

ASP, The Art and Science of Practice: Getting the *R* in Contact

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Business schools increasingly pressure faculty members to prepare MBA students to immediately contribute to their employers' bottom lines. Many academics have had little or no business experience themselves, and administrators are encouraging them to acquire it to improve their classroom effectiveness. My guidelines to help faculty get involved with the business community concern handling the initial contact with a company, developing a proposal, managing the project, and following up to ensure successful implementation. I seek to help the faculty member get the *r* in the word *contact*, to convert it into *contract*. I focus on operations management and management science, and my intent is to start a process of sharing ideas that encourages others to add to the set.

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In a recent article in *The Chronicle of Higher Education*, Mangan (2003) provided this insight into the pressures on the MBA degree:

In addition, M.B.A. classes themselves are not always conducive to clinical learning. That's because a severe shortage of business-school faculty members with Ph.D.'s has, in many cases, spawned larger classes and prompted many schools to hire professors with training in fields like psychology and history—academics who are less likely to have business contacts.

But most graduate business schools have concluded that they can no longer afford to be viewed as detached from the world they are training their students to enter. (p. 3)

Many faculty members with PhDs in business may lack contacts and experience with companies and may therefore be detached from the business world. At the same time, the publish-or-perish pressures are as high as they have ever been in business schools. Faculty members can obtain three benefits from involving themselves with the business community: The experience they gain can enhance their credibility and performance in the MBA classroom, the complex problems they encounter and solve in business can drive research and publication programs, and they can earn supplemental income that is becoming increasingly difficult to obtain from other internal and external (agency research) sources. My purpose in writing this article is to help business faculty members in this situation who want some involvement with industry. I base it on my experience in obtaining and completing over 50 sponsored projects with a variety of industries during more than 30 years. The

projects generally required quantitative modeling and often resulted in implementing software. Since these areas are often particularly hard to sell to MBA students, it seems especially important that faculty members gain credibility from real-world experience.

How Do You Get Contacts in the First Place?

One of the best sources of contacts is your current and former students. They know you and your capabilities, and they know the needs of their companies. They can easily put the two together, and can often arrange preliminary meetings so that you and the decision maker(s) can evaluate potential opportunities. Many of us never let our students know that we are interested in working on applied projects. While we must refrain from blatant advertising, some subtle suggestion should be acceptable. If a class session on a subject that is near and dear to your heart has gone particularly well, you can reveal that you enjoy helping companies implement the ideas.

My experience is that firms near the business school are the most fertile ground, since they often have existing relationships with the school. Simply reading and following the local business news can help. If you see an article about a local firm getting a big contract with a customer to codevelop several products, and you have interests in such areas as product development or project management, note the names and titles of the company personnel and call them. Congratulate them on the award and indicate your specific interest in it. Offer to meet with them to chat about the project if the contact seems warm.

Your colleagues and school administrators may also be able to help you with contacts. If you pursue this strategy, be sure to establish a clear understanding of the ground rules that your colleagues want you to follow so that you don't hurt their relationships with their contacts. Even friends and neighbors can sometimes help with introductions and contacts.

The companies that best fit your expertise may not be located in your area, so you may need a remote contact. Start with the alumni office of your employer and see if any graduate of the school works at the company. Alums generally enjoy promoting their schools to others in their companies, and many companies have hired so many graduates of a particular university that they have active in-house alumni groups. If this search fails, you can still follow news about companies of interest and try to make contact just as you would with nearby companies, except you will have to work harder without face-to-face interaction. You can also search for publications that faculty members of other schools have written about your companies of choice. Some authors may be benevolent enough to help colleagues from other schools gain access, especially when your interests and theirs do not overlap.

The First Exploratory Meeting

Probably most important during your first interaction with company personnel is to be a good listener. Faculty members usually do a lot of talking, so listening is a challenge. Ask questions that help you to understand the problem in detail, but resist the temptation to propose an immediate solution to it. I have several reasons for these suggestions.

First, company personnel may not be totally comfortable with a professor. The more you can put them at ease, the better your chances of getting the *r* in contact. If you use technical language that they don't understand, your chance of success drops. Initial explanations of the problem may make it appear to be outside your areas of interest. However, as the layers of the problem unfold you will learn more about it. At times, company personnel will pause to give you the floor. If you are comfortable summarizing your understanding of the problem to that point using their language as much as possible, do so.

I once went to Texas Instruments (TI) to discuss a problem described as a production-scheduling problem and learned that it was really an assembly-line-balancing problem. Such problems were not of great interest to me, but the problem became interesting once I understood all its complexities. I developed a lot of ideas and went back for a second meeting to discuss the ideas, which TI received enthusiastically. So I suggested that I write a proposal to develop

and implement the ideas. I was informed that TI did not employ outside contractors (this was in 1978) but would buy software. Therefore, I developed a computer program (Flowers 1978) that implemented the ideas, and the company bought it after seeing some of its results. It paid \$5,000 for it and estimated that it saved them between \$3 and \$5 million per year in direct labor savings.

Had I been overly concerned about the meter running (being guaranteed payment for my services), I would not have taken advantage of this opportunity. If you are fairly new to working with companies, I suggest that you focus on how much benefit you are going to provide to them, rather than how much money you are going to make. If you are effective in working with companies, you will have many more opportunities to make money as you gain experience and confidence.

Subsequent Interviews

Often you will need to learn more about the problem and its environment before you can develop an intelligent proposal. You may need to schedule additional interviews with key people to obtain this information. For two critical reasons you should be thoroughly prepared for these interviews. First, they are your last chance to get answers to your questions and to test your concepts before submitting your formal proposal. Second, the people you meet will size you up and give their assessments to the primary decision makers who decide whether to fund the project. In addition to asking specific questions of people who represent different points of view on the problem (marketing and manufacturing, for example), you should also parrot back a summary of your understanding of the problem to each person to solicit elaboration. Through this process, you may obtain a broader understanding of the problem.

In these interviews, each person you are meeting may try to get you to commit to his or her point of view. A marketing manager may tell you that inventories in the company are so low that the company is missing sales opportunities. Then the marketing manager will ask you, "You will be able to prove that we need to increase our inventories, right?" The finance manager may tell you just the opposite and ask you the opposite question. You need to have ready answers that don't turn either individual off, since you do not want them to argue against retaining you. A useful answer is the simple statement that you are too new and inexperienced in their company to draw any conclusions yet, but that the process of your analysis will certainly reveal what the problem is and provide good recommendations for solving it.

During this interview process, you should also try to understand the problem environment and

the leverage points. I once wrote a proposal for a steel company to work on loading furnaces for a batch-annealing process. I learned that the company updated information on its coil inventories only once every 24 hours and that the inventory turned about once every 24 hours. This meant that trying to select a batch of coils to anneal even 12 hours after the last inventory update would probably not be successful, since you would have no information on half of the inventory available. Any algorithm I developed using antiquated data would have failed.

The problem scope that a company lays out may be so narrow that it will be hard to show major benefits. In 1979, a consumer-products company asked me to do a layout study to develop new layouts for its office, warehouse, and manufacturing areas. At the time, these areas were spread across two locations. I knew that the savings in materials handling that the company might obtain from the study would be modest, and I suggested the company consider a broader facilities-consolidation study. It declined to do so, and I went ahead with the layout study. The results produced a more organized and productive company but left much unused space in the two facilities. The company later retained me for the facilities-consolidation study, which resulted in its closing one facility and combining its operations in the other one. The before-tax rate of return for the consolidation study was 44 percent, and the company was elated. If I had not been looking beyond the project I was asked to do, I might have missed this opportunity to better serve the company.

A general criterion that can guide you in any situation is, "What would I do if I owned this company and wanted it to be successful in its industry in both the short term and the long term?" In 1990, Merit Brass Company asked me to help it write a quality manual for the company. I explained that this was not the kind of thing I normally did, but if the company would increase the scope a bit to include a quality and operational audit, I would quote on the work. What the company and I learned from the audit and what we did about it led to a Franz Edelman finalist award (Flowers 1993). Some companies resist any effort to broaden the scope of a project for fear it will cost more money and take more time. These are real fears. On the other hand, you have to be somewhat confident that the project as defined can benefit the company. Otherwise, you are not building the kind of reputation you want for the long term.

After your meetings with various company personnel, you should have a good idea of the nature of the problem. You should ask yourself a critical question. Is the project consistent with your own professional objectives for it? I characterize projects as oriented more toward consulting or more toward applied

research. The work is consulting if the problem has well-known answers that require no extension of the body of knowledge. You may still decide to take such an assignment if (1) you want the experience for your professional development, (2) you want to integrate the learning into your classroom activities, (3) you feel you may be able to publish a case study and an implementation article based on it, (4) you are doing the work for financial reasons, and/or (5) you have the time to do it without jeopardizing other important activities. If the project does not meet your go criteria, try to bow out gracefully in such a way that you still help the company. You can refer the company to a colleague you think would do a good job on the work. You can suggest a professional consulting organization that should be able to handle the work. You can suggest that it hire one or more of your students to do the project, with or without your supervision.

To help you decide whether you should supervise students on a project, you can rely on the following logic. If the company has all the expertise it needs to do the project in house and has the time and willingness to supervise the project, you should be able to refer a student and bow out. If the company does not meet either of these criteria and you bow out, you and the company are making the student the project leader for both content and process. Few students are ready for such responsibility, and as a result, the project may stall and create dissatisfaction. Company personnel will generally be honest with you if you explain your criteria and will admit they need your time.

Assuming a project meets your professional objectives, you are ready to proceed to the proposal stage.

Writing the Proposal

Write a juicy proposal. Do not worry about giving away the answer. If the client firm feels that it can take your proposal and run with it without you, it is probably not the kind of client you want. Real players recognize the value of the external professional's point of view and want the person who wrote the great proposal to help the company implement it.

The Introduction and Background Section

In the introduction and background section of the proposal, you should summarize what you have learned about the company and the problem it wants you to help it to solve. You should include a forceful statement that this problem needs to be solved (for example, "If inventories continue to increase at this rate, half of all assets will be inventory within two years"). You should demonstrate that you were a good listener during the interview process and that you have an excellent grasp of what the company needs to accomplish. If the company provided

you with any metrics that reveal the depth of the problem, by all means include a summary of them in this section.

The Approach Section

In the approach section, you should address both process and content issues. In describing the process, spell out how you want to work with the company personnel. I establish a total quality management (TQM) team for each project. I request a representative from each area who can contribute to the solution and to its implementation. Implementation is critical. Will your work be of any value to the sponsor if it is never implemented? Its value will be negative: your cost and the internal costs for the project. By including everyone in the team process, you will ensure that you address the right problem and that you maximize your chance for an enthusiastic implementation. A mediocre solution implemented enthusiastically will produce more tangible benefit than a perfect solution implemented halfheartedly. I have repeatedly worked in environments in which I could see that pushing the envelope in the implementation process would produce great benefits, but the company team members pushed back, arguing that the firm could not handle that much change. In such cases, I must compromise on the solution quality to ensure its enthusiastic implementation. I can, however, pursue the extensive version of the problem in my research. Many times, sponsors later implement the more complex and demanding versions of the solution processes, but they do so in steps.

I once did a project for a manufacturer of semiconductor devices to improve the efficiency of its incoming inspection process (Flowers 1980, Flowers and Cole 1985). The design criteria for the inspections were so tight that sample sizes as large as 500 were common for the single-stage sampling plans in effect. (A single-stage plan means that one sample is drawn and every unit is inspected, and then a final accept or reject decision is made.) For months, inspectors worked overtime on Saturdays and many Sundays with a corresponding loss of spirit. I wrote a computer program that allowed for multiple-stage attribute-sampling plans, with the minimal sample size per stage equal to one unit. (Multiple-stage plans allow you to take a small sample and then decide to accept, reject, or continue sampling based on the results. If you either accept or reject at an early stage, you inspect many fewer total units than you would with a corresponding single-sampling plan.) However, the company managers thought that diverging too radically from the previous practice would be going too far too fast. They started with two-stage plans at 200 to 250 items per stage, went on to five-stage plans with 100 per stage, and finally to plans with up to

10 stages of 50 items per stage. They completely eliminated overtime; in fact, they reduced the number of inspectors needed. This work was awarded an *IIE Transactions* Development and Application Award.

In addition to explaining the process component of your work, you should explain in simple terms the technical approach you plan to take (for example, mathematical programming or simulation). It is usually not necessary to spell out technical details at this point. In fact, such details may make decision makers less likely to accept the project.

Working Arrangements Section

In the section on working arrangements, you should explain the important logistics for the project. You may have discussed them with your primary liaison in the company. You should include meeting schedules. If you have to spend time traveling to reach the company facility, you can reasonably ask that meetings be scheduled in a concentrated way when you make a trip. You should also make the company responsible for collecting the data, for ensuring its integrity, and for providing it to you in a convenient computer-readable format (a spreadsheet, for example). Even with this provision, study the data carefully as soon as you receive them. If they do not look correct, immediately make your suspicions known to the providers and push them to correct the data. The client firm will not be happy if you do a lot of analysis with data that are obviously bogus. You will not be happy if the firm expects you to repeat all that work on the correct data for no additional compensation. So make sure you have the right data.

Deliverables Section

In the deliverables section, spell out exactly what you are going to provide. Typical deliverables include a final presentation, any data or spreadsheet files you create in the process, any computer software you create, and possibly a final written report. Try to minimize the length of final reports; they are time sinks. On the other hand, if the client requires a final report, don't avoid it; simply be sure you include time to prepare it in estimating your hours for the project. A final presentation is useful since it allows an interactive dialogue with the company personnel that promotes better understanding of your work than the written report would on its own.

Confidentiality Section

Companies are incredibly secretive about their data. I once did a project for a large metropolitan newspaper to implement newsboy theory for sales of its paper from vending machines and stores (pharmacies, restaurants, groceries, and so forth). I signed a confidentiality agreement and subsequently asked for circulation data. I was flatly denied! A few months

later a local magazine that competes with the paper published the daily and Sunday circulation figures for the paper. The paper never confirmed or denied the figures to me, continuing its secretive habits. By including a standard confidentiality clause in your proposal, you relieve the anxieties of company personnel and you make yourself look as if you've been there before and know what you're doing.

Resource-Requirements Section

In the resource-requirements section, you provide an estimate of the number of hours you believe you and your team will spend on the project and the amount you propose to charge. By totaling the estimated hours for all personnel and the resulting costs, you will obtain a weighted average cost that will attract much less attention than if you provide separate lists of your hours and costs and, for example, student hours and costs. Unfortunately, this section is often the first section that company personnel read. You should emphasize that your requirements are modest compared to the benefits your work will provide to the company.

You should also spell out what support you expect from the company (for example, that it will schedule meetings promptly to support the project schedule, with the understanding that you will not ask company personnel to attend extensive meetings at a moment's notice).

Early in my career, I underestimated the time I needed by as much as a factor of four, so I charged for only one quarter of the time I actually spent on a project. Everything looks easier than it will actually be. Even so, I still think sponsors are most likely to accept fixed-fee contracts. As you get better at estimating the time you need, you won't often need more resources than you estimated. Since you will improve your teaching and research effectiveness through your work in industry, whatever pay you collect is just an extra benefit. Even if you are willing to do work for free just to gain the experience, you should have some costs that you ask the company to reimburse. This is an acid test. If the company will commit no resources to your effort, the likelihood that it will do anything with your results is small.

Legal Section

The legal section is pretty standard; it usually simply states that if any part of the proposal is found to be unenforceable, that does not affect the balance. It also spells out where any disputes will be resolved. The company typically has the upper hand here, so you must usually accept that resolutions of any disputes will be governed by the laws where the company is located. Since we never want to be in disputes anyway, this should not be a big deal.

Signature Section

The final section is just a signature block with lines for the necessary signatures and their dates, typically just your signature and that of a responsible person from the company. If you need student assistants, they typically work for you and not the company, so their signatures are not needed. You should have student assistants sign the same confidentiality clause that you sign before you share company data with them.

Negotiating the Proposal

Once a company has a proposal, it commonly tries to negotiate certain aspects. It may be bargain hunting, but it may have reasons for other aspects. One company asked me to do all the work spelled out in my proposal for half of the budget request. I declined; the budget was what I really needed. The company accepted my original proposal and indicated that it routinely checked to see if proposed budgets had any fat in them. Another time, a \$500 million division of a large corporation asked me to redraft my proposal into two pieces, each for half of the original budget. It could approve the lower amounts without asking for corporate approval; otherwise corporate attorneys had to be involved. I recommend a policy of accurate estimates and little or no negotiation.

Managing the Project

Once your project is accepted, it's time to get going. Since entire books have been written about project management, I won't cover the subject here. It amazes me, however, that many academics with book knowledge of project management ignore it when they are working on projects. Use your knowledge of project management to brainstorm a list of all activities that must be done to complete the project, the precedence relationships between them, and the estimated times for each, and identify the critical path. You will be glad that you did, and your estimates of resource requirements are likely to be accurate.

Project management has a behavioral side as well as a technical side. I recommend *The Team Handbook* (Streibel et al. 2003) for practical and behavioral guidelines for teams. A simple topic the book covers is how to keep minutes of meetings. I suggest circulating minutes within 24 hours of a meeting. Participants won't remember the details weeks or months later, much less that they agreed to complete tasks that they haven't done. The minutes and their attachments provide a superb starting place for creating your final presentation and report.

I suggest hiring students for all the project tasks they can handle with your support and direction. Student help will lower the cost of your project and will typically enhance the quality of work done

because students can devote more hours to it than you can. The students will learn from the experience, and it adds to their resumes. Many of my students say that these projects were highlights of their graduate careers. Here are some suggestions to enhance the experience for you and your students. First, spend time explaining the projects to the students and clearly describe your expectations. I tell them about their compensation and my own, so that they can make informed decisions about joining a project. Typically, they work 80 percent of the hours estimated for 20 percent of the contract price. In spite of that, I try to try to get them more per hour than they would earn for other student appointments in our department. By sharing financial information up front, I avoid their being surprised if they later learn the contract amount.

You should invite students to participate as colleagues in discussions with you about the project. However, students should understand that you must retain final authority, since yours is the signature on the contract. You should also emphasize that students cannot commit your project resources during interactions with the client. For example, when your agreement specifies that the company will collect the data, a student must not agree to do so to try to be responsive and service oriented. As the project moves along, you may be able to give students more discretion and more challenging assignments. I have sometimes had students make presentations to sponsor groups when I thought they and the sponsors were ready for that.

Final Deliverables

Most professors make sure the deliverables include those promised in the proposal. You should also make

sure that you communicate that content effectively. For example, you might distribute color copies of your presentation. For final presentations to small groups, color displays can easily improve the appearance of a key deliverable. Similarly, make sure that you edit, polish, and proofread the final report so that it reads really well and that you put it in a nice binder. If your work is successful, it may attract the attention of top managers who could ask you to bid on large projects in the future.

Following Up

You are not finished with the project when you submit your deliverables. The company may contact you to ask for some additional implementation assistance. If it has not done so after a reasonable time, call a particularly friendly contact at the company and ask about the progress. Offer to meet with the implementation team to answer questions and provide support. Remember, the client will obtain tangible benefits only if it implements your results!

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