

Selecting and Effectively Using Computer Consultants

Many small businesses need help when they computerize some of their operations. This paper discusses which small business owners use consultants, how to select a consultant, procedures by which consultants build systems, tips on how to work effectively with a consultant, and key points to look for in contracts with computer consultants.

The emphasis of the article is on providing practical advice for improving an important business relationship.

Most owners prefer to remain business people rather than become computer gurus. At a time when anyone with computer can call himself or herself a computer consultant, how can the small business owner be assured that a consultant can actually help them? How can an owner most effectively use a consultant's time and talent and avoid wasting money on unproductive ventures? How does one select a consultant fitted to your needs?

First, who needs a consultant?

Owners who have no additional staff for on-going projects and who can't hire full-time, computer staff.

Owners who perceive the need for point-of-sale, inventory, accounting, or other systems but who are not themselves computer-proficient and who do not have staff capable of implementing critical systems.

Owners who no longer have access to someone on staff or to a consultant they used in the past but whose systems must now be modified and improved.

Owners whose computer-literate staff cannot keep up with changing technologies.

Owners who feel that in-house developed systems are no longer appropriate solutions to their business' problems and want an evaluation of their systems.

Owners who need systems fitted to their unique business needs.

To Contract or to Hire?

It is not always clear whether it is preferable to hire a new part-time or full-time employee to carry out tasks requiring computer skills or whether a short-term consultancy is likely to be more productive.

When an employee is hired, the owner has a more direct control over the development of new systems. If a large amount of on-going, low skill-level work is required, effort expended on negotiations with a consultant's contract is moved into effort in hiring trained staff. Employees compare favorably to consultants on a cost-per-hour basis. Computer consultants may be required in the following situations:

1. When an application has to be developed immediately or when a system you have been using has to be brought back into operation rapidly, a consultant may need less time to get it online. Quick fixes don't demand the hiring of an employee.
2. When a specialized problem like the installation of a point-of-sale system or the setting up of a small computer network exists, a person who has the necessary expertise and prior experience with similar systems can work more efficiently than can a person who is thinking this through for the first time.
3. When all the compensation and support (training and office, for example) costs of a full-time person are considered, a consultant, even at considerably higher per-hour rates may be justifiable. The compensation for a well trained, computer person alone begins at around \$30,000 per year.
4. When companies of comparable size and type do not hire people to carry out their computer tasks, it is unlikely that your company can or should do so.
5. Effective computer consultants often have expertise in the fields for which specialized software applications are needed.

An employee may have the basic computer skills to install, for instance, an accounting program. They may not be able to help you to decide on which package is best for your type and size of company

When you are uncertain if you understand your own requirements, you may need someone who can offer the "bigger picture" to you and your staff.

Employees to handle your computing needs are only cost effective if they can be kept on staff. When you require assistance during crises, a consultant can provide system backup.

Selecting a Consultant

Anyone can purport to be a consultant. How, if you've decided that you need a consultant, can you do so when your need emerges from a lack of computing knowledge to begin with? A poor consultancy is worse than a waste of money; it is a waste of time, morale, and employee confidence. The effort you put into locating a consultant varies with the extensiveness of your needs. If you are confident that you have an easily handled task requiring only a few hours of a consultant's time and if a colleague refers a well-recommended consultant to you, you might simply call that person and discuss your needs with them. The results of your conversation may lead to a short-term, limited-scope contract.

Whenever you have a more demanding problem; one that is likely to compel a longer-term and more expensive agreement, the risks attached to selecting a poor consultant increase. You have to put more effort into the process. When this is the case, you should develop a brief (one page), request for proposal that succinctly outlines your problem, the goals and the scope of the project.

In some systems, you should be prepared to describe the kinds of reports and data entry screens you desire. Invite several consultants to discuss your project with you. Give them the written overview of your problem and discuss it with them in a short (1-2 hours) interview. Ask them to submit proposals that describe how they would work with you further in analyzing your requirements and in designing and implementing a system. Their proposals provide one indicator of their interest in solving your problem and a strong basis on which to evaluate their ability to communicate with you.

Ask yourself, is their proposal reasonable? Did the consultant correctly understand the problem? Do you and the consultant understand the procedures involved and what is required?

Be ethical. Don't expect the consultant to write applications using pirated software. Don't divulge one consultant's proposal to another so that the second can be hired less expensively. The consultant is a businessperson just like yourself so pay them just as quickly as you expect others to be paid for your services.

How to find and hire the right consultant

Identify potential consultants from various sources. . Many people can help you identify potential consultants including: (1) your peers who can tell you who they have retained and with what results, (2) your trade association members, (3) members of professional computing associations.

Processing Management Association, and the Association for System Managers, (4) local computer user group officers and other computer knowledgeable people, (5) the regional small business development center, and (6) local campus-computing faculty who can suggest possible candidates. Don't limit yourself to the first name you encounter.

Develop a list of possible consultants.

Perhaps, the first and foremost characteristic to consider when selecting from available consultants is the level of trust and confidence you can place in that person. Trust emerges from many sources and if you can't place a high degree of trust in a consultant, don't go any further.

Why is trust so important? First, there is a mutual need for trust regarding one another's businesses. You must have the consultant's commitment to confidentiality. They have access to details and information about the state of your business. You don't want them to talk about your business and finances with their other clients or your competitors. There are other reasons to consider as well. Anyone working on your computer may inadvertently cause damage to your hardware, software, or data. You will need someone who guarantees their reliability even when they are at fault.

There is also a potential for theft; not an insignificant concern for people who work at home, have expensive stock on hand, or who must leave a consultant to work independently on-site during off hours.

A consultant's personality is real important. You will have to deal with this person on an on-going basis. You will want to feel comfortable in discussing system features, reorganization of aspects of your business, and have the belief that you are not being sold what you don't need. They have to listen to and understand what you want and what goals you are seeking to achieve.

The Interview

Be aware that consultant interviews work in two directions. Good consultants have plenty of work to do and they have a sense for who is likely to be a good client. They turn down jobs that don't compensate them for their time adequately or for which they may not get paid. They do not undertake jobs that cannot be implemented or which the client is unclear about the goals to be achieved,

There is no benefit to them in working with a client who is likely to become a poor reference or who is likely to take their proposal and use it to shop around for the lowest bidder.

Be clear about the kind of help you need. Your initial discussions with consultants should help you to decide the extent to which your problem requires (1) new software development, (2) Acquisition of packaged software, (3) additional hardware, (4) staff training, (5) line-of-business consulting, and (6) data input. If the latter is true, don't pay high-cost consulting for a low-cost task. The consultant should have experience in your line of business. A consultant who has an understanding of your industry's dynamics brings Assets to the task that a consultant unfamiliar with your industry's terminology, procedures, legal requirements, and environment cannot provide.

Thoroughly check a consultant's references.

The best indicator of a consultant's performance with you is their performance with others. Find out from their references whether they delivered systems on time, under-budget, and in-line with client expectations. Did the references obtain assistance on projects that are similar to yours? How well did the consultant recover from problems that appeared? How cooperative was the consultant after the project was completed? If a consultant has been able to stay in business for several years, that is a strong, but not a guaranteed, basis for assuming their continued presence. Stay away from recently announced consultants whose future availability is more suspect. Get as complete a list of a consultant's clients as possible. Find out how many clients the consultant is currently serving to see if he or she has the time to commit to your project

Be especially wary of consultants who purport to have all skills in all areas of computing. Do they have the analytic skills? A consultant needs to visualize your problem and develop creative approaches for applying new technologies for your competitive advantage. The consultant should have a broad knowledge of digital technologies to avoid building outmoded systems. He or she should be familiar with already available software packages not just with programming languages. It is almost always preferable to acquire an existing software package than it is build your own. Most industrial segments have prepackaged software available that is likely to be better than what you can afford to build for yourself. You need a problem solver, not just a programmer. The consultant must have the appropriate technical skills.

If the situation requires development of a complex system, modifications to a program written in an outdated computer language, or the linking of two branch sites with a communications link, does the Consultant already have the skill needed to do this?

You should not be paying for the consultant's education. Either, the consultant should have the skill set needed to complete your project effectively or they should obtain the necessary skills at their own expense.

Don't Provide the training ground for consultants-in-training when you are paying for a skilled professional.

For larger projects, a one-person consultancy may be inadequate a larger firm may be needed. Make sure they have the skills needed on board or can acquire these skills readily also be certain that the person you are evaluating is, in fact, the person who will do your work.

Evaluate a consultant's communications skills. The consultant must have the people skills needed to elicit cooperation. Can he or she communicate with you and your employees accurately and openly? Are procedures explained clearly? Have your needs been responded to? Does the consultant generate confidence in his or her ability to do the job right? Do you trust the consultant? Although a consultant needs to obtain and assimilate information, he or she must avoid antagonizing and demoralizing people. Any new system must be introduced in an atmosphere that is positive and helpful.

Cost is an important but not overriding factor. You can, indeed, go broke saving money. Your primary goal is to solve a problem, not to save money. Computing consultants commonly charge from \$40 to well over \$100 per hour. Fees may or may not correlate to skill level, however, so your evaluation of their ability to perform must come before your judgment of their price. A low cost per hour may turn out to be very expensive in the end.

Always get an estimate for the cost and time anticipated by the consultant. Make sure you are charged for productive, billable time only. Don't pay for on-the-job learning time unless this was stated in advance.

Types of Proposals

There are two types of cost proposals. Some consultant's give you hourly labor costs and a breakdown of the hardware and software that is required. This type of proposal, if it does not state the maximum number of hours to be used or the maximum costs, the consultant has an incentive to take the longest possible time to complete the Project.

With this type of proposal is generally called a time and materials proposal.

With a time and materials proposal, if you can insist on a maximum number of hours for completion. Any additional time needed to finish the job becomes the responsibility of the consultant.

The second form of a proposal allows you to evaluate the overall total cost of a project and to review the overall design of a project but limits the degree to which you can determine the price of any one item or component.

Some project costs can be very hard to estimate consultants and owners alike are notoriously overly optimistic about how quickly a project can be finished.

A productive strategy for larger projects may be to break the project into smaller units. The consultant can report to you how much time has been used, what equipment and software has been acquired, and what reports, input screens, data files, and the like, have been finished at each milestone. This allows you to track costs and output.

If you are working with a consultant who does not have an established reputation, consider separating out a small project for initial development so you can evaluate the consultant's work before committing to a larger project.

A smaller-sized project gives you insight into whether a consultancy is or is not working. Probably, if you have to ask yourself whether the consultancy is working, it isn't. When the consultant doesn't come around, doesn't return calls, or can't describe cogently what progress has taken place, it's time to terminate the relationship.

Certainly, you should be able to answer the following questions affirmatively. Is this portion of the project complete (programming, training, documentation)? Are the features you expected present? Do the actual costs conform to the projected costs? Has the process of working with the consultant been positive? Does he or she work well with you and your employees? Do you have confidence in the consultant's work so far?

If you are in doubt, ask other knowledgeable people to assess the project.

All proposals should anticipate some consideration for cost overruns in the event of unforeseen circumstances.

Never make final payments until the final product is delivered, tested and documented.

The Right Consultant

There is no commonly agreed upon general certification for a computer consultant. Consultants may or may not have a college degree, professionally awarded certification, certification from a hardware or software vendor, or formal training of any type.

While no certificate is a guarantor of a consultant's productivity or competency you need to determine whether a certificate from a company like Novell or Microsoft or a degree from a local university pertains in resolving your problem.

The lack of certification applies to employees as well. Consultants often report that their work is hindered by in-house "computer experts" who have built systems with the wrong software, who don't take training because "they know it already," or who confuse others by taking steps that are not documented by or intended for use by a trained consultant.

Make sure you understand whether your consultant is also a vendor of hardware and or software. Vendors may not be interested in identifying the most appropriate solution for you but in finding a way to sell you their product line.

Many small business development horror stories start with a vendor whose service stopped when hardware was delivered. Similarly, profit margins on off-the-shelf hardware and software are so small that it is ill considered to expect that computer store salespeople can give you a thorough, objective assessment of your needs. They do not have the time and very often not the skill, needed for this.

Don't lay your money on the table immediately. Establish a firm cost for your system when you fully understand what the project requires and after you have established a level of trust with your consultant. Verify the warranty period and what is and isn't covered.

When done properly you can let the consultants' proposals tell you what a project is going to cost. At the same time you should have and be willing to share a general estimate of how much you can spend. Consultants shouldn't be expected to expend large amounts of time planning a project only to find that your budget doesn't support its implementation adequately.

The Wrong Consultant

Be sure your problem is a computational problem. Is the origin of your concern a business or a computational problem? . Few people provide business and computer consulting equally well. **Pick the right type of consultant.**

Be wary of consultants who reach conclusions too quickly and without appropriate information, For instance, avoid consultants who “know” what hardware you need or what language or package is required before they have fully analyzed your requirements

Obtain a sample contract from the consultant. Their contract enables you to see what type of arrangements they expect if they are selected. The proposal should provide an outline of approximately how much it will cost to deliver a system, a rough idea as to what type of an implementation is desirable, and a time line for future activities.

Look for a consultant who is attempting to give you independence once the system is installed. Unless you are seeking a long-term engagement avoid consultants whose primary interest is fostering a dependency on their services.

You don't want a consultant whose first priority is to try to lock in a second contract or is unwilling to provide proper documentation that will allow you to decide the next evolution in the consultancy.

Needs Assessment

Some projects are defined quickly and easily. A “quick fix” may be all that is required. It's broken and needs fixed end of story.

However, in many situations the consultant selected has to conduct a thorough needs analysis. The consultant may need to fully identify such things as the reports and screens that are needed, the types of data that are to be collected, the people who will use the system, security considerations, networking, and other requirements. By discussing the problem with you and your employees, a consultant determines what the company's needs are, understands how the system fits into or impacts operating procedures. It is only after the needs assessment that appropriate solutions can be identified and proposed for implementation.

This stage often requires a significant investment in time and owners should never expect their consultant to deliver a system without engaging in this type of analysis. Commit your time and your employees' time to this essential activity. Participation by employees fosters completeness and a sense of ownership.

Don't shortchange this essential step. Analysis and design are necessary preconditions for the development of any sophisticated system. Neither the consultant nor the owner should attempt “quick fixes” that don't address all aspects of your problem in a logical manner. Jumping into design and implementation before fully understanding the type of a system you need is a mistake whether motivated by your desire to get a system up and running or by a consultant's desire to save time.

Don't delegate responsibility for project coordination to a staff member unless that person also has the authority to make decisions. Inviting consultants to develop a proposal or to respond to changes in a project imposes work, often-unbillable work, on them. They should not be asked to second-guess whether their work is of interest to the owner or manager who may veto a decision, refuse to install a system, change the requirements, and so on.

Involve all appropriate people in analysis and design. Anyone who has the potential for sabotaging a system, who has a legitimate stake in the system's usability, or who has a contribution to make to the consultant's understanding of how the system is to function, should be encouraged to participate in analysis and design. Consultants do not know the details of your operation even when they are familiar with your type of business. They need to ask many questions and to receive correct answers.

Pay close attention to the details. Simple misunderstandings are the downfall of many systems. You don't have the money or time to build systems twice.

If possible integrate your existing computer systems. If some operations have already been computerized, have the consultant explain how the new system relates to the old ones. Make sure that the new system is integrated with and complements them. Find out how existing data can be reused and how it is to be integrated with the new system.

Thoughtful needs analyses uncover the need for decisions that must be made by the owner, not by the consultant. The consultant cannot, for example, decide which fiscal year to use or which people in the company are authorized to override normal system limits. Dragging out a decision lengthens the time needed and increases costs. Analysis must lead to design in an appropriate time frame. System options have to be closed and the specifications frozen at some point.

System Design

All consultants have biases. Each consultant leans toward certain packages, languages, and hardware devices they already know. Their choices may not be the best for your situation so evaluate as well as you can what each consultant has to say before committing yourself to any approach.

If the consultancy is not working out as you planned, cut bait early. As you work with a consultant, even at an early stage of a project, if you find that a mutually satisfactory relationship is not possible, be prepared to terminate the process. Be wary of contracts that limit your ability to terminate a consultancy.

Having analyzed the system's requirements, the consultant designs a system that meets these requirements. The design process need not be highly formal for all projects. Simple sketches and reports may suffice for many small projects. They also provide a critical basis on which to decide whether the consultant is making real progress. Because designs are like blueprints, changes made after this point increase project costs dramatically.

Ask why a particular design was chosen, your consultant should be able to clearly describe why he choose a particular hardware vendor or software package/

Accept the fact that new computer systems may suggest the need for other changes. This phase offers you an opportunity to evaluate the effectiveness of your current data handling techniques. It may well be that new the consultant can suggest approaches, by yourself, and by your staff. "We've always done it that way," provides weak grounds for continuing to do it the old way.

It has been observed often that you should not use a computer to simply speed up the confusion. A new system may, for example, realign job assignments, alter workflow, or foster new procedures. Implementing these changes requires management leadership and support

Family members frequently staff small businesses so it is not uncommon for consultants to find that they must replace or substantially modify systems that were built by the family's computer "expert." Owners who have some background in computing should avoid becoming involved in the nitty-gritty of the system design except by way of evaluation of the product and the process being used to develop it.

If you had the time to do it yourself you wouldn't have hired the consultant in the first place.

System Implementation

After management has approved a design, the consultant selects the software and hardware with which to build the system and takes whatever steps are necessary to build an effective system. This can include the purchase of software, the writing of programs, the construction of data files, and the like

"Off-the-shelf" packages suitable to your business may fill many, if not all, of your needs. Before developing unique software, your consultant should determine whether software adequate to your purposes could be acquired from another source. Building software for only one user is more expensive, time consuming, and risky than is installation of an existing system.

Testing is an important part of systems development. Once the system is operational additional programming and any problems may appear that must be corrected. This phase terminates with acceptance of the system by the owner or with a request for modifications before acceptance.

Beware of efforts by the consultant to "gold plate" the system. Avoid the addition of unnecessarily expensive features that offer little benefit.

Examples of gold plate are such items as reports that print more data than you need (just in case you find you need it), data files that store more data than you have time to enter or use (in case you want to collect it later), and the addition of more hardware than you need now (but might like to have later). Stick to your original proposal unless you are persuaded of a feature's value. If it isn't in the contract, don't do it. Before you agree, obtain the cost for additional work. Change orders are expensive

User Training

Once a system is approved for implementation and the system is put into operation. The staff must be trained to use the system and, often, new procedures must be implemented along with the introduction of the new computer.

Insist on complete documentation. At a minimum, documentation includes complete operating instructions for users. It may also include a technical, operator's manual that helps a system administrator to resolve problem situations and that describes whom to contact for further support.

Owners frequently ask for, but seldom receive, systems that can be used without some training. Few systems are intuitive. Users need to be shown how to use new systems. They require some hand holding to bring them to the point where they comfortably use these systems.

In instances where you are going to be using standard software packages adapted to your business, the consultant may not be the only source for training. Continuing education departments of your local university, college or school district, and other consultants, who focus on training, may provide training that is more cost effective because they are doing it for a larger group. You may also be able to buy trade books that augment what the consultant has provided.

Keep employees and others from tinkering with the delivered system. Computers can be very complex systems. After delivering and installing an accounting package for a client, one consultant received a frantic telephone call complaining that the system was crashing on boot up. Upon inspection, it was found that the owner's son had tinkered with the system over the weekend so he could install a sound system on this hot, new machine with which to play computer games. He had changed important files that allowed the games to run but that prevented the operating system to function properly with the system's software.

Rigorously test the system before accepting it. Be sure that subtotals and totals are correct, that errors are being trapped, that reports are correct, and that data records are accurate. Don't assume that because the consultant told you and your staff how the system should behave, the system, will in fact behave that way. Testing includes assessment of software reliability. Bored employees and unanticipated entries may break it. If it breaks, get the consultant to modify and correct it immediately and within the warranty period.

One of the problems that many owners come to understand belatedly is that non-professional hackers who often compete with professional consultants don't believe in writing documentation, don't mind if a system breaks down once in a while, and can't teach others to use their systems.

Workable systems are more than clever coding. They involve solid programs, effective procedures, trained and confident users, well thought out data files, and understandable documentation.

New computer systems should only be introduced with care and forethought. Experience addressing the inevitable people problems is one of a consultant's valued assets.

Anticipate the need for a "break-in" phase. When a system is being used in day-to-day operations, problems will occur that have to be repaired. Distinguish between minor, temporary problems that are remedied quickly and major problems that jeopardize the whole system's effectiveness. The latter can be characterized as one in which the developer completely omitted or misunderstood key requirements. A system with a major problem cannot remain in operation.

Notwithstanding the responsibility of the consultant to iron out minor difficulties with the software to achieve the original design objectives, the owner should understand that when the system is running, users may see the need for new reports and screens, modifications to security procedures, and the like, that had not occurred to them earlier.

It is generally undesirable to keep a system from going online because of features that can be added later. It is also desirable to refrain from changing the system for several months so users can work with it. Some of their "problems" disappear after they become comfortable with the new system.

Under the initial contract, the consultant should be committed to remedying corrective changes. Within the warranty period, the consultant should be expected to bring the system into line with the original specifications. They should not be required to make improvements to the system or to adapt it to a new hardware environment. These enhancements entail the creation of a new contract and the budgeting for additional changes.

Management's failure to fully specify the system initially is not a valid reason for withholding payments to the consultant.

Wrapping the Project Up

Go back over the original contract with the consultant. Before your consultant moves on to his next job is the time to ensure the all of your expectations were met.

The contract should have clearly defined the consultant's as well as the business' responsibilities. It should have also included time lines, a description of the project's scope, deliverables, and continued support through a warranty period.

The contract can provide for phased payments and/or time and materials payments rather than an up-front payment or fixed price payment. Pay for productivity, not for promises and predictions. Is the consultant penalized if the requested system is not delivered as per the schedule? Bad publicity is damaging to a consultant, but financial penalties, which eliminate their profits, may be equally important.

Make sure you know who owns the program that is produced. Program copyrights and licenses are a negotiable item. Unless your contract assigns the rights to a program to you, the consultant owns the program and you are simply licensed to use it. Does the license limit you to use on one computer? If it does, you may have to pay again to use it on a second computer. Is the license limited to some period of time after which you have to pay a maintenance fee even if the program is not changed or enhanced?

The contract should have provided for a formal acceptance procedure within a warranty period. Most contracts provide for a warrantee period of up to three months. During this period, the consultant is responsible for fixing problems and for adding features that were in the original contract.

The contract should have also provided for mediation or arbitration to reduce contract dispute costs.

Make sure the contract permits termination of the consultancy should the warranty not be honored

Treat the consultant as a consultant. You have retained the consultant to work on a mutually agreed upon, well-defined project. You haven't hired a friend! The consultant is a businessperson just like yourself so pay them just as quickly as you expect others to pay for your services.

Maintain the System

No system, and certainly not a computer system, performs satisfactorily forever. Changes may be necessitated due to company changes in procedures, to changes in personnel, to improved technologies, and to improved understandings as to how the company can become more efficient or competitive. These changes frequently require the company to modify its computer systems.

When changes to a program or system are required, it is generally desirable to go back to the original consultant if that person performed satisfactorily.

The original consultant understands your needs and the system's logic. This person should be able to modify or fix it easily,

On occasion, it may be necessary to hire another consultant for some specific portion of a program or if the original consultant is unavailable.

This may be a legitimate and useful expense, but be sure that the consultant remains the prime contractor or at the very least remains in the information loop.

If someone else makes changes he is unaware of the original consultant may refuse to provide other forms of assistance since they can no longer be sure that the program functions as they designed it.

This also makes them responsible for resolving problems and avoids finger pointing when solutions cannot be located immediately.

Conclusion

Naturally, the time required to complete the preceding steps depends on the size of the system being developed. A small system requires less time and, perhaps, less formality in the degree to which documents outline the system, its design, and its implementation. The larger a project's size, however, the more important it becomes that the phases be treated as distinct, non-overlapping, phases.

The selection of a computing consultant is a commonly encountered task for small business owners. It is as important for an owner to select a consultant whom he or she trusts and can communicate with, as it is to select someone who is technically proficient. If possible, try to find an existing software package to meet your needs before you build your own system. Management should evaluate systems developed by consultants frequently as they progress. Throughout the system development process, the owner should schedule periodic reviews to insure that both the consultant and the contractor are fulfilling their respective responsibilities and to provide a basis for determining whether a project is on time and within budget. Properly managed, a consultant-developed system can be successfully deployed and many commonly experienced pitfalls can be avoided.