Chapter – III

Research Methodology

The methodology adapted to design and structure the present study is summarized in this chapter. The main purpose of the study is to identify and bring out the influencing variables in sales force effectiveness. To work out this identification process, a descriptive and analytical design was framed. The sources of data, statistical methods and models used to analyse the collected data are given in the following paragraphs.

3.1. RESEARCH DESIGN:

A sales person has different traits, which are the net result of various capabilities built upon with different skill sets gained through various means like experience, training, coordination etc. Increase in the sales of an organisation is dependent on the skills of these sales people. But again, not all confer the required skills to give these sales. This may lead to a drag in sales, which is common in a few companies. The skills, which really push the sales chart is one, which proves the effectiveness of the sales force. In short, one has to understand the characteristics of these sales people to measure the effectiveness. As the present study attempted to describe and analyse these behaviours and to outline the skill sets necessary to call a sales force as being effective, this study is descriptive and analytical in nature.

3.2. SAMPLING DESIGN:

To collect the required data, a field survey method was adopted in getting the information. A structured questionnaire was used in the survey to collect the data. Only 2\textsuperscript{nd} and 3\textsuperscript{rd} line managers were selected as sample respondents. Non-probability sampling method was used in finalizing the sample respondents. A method called as accidental-quota sampling was adopted in narrowing down the sample size.

With the help of 35 executives and 5 distributors representing 21 pharmaceutical organizations the necessary information was collected.
A total of 32 pharmaceutical company front line sales executives participated in this survey to give their opinions. The state of Tamil Nadu and Karnataka were selected based on availability of these front line sales people during the study period from March 2012 to January 2013. A sample of 352 respondents was chosen randomly for this survey.

The word random is used here to elaborate certain situation that prevailed during the study period. The targeted pharma sales people were not in a position to give out the required information during their free time as most of them were engaged in prefixed field work and continuous meeting with their section heads. Availability of them was found to be wanting in subsequent intervals. Hence, the researcher had to wait in the place where people gather and had to request for permission and then had to convince them about the importance of this survey. The researcher experienced continuous decline and denial from the sales executives to give out data. Therefore, randomly one has to move along their crowd and spend at least 30 minutes with them to get the necessary information. During this survey period, two sales executives in fact had to face the wrath of their higher authorities for revealing the information.

3.3. SAMPLE SIZE:

Pharmaceutical sales executives as members of Federal Medical Representatives Association of India come to around 85,000. In Tamilnadu and Karnataka, the registered number was 12,000 and 6,000 respectively. Of these total 18,000 pharmaceutical executives, 450 samples were collected. Due to lack of information and other errors in the questionnaire, the present study considered only 352 respondents for the current research. No equal distribution of sample was considered between these two States due to personal difficulty faced by the respondents in the survey. Hence, out of these 352 samples, 114 responses came from Karnataka and the remaining 238 sample were drawn from Tamil Nadu.

3.4. ANALYTICAL FRAMEWORK:

Initially, before finalizing the questionnaire for the survey, a pilot study was conducted on sales executives of automobile industry and a few pharmaceutical industries. The results and the suggestions were carried out in the final questionnaire constructs to exercise on the selected sample size.
Analysis of data for the present research was done after categorizing the important variables that emerged from the survey. To extract the required constructs and other variables, the following statistical tools were applied:

**3.4.1. SIMPLE PERCENTAGE ANALYSIS**

Simple percentage analysis was used to bring out the proportionate portion of each variable to understand the composition of respondents in different criteria chosen. This percentage method was utilized in constructing cross-tabulation to estimate the two-way cross analysis of selected variables.

**3.4.2. CHI-SQUARE TEST**

Relationship between the selected variables has been estimated with this test. For this purpose, the following set of components was considered:

a) Age of the respondents
b) Educational qualification of the respondents
c) Work experience in the present company
d) Work experience in pharmaceutical industry
e) Number of organisation worked
f) Sales target achieved
g) Number of new accounts added.

The inference of the above is structured on the maximum number of times the variables are found to be related with the dependent variable and if it is disclosing a relevant relationship.

**3.4.3. FACTOR ANALYSIS:**

Combination of related variables into a smaller number of relevant factors is an effective way of narrowing down to a few variables which might have a strong influence on the attitude and perception of the respondents. This has been analyzed with the help of
factor analysis. From this factor analysis, we have taken into consideration rotated matrix of the factors, and have renamed the factors which end with the correlation of more than 0.50. These factors are then taken as estimation variables in the regression equations.

This method was applied using the following steps:

a) **Sampling Adequacy:**

Sampling adequacy was adopted for the selected three constructs namely, (i) Inter-personal skills, (ii) Salesmanship skills, and (iii) Technical skills. Adequacy was tested based on the results of Kaiser-Meyer-Olkin measure and Bartlett’s test of sphericity.

b) **Cronbach’s alpha:**

Reliability of the responses received was tested using this method. A value of more than 0.70 was considered strong and that particular component was taken as reliable information for further analysis. A value less than 0.70 were considered to be weak, which showed to exhibit a less reliable component. However, in the present study, a few components were taken for extraction even with value less than 0.30, since adding this strengthens the other components correlation matrix. This in addition gave better explanation for the variance. If the components are able to explain more than 60 per cent of variations, it was considered as strong explanatory power. Here also, the study had taken little deviation from the benchmark of 0.60, in a few instances; the present study had to rely on scores which had explanatory power of 55 percent.

c) **Factor Extraction:**

Principal component method was used to extract factor loadings from the components exported to the data base. Factors with eigen value more than one was extracted using the scree plots.

d) **Factor rotation:**

Varimax method of rotation was adopted in rotating the factors extracted and was used for renaming the same. The factor scores were then saved as each separate variable in the regression format for further analysis.
3.4.4. MULTIPLE REGRESSION ANALYSIS:

Simple least square method was tested on selected variable. These variables have been categorized into dependent and independent variables according to the necessity of the estimation. Two features which were considered important for setting up the required equation was used as both dependent and independent variables interchangeably, viz., different skill sets and the sales effectiveness.

1) Interpersonal Skills (IPS)

In this model, the degree of influence between interpersonal skill sets and sales target were structured based on the following:

*Interpersonal skill set components:*

a) Listening skills(X1)

b) Optimism(X2)

c) Empathy(X3)

d) Buyer-seller relationship(X4)

e) Perceptive observation(X5)

a) IPS and Sales Target Fixed:

*Assumption:*

1. Sales target fixed in 2009 was influenced by the IPS sets.
2. Sales target fixed in 2010 was influenced by the IPS sets.
3. Sales target fixed in 2011 was influenced by the IPS sets

*Model:*

Sales Target 2009 = f(X1,X2,X3,X4,X5)  ----------------------- (1)

Sales Target 2010 = f(X1,X2,X3,X4,X5)  ----------------------- (2)

Sales Target 2011 = f(X1,X2,X3,X4,X5)  ----------------------- (3)
**OLS Equation:**

Sales Target 2009 = $b_0 + b_1 X1 + b_2 X2 + b_3 X3 + b_4 X4 + b_5 X5 + U_e$  

Where $b_1$ = coefficient of Listening skills  

$b_2$ = coefficient of Optimism  

$b_3$ = coefficient of Empathy  

$b_4$ = coefficient of buyer-seller relationship  

$b_5$ = coefficient of perceptive observation  

$b_0$ = constant  

Similarly, all sets of estimation for the described functions for sales target 2010, and 2011 were followed on the above stated equation format.

**b) IPS and Net Account Added:**

**Assumption:**

1. Net account added in 2009 was influenced by the IPS sets  
2. Net account added in 2010 was influenced by the IPS sets  
3. Net account added in 2011 was influenced by the IPS sets  

**Model:**

Net account added 2009 = $f(X1,X2,X3,X4,X5)$ ----------------- (1)  
Net account added 2010 = $f(X1,X2,X3,X4,X5)$ ----------------- (2)  
Net account added 2011 = $f(X1,X2,X3,X4,X5)$ ----------------- (3)  

**OLS Equation:**

Net account added 2009 = $b_0 + b_1 X1 + b_2 X2 + b_3 X3 + b_4 X4 + b_5 X5 + U_e$  

Where $b_1$ = coefficient of Listening skills  

$b_2$ = coefficient of Optimism  

$b_3$ = coefficient of Empathy
\( b_4 = \) coefficient of buyer-seller relationship \\
\( b_5 = \) coefficient of perceptive observation \\
\( b_0 = \) constant \\

Similarly, all the set of estimation for the described functions for Net account added 2010, and 2011 were followed on the above stated equation format.

c) Sales training received and IPS:

Assumption:

1) Sales training attended in 2009 influences the IPS sets.(Y1)
2) Sales training attended in 2010 influences the IPS sets.(Y2)
3) Sales training attended in 2011 influences the IPS sets.(Y3)

Model:

\[
X_1 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (1) \\
X_2 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (2) \\
X_3 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (3) \\
X_4 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (4) \\
X_5 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (5)
\]

OLS Equation:

\[
X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e
\]

Where \( b_1 = \) coefficient of Sales training 2009 \\
\( b_2 = \) coefficient of Sales training 2010 \\
\( b_3 = \) coefficient of Sales training 2011 \\
\( b_0 = \) constant \\

Similarly, all the sets of estimation for the described functions for \( X_2, X_3, X_4, \) and \( X_5 \) were followed on the above stated equation format.
d) Recognition received and IPS:

Assumption:

1) Recognition in 2009 influences the IPS sets.(Y1)
2) Recognition in 2010 influences the IPS sets.(Y2)
3) Recognition in 2011 influences the IPS sets.(Y3)

Model:

\[ X_1 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \quad \text{(1)} \]
\[ X_2 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \quad \text{(2)} \]
\[ X_3 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \quad \text{(3)} \]
\[ X_4 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \quad \text{(4)} \]
\[ X_5 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \quad \text{(5)} \]

OLS Equation:

\[ X_1 = b_0 + b_1Y_1 + b_2Y_2 + b_3Y_3 + \varepsilon \]

Where \( b_1 = \text{coefficient of Recognition 2009} \)
\( b_2 = \text{coefficient of Recognition 2010} \)
\( b_3 = \text{coefficient of Recognition 2011} \)
\( b_0 = \text{constant} \)

Similarly, all the set of estimation for the described functions for \( X_2, X_3, X_4, \) and \( X_5 \) were followed on the above stated equation format.

e) Work Experience and IPS:

Assumption:

1) Work Experience Influences the IPS sets.(Y)

Where Work Experience is defined as:

- Number of work experience in Pharmaceutical industry (Industry Exp)
- Number of work experience in different organizations (Organisation Exp)
- Number of work experience in Present company (Present company Exp)
Model:

\[ X_1 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \quad \ldots \ldots (1) \]
\[ X_2 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \quad \ldots \ldots (2) \]
\[ X_3 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \quad \ldots \ldots (3) \]
\[ X_4 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \quad \ldots \ldots (4) \]
\[ X_5 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \quad \ldots \ldots (5) \]

OLS Equation:

\[ X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e \]

Where \( b_1 \) = coefficient of Industry Exp
\( b_2 \) = coefficient of Organization Exp
\( b_3 \) = coefficient of Present company Exp
\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for \( X_2, X_3, X_4, \) and \( X_5 \) were followed on the above stated equation format.

2) Salesmanship Skills (SMS)

In this model, the degree of influence between salesmanship skill sets and sales target were structured based on the following:

Salesmanship skill set components:

a) Consultative Selling (X1)

b) Salesperson cues & Communication style (X2)

c) Adaptability (X3)

d) Negotiation (X4)

a) SMS and Sales Target Fixed:

Assumption:

1. Sales target fixed in 2009 was influenced by the SMS sets.
2. Sales target fixed in 2010 was influenced by the SMS sets.
3. Sales target fixed in 2011 was influenced by the SMS sets
Model:

Sales Target 2009 = f(X1,X2,X3,X4) ------------------ (1)
Sales Target 2010 = f(X1,X2,X3,X4) ------------------ (2)
Sales Target 2011 = f(X1,X2,X3,X4) ------------------ (3)

OLS Equation:

Sales Target 2009 = b0 + b1 X1 + b2X2 + b3X3 + b4X4 + U_c

Where b₁ = coefficient of Consultative selling
b₂ = coefficient of Salesperson cues & Communication style
b₃ = coefficient of Adaptability
b₄ = coefficient of Negotiation
b₀ = constant

Similarly, all the set of estimation for the described functions for sales target 2010, and 2011 were followed on the above stated equation format.

b) SMS and Net Account Added:

Assumption:

1. Net account added in 2009 was influenced by the SMS sets
2. Net account added in 2010 was influenced by the SMS sets
3. Net account added in 2011 was influenced by the SMS sets

Model:

Net account added 2009 = f(X1,X2,X3,X4) ------------------ (1)
Net account added 2010 = f(X1,X2,X3,X4) ------------------ (2)
Net account added 2011 = f(X1,X2,X3,X4) ------------------ (3)

OLS Equation:

Net account added 2009 = b₀ + b₁ X1 + b₂X2 + b₃X3 + b₄X4 + U_c
Where \( b_1 \) = coefficient of Consultative selling

\( b_2 \) = coefficient of Salesperson cues & Communication style

\( b_3 \) = coefficient of Adaptability

\( b_4 \) = coefficient of Negotiation

\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for Net account added 2010, and 2011 were followed on the above stated equation format.

c) **Sales training received and SMS:**

**Assumption:**

1) Sales training attended in 2009 influences the SMS sets.(Y1)

2) Sales training attended in 2010 influences the SMS sets.(Y2)

3) Sales training attended in 2011 influences the SMS sets.(Y3)

**Model:**

\[ X_1 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \] \quad (1)

\[ X_2 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \] \quad (2)

\[ X_3 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \] \quad (3)

\[ X_4 = f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \] \quad (4)

**OLS Equation:**

\[ X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e \]

Where \( b_1 \) = coefficient of Sales training 2009

\( b_2 \) = coefficient of Sales training 2010

\( b_3 \) = coefficient of Sales training 2011

\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for X2, X3, and X4 were followed on the above stated equation format.
d) Recognition received and IPS:

Assumption:

1) Recognition in 2009 influences the SMS sets. (Y1)
2) Recognition in 2010 influences the SMS sets. (Y2)
3) Recognition in 2011 influences the SMS sets. (Y3)

Model:

\[ X_1 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \]  
\[ X_2 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \]  
\[ X_3 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \]  
\[ X_4 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \]

OLS Equation:

\[ X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e \]

Where \( b_1 \) = coefficient of Recognition 2009
\( b_2 \) = coefficient of Recognition 2010
\( b_3 \) = coefficient of Recognition 2011
\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for \( X_2, X_3, \) and \( X_4 \) were followed on the above stated equation format.

e) Work Experience and SMS:

Assumption:

1) Work Experience Influences the SMS sets. (Y)

Where Work Experience is defined as:

- Number of work experience in Pharmaceutical industry (Industry Exp)
- Number of work experience in different organizations (Organisation Exp)
- Number of work experience in Present company (Present company Exp)
Model:

\[ X_1 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \] ------- (1)

\[ X_2 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \] ------- (2)

\[ X_3 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \] ------- (3)

\[ X_4 = f(\text{Industry Exp, Organizations Exp, Present Company Exp}) \] ------- (4)

**OLS Equation:**

\[ X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e \]

Where \( b_1 = \) coefficient of Industry Exp

\( b_2 = \) coefficient of Organization Exp

\( b_3 = \) coefficient of Present company Exp

\( b_0 = \) constant

Similarly, all the set of estimation for the described functions for \( X_2, X_3, \) and \( X_4 \) were followed on the above stated equation format.

3) **Technical Skills (TES)**

In this model, the degree of influence between technical skill sets and sales target were structured based on the following:

**Technical skill set components:**

a) Customer/product knowledge (\( X_1 \))

b) Competitive strength (\( X_2 \))

c) Client Evaluation (\( X_3 \))

d) Organization Knowledge (\( X_4 \))

a) **TES and Sales Target Fixed:**

**Assumption:**

1. Sales target fixed in 2009 was influenced by the TES sets.

2. Sales target fixed in 2010 was influenced by the TES sets.

3. Sales target fixed in 2011 was influenced by the TES sets
Model:

Sales Target 2009 = f(X1,X2,X3,X4) ------------------ (1)
Sales Target 2010 = f(X1,X2,X3,X4) ------------------ (2)
Sales Target 2011 = f(X1,X2,X3,X4) ------------------ (3)

OLS Equation:

Sales Target 2009 = b_0 + b_1 X1 + b_2 X2 + b_3 X3 + b_4 X4 + U_e

Where

b_1 = coefficient of customer/product knowledge
b_2 = coefficient of competitive strength
b_3 = coefficient of client evaluation
b_4 = coefficient of organization knowledge
b_0 = constant

Similarly, all the set of estimation for the described functions for sales target 2010, and 2011 were followed on the above stated equation format.

b) TES and Net Account Added:

Assumption:

1. Net account added in 2009 was influenced by the TES sets
2. Net account added in 2010 was influenced by the TES sets
3. Net account added in 2011 was influenced by the TES sets

Model:

Net account added 2009 = f(X1,X2,X3,X4) ------------------ (1)
Net account added 2010 = f(X1,X2,X3,X4) ------------------ (2)
Net account added 2011 = f(X1,X2,X3,X4) ------------------ (3)

OLS Equation:

Net account added 2009 = b_0 + b_1 X1 + b_2 X2 + b_3 X3 + b_4 X4 + U_e
Where \( b_1 \) = coefficient of customer/product knowledge

\( b_2 \) = coefficient of competitive strength

\( b_3 \) = coefficient of client evaluation

\( b_4 \) = coefficient of organization knowledge

\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for Net account added 2010, and 2011 were followed on the above stated equation format.

c) Sales training received and TES:

Assumption:

1) Sales training attended in 2009 influences the TES sets. (Y1)
2) Sales training attended in 2010 influences the TES sets. (Y2)
3) Sales training attended in 2011 influences the TES sets. (Y3)

Model:

\[
\begin{align*}
X_1 &= f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (1) \\
X_2 &= f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (2) \\
X_3 &= f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (3) \\
X_4 &= f (\text{Sales training 2009, Sales training 2010, Sales training 2011}) \quad (4)
\end{align*}
\]

OLS Equation:

\[
X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e
\]

Where \( b_1 \) = coefficient of Sales training 2009

\( b_2 \) = coefficient of Sales training 2010

\( b_3 \) = coefficient of Sales training 2011

\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for \( X_2, X_3, X_4 \) were followed on the above stated equation format.
d) Recognition received and TES:

Assumption:

1) Recognition in 2009 influences the TES sets. (Y1)
2) Recognition in 2010 influences the TES sets. (Y2)
3) Recognition in 2011 influences the TES sets. (Y3)

Model:

\[ X_1 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \] ------ (1)
\[ X_2 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \] ------ (2)
\[ X_3 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \] ------ (3)
\[ X_4 = f(\text{Recognition 2009, Recognition 2010, Recognition 2011}) \] ------ (4)

OLS Equation:

\[ X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e \]

Where \( b_1 \) = coefficient of Recognition 2009
\( b_2 \) = coefficient of Recognition 2010
\( b_3 \) = coefficient of Recognition 2011
\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for \( X_2, X_3, X_4 \), and \( X_5 \) were followed on the above stated equation format.

e) Work Experience and TES:

Assumption:

1) Work Experience Influences the TES sets. (Y)

Where Work Experience is defined as:

Number of work experience in Pharmaceutical industry (Industry Exp)
Number of work experience in different organizations (Organisation Exp)
Number of work experience in Present company (Present company Exp)
Model:

\[ X_1 = f \text{(Industry Exp, Organizations Exp, Present Company Exp)} \] ------ (1)

\[ X_2 = f \text{(Industry Exp, Organizations Exp, Present Company Exp)} \] ------ (2)

\[ X_3 = f \text{(Industry Exp, Organizations Exp, Present Company Exp)} \] ------ (3)

\[ X_4 = f \text{(Industry Exp, Organizations Exp, Present Company Exp)} \] ------ (4)

**OLS Equation:**

\[ X_1 = b_0 + b_1 Y_1 + b_2 Y_2 + b_3 Y_3 + U_e \]

Where \( b_1 \) = coefficient of Industry Exp

\( b_2 \) = coefficient of Organization Exp

\( b_3 \) = coefficient of Present company Exp

\( b_0 \) = constant

Similarly, all the set of estimation for the described functions for \( X_2, X_3, X_4 \), and \( X_5 \) were followed on the above stated equation format.