

Public-Sector vs. Private-Sector R&D In India: A Comparative Analysis of Two R&D Teams

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The subject of this paper is a comparative analysis of two Indian R&D teams with similar objectives and activities. The team which we first studied (team A) was located in a public-sector electrical power research institute. The second team (team B) was the R&D unit of a private-sector company which manufactures and sells electrical equipment such as motors, generators, and transformers. Using qualitative methodology, we developed a process model of the ineffectiveness of team A. This model served as an interpretive framework with which to study team B and compare it with team A.

Introduction

The subject of this paper is a comparative analysis of two Indian R&D teams, one of which (team A) was located in a public-sector research organization (Institute X) while the other (team B) was the R&D unit of a private-sector manufacturing concern (Company Y). An earlier paper (Mouly and Sankaran, 1996) presented an in-depth, qualitative case-study of team A. The motivation for the study was to gain rich, qualitative insight into the relative failure of public-sector R&D in India. The major theme that emerged from the study was that a highly centralized administration, excessive bureaucracy, strong authoritarian hierarchy coupled with professional incompetence could seriously damage the quality of life and work of an R&D team. This adverse influence could manifest in severely strained interpersonal relationships, lack of group identity and low self-esteem of the team members, apathetic working lives, and inferior quality of work.

One can conceivably attempt to generalize these findings across public-sector R&D settings. However, the focus of this paper is not on the generalizability of the findings from the study of team A. Rather, it is on a comparative analysis of two R&D teams, one in the public-sector (team A) and the other in the private-sector R&D (team B), whose objectives, nature and scope of activities were similar. During the study of team A, members of the team and other R&D personnel of Institute X had cited team B as a model of a very effective R&D team, comparable with team A. Therefore, we studied team B to try and understand how and why a public-sector R&D team failed where a comparable private-sector R&D team succeeded.

The paper is laid out as follows. We first describe a process model of the ineffectiveness of team A. Then, we present a case-study of team B. Finally, we make a comparative analysis of the various factors that influenced the productivity and quality of work in the two R&D settings.

0-7803-3552-X/96/\$5.00 © 1996 IEEE

A Process Model of the Ineffectiveness of Team A

We have developed a process model to conceptualize and understand better the major cause-effect linkages that could lead to the ineffectiveness of a public-sector R&D team such as team A. While we used this model as a starting point for our study of team B, the model is sufficiently abstract and stated in general terms in order that it can be tested across R&D teams located in public-sector institutions.

Prior to an explanation of the process model, it is essential to present a brief description of team A and Institute X. Institute X was founded by the government of India in 1960 to function as a national institute in power research and undertake development projects in the generation, transmission, distribution, and operation of electricity power systems. The R&D personnel were organized into eight divisions. Team A was a group of five R&D personnel that belonged to an R&D division within Institute X. One of the five team members was both the leader of the team and the division. The division had seven supporting staff members. The process model has emerged from the findings of the study of team A by Mouly and Sankaran (1992).

We have identified several factors of ineffectiveness, each of which operates at one or more levels, i.e. at the level of the individual, the group, and the institution. In the model, if two factors are related, then one of them is either an effect or an indicator of the other.

Owing to limitations of space, it is not possible to present the model here. The interested reader is invited to contact the authors for the same.

A Case-study of a Private-Sector R&D Team

We now present a case-study of team B. As mentioned in the introduction, we were motivated to study team B since members of team A had cited team B as a team with which they shared a lot in common, in terms of R&D projects. Further, team B and Company Y were considered very successful by professionals in both academic institutions and industry alike.

Background

Company Y was established in 1946 and undertook the production, manufacture, purchase, and sales of electrical equipment. It worked six days a week (while Institute X worked five days a week). Company Y had a central R&D wing which catered to the R&D needs of all the divisions of the company. The R&D wing had a total of 17 employees of which 5 were R&D personnel, the rest being support staff. The R&D wing was involved in developing new products, improving and testing the quality of materials and providing other services, such as marketing, to various project groups within the organization.

Each R&D project that came to the R&D division went through the stages of R&D innovation such as basic research, applied research, development and design, prototyping, and testing. Since Company Y was a private-sector undertaking where profits were an important consideration, the R&D projects were chiefly motivated by marketability and profit. Taking up all the stages of the project work not only speeded up the process leading to manufacture but also gave the R&D personnel control over their work. Most of the projects were non-sponsored, i.e. they were independent research projects pursuing profitable product ideas. A few were specific projects occasioned by requests from the industrial clientele.

The R&D division was headed by a vice-president of Company Y. However, his role was mainly administrative. In fact, during the initial phase of our fieldwork in the R&D division, he was abroad on administrative work. The R&D team in Company Y essentially consisted of the Deputy Manager (who was the head of the team) and four Assistant Managers. The lower cadres of the R&D division comprised the support staff.

Methodology for the Study

Our process model of the ineffectiveness of team A provided us with an initial set of themes to investigate during our study of team B. We found that some of the major influences, either direct or indirect, on the ineffectiveness of team A and of Institute X as a whole, were the project selection process, the personnel recruitment process, the reward structure, the extent of involvement of subordinates in decision-making, the prevailing communication practices, and the external environment. Hence, our study initially focused on these aspects of team B as a group and of Company Y as a whole. We administered an open-ended questionnaire that pertained to the above aspects, to the members of team B. A communications study questionnaire (which was an improvised version of the one that had been developed for the study of team A) was also given to the team members. After this, a three month-long fieldwork was conducted in which we collected data through focused interviews and participant observation.

Again, for reasons of space, it is not possible to list the factors and discuss them at length. The interested reader is invited to contact the authors for a fuller version of the present paper which contains such a discussion.

Conclusion

We now present a comparative analysis of the various influences, at the institutional, group, and individual levels, on the productivity and quality of work of teams A and B.

Institutional-level influences

Since its primary role was to test and standardize electrical equipment, Institute X did not face direct competition. Being a government-funded institution, it did not have to concern with profits and market-position or image. This lack of concern was reflected in a lenient style of functioning as was evident in the recruitment process of Institute X and in the lack of concern of its R&D personnel with quality of work. On the other hand, since Company Y was a private-sector firm, profits and market position were crucial to its very survival. The image-consciousness and concern with productivity of the company was reflected in its recruitment and project selection processes, in its measures to imbibe total quality management (TQM) in its personnel and in its merit-based reward structure for team B members.

Group-level influences

Owing to their involvement in the project selection process, team B members could ensure that they had sufficient time and expertise for the projects that they undertook. Hence, neither time-pressures nor professional inability hampered their work. In team A however, projects were thrust exogenously without regard to the expertise and availability of time of the members. This affected the effectiveness of team A adversely.

In team B, members formed groups by themselves. Thus, members within a group shared interests and could work cohesively. The project leader, even if of a higher rank than his colleagues, was easily accessible to them. To their mutual benefit, project members held informal discussions and brain-storming sessions for "problem-solving purposes". Deadlines were met through peer pressure. Through informal channels of communication and interaction, project members had clarity regarding their respective roles.

In contrast, in team A, members had little in common and yet were forced to work together on all projects. Meetings to discuss project work were rigidly scheduled and regarded as perfunctory rituals. The excessive use of formal communication channels caused delays and loss of clarity among team members regarding their duties and

responsibilities, and heightened the dichotomy between the superior and his subordinates.

Individual-level influences

Team B members were aware of their professional aptitude and competitiveness in the job market and were consequently, highly motivated. Their drive and enthusiasm towards work was also fostered by the autonomy granted by Company Y, and the merit-based reward structure and incentives for productivity provided by Company Y. The top-level management of Company Y openly acknowledged the high calibre of its R&D personnel and made them feel wanted for the growth of the company.

On the other hand, team A members were professionally incompetent and their awareness of their lack of competitiveness in the job market led to poor self-images and to apathy towards work. This indifference was aggravated by a total lack of individual autonomy at work and by the reward- and recognition-structure of Institute X which was not merit-based but aligned more with the organizational hierarchy. In fact, the team superior and the director of Institute X held low opinions of team A members, regarding them as mediocre technicians who merely executed what was assigned to them.

We would like to acknowledge that other researchers have identified factors of effectiveness and ineffectiveness similar to those described by us with reference to teams A and B. However, we emphasize that the significance of our comparative study is that it is grounded in in-depth investigations of two comparable R&D settings and not based on inferences from other studies of organizational effectiveness. Hence, for the sake of completeness, we conclude this paper with citations of a few, illustrative studies in the literature, that report findings similar to those from our studies of teams A and B. Through a longitudinal field experiment of job change, conducted over a one-year period with forty-two geographically dispersed railway track maintenance gangs, Pearson (1987) found that those who were engaged in participative goal setting reported higher perceived states of involvement in decision-making and greater job satisfaction. Similar findings were also reported by Morse and Reimer (1956). Coch and French (1948) found that participation improves group cohesion, commitment, and productivity. Similarly, Miles (1975) concluded from a study of R&D professionals that participative goal-setting or MBO may be appropriate for reducing both job conflicts and ambiguity.

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