estimated correlations between
the variables and the factors. The differences between observed correlations (as
given in the input correlation matrix) and reproduced correlations (as estimated
from the factor matrix) can be examined to determine model fit. These differences are called residuals. If there are many large residuals (not in this study) present in the upper right triangle of the Reproduced Correlation Matrix, the factor model does not provide a good fit to the data and the model should be reconsidered.

Following interpretation, exact factor scores can be calculated for each respondent (only in the case of principal component analysis), which are uncorrelated (the last Component Score Covariance Matrix is an identity matrix). The factor scores can be used instead of the original variables in subsequent multivariate analysis. A factor is simply a linear combination of the original variables. The factor scores for the $i$th factor may be estimated as follows:

$$F_i = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \ldots + W_{ik}X_k$$

4.4.2 N-Way Analysis of Variance

Analysis of variance and analysis of covariance are used for examining the differences in the mean values of the dependent variable associated with the effect of the controlled independent variables, after taking into account the influence of the uncontrolled independent variables. Essentially, analysis of various (ANOVA) is used as a test of means for two or more populations. The null hypothesis, typically, is that all means are equal. In its simplest form, analysis of variance must have a dependent variable that is metric (measured using an interval or ratio scale). There must also be one or more independent variables. The independent variables must be all categorical (nonmetric). Categorical independent variables are also called factors. A particular combination of factor levels or categories, is called a treatment. One-way analysis of variance involves only one categorical variable or a single factor. In one-way analysis of variance, a treatment is the same as a factor level. If two or more factors are involved, the analysis is termed $N$-way analysis of variance.

If the set of independent variables consists of both categorical and metric variables, the technique is called analysis of covariance (ANCOVA). ANCOVA is an advanced analysis of variance procedure, in which the effects of one or more
metric-scaled extraneous variables are removed from the dependent variable before conducting the ANOVA. In marketing research, one is often concerned with the effect of more than one factor simultaneously. In determining such effects, *n-way analysis of variance* can be used. A major advantage of this technique is that it enables the researcher to examine interactions between the factors. *Interactions* occur when the effects of one factor on the dependent variable depend on the level (category) of the other factors. The procedure for conducting n-way analysis of variance is similar to that for one-way analysis of variance. The statistics associated with n-way analysis of variance are also defined similarly. Considering the simple case of two factors $X_1$ and $X_2$, having categories $c_1$ and $c_2$, the total variation in this case is partitioned as follows:

$$SS_{total} = SS \text{ due to } X_1 + SS \text{ due to } X_2 + SS \text{ due to interaction of } X_1 \text{ and } X_2 + SS_{within}$$

or

$$SS_y = SS_{x_1} + SS_{x_2} + SS_{x_1x_2} + SS_{error}$$

A large effect of $X_1$ will be reflected in a greater mean difference in the levels of $X_1$ and a large $SS_{x_1}$. The same is true for the effect of $X_2$. The larger the interaction between $X_1$ and $X_2$, the larger $SS_{x_1x_2}$ will be. On the other hand, if $X_1$ and $X_2$ are independent, the value of $SS_{x_1x_2}$ will be close to zero. The strength of the joint effect of two factors, called the overall effect or *multiple*, is measured as follows:

$$\text{multiple } \eta^2 = \frac{(SS_{x_1} + SS_{x_2} + SS_{x_1x_2})}{SS_y}$$

The significance of the overall effect may be tested by an $F$ test, as follows:

$$F = \frac{(SS_{x_1} + SS_{x_2} + SS_{x_1x_2})/df_n}{(SS_{error}/df_d)} = \frac{MS_{x_1x_2}/MS_{error}}{df_n/df_d}$$

where $df_n = \text{degrees of freedom for the numerator} = (c_1-1) + (c_2-1) + (c_1-1)(c_2-1) = c_1 c_2 - 1$

$df_d = \text{degrees of freedom for the denominator} = N - c_1 c_2$ and $MS = \text{mean square}$

If overall effect is significant, the next step is to examine *significance of interaction effect* (a test of the significance of interaction between two or more independent variables). Under null hypothesis of no interaction, the appropriate $F$ test is:

$$F = \frac{SS_{x_1x_2}/df_d}{(SS_{error}/df_d)} = \frac{MS_{x_1x_2}/MS_{error}}{df_n/df_d}$$

If the interaction effect is found to be significant, then the effect of $X_1$ depends on
the level of $X_2$ and vice-versa. Because the effect of one factor is not uniform, but varies with the level of the other factor, it is not generally meaningful to test the significance of the main effects. However, it is meaningful to test the significance of each main effect of each factor if the interaction effect is not significant. The significance of the main effect (a test of the significance of the main effect for each individual member) of each factor may be tested as follows for $X_i$:

$$F = \frac{(SS_{xi}/df_n)/(SS_{error}/df_d)}{= MS_{xi}/MS_{error}} \text{ where } df_n = c_1 - 1 \text{ and } df_d = N - c_1 c_2$$

The foregoing analysis assumes that the design was orthogonal or balanced (no. of cases in each cell was same). If cell size varies, analysis becomes more complex. Experimental designs are usually balanced, in that each cell contains same no. of respondents. This results in an orthogonal design in which the factors are uncorrelated. Hence, it is possible to determine unambiguously the relative importance of each factor in explaining the variation in the dependent variable. The most commonly used measure in ANOVA is omega squared, $\omega^2$. This measure indicates what proportion of the variation in the dependent variable is related to a particular independent variable or factor. Normally, $\omega^2$ is interpreted only for statistically significant effects. The relative contribution of a factor is calculated as follows:

$$\omega_x^2 = \frac{(SS_x - (df_x \times MS_{error}))}{(SS_{total} + MS_{error})}$$

4.5 Limitations

The sample taken could have been much larger and not limited to a specific geographical region or it could have been best drawn from all the regions in the country for pan-India generalization of inferences, but for lack of resources. The results of this study are based on survey technique and convenient sampling method, whereas an alternative experimental methodology could have been adopted. The findings of this study may be extended by adding the views of Web advertising experts/professionals. Future research, especially in Indian context, can investigate the effectiveness, reach and precipitating action of the Web and the receptiveness of Indian corporates towards Web Communication/Advertising. The advent of newer technologies in the Web domain can also be examined. A follow-up study can underline the changes happening in the Web media landscape.