

Project Managers and Functional Managers: A Case Study of Job Satisfaction in a Matrix Organization

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■ Abstract

Information regarding job satisfaction within an organization using a matrix structure is limited. This paper provides empirical evidence regarding the difference in job satisfaction between project managers and functional managers in one matrix organization: a government research and development center. Key findings of this research include the identification of the factors that provide job satisfaction for both groups and the significant difference in job satisfaction between the groups. The perceived efficiencies provided by the matrix structure may be negated by the lack of job satisfaction experienced by the functional managers.

Keywords: cross-functional organization; matrix organization; job satisfaction; project manager; functional manager

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An R&D company or government agency operates in a dynamic environment. Technology changes rapidly and the skills required to perform R&D or deliver any high technology product or service are highly specialized and costly. In an effort to maximize the use of these specialized skills across numerous projects, numerous aerospace companies and government organizations have used a matrix or cross-functional structure. Most people accept that a matrix organization is more costly in terms of overhead than a traditional structure; however, this cost is believed to be offset by the gains in technical excellence and flexibility.

Literature Review

A review of the literature on cross-functional organization forms (Ford & Randolph, 1992) published since 1976 found numerous paradoxes regarding the advantages and disadvantages of the matrix organizational form. In particular, several researchers have posited that

a matrix structure positively influences motivation and job satisfaction (Denis, 1986; Larson & Gobeli, 1987). It has also been suggested that motivation and satisfaction are negatively influenced by the ambiguous, dual authority of a matrix (Denis, 1986). The research reported in this paper focuses on determining if there is a significant difference in job satisfaction among project managers and functional managers in a matrix organization, using a government research and development center as the test environment.

Herzberg's Two-Factor Theory of Job Satisfaction

In 1959, Frederick Herzberg, Bernard Mausner, and Barbara Block Snyderman performed research to determine which factors contribute to job satisfaction and which factors contribute to job dissatisfaction. They found that the factors that contributed to job satisfaction were different from the factors that caused people to experience dissatisfaction with their jobs (Herzberg,

Mausner, & Snyderman, 1959). The study was well documented in *The Motivation to Work*. Unless otherwise noted, the information on the original study comes from this book. The factors that caused dissatisfaction were related to the conditions that surround the performance of the job and those that caused satisfaction dealt with job content. The job content factors were called "motivators" and the job environmental factors were called "hygienes." The deficiencies in hygienes caused dissatisfaction. Their research indicated that the positive hygienes would not increase satisfaction but would simply act as prevention of dissatisfaction and cause a neutral attitude toward the job. The theory that evolved from the research has become known as Herzberg's Two-Factor Theory of Job Satisfaction.

Herzberg and his associates identified achievement, recognition, the work itself, responsibility, and advancement as sources of satisfaction. Hygiene factors were found to be company policy and administration, supervision-technical, salary, interpersonal relations-supervisor, and working conditions. These factors related most

strongly to dissatisfaction. When the employee experienced the positive effects of these hygiene factors, the result was merely a sense of neutrality toward the job.

Although Herzberg's original study was performed almost 35 years ago, and sparked much controversy, his theory is still being applied today. A study performed in 1994 by Jim Phillipchuk and John Whittaker attempted to validate Herzberg's original study (Phillipchuk, 1996). The approach in the 1994 study attempted to duplicate Herzberg's study via a written survey of 75 engineers in a Canadian utility company. The factors affecting job satisfaction could still be classified into two distinct categories: motivators that contribute to job satisfaction and hygienes that account for job dissatisfaction. No new factors were found, but salary and working conditions were absent. Despite the small sample of the study, they concluded the theory was valid.

Matrix Structures

The matrix structure lies in the center of a continuum of organizational structures (Galbraith, 1971). The chosen authority structure determines where on the spectrum an organization lies. The alternatives range from a purely functional organization to a purely project organization. Within a purely functional structure, the decision-making authority and project responsibility rests with a functional manager. Within a purely project organization, the project manager possesses full control. The appropriate organizational form is related to the rate of change of technology of the organization's products or services, the size of the organization, and schedule criticality. The matrix structure integrates the functional and project forms. In a typical matrix, the project or business groups make up one side of the matrix and the functional groups the other side (Kolodny, 1981) (see Figure 1).

In a government agency, many different types and complexity of projects are undertaken. This demands a wide variety of specialists. To execute a research project, a project manager may call upon in-house technical specialists who possess expertise in various areas. The budgetary constraints and the uniqueness of the expertise required for these projects necessitate the sharing of manpower. Therefore, a matrix approach is used.

The matrix structure can operate in many different ways. Larson and Gobeli (1987) defined three matrix types: functional, balanced, and project. The types differ in the amount of authority the functional manager legitimately possesses. In a functional matrix, the functional manager retains control over the people involved in the project and is assigned responsibility for a portion of the project. In a balanced matrix, the functional manager and the project manager are jointly responsible for the resources and the project. In a project matrix, the functional managers assign resources for the project and

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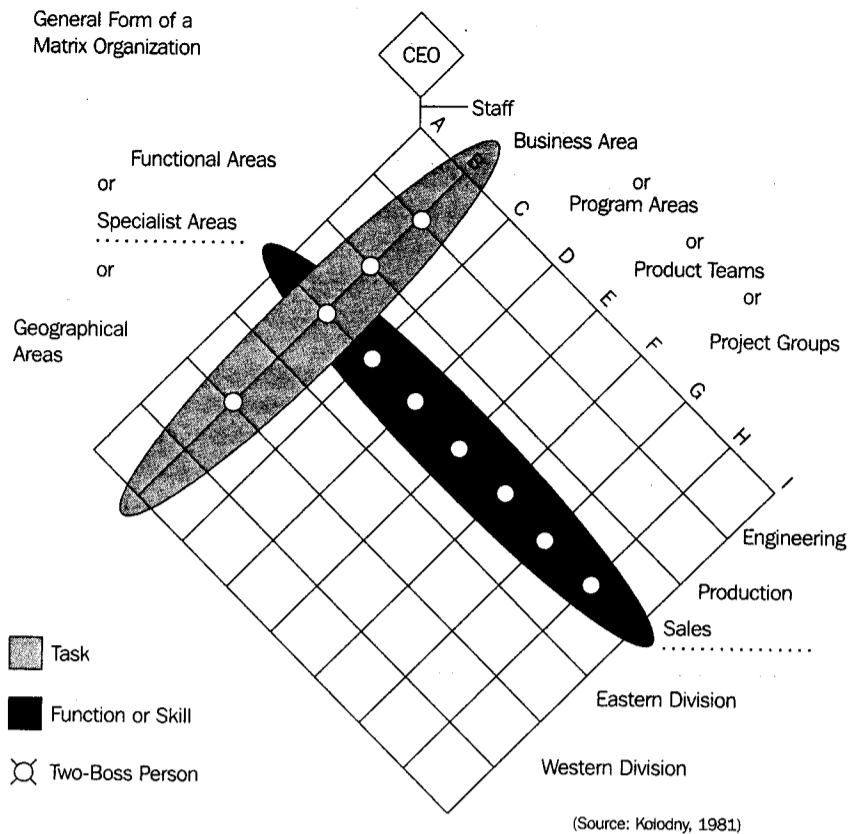


Figure 1. General Form of a Matrix Organization

Functional Matrix	Project managers are formally designated to oversee the project across different functional areas. They have limited authority over functional people involved and serves primarily to plan and coordinate the project. Functional managers retain primary responsibility for their specific segments of the project.
Balanced Matrix	Project managers are assigned to oversee the project and interact on an equal basis with functional managers. Project managers and the functional managers jointly direct workflow segments and approve technical and operational decisions.
Project Matrix	Project managers are assigned to oversee the project and are responsible for the completion of the project. Functional managers' involvement is limited to assigning personnel as needed and providing advisory expertise.

Table 1. Description of Matrix Types

provide technical consultation on an as-needed basis. Table 1 summarizes the types of matrix.

Advantages and Disadvantages of a Matrix

Some advantages most frequently cited for a cross-functional structure are flexibility in the use of human and capital resources; increased individual motivation, job satisfaction, commitment and personal development; and the creation of lateral communication channels that

increase frequency of communication in the organization (Ford & Randolph, 1992). Some of the disadvantages most frequently cited that a cross-functional structure is are more costly for the organization in terms of overhead and staff, more meetings, delayed decisions, and information processing; creates conflict among individuals who must work together but have different backgrounds and perspectives on work, time horizons, and goals; and creates ambiguity over resources, technical issues, pay, and personnel assignments (Ford & Randolph, 1992).

Manager Type	Number of Respondents
Functional	17
Project	14
Total	31

Table 2. Number of Respondents

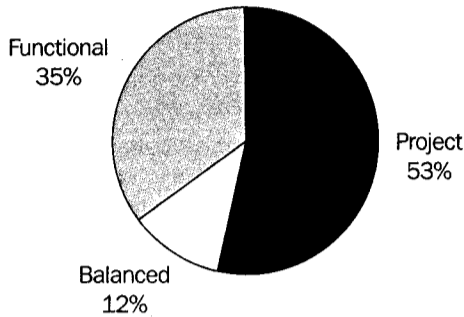


Figure 2. Matrix Type by Functional Managers

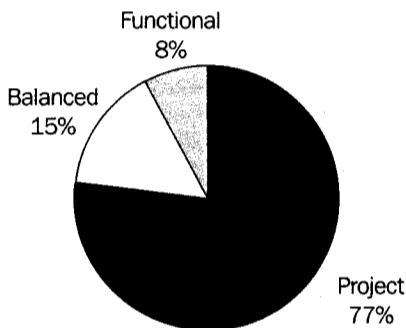


Figure 3. Matrix Type by Project Managers

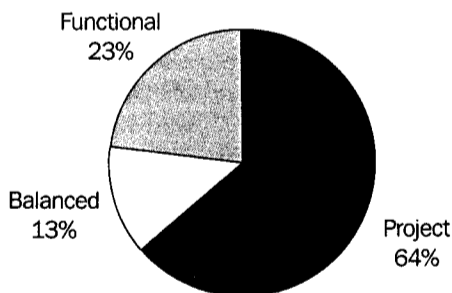


Figure 4. Matrix Type by All Respondents

If maintenance of technical expertise and providing career paths for technical specialists is viewed as highly desirable, a functional matrix would be appropriate. A project matrix does not provide the organizational mechanism to facilitate this. A project matrix focuses on coordination among team members to deliver the product on time and within budget. If flexibility is of utmost importance, a balanced matrix would be recommended over the project or functional approach. Conflict is reduced in a functional matrix over any other approach because the unity of command principle is not violated. The functional manager retains decision-making authority for the project as well as control of personnel. If improved motivation and commitment are desired, the answer is uncertain (Larson, 1987).

Motivation within a matrix organization presents a paradox. Does a matrix structure provide increased motivation and job satisfaction for managers or do the inherent conflicts negate any positive effects of the approach?

The Study

The Approach. The R&D organization providing the test environment employs about 3,000 engineers, scientists, business professionals and support personnel. Approximately 66% of the personnel are within the science and engineering group. A project management approach, within a matrix structure, is used to execute R&D programs.

To evaluate the project and functional managers' job satisfaction, a survey instrument was used. The instrument was mailed, along with a return envelope, to 74 engineers who had been identified as either functional managers or project managers. A cover letter explained the purpose of the survey and assurance of the anonymity of the respondents.

Data were collected via this survey instrument during the last two weeks of November 1996. A 41% overall response rate was received: 17 functional managers (41%) and 14 project managers (42%). Each respondent was asked to identify himself or herself as either a project or functional manager. The questionnaire began by asking the participant to select the matrix type (the definitions in Table 1 were provided) that best described his or her organization. Part two of the questionnaire was an approximation of Herzberg's technique and resulting theory about job satisfaction that has been used by Utley (1995). It consisted of three questions. First, the participants were asked to describe an event in their current job as a manager when they felt internally motivated during and satisfied at the conclusion of the situation. They were asked to be as detailed as possible about the specific reasons and circumstances for this feeling. The second question asked each respondent to describe an event in which he or she felt frustration during and dissatisfaction at the conclusion of

Motivator Factors	Number of Thought Units		Hygiene Factors	Number of Thought Units	
	Satisfying	Dissatisfying		Satisfying	Dissatisfying
Accomplishment	20	4	External environment	0	19
Teamwork	11	0	Management style	0	18
Responsibility	10	4	Company policy	0	13
Work itself	11	2	Interpersonal relations	0	12
Personal growth/learning	5	0	Authority	5	5
Respect	5	0			
Recognition	2	0			
Total	64	10	Total	5	67

Table 3. Motivator and Hygiene Factors, All Respondents

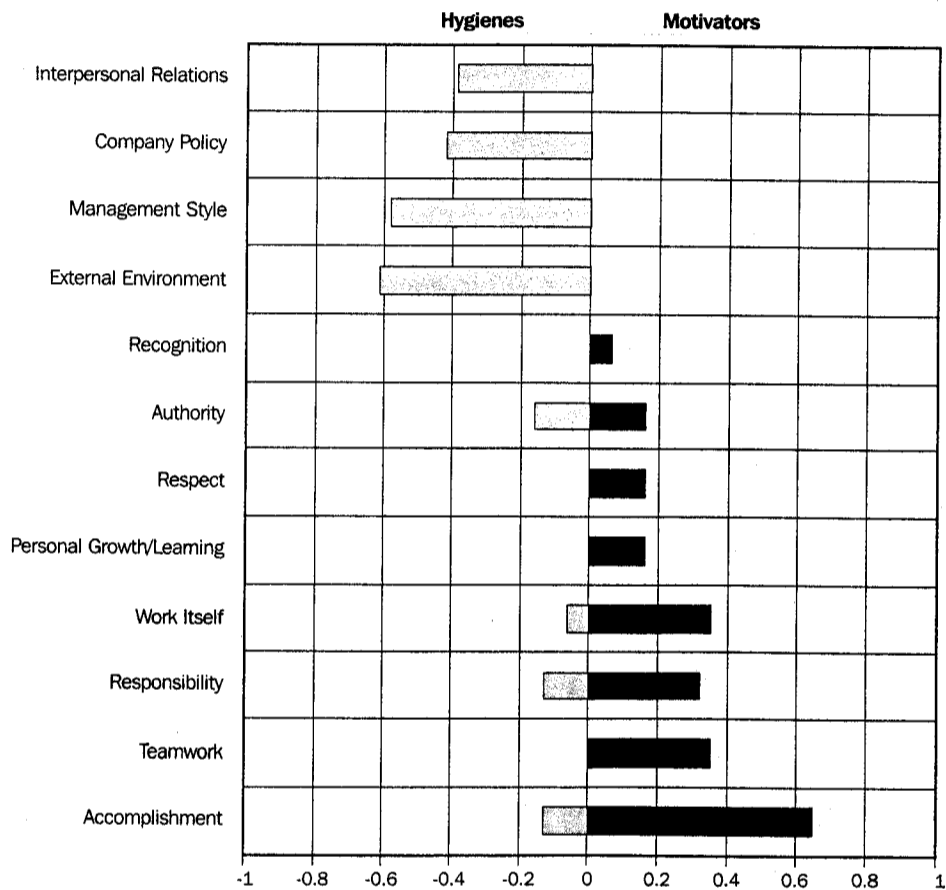


Figure 5. Herzberg's Two Factors, All Respondents

the situation. Again, they were asked to be as detailed as possible about the specific reasons. The third question asked the participants to select which scenario best described their overall feeling concerning their job.

Results. The questionnaire responses were entered into a spreadsheet for evaluation and analysis. The data were separated by manager type, functional or project, and by individual respondent. A total of 31 respondents

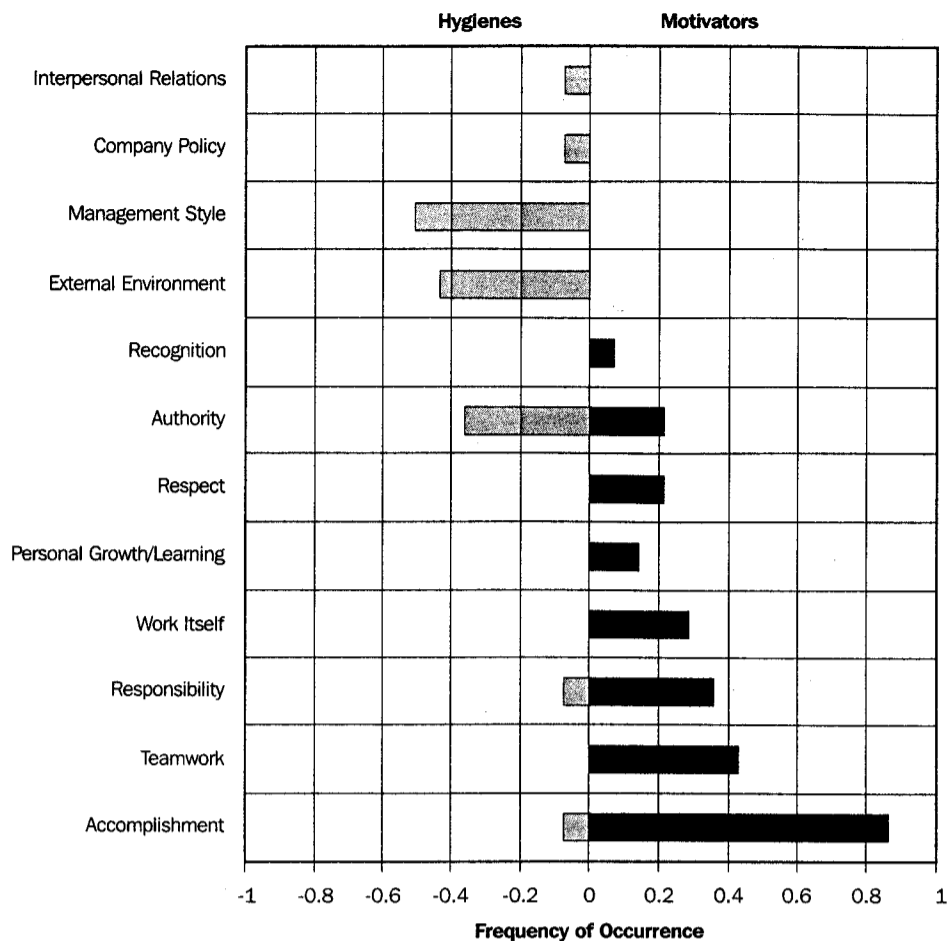


Figure 6. Herzberg's Two Factors, Project Managers Only

completed the survey. Table 2 shows the number of respondents of each type.

Matrix Type. The three types of matrix, functional, balanced and project, differ primarily with respect to the possession of legitimate authority. Each respondent was asked to select which definition (Table 1 definitions were supplied) best described the mode of operation in his or her organization. The results are shown in Figures 2, 3, and 4.

Herzberg's Two-Factor Theory, Hygienes and Motivators. To establish a general list of motivators and hygienes factors, all of the responses to the questionnaire were pooled and read. The thought units mentioned either in the satisfying experience or in the dissatisfying experience of each of the respondents were listed. These units were then categorized into 12 distinct factors, as shown in Table 3, and tallied according to frequency of mention.

A composite chart was made of all respondent data and compared to the results found in the original study by Herzberg, et al. (1959). The results for all respondents are shown in Figure 5. The top four motivators were found to be accomplishment, teamwork, responsibility,

and the work itself. Three of these four were reported in the original study by Herzberg. Teamwork has also been shown to be a motivator (Utley, 1995), using an approach similar to Herzberg's.

Charts for documenting the responses of the functional managers and the project managers were also made. The results are shown in graphical form in Figures 6 and 7. The top four motivators are the same for both types of managers—accomplishment, teamwork, responsibility, and the work itself.

The interesting difference between the responses of the two types of managers is the number and frequency of hygienes noted by the functional managers compared to the project managers. The functional managers' dissatisfying experiences contained over twice as many mentions of hygienes factors as did the project managers'. This difference is validated when reexamining the responses. Fourteen of the 17 functional managers described dissatisfying events and 12 of the project managers provided a description of a dissatisfying experience. The additional two responses from functional managers do not explain the large difference in the level of hygienes. Tables 4 and 5 show a normalized presentation of the results. The

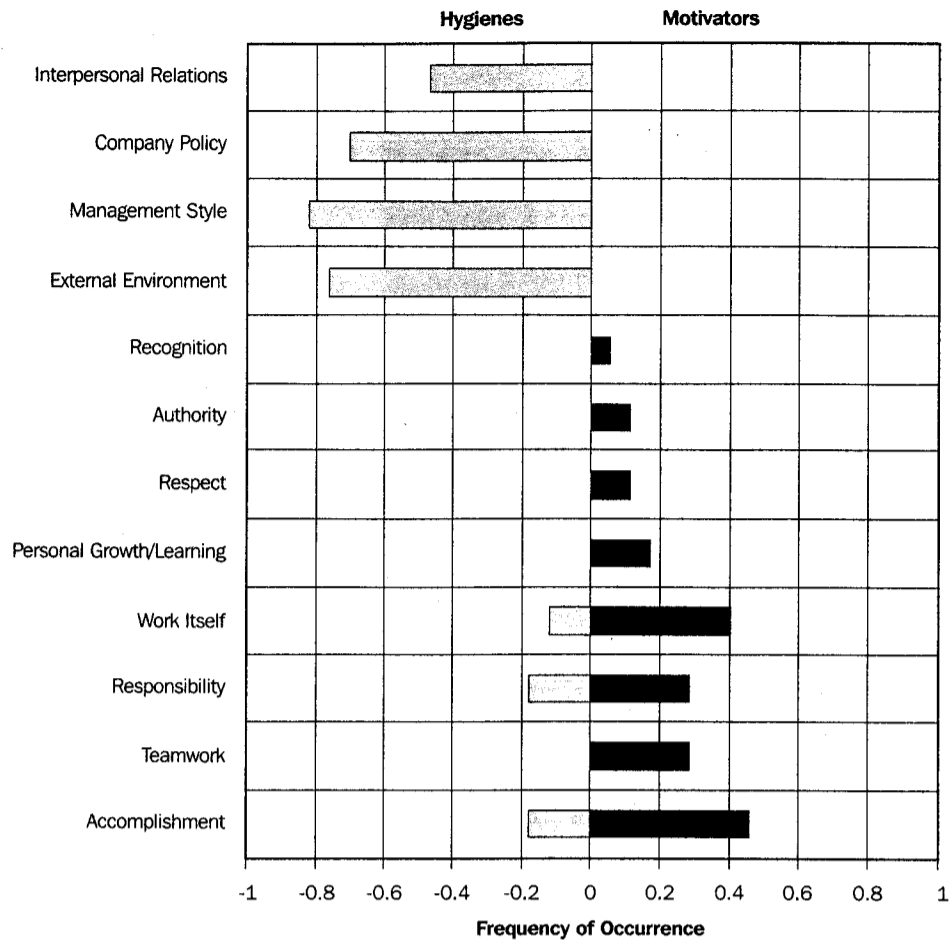


Figure 7. Herzberg's Two Factors, Functional Managers Only

frequency of occurrence of each thought unit was divided by the number of respondents in each category. The resulting total under hygiene factors for project managers was substantially lower than the total for the functional managers.

Job Satisfaction. In addition to describing a satisfying experience and a dissatisfying experience, each respondent was asked to choose which scenario best describes his or her overall feeling about the job, either satisfied or dissatisfied. In two instances, the respondents wrote in a third choice of neutral (see Table 6).

A statistical test was performed to test the equivalency of the proportion of satisfied project managers to the proportion of satisfied functional managers. At $\alpha = 0.10$, the proportion of functional managers who expressed job satisfaction is less than the proportion satisfied of project managers. This could be due to the level of negative hygienes experienced by the functional managers. The project managers reported very few frustrations with hygienes. The functional managers are satisfied by the same factors as the project managers; however, the motivators are not present at the same level as for the project managers.

Conclusions and Recommendations

The matrix structure is intended to provide flexibility and increase efficiency in using resources. This assumes productivity will be the same or higher than in a traditional functional organization. If knowledge workers fail to experience job satisfaction, it is reasonable to expect that their productivity might be affected or at least their enthusiasm for their work might be hindered. The proportion of functional managers who expressed job satisfaction was lower than that for project managers. The lower level of job satisfaction reported by the functional managers is related to the large number of negative hygiene factors they experienced. There is an obvious question then: Can the hygiene factors be eliminated or is the presence of the factors inherent in the matrix structure?

Recognition of the hurdles to overcome using the matrix structure is critical to implementing it successfully. This study suggests that functional managers are less satisfied with their positions than project managers. According to Herzberg, removing or improving hygiene factors will only result in reducing dissatisfaction. To improve satisfaction, motivators like accomplishment

Motivator Factors	Percentage of Appearance		Hygiene Factors	Percentage of Appearance	
	Satisfying	Dissatisfying		Satisfying	Dissatisfying
Accomplishment	0.86	0.07	External environment	0	0.43
Teamwork	0.43	0	Management style	0	0.50
Responsibility	0.36	0.07	Company policy	0	0.07
Work itself	0.29	0	Interpersonal relations	0	0.07
Personal growth/learning	0.14	0	Authority	0.21	0.36
Respect	0.21	0			
Recognition	0.07	0			
Total	2.36	0.14	Total	0.21	1.43

Table 4. Herzberg's Two Factors, Project Managers

Motivator Factors	Percentage of Appearance		Hygiene Factors	Percentage of Appearance	
	Satisfying	Dissatisfying		Satisfying	Dissatisfying
Accomplishment	0.47	0.18	External environment	0	0.76
Teamwork	0.29	0	Management style	0	0.82
Responsibility	0.29	0.18	Company policy	0	0.71
Work itself	0.41	0.12	Interpersonal relations	0	0.47
Personal growth/learning	0.18	0	Authority	0.12	0
Respect	0.12	0			
Recognition	0.06	0			
	1.82	0.48		0.12	2.76

Table 5. Herzberg's Two Factors, Functional Managers

and responsibility must be present. To improve the hygiene factors like peer relations and working conditions, communication skills are important. Communication, especially concerning changes in programs and priorities, can be enhanced by the use of e-mail, bulletin boards, and more frequent face-to-face meetings. Training in the area of facilitation and teamwork skills for both the functional managers and the project managers would facilitate improved interpersonal relations and teamwork. Additionally, opportunities should be provided for functional managers to experience being part of a team, and to recognize their accomplishments in support of projects.

The project managers and functional managers failed to agree as to the type of matrix. Why was there little agreement over which type of matrix is in use? The

most probable explanation may be found in the work of Larson and Gobeli (1987). They hypothesize that matrix systems evolve over time. At the R&D center there are in excess of 33 different projects, all at different stages of development. Therefore, agreement should be expected only among those who are working on the same project. A second explanation may simply be a bias toward the observer's position as the one in authority. This apparent power struggle has been cited by Davis and Lawrence (1978) as one of nine pathologies of the matrix.

Managerial Implications

"Matrix is an exceedingly complex form that is not for everybody. To put it bluntly, if you do not really need it, leave it alone" (Davis & Lawrence, 1977). The results of

	Satisfied	Dissatisfied	Neutral
Functional Managers	11	6	0
Project Managers	12	0	2
Total	23	6	2

Table 6. Job Satisfaction by Manager Type

this research tend to support the difficulty of managing within a matrix. A purely structural approach to organizing indicates the matrix structure is nearly optimum. The structure is a perfect balance between project focus and technical excellence. This "perfection" ignores that people are the organization. Structure can facilitate or inhibit the efforts of the people within it. A holistic approach to selecting an organization structure would include considering the people within the organization, the organizational culture, environmental influences, and the nature of the work.

The matrix structure is not for everyone. The structure requires people who are very adaptive, and comfortable with some ambiguity. Those who seek identity through an organizational entity affiliation or who derive their sense of self-importance from their position in the hierarchy would fail to find what they are seeking in a matrix structure. The research presented in this paper indicates that interpersonal relations are a source of dissatisfaction among functional managers. The functional managers are traditionally selected for their positions based on technical excellence. The results of this study would suggest that good interpersonal relations skills might help eliminate the negative hygiene of peer and boss relations. Communication skills are essential for both the project manager and the functional manager because of the numerous interfaces inherent in the matrix structure. Failure to recognize the necessity of these skills when selecting functional managers may result in a lose-lose situation. The individual loses through decreased job satisfaction in the new role as functional manager and the organizational group that he or she manages experiences possible reduced productivity from that person due to this frustration.

Future Work

Future work in this area should include studies beyond government and the aerospace industry. Does a successful matrix structure exist? The different types of matrix (functional, balanced, and project) must be considered when evaluating an organization. Authority or lack of it can be a source of dissatisfaction and the type of matrix determines who possesses the authority. Recognition of the

type of matrix in use may provide insight as to whether one matrix type is more or less successful than another.

The differing views of the project manager and the functional manager with respect to the type of matrix in use require further study. Identification of the cause of the incongruity between the views of the project manager and the functional manager could be essential to improving the likelihood of successful implementation of a matrix structure.

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