

An Exploratory Study on Effect of Behavioural Interventions on Managerial Styles

R.S. Murali

Managing Director, NCR Consultants Limited
e-mail: muralirs@ncrcl.com

INTRODUCTION

Background

How are the attributes like quality, delivery, etc developed or evolved in an organisation and how are these practiced in reality? Are these managed by only one person in an organisation or several persons take charge? How are these attributes understood by various employees, how do they orient themselves towards these attributes? Can the organisational systems (processes, procedures, etc) alone decide these? If someone does not follow these attributes will that person be punished or alienated? How do people hold on to these attributes continually? - are questions that arise. Once these questions are answered and understood we get to know of the "managerial style" of an organisation.

Some of these attributes are created consciously and some of them unconsciously. The managerial styles of various employees combine together and form the culture or values of an organisation. Organisations evolve. The way an organisation evolves is similar to that of a human being. The attributes or characteristics with which an organisation develops can be based on different "approaches" or "styles". The field of management science is evolving making appropriate use of technology and through multi-disciplinary research. However, there is no management without "man" or the human being. While there have been periodic and major contributions to management thought by the "behavioural scientists" one question that has not been completely addressed is the area of "managerial styles". While shape of organisations are understood today by organisation structure or organogram, is there a way by which organisation styles can be understood, *is there a way by which we can establish or plot in a diagram "managerial styles" of organisations? is one major question.*

Management is a product of human thinking. It is not just managerial "systems" (consisting of organisation charts, job descriptions, information technology, management information systems, etc oriented towards processes of management) that alone contribute for the achievement of the organizational objectives. Even if systems are in place it requires a human being to undertake the "actual delivery". In any structured organisation the problem is not related to systems but to people. The way or the "style" in which a person performs his job decides the success. Hence the entire organisation process can be in a simple way explained with a simple diagram as shown in Fig.1.

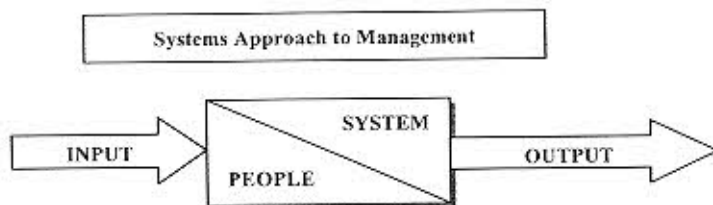


Fig. 1: Systems Approach to Management

The “people” who are actually involved in day to day decision making and running of an organisation shape the way in which the organisation performs and they determine the “managerial style”. These persons who decide the managerial style of the organisation do so making use of their mental capacity and their emotions to take such decisions. In a given situation the employees make use of both their intelligence and their emotions and take decisions within the framework of their “managerial style”. This involves their psyche. Hence running an organisation is deeply related to the psychology of the persons who run them. “Can the managerial style of the persons in an organisation be modified by proper behavioural interventions?” is the second question that needs to be addressed to understand the complete phenomenon of managerial styles.

Objectives of the Study

The Objectives of the Study:

- To examine whether Managerial Style Diagram can show visually, the impact of behavioural interventions;
- To examine whether behavioural interventions significantly influence the Managerial Styles of an Organisation on overall basis (to be statistically tested);
- To examine whether behavioural interventions significantly influence individual elements constituting the Managerial Styles of an Organisation (to be statistically tested);
- To examine whether behavioural interventions significantly influence the Managerial Styles of the individual subjects (persons under study) in an Organisation, (to be statistically tested).

This exploratory study is based on the pioneering work by Joseph A. Petrick and John F. Quinn (1997), *Management Ethics – Integrity at Work*. It is based on the theoretical foundation of the Competing Values Framework (CVF) originally proposed by Robert E. Quinn. These authors, in this study developed a Management Assessment Style questionnaire that was used to evaluate the managerial style of an organisation through its executives. The focus of the study was on the competing values – that is how values, in relation to ethics, economics and management, influence the managerial style of an organisation. The study looked at four basic theories in management: open systems theory, rational goal theory, internal process theory and human relations theory. Based on these concepts eight managerial styles have been evolved *Innovator/Broker* based on open systems theory, *Producer/Director* based on rational goal theory, *Coordinator/Monitor* based on internal systems theory and

Facilitator /Mentor based on Human relations theory. Based on a 36 response questionnaire (Managerial Style Assessment Questionnaire) the managerial style pattern can be plotted on a seven point scale. Hence based on the four theories and the competing values propagated by them eight managerial styles evolve.

The study in the recent times was further extended to compare the competing values of the executives of two different continents: America and Europe. This study done by Annemette Kruse Jensen¹ (2002) "Handling Competing Values in Ethics, Economics and Management - A Cross-Cultural Empirical Study of American and Danish Managerial Attitudes"² looked at the CVF from a different perspective. In the study the author completed a cross-cultural, comparative empirical survey of American and Danish managers and confirmed four hypotheses. According to hypothesis one it was found that a strong correlation exists between ethics, economics and management for American managers. Further, hypothesis two demonstrated that American managers emphasize control in ethics, economics and management, while hypothesis three illustrated that Danish managers tend to focus on a more flexible approach or attitude. Finally, the fourth hypothesis illustrated that some smaller countries might emphasize extreme managerial attitudes to be externally competitive.

The original and the subsequent studies looked at the CVF and studied the behavior of various sets of executives from ethical, economic and management perspective. This current study, however, looks at the CVF and Managerial Style Assessment instrument from a different perspective. The instrument used in these studies basically plots the managerial style followed by an organisation. In this study a pioneering attempt has been made to use the MSA diagram to plot the shape of the managerial style of an organisation. It is believed that this would highlight the managerial "imbalances" of an organisation. Based on the analysis of existing managerial style, an attempt is made to provide certain behavioural modification inputs to correct the observed imbalances, if any, and the impact of such behavioural interventions is then studied. The instrument is used to study the change in managerial style of a Consultancy Organization when Organizational Behaviour Modification techniques are used.

CV FRAMEWORK AND BEHAVIOURAL MODIFICATION

Managerial Style

The Competing Values Framework³ takes into account four basic management theories: human relations theory, open systems theory, internal process theory and rational goal theory. Based on these four approaches the authors have identified four dimensions that influence an organisation: flexibility – control – internal – external.

¹ Department of Economics, Wright State University.

² Jensen Annemette Kruse (2002), "Handling competing values in ethics, economics and management: a cross-cultural empirical study of American and Danish managerial attitudes" (a report submitted in partial fulfillment of the requirements for the degree of Master of Science in Applied and Social Economics), Wright State University.

³ Joseph A Petrick & John F Quim, (1997), *ibid*.

The interaction between the four theories and the directions result in eight managerial styles: Innovator – Broker – Producer – Director – Coordinator – Monitor – Facilitator – Mentor. These managerial styles reflect the values and define the culture of the organisation from scientific management viewpoint.

The rational goal theory, which Frederick Taylor introduced at the beginning of the 20th century, stresses the **director** and **producer** role responsibilities of setting goals, taking initiative, increasing productivity, and maximizing output by emphasizing goal clarification, rational analysis, and action taking⁴.

The internal process theory, which Max Weber and Henri Fayol developed in the first quarter of the 20th century, stresses the **monitor** and **coordinator** role responsibilities of information management, documentation control, efficient processing, and consolidated continuity by emphasizing process measurement, smooth functioning of organisational operations, and structural order⁵.

The human relations theory, which was made famous by Elton Mayo and Hawthorne studies in the second quarter of the 20th century, stresses the **facilitator** and **mentor** role responsibilities of fostering openness, participation, team morale building, and commitment by employee involvement, humane conflict resolution, and consensus building⁶.

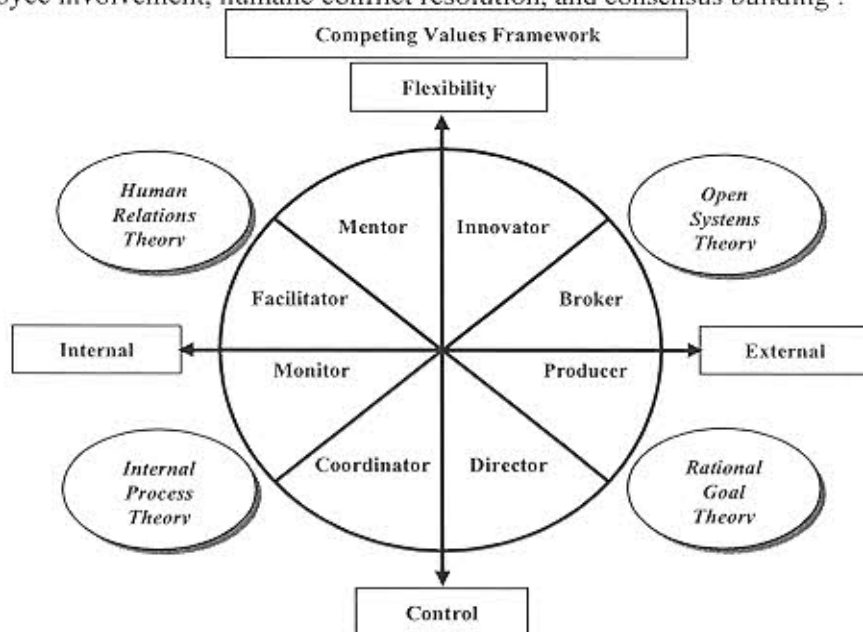


Fig. 2: Competing Values.

The opens systems theory, which was advocated by Paul Lawrence and Jay Lorsch in the third quarter of the 20th century, stresses the **innovator** and **broker** role responsibilities of cultivating organisational learning capabilities and developing the competitive power of

⁴ Taylor F.W. (1911), *The Principles of Scientific Management*, Harper & Brothers, New York.

⁵ Weber M. (1921), *Theory of Social and Economic Organisation*, Oxford University Press, London.

⁶ Mayo E. (1933), *The Human Problems of Industrial Civilization*, Macmillan, New York.

continual creativity, political adaptation, and negotiated external resource acquisition by emphasizing external trend scanning, creative system change and development, and negotiated contractual agreements and networking⁷.

For a well run organisation these eight roles need to be properly balanced. It is proposed to examine how in any organisation these roles are exhibited. This is evaluated through Management Style Assessment Questionnaire.

Behavioural Modification through Positive Reinforcements

Organizational Behaviour Modification is the application of the principles of behavioural modification, which evolved from the work of B.F. Skinner⁸. The OB Mod approaches provide perspectives on the dynamics by which employees can be motivated to change their behaviour in order to bring the desired results for the organization. The OB Mod uses four alternative consequences based on the manager's use of modification techniques and the arising nature of consequences commonly referred to as "law of effect".

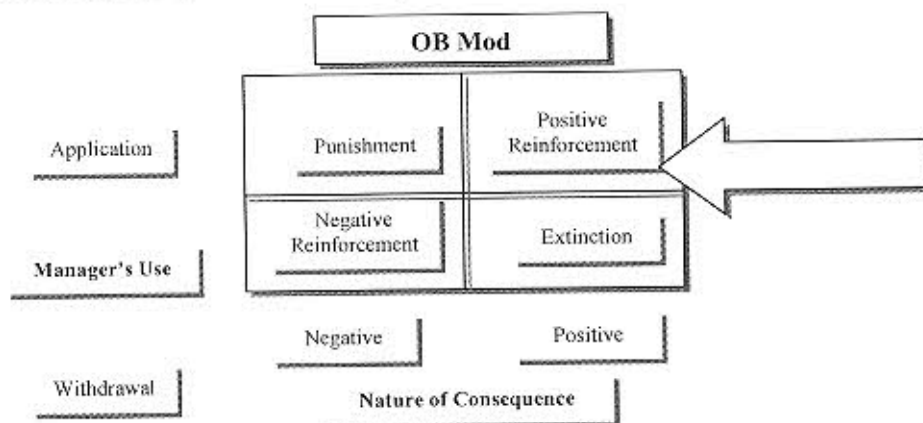


Fig. 3: The OB Modification Model.

In this study, the use of OB Mod⁹ by Manager for providing positive behaviour towards organizational work has been considered. This is called positive reinforcement. "Thus in attempting to help an individual or group develop – to get them to take more and more responsibility for performing a specific task – a leader must first tell and show the follower(s) what to do; second, delegate *some* responsibility (not too much or failure might result); and third, reward as soon as possible any behaviour in desired direction. This process should continue as the individual's behaviour comes closer and closer to the leader's expectations of good performance.... Relationship behaviour would involve providing "positive strokes" and reinforcements. Positive reinforcement strokes are anything that is desired or needed by an individual whose behaviour is being reinforced... **This three step process of (1) initiating**

⁷ Lawrence P.R. & Lorsch J.W. (1967), *Organisation and Environment*, Harvard University Press, Cambridge.

⁸ Skinner B.F. (1953), *Science and Human Behaviour*, New York Macmillan (Free Press).

⁹ Newstrom J.W, Davis Keith (2002), *Organisational Behaviour – Human Behaviour at Work*, Tata McGraw Hill Publishing Company Limited, pp 112.

structure or providing direction (task behaviour), (2) reducing the amount of direction and support (relationship behaviour) is known as *positively reinforcing successive approximations*. This concept is associated with behaviour modification and reinforcement theory, and more recently, in industrial circles it has been called performance management¹⁰.

Reinforcement versus Motivation: It is important to differentiate reinforcement from the concept of employee motivation. Motivation represents a primary psychological process that is largely cognitive in nature. Thus, motivation is largely internal, it is experienced by the employee, and we can see only subsequent manifestations of it in actual behavior. Reinforcement, on the other hand, is typically observable and most often externally administered. A supervisor may reinforce what he or she considers desirable behavior without knowing anything about the underlying motives that prompted it. This distinction should be kept in mind when we examine behavior modification and behavioral self-management.

In order for a positive reinforcement to be effective in facilitating the repetition of desired behavior, several conditions must be met. First, the reinforcer itself (praise) must be valued by the employee. It would prove ineffective in shaping behavior if employees were indifferent to it. Second, reinforcer must be strongly tied to the desired behavior. Receipt of the reinforcer by the employee must be directly contingent upon performing the desired behavior. "Rewards must result from performance, and the greater the degree of performance by an employee, the greater should be his reward." It is important to keep in mind here that 'desired behavior' represents behavior defined by the supervisor, not the employee. Third, there must be ample occasion for the reinforcer to be administered following desired behavior. If the reinforcer is tied to certain behavior that seldom occurs, such as very high performance, then individuals will seldom be reinforced and will probably associate this behavior with a reward. It is important that the performance-reward contingencies be structured so that they are easily attainable¹¹.

Behavioural Interventions

The behavioural interventions supposed is based on the concept of "successive approximations". No one learns how to do anything all at once. A little bit is learnt every time. Hence if a Manager wants to change the behaviour (in this present study "managerial style") then the Manager should reward the slightest progress the person makes for creating positive reinforcements. Such reinforcements make them move to the next stage of betterment and again the needed positive intervention is given. Such successive attempts enable "successive approximations" in the person and move him to the desired level of behaviour.

The behavioural interventions that were taken up in this study were:

- Providing structure and direction by giving specific job responsibility, clarity in work by introduction of daily reporting;

¹⁰ Hersey Paul, Blanchard H. Kenneth (1990), *Management of Organizational Behaviour – Utilizing Human Resources*, Prentice Hall of India Private Limited, pp-239-240.

¹¹ Richard M Steers (1991), *Introduction to Organisational Behavior*, pp- 96-97.

- Reducing Supervisions and Direction by providing the person with more responsibility;
- Review of work on periodic basis and providing socio emotional support by increased personnel contacts and counseling.

TABLE 1: SCHEDULES OF REINFORCEMENT

Schedule of Reinforcement	Nature of Reinforcement	Effects on Behavior When Applied	Effects on behavior When Terminated	Example
1. Fixed interval	Reward on fixed time basis	Leads to average and irregular performance	Quick extinction of behavior	Weekly paycheck
2. Fixed ratio	Reward consistently tied to output	Leads quickly to very high and stable performance	Quick extinction of behavior	Piece-rate pay system
3. Variable interval	Reward given at variable intervals around some average time	Leads to moderately high and stable performance	Slow extinction of behavior	Monthly performance appraisal and reward at random times each month
4. Variable ratio	Reward given at variable output levels around some average output	Leads to very high performance	Slow extinction of behavior	Sales bonus tied to selling X accounts, but X constantly changes around some mean

Source: Richard M Steers (1991), "Introduction to Organizational Behavior", pp 101.

The successive approximations taken up are based on the reinforcements given at variable interval during the study.

METHODOLOGY

Statement of the Problem

This study seeks to look at the way in which Managerial Style patterns in organizations could be mapped and examine if behavioural interventions can influence Managerial Styles.

Hence the Hypotheses for the study have been framed as under:

H₁: Behavioural interventions cannot influence the *overall managerial styles* of an organization

H₂: Behavioural interventions cannot influence the *individual elements of managerial styles* of an organization

H₃: Behavioural interventions cannot influence the *managerial styles of individuals* (subjects) in an organization

Research Design

The research design for the study is exploratory/formulative research, which can be classified as quasi experimental. The overall design is explorative in order to provide opportunity for considering different aspects of the problem. The research design is explorative (purposive sample) with regard to sample design and statistical design (with no preplanned design for analysis) and is experimental (descriptive/diagnostic) to the extent of the observational design (through structured questionnaires for collection of data) and operational design (as it uses well laid out operational procedures).

Sample

The sample for the design has been selected from a Consultancy Company specializing in Management Consultancy. The sample size is 32 and consists of employees at three levels: Senior (Consultant), Middle (Executive) and Operational (Trainees). The sample includes males and females, married and unmarried, professionally qualified, post graduates and graduates, experienced and inexperienced and from families with different backgrounds.

Since the study is of quasi-experimental or explorative nature, purposive sampling method has been used.

Research Instrument

The primary tool used for the study is a questionnaire developed and tested in several countries. This tool was developed by Joseph A Petrick and John F Quinn as part of their work on Management Ethics¹². The tool is basically a questionnaire containing 36 questions on various aspects of Managerial Style. Based on the response the organizational Managerial Style can be mapped in a Map consisting of 8 different axes.

While it is claimed that the tool has been used in many places and found to be effective, no specific information was available regarding the reliability of the questionnaire. Hence an attempt was made to verify the reliability as a part of the project. The test retest reliability index was found to be 0.877 and the Kuder Richardson test results show a reliability index of 0.857.

Procedure

Step A: identification of sample

The sample for the study was selected based on convenience sampling method from a single organisation. The organisation consists of three levels of employees: Consultants at the senior level, Executives at the middle level and Trainees at the junior level. There are totally 32 persons in the sample belonging to the age group 20 years to 29 years. Considering organizations in professions this is considered a homogenous group. The samples contain a mix of males (20) and females (12) who are either married (5) or unmarried (29). In the sample all are graduates, 11 possess post graduation degrees, of which 6 are professional qualifications. 6 of the other employees were pursuing post graduate courses.

Step B: administering of the questionnaire – stage 1 – preliminary assessment

In the stage 1 i.e. at the beginning of the study, the MSA questionnaire and team survey questionnaires were administered during the month of January. In this questionnaire, the

¹² Joseph A Petrick & John F Quinn, (1997), *Management Ethics – Integrity at Work*, Response Books – Sage Publications, pp 327-331.

subjects were asked to respond to the 36 questions of the MSA assessment questionnaire. The MSA plot was made and observations noted for the approach to be followed in the behavioural modifications to be given as described in step-D.

Step C: administering of the questionnaires – stage 2 (for reliability/validity test¹⁵)

The main reason for administering the questionnaire in stage 2 was to test the reliability and validity of the questionnaire. In about a gap of 15 to 18 days the MSA instrument was again administered on the sample.

Step D: various behavioural interventions

The behavioural modification programme was implemented in five stages as given in the following schematic diagram.

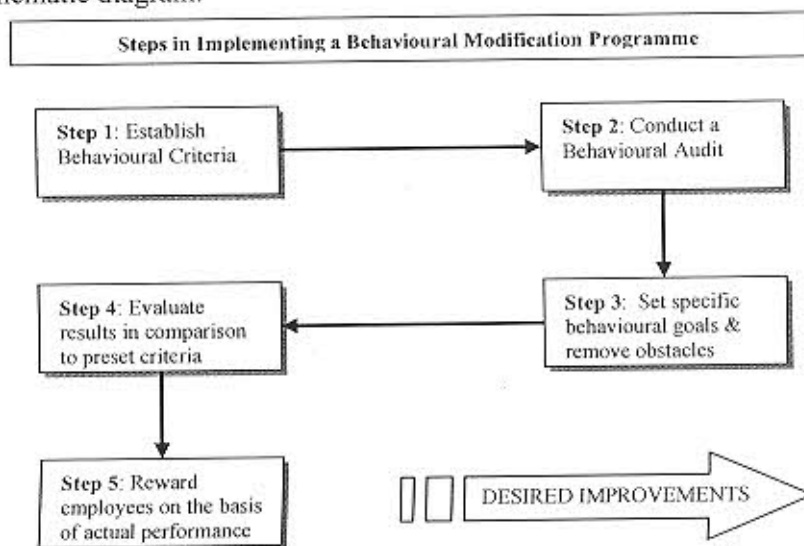


Fig. 4: Steps in Implementing Behavioural Modification Programme¹⁴.

This five step model was used as the base for providing behavioural modification programme.

Step 1

Establishing behavioural criteria

The behavioral criteria were established based on the eight managerial styles as per CVF model. Ideally all the average scores in each of the 8 managerial styles should be above 5.00.

¹⁵ Arun Kumar Singh (1998) "Tests, Measurements and Research Methods in Behavioural Sciences", Bharati Bhawan – pp-58; "In computing retest reliability the investigator is often faced with the problem of determining a reasonable time between two administrations of the test.... The most appropriate and convenient time gap between two administrations is fortnight, which is considered neither too short nor too long"

¹⁴ Based on Richard M Steers (1991), "Introduction to Organisational Behavior", pp-105.

This would provide a balanced model and the MSA plot will also appear symmetric. This “ideal score” of 5.00 was based on the fact that out of a 7 point scale 5 and plus would indicate a positive position. However, there is no scientific support for this argument. Moreover anything around 4.000 would indicate an average performance in a scale of 1 to 7;

Step 2

Conducting a behavioural audit

In order to conduct the behavioral audit, the MSA instrument was used. The actual responses of all the 32 samples for all the 36 questions were tabulated. Based on the average score made by all 32 respondents and grouping the scores as per the rules of scoring (given by the Model) the scores for all the 8 managerial styles were calculated and the MSA Plot made. Out of the 8 managerial styles two were found to be relatively low scoring: the “producer” (rational goal theory) score was marginally higher than the 5.000 mark at 5.063 and the “broker” (open systems theory) score was at 4.852. This imbalance was shown very clearly in the shape of the MSA plot (discussed in detail in the next section);

Step 3

Set specific behavioural goals and remove obstacles

The behavioural goals set were to increase the “producer” and “broker” aspects of the managerial style. The “Producer” related aspects of the MSA were covered by the question Nos.3, 13,19,29,33 and those related to “Broker” style were covered by question Nos.2, 20, 28, and 34.

TABLE 2: SPECIFIC MANAGERIAL QUALITIES IN PRODUCER AND BROKER STYLES

Producer	Managerial Qualities Contributing for the Style
3	Ignore the need to achieve unit goals.
13	Push the unit to meet objectives.
19	Seek to improve the work group's technical capacity.
29	See that the unit delivers on stated goals.
33	Maintain a “results” orientation in the unit.
Broker	Managerial Qualities Contributing for the Style
2	Exert upward influence in the organization.
20	Get access to people at higher levels.
28	Persuasively sell new ideas to higher-ups.
34	Influence decisions made at higher levels.

The Producer qualities required are basically related to orienting the organisation towards achieving the goals of the organisation and also improving the technical ability of the organisation to achieve results. *This was done by providing clarity in the work, increasing the discussions, and providing training to the employees on specific technical issues relating to the work.*

The Broker qualities are oriented towards exerting influence over higher levels in an organisation. In a typical consultancy organisation where the design of the consultancy is made in agreement with the clients and are generally related to both concept and practice

aspects of “technical” needs of organisations, and employees at various levels may not be involved. Similarly the employees are generally provided clear step by step approach for attending to a client. Hence upward influence in such organisations is generally less. However, based on this analysis, *group discussions were introduced and ideas of employees were discussed democratically to be considered by the higher authorities.*

While these were done to tackle the issues of producer and broker related aspects, the *three step* approach specifically discussed before were followed:

1. Initiating structure or providing direction (task behaviour): *the employees were given clear cut tasks,*
2. Reducing the amount of direction and supervision: *persons belonging to each of the projects and sub modules were treated as a group where particular individual may not feel that he is being supervised. The group (not individuals) would be given tasks and depending on their interest / commitment they would take up the delivery of the same so that individual directions are avoided, and*
3. After adequate performance follows increasing socio-emotional support (relationship behaviour). *This was a very vital aspect of the intervention. Informal meetings with individual and groups were held. Necessary encouragement by positively praising them, sending them personally addressed emails encouraging their work, in certain deserving cases providing financial compensations and increments, making them directly take up responsibilities including dealing with the client to enable them take responsibilities and feel important were taken.*

There were also other niceties like calling the persons for informal discussions and encouraging them on their “extra achievements” in histrionics like music, etc. Such sessions of positive inputs and encouragements were administered at infrequent intervals.

Step 4

Evaluate the results in comparison to the present criteria

Approximately 3 months after the preliminary analysis and introduction of various behavioural interventions, the MSA instrument was again administered on the population.

Step 5

Reward employees on the basis of actual performance

There are two aspects in this regard. One, based on the results given in this study further intervention will be given. Second, even during the study (even before making post intervention analysis) rewarding of the employees was undertaken.

Step E

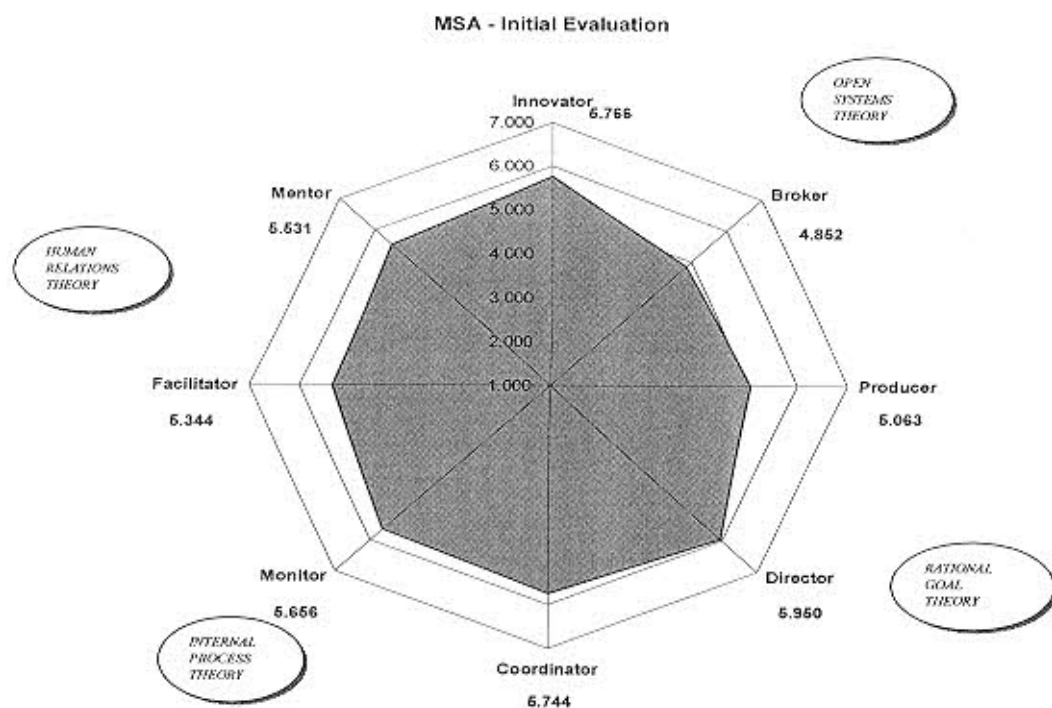
Administering of the Questionnaire – Post intervention – measurement of impact of the behavioural interventions

As mentioned earlier, the MSA questionnaire was again administered on the population. The results are discussed in the next chapter.

RESULTS AND DISCUSSION

Managerial Style before Behavioural Interventions

Before the commencement of the behavioral interventions, the managerial style status of the organisation was assessed. The results are given in Annex D. Based on the response to the questionnaire, the average score of each of the questionnaire were grouped as per key resulting in scores for the eight managerial styles. The results of the same are plotted in Graph #1.



Graph #1:MSA Assessment – Preliminary.

Observations

Graph #1 shows the Managerial Style Map of the company as a whole. The analysis of this graph, brings to light the following:

- The octagon is not symmetric, indicating some imbalances in the overall managerial style;
- The managerial styles predominant in the organisation are:

- **Director** (5.950): the employees get good direction and also are able to give directions to others;
- **Innovator** (5.766): the employees have full freedom to use their creative approach;
- **Coordinator** (5.744): the employees have good rapport with other employees in coordinating their work;
- **Monitor** (5.656): the employees are able to monitor their work properly;
- **Mentor** (5.531): the mentor or guidance support is also well established in the organisation;
- **Facilitator** (5.344): the role of providing various support is also well understood by the employees;
- The managerial styles that are found to be relatively weak in the organisation are:
- **Producer** (5.063): the producer role or "production" or output related role is found to be weak;
- **Broker** (4.852): is the weakest aspect of managerial style in this organisation.
- Based on the CV framework of the theories the ranking is as follows:

TABLE 3: CV FRAMEWORK: RANKING BASED ON PRELIMINARY FINDINGS

CV Framework	Managerial Style / Score	Managerial Style / Score	Total Score	Rank
Internal Process	Monitor 5.656	Coordinator 5.744	11.400	1
Rational Goal	Producer 5.063	Director 5.950	11.013	2
Human Relations	Mentor 5.531	Facilitator 5.344	10.875	3
Open Systems	Innovator 5.766	Broker 4.852	10.618	4

Analysis

The organization is a management consultancy company where the focus is on providing value added services in the field of management to various organisations. The organisation focuses on improving the managerial systems and processes of client organisations. Based on the various observations, the status of the organisation before commencement of the behavioral interventions is as follows:

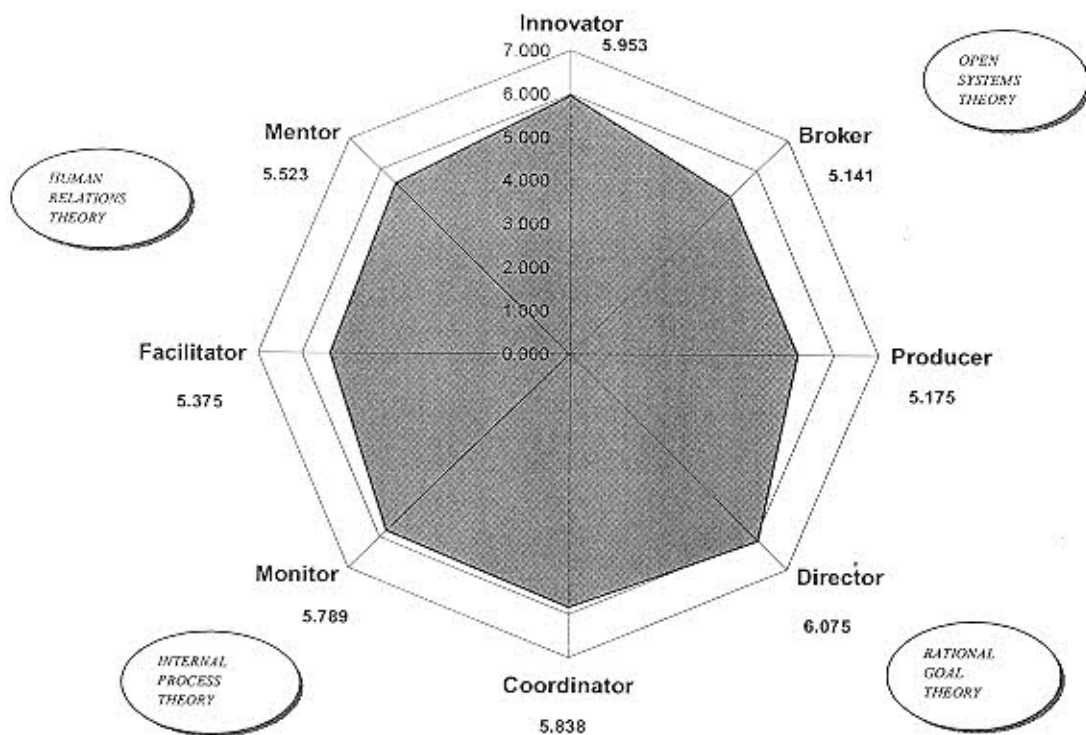
- The above average performance in the six managerial style aspects shows the general strength of the organisation;
- The relatively weak "producer" role could be due to the fact that the company is not involved in production related activity like manufacture of goods and the like;
- The weak "broker" role could be due to the lack of "negotiated external source acquisition" for employees at various levels;
- CV framework aspects:
- The "internal process" aspects seems to rank top with the monitor and coordinator roles well defined. This indicates that internal systems are well set;
- The "rational goal" of having clarified goals is also high ranking in spite of low score on the role of producer. This could mean that the organisation could have low productivity;

- The “human relations” aspect though ranking third seems to be well balanced;
- The “open systems” aspects rank the fourth in spite of high scores for “innovator” role. The low “broker” score could indicate that employees have gap in an understanding of the negotiations with the external agencies and client. This could prove a weakness when they grow up and need to deal with external entities.

Managerial Style after Behavioural Interventions

Graph # 2 shows the MSA Plot –post interventions.

MSA Analysis - Post Intervention



Graph # 2: MSA Post Interventions.

Observations

Based on the Graph#2 are:

- In general, there has been an overall development in the overall managerial style based on the increased symmetry of the MSA map;
- The scores have increased for all the managerial styles except for Mentor, for which the score has very marginally reduced;

- In the case of **Broker** there have been improvement from 4.852 to 5.141 and in the case of **Producer** from 5.063 to 5.175 indicating that there have been improvements in the desired direction based on the interventions.;

The results of the post intervention data have been tabulated in Table 4 based on CV framework and is comparable to Table 3.

TABLE 4: CV FRAMEWORK: RANKING BASED POST INTERVENTION DATA

CV Framework	Managerial Style / Score	Managerial Style / Score	Total Score	Rank
Internal Process	Monitor 5.789	Coordinator 5.838	11.400	1
Rational Goal	Producer 5.175	Director 6.075	11.250	2
Human Relations	Mentor 5.523	Facilitator 5.375	10.898	4
Open Systems	Innovator 5.953	Broker 5.141	11.094	3

Table 4 indicates the following:

- There has been an overall increase in the total scores per CV framework, in general showing the positive trend;
- All the managerial styles have scores above 5.000 after the interventions;
- The overall ranking position has changed for human relations and open systems.

Analysis

- Basically the behavioural interventions seem to help in enabling changes in the required directions.
- It may also be a case that there are certain areas in which there could some reduction in the scores (post interventions) as it was observed in the case of Mentor managerial style, where the score marginally shifted down from 5.531 to 5.523 post intervention;
- Though the interventions were aimed at improving specific characteristics (in this case towards the Producer and Broker styles), the effect was overall. This could have been because of the general nature of the intervention.

Statistical Significance of the Influence after Behavioural Interventions

The prima facie results show that there seem to be some evidence of change visualized through the MSA Diagram and the MSA scores. Are these changes statistically valid? In this regard all the three hypotheses taken up for investigation were examined. The examinations were as per the research design using both T paired sample test and ANOVA using F test.

INVESTIGATION OF OBJECTIVE 1

H_1 : Behavioural interventions cannot influence the *overall managerial styles* of an organization

The objective was to examine whether the behavioural interventions have had any influence on the managerial styles of the organisation, considering all the 32 subjects each responding to 36 items of enquiry. The examination here was on an overall basis where the scores of all the subjects per question was averaged.

Observation

- The calculated value of t at **-1.534** is less than the table value of **2.041** at 95 % confident level and hence the hypothesis that there is no significant difference between the pre and post data is **accepted** indicating that the behavioural interventions have not had any significant influence on the managerial styles.

Analysis of Variance – F Test

The analysis of variance of the pre-intervention and post intervention situations were studied. The following table – 6 shows the tabulation and computation of the F statistics.

Observation

- The calculated value of F at 0.4135 is less than the table value of **4.170** at 95 % confident level and hence the hypothesis that there is no significant difference between the pre and post data is **accepted** indicating that the behavioural interventions have not had any significant influence on the overall managerial styles.
- The paired T test and ANOVA – F test accepted the hypothesis that there was no significant difference observed based on the interventions. *Due to this reason further analysis based on demographic variables was not performed.* However, the MSA scores showed certain positive trends

Investigation of Objective 2

H₂: Behavioural Interventions Cannot Influence the Individual Elements of Managerial Styles of an Organization

The objective here was to examine whether the behavioural interventions had any influence on any one of the 36 elements constituting 8 different managerial styles. Under this analysis, paired t test and ANOVA were performed for all the 36 questions considering the pre and post test data for these questions from 32 subjects. Hence 36 such tests were performed. The results are tabulated below in table-8:

Observations

- F Test: Out of the 36 questions only for two questions: No 25 (of Innovator Style) and No. 4 (of Director Style) the variance between groups are more than the variance within the groups. The F value in these two cases are relatively high but still within the acceptance region. Hence there is no significant influence of the behavioural interventions on the managerial styles of the Organisation.
- Paired T test: In the case of paired t test, the same two questions have t values beyond the acceptance region Q 25 (2.7899) and Q 4(2.6969), indicating that in these two cases the hypothesis is rejected, as these values are greater than the table value of 2.041. This means in these two cases there has been significant influence of the interventions on the managerial style. The managerial styles influenced are respectively Director and Innovator styles.

Investigation of Objective 3

H₃: Behavioural Interventions Cannot Influence the Managerial Styles of Individuals (subjects) in an Organization

The Objective here was to examine the influence of the behavioural interventions on any of the specific individuals (subjects) taken up for the study.

Under this analysis, paired t test and ANOVA was performed for all the 32 samples (subjects) under study. This was done by taking responses to all the 36 questions considering the pre and post test data from 32 subjects. Hence 32 such tests were performed. The results are tabulated below in table 9:

Observations

- F Test: For some of the samples the variance between the groups is indicated to be higher than the variance within the group. This indicates some impact of the interventions on these subjects. In the case of Subject Nos. 2,8,12, 14, 16,17, 19,20, 24 and 32 such a pattern has been noticed;
- The F test scores that have been found higher than the table score of 4.021 (95% confidence level) are for subject Nos: 12 (4.3528), 19 (6.4868), 20 (14.9120) and 24 (4.5123). In these cases significant changes have been noticed. This means that there has been significant influence of the behavioural interventions on the managerial styles of some of the subjects;
- T test: In the case of two subjects. Nos 8 (2.1081) and 19 (2.0080), t scores are beyond the table value in the case of former and very near the table value of 2.041(95% confidence level) in the case of the latter. This indicates that there has been some influence of the behavioural interventions on the managerial styles of some of the subjects.

Analysis

- In the overall analysis there have been no significant differences pre and post interventions due to averaging of scores. The question wise analysis also confirms this because the averaging out of responses of various persons does not show significant improvements.
- The analysis shows that even though there is no significant overall impact of the interventions, the impact could be felt subject wise. This is a very important finding because in certain cases (particularly for persons who are already well balanced) there may not be significant improvement because of the interventions. However, in certain individual cases there could be more impact which due to generalizations does not come out. This takes care of individual differences in people. In real life situations, the managerial style of individual could be examined and behavioural interventions prescribed as per needs.

