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THE PARADOX OF MANAGING A PROJECT
ORIENTED MATRIX: ESTABLISHING
COHERENCE WITHIN CHAOS

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This article focuses on the "Behavioral pathologies" that arise nat-
urally in a project structure with mult-disciplinary team; one example
being "authority ambiguity and responsibility confusion." Prescriptions
are offered for managers confronted with the common "diseases" of matrix
structures.

THE PARADOX OF MANAGING A PROJECT-ORIENTED MATRIX:

ESTABLISHING COHERENCE WITHIN CHAOS

Growing in practice throughout industry and the public sector is the use of more "organic" organization structures to cope with rapidly changing technologies, unique customer requirements, and the need for multi-disciplinary teams to solve complex problems.[1] These organizations tend to adopt a matrix structure to manage a variety of projects wherein specialists are assigned to different functional pools but spend their working time in one or more inter-disciplinary teams led by project leaders.

Businesses which commonly use matrix structures for managing projects include advertising agencies, R&D laboratories, entertainment companies, health services, construction companies, management consulting, educational institutions, accounting firms, and aerospace companies.[2] A consulting firm, for example, may put together an economist, psychologist, and a tax accountant to solve a client's request to design an early retirement plan. Or an advertising agency will establish a team of an account executive, copy writer, media expert, and market researcher to formulate an advertising campaign for a client's new product.

The "looseness" and "flatness" of a project-oriented matrix, while necessary to accomplish complex tasks, breeds significant management problems for senior executives. The inherent tendency of this matrix is to become anarchic and "out-of-control." As a result, senior managers are tempted to apply classical solutions, such as pulling back decision-making authority to themselves, or over-involving themselves in daily operations, or promoting endless manuals of job descriptions.

A retreat to classical management priciples, however, is self-defeating, since it destroys the needed flexibility of a matrix design. Project organizations with a matrix structure cannot be managed as if they are pyramids with a steep hierarchy of managers and a long chain of command.[3] These organizations defy such deeply cherished classical management principles as:

- "Authority should equal responsibility" (But a project leader in a matrix does not exclusively control all of his own staff who may be working for other project leaders.)

- "Every subordinate should be assigned to a single boss" (But a specialist in a matrix may have several bosses ranging from his functional head to a variety of project leaders).

- "Labor is more efficient if divided into specialized departments" (But specializations must be combined in a matrix to achieve an integrated solution for each client's problem.)

New management solutions are required to promote coherency and direction for a project-oriented matrix without undermining its essential looseness and flexiblity. This article identifies a variety of nonclassical management solutions that are uniquely appropriate for the inherent problems and paradoxes of a matrix structure. Four major problems, and their management solutions, will be discussed in depth:

- Professional Egos and Divided Allegiance

- Authority Ambiguity and Responsiblity Confusion

- Technical Bias and Economic Sacrifice

- Interpersonal Myopia and Team Deterioration

Professional Egos and Divided Allegiance

The lifeblood of most businesses using project/matrix structures is its professional labor force, which provides the critical technical

know-how for accomplishing complex tasks. In contrast to businesses with classical structures that are capital intensive, project organizations are usually labor intensive with few visible signs of machinery or factory facilities. Moreover, the labor content of matrix businesses is exceptionally expensive because highly educated professionals are hired to contribute forefront knowledge.

A major trade-off cost is inherent in placing so much emphasis on well-educated professionals. They tend to be highly oriented to professional disciplines which transcend company boundaries. They judge their career progress and pay relative to their professional peers in other companies. Labor mobility is high because professionals seek jobs, not companies, where their work and pay give them recognition and opportunities to develop their talents. Loyalty to a particular company is usually secondary to conforming with the professional norms, values, and standards of ones' own discipline.[4]

The senior management of a project/matrix organization faces a difficult dilemma in handling sensitive professional egos. They must attract the best professional talent and mobilize them around company products and economic targets, while at the same time maintaining an exciting climate for professional development. Traditional management approaches, such as promoting professionals into management careers, or waving the company flag, or exerting close supervision, or writing precise job descriptions, will likely fail in achieving these dual objectives. Most professionals have strong autonomy needs and therefore are inclined to sneer at displays of formal authority, emotional appeals, or restrictive rules.

A basic remedy is for management to design a challenging career system that gives strong support and recognition to professional advancement. There must be provision for a dual promotion hierarchy with suitable job titles that parallel the managerial hierarchy. Salary scales should be highly competitive with the professional marketplace; managers within the firm need to recognize that outstanding professionals in the company may indeed earn more than their supervisors--another difference from classical pay practices where pay tends to correspond with hierarchy. Other benefits will also be important to professionals, such as in-house seminars, liberal travel allowances for attending conferences, sabbaticals, and leaves of absence.

At the same time, senior executives need to assure that the professional staff does not turn the company into a "not-for-profit university." Project managers must be trained in interpersonal skills for relating effectively to professionals, since it is often communications skill, not hierarchical position, that is persuasive with professionals. A performance appraisal system should be designed which incorporates a two-way dialogue for integrating professional development plans with work-related goals. A flexible manpower assignment system must be devised that allocates the best talent to projects while also recognizing professional preferences for challenging assignments. A profit-sharing system can be implemented that shows the professional how his or her labors can be richly awarded by company progress.

Finally, careful attention must be given to the selection of key functional managers for each professional discipline. This person must be highly respected by the professional staff for his or her technical competence, while also being closely attuned to company goals. If these

executives lean too far in promoting professional development at the expense of project performance, then project managers will not only become alienated, but professionals will assign less priority to their economic responsibilities.

Authority Ambiguity and Responsibility Confusion

Project organizations with a matrix design purposely avoid pyramidal chains of command where directions are handed down from above. The wide variety of unique and complex tasks require delegated decision-making to project teams which possess the necessary knowledge and a close familiarity with the problems at hand.

But the distribution of authority in such a matrix structure is far more complicated than simple vertical delegation of authority.[6] Project leaders do not usually command exclusive use of specialists assigned to their projects; professionals also belong horizontally to different functional pools related to their respective disciplines. They are then farmed out to various project leaders on an "as needed" basis, thus permitting a more efficient use of expensive labor. As a consequence, professionals frequently find themselves working for three or four project leaders simultaneously. In addition, they retain a continuous reporting responsibility to the head of their functional disciplines.

Significant behavioral problems arise from this necessary but confusing diffusion of authority. Unlike mechanistic structures where the classical rule of "authority should equal responsibility" applies, employees of matrix structures are often perplexed as to "who has authority over whom," and "who has responsibility for what tasks." Conflicts arise as project leaders plead for the assignment of the best specialists to their respective projects, only to find them committed to other

projects. Maintaining discipline is difficult because professionals do
not see themselves as beholden to a single boss. Individual responsibil-
ity for mistakes becomes difficult to pin down. And even professionals
complain about the general lack of formal structure to guide their
efforts.

While these problems of ambiguous authority will never disappear
from a matrix structure, project managers can provide certain remedies
for "continuous clarification" of individual responsibilities. This is
achieved mainly through techniques of discussion and persuasion--not
through written job descriptions. Project leaders need to be trained in
the importance of constantly asking "responsibility clarification"
questions of their team members; never adjourning a meeting, for example,
until asking "who is supposed to do what with whom by when?"

As inevitable conflicts arise among project leaders and with func-
tional heads over personnel assignments, the organization can employ
"third party" consultants who bring the various factions together in
conflict resolution sessions. Techniques of group decision-making need
to be taught and emphasized as being more useful than hierarchical modes
for achieving commitment to team goals from an elusive group of autono-
mous professionals.

Moving up to the senior levels of management, the job responsibili-
ties of project leaders must be delineated from those of functional
discipline heads. Project leaders should be responsible primarily for
project performance and budget control, while functional heads should be
given control over the recruitment, training, and development of their
respective professional pools. Top management must retain responsibil-
ity for priority setting and major resource allocation decisions, but

these should be made in frequent planning meetings that involve both project and functional heads who have the necessary "grass roots" knowledge. While assignments of personnel can be dealt with in such meetings, they can also be delegated to a full-time "manpower scheduler" who is not only skilled in negotiating between functional and project leaders, but who is sensitive to fitting professional talents with the technical requirements of each project.

Technology Bias And Economic Sacrifice

The major products of businesses with project/matrix structures tend to have a high-technology component. Each project requires the combination of knowledge from several disciplines to create a unique finished product. It can be an advertising campaign which emerges out of the disciplines of copy, art, and media, or a space vehicle that develops out of a combination of physics, engineering, and the life sciences. These projects are usually "one of a kind" and depend on break-throughs in technology with tailor-made solutions.

This heavy emphasis on technology and knowledge can seduce professionals into overlooking the economic realities of each project. Discipline-oriented specialists are inclined to see the project in terms of its knowledge challenge, not its profit and loss statement. Consequently, an electrical engineer may over-design the electrical components, or a physicist may reject the math of a mechanical engineer. Project leaders find themselves looked down upon by specialists because they are not "up to date" in each discipline merging into their projects. Communications become difficult because of the "buzzword" vocabulary inherent in each discipline. Compromises are made at the expense of synthesis solutions, projects over-run costs, delivery dates are missed, and quality falls short of client standards.

A critical managerial focus here should be on the management capability of the project leader--especially for his or her selection, training, and necessary support systems.[6] Project leaders cannot be picked strictly for their technical achievements (as often happens), or exclusively for their knowledge of accounting and cost control. Rather, they must combine a rare blend of technical savvy with business aptitude in order to maintain professional respect and achieve performance targets. In-house training for project management skills, such as PERT (Program Evaluation and Review Techniques) and CPM (Critical Path Methods), is essential. "Real-time" accounting systems need to be implemented, which often involve remote entry terminals for project managers to keep track of on-going expenses, rather than waiting for quarterly statements.[7]

Project leaders must apply "continuous planning" in ways that involve the whole project team. If the project manager attempts to plan alone or if he/she waits too long before conducting a progress critique, then team effort is likely to suffer, with costs getting out-of-control. Off-site meetings can be held with all team memebers before and during a project to identify problems and to set realistic action plans. Project leaders should also be given a key role in the performance appraisal of professionals, with reports filed to their functional discipline heads at the close of each project.

A vital role for senior management is to conduct periodic reviews of major projects. These involve oral presentations by project managers and their key project members, followed by a thorough probing for hidden problems. Such sessions symbolize top management's desire to avoid surprises and to make other teams more alert to performing within budget and schedule.

Interpersonal Myopia And Team Deterioration

A proliferation of project teams are the basic building blocks and principal operating units of project/matrix organizations. Because of the complexity of tasks and the interweaving of professional disciplines, the overall effectiveness of these organizations depends heavily on smoothly functioning teams. Teamwork is especially critical for tapping the collective intellects of professionals and turning their ideas into finished products. Solutions cannot be so easily pre-programmed as in mechanistic organizations; instead, they are likely to emerge out of the motivational climate provided within each team.

Yet few professionals have been trained to work effectively in teams. As we all know from numerous research studies, technical specialists tend to be "idea" and "thing" oriented, rather than concerned with social relationships.[8] Long years of specialized education have taught them the positive side of intellectualism and individualism, and the negative side of emotionalism and group-think. As a result, few professionals are prepared to work effectively within a collaborative atmosphere required by project/matrix organizations. They suffer from the malady of interpersonal myopia.

Behavioral science techniques, based on the field of organization development (OD), can be applied to improve the interpersonal skills of professional specialists...such as the use of sensitivity training and team building.[9] TRW Systems pioneered in this area with effective OD applications in their aerospace operations. It created a new kind of personnel department that went far beyond the classical personnel practices of hiring, training, and labor negotiations.[10] Personnel specialists at TRW became internal consultants "on call" to project

managers and their teams. They would, for example, assist project managers in the conduct of "off-site" meetings early in a project's life as a means for taking a team beyond technical discussions to set behavioral expectations and mutual performance goals. Once the team was in operation, periodic critique sessions were held to detect conflicts before they became destructive. Such techniques can also be learned and applied by project managers without the assistance of outside consultants.

Inevitably there is a "bad apple" who disrupts a team and resists peer pressure for more constructive behavior. Project managers must be prepared to apply "on-the-spot" performance appraisals to change this behavior. If this fails, the "bad apple" should be removed at once in order to "save" the project. Project teams are fragile and cannot stand too much strain before they fall apart. Annual performance appraisals, which are common in classical organizations, are easily outdated in matrix organizations.

All of which brings us full circle back to the question of why the "bad apple" was hired in the first place. It is tempting in a project/ matrix to hire strictly on technical criteria, with hiring decisions made by technical experts. Matrix managers need to assert themselves to insure that a selection assessment is also made of each candidate's social skills. Unlike classical organizations that delegate hiring to their personnel departments, matrix organizations require a collaborative hiring process wherein both project managers and technical experts interview directly all professional talent.

Careful consideration of who is let into a project/matrix is probably the most effective "preventative medicine" that can be applied to

all of the diseases mentioned previously. Professional egos are inevitable, but if their only goals are external to the company, then they are a poor risk. Or if new hires cannot tolerate ambiguous authority and want only one boss to give clear direction, then both they and the organization will be unhappy. Finally, if prospective employees cannot respect the importance of economics and the value of other technical disciplines, then profits and teamwork are likely to suffer.

Matrix Management Paradox

The underlying theme of our remedies for matrix diseases is one of bringing more coherence and structure to an inherently free-flowing and chaotic situation. In essense, we are urging matrix managers to understand better, and even enjoy, the paradox that matrix organizations must of necessity be kept open and flexible, yet they must be given closure to prevent anarchy.

Managerial actions to give closure do not happen naturally or easily, nor can solutions be found in the principles of classical management. Matrix organizations do not manage themselves, rather intervention is essential. Solutions introduced by management will, in some sense, flow against the grain of matrix tendencies. Professionals will be asked to share their professional identity with the organization's goals, in exchange for autonomy and professional support. Task responsibilities must be informally clarified in return for avoiding rigid rules and regulations. Technical achievement will be highly valued and rewarded, but it must contribute to the economic viability of the firm. Decentralized decision-making in teams will be encouraged, provided team members can mold themselves into an effective group.

A final irony is that matrix management in project-oriented businesses is more a process shared by all employees than a role or position occupied by a few key executives. Even the professional technicial becomes a manager, because self-discipline, a willingness to share knowledge, and a desire to take responsibility are essential at the lowest levels. Management is everyone's business in a matrix organization.

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