

Designed LearningSM

**Building
Relationships
For Engineering
Impact**



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866 770-2227

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In an increasingly technical world, engineering makes ideas real. Engineers and the skills they bring to situations are key to progress and problem solving. Other people often see engineers as “experts” with ingenious innovations and technical solutions to complicated problems. Managers inside companies depend on the wizardry of engineers, and even sometimes expect miracles from them.

To have real impact, engineers too, are dependent. They need the support of managers or internal clients and their people.

Engineers seldom control operations. Because of this, they must establish collaborative relationships with clients or customers in the organization. If not, their expert solutions go unused, their clients are dissatisfied and they themselves are frustrated.

Collaboration with clients requires melding expert engineering skills with consulting skills. This means involving clients from the beginning of a project to work out issues of commitment and responsibility. It means engaging clients in the process - from defining the problem - to implementing the solution.

DIFFERENT RELATIONSHIP

Engineers by temperament and training focus on the technical aspects of a problem. But in today’s organizations is there ever such a thing as a purely

technical problem? —
PROBABLY NOT!

When the only focus is technical, important issues get lost: managing the problem; incentives for handling technical factors in a certain way and other people’s resistance to measures the engineer proposes. These non technical issues are part of the big picture affecting virtually every problem.

How often does this occur? An engineer recognizes that management issues surround a project. The engineer, upon returning to the office, gives valuable information about matters that negatively affect the project to peers, rather than to his/her client. The peer can do nothing about the situation, only the client can. By contrast, engineers, who act as consultants share all pertinent information with their clients, not just the technical.

FIXING THE REAL PROBLEM

One engineer tells how he returned to one location five times to fix a technical problem regarding a furnace. He learned on the first visit that operators were not following the maintenance procedures. The people in the field had so many other tasks no time was given to preventive maintenance. Not wanting to complain, they did not bring up the matter with their supervisor. On his fifth return trip, the engineer called the lack of maintenance to the site manager’s attention. Once preventive maintenance became a

priority, the problem did not recur. Acting as a true consultant, this engineer felt that the “people problem” fell within his sphere of influence.

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GETTING THE BIG PICTURE

“If the widget broke, I’d fix the widget or tell them how to fix it”, says Frank Talbot, Staff Engineer for Chevron Corporation in San Ramon, California. “Now I get outside of purely technical issues and look at the human factors. I’ve learned to ask: What is the client contributing to the problem?”

Talbot recalls being called to a plant where the coupling on a compressor was broken. After a week’s work he made recommendations. One or two concerned instrumentation and controls, his area of expertise. Four or five recommendations concerned the way line managers could prevent the problem from recurring, such as better training and documentation. A surprising number of recommendations were adopted.

“That was a first for me”, says Talbot. “It never occurred to me that a plant manager would welcome the advice of a technical guy beyond the widget level.

Earning that welcome takes specific skills.”

There is power in being a true consultant. The engineer is neither an "expert" solving problems all alone nor a "pair of hands" implementing someone else's solutions. True consultants give the relationship with the client as much attention as the technical issues.

DIFFERENT VIEWS OF THE PROBLEM

Many dilemmas facing staff engineers pertain to costs. Staff engineers want to solve technical problems and design engineering projects in the best possible way. Client/managers on the other hand often want to solve problems in the cheapest way. What the engineer thinks is necessary or desirable, the client may consider “over-engineering.”

Engineers may find it hard to stand up to their internal clients. Client/managers sometimes consider engineers who hold their ground, stubborn and inflexible. Consulting skills help narrow the gap between these two positions.

Charles Fields, formerly an engineer with Hartford Steam Boiler, recalls an engineer sent to investigate a boiler failure who wanted to perform additional tests. When he learned the tests would lengthen the outage by two days, the plant manager resisted.

Instead of insisting on the tests, the engineer encouraged the plant manager to express his concerns.

The plant manager was feeling pressured because production was behind schedule.

Once the engineer convinced the plant manager he was “on his side”, they were then able to eliminate the cause of the boiler failure and get quickly back into production.

In extreme cases, clients may

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pressure engineers to take short-cuts that will fail in the long run. They sometimes demand a “quick and dirty” solution the engineer feels is unacceptable or even dangerous. Although it is difficult for the engineer to say “no” to clients, he/she must do so and without setting up a power struggle between them. “It is important to avoid establishing possible courses of action as “your way” and “my way” but more neutrally,” says Richard Bergman of Corning Inc.

COST ISSUES

More organizations are charging back for the work of staff engineers. This means corporate engineering departments must compete with external engineering consulting firms that bid on projects.

Staff engineers are sometimes restricted in the ways they can set prices, priorities, and shift resources. This can prevent them from competitive bidding. Internal engineering departments

must support corporate overhead, putting them at a pricing disadvantage. While staff engineers base quotes on time spent, clients prefer a set price. More effective contracting, helps staff engineers and their clients better understand each other's situation.

Charles Fields describes a time the home office sent an account engineer to find out why a regional manager could not provide an engineer for a temporary assignment. The manager blamed “limited resources” as the reason. Rather than arguing with him, the account engineer lent a sympathetic ear. He encouraged the manager to open up about the larger picture.

The company's accounting procedures did not provide compensation for the time and expenses of an engineer temporarily reassigned. Since the engineering manager was measured on profitability, assigning an engineer would affect his results. The account engineer arranged a meeting with accounting, data processing, and the regional managers. Together they worked out a simple procedure to transfer expenses across regions.

NOT JUST AN EXPERT , PAIR OF HANDS, OR POLICEMAN

Engineers, like other staff functions, can be trapped into the role of “expert”, or “a pair of hands”, rather than a partner. Both of these roles block collaboration. Clients often feel vulnerable and threatened when

they cannot solve problems without engineering help.

As “expert” the engineer takes over the client’s problem. The “expert” has full responsibility for deciding how to proceed, and what information to gather. The client/manager plays an inactive role, evaluating only after the fact.

Rather than working with the engineers, managers give the engineers the whole project. Later, if the project doesn’t work, the client blames the engineer. Engineers must understand the factors that push them and their clients toward expert/client relationships to avoid these pitfalls.

A “pair of hands” is the opposite of the expert. The engineer who becomes a “pair of hands” accepts the manager’s plan of action and implements it without exploring the over-all situation.

Too often managers want the staff engineer to do some chore the manager cannot or does not want to do. Some engineers welcome this role because they like collecting data and creating designs. They may be less comfortable at the communication necessary to uncover the larger problem.

A good contract includes knowledge of the larger problem and the right to influence decisions. Without this clarification the data might be used inappropriately and the engineer may fail.

Neither of these roles "expert" or “pair of hands” requires collaboration. If engineers want

to work as partners, collaboration is required.

As consultants, engineers need to develop trust in the relationship. Once clients trust the consulting process, they

“Clearly, I'd skipped over the contracting portion of my involvement. I became a pair of hands.”

are more willing to commit the money, time, and effort needed for a successful project..

One engineer clearly worked on the relationship first when she arrived at a pulp and paper mill to make a risk assessment. Because the plant manager seemed upset, the engineer asked, “How do you personally feel about having the assessment conducted?”

Disarmed by the engineer’s personal concern, the manager confided he was upset because past risk assessments took too long. The engineers acted like policemen, he told her and there had been problems with the home office.

Getting these concerns on the table early enabled the engineer and manager to work out procedures to eliminate anticipated problems.

CONTRACTING IS ESSENTIAL

The point of maximum leverage for the engineer/consultant is in the contracting phase of a project. There are possibilities for impact

that may be lost if not pursued when contracting.

Internal consultants often undervalue the process or overlook the essential steps of contracting. These are some of the steps:

- Defining the boundaries of a project.
- Negotiating the roles and responsibilities of all participants
- Establishing a time frame
- Guaranteeing confidentiality
- Committing resources
- Agreeing on a definition of success and failure.

“ those underlying feelings would have slowed the project and made for a miserable relationship at the plant.”

Richard Bergman agrees. “Once I jumped into a project and got going even though I had nagging questions. In meetings with the project leader, I provided him with the data he wanted. He, however made his decisions in private. I realized that my services and abilities were being underutilized. Clearly, I’d skipped over the contracting portion of my involvement. I became a pair of hands.” Realizing what happened, Bergman was able to stop the project long enough to negotiate a more appropriate role.

ONE PROJECT-MANY CONTRACTS

Good and complete contracting must be done with all the people who will participate in the project. One obstacle to good contracting is when staff engineers are confused about with whom they are contracting. They must cope with a constant vacillation between centralizing and decentralizing the engineering consulting function. They need to manage dotted-line relationships with either corporate, the field, or both.

Sometimes the contract must be a triangular one among the staff engineer from corporate headquarters, the client/manager, and the local engineer involved in the project. Feelings of rivalry, vulnerability, and intrusion may interfere. The engineer/consultant must learn to bring these concerns out in the open to make the relationship work.

Charles Fields relates a story of a plant manager of a utility who requested a corporate engineer to oversee the dismantled inspection of a large turbine. Discovering that the plant engineers did not know he was coming, the specialist began his first meeting by asking the local engineers how they felt about working with him. After some give and take, they told him they didn't like the idea of a "hot shot" from corporate telling them how to do a dismantled examination. The specialist/engineer acknowledged their feelings as natural, paving the way for a discussion of how

they could work together. "Had this step not been taken," says Fields, "those underlying feelings would have slowed the project and made for a miserable relationship at the plant."

Another triangular relationship arises in union environments. Engineers like to be seen as separate from both management and labor. They must contract with the union as well as with management.

When engineers do "pilot projects," they must contract effectively with multiple clients — not only managers but all the on-site employees who may be distracted or removed from their regular duties. Keeping everyone informed takes time, energy and commitment to communication.

A MATTER OF PRACTICE

"Engineers sometimes have trouble de-emphasizing their technical competencies when called in to solve problems with internal clients," says Dave Bryson of Chevron Inc. "But once engineers force themselves to begin talking about the personal aspects of projects, they are good at it. I enjoy watching

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engineers learn new aspects of consulting," he says.

"Engineers first want to fight the model for contracting taught in Designed Learning workshops because they are concerned about showing weaknesses", he continues. "Once they take it step-by-step, the pieces get more comfortable. Once they feel it's okay to not have all the answers, they know they can work collaboratively with clients."

"Waking up to these new dimensions of their work," Bryson concludes, "is good for the engineer and the organization."

For additional copies contact:

Designed Learning Inc.
313 South Avenue
Suite 202
Fanwood, NJ 07023
908-889-0300
908-889-4995 (fax)
E-Mail:
Info@DesignedLearning.com