Outsourcing

Introduction

Ed Yourdon

Over the past decade, the concept of outsourcing has not only become popular, it has become a "mega-business." As Michael Mah points out in the first article of this issue, outsourcing is expected to generate over US $150 billion in revenues by 2003. What was originally viewed as a convenient way to have someone else take over the burden of running a data center has grown to include the maintenance of existing legacy applications and, in recent years, application development and systems integration. In some cases, it includes all of the development, integration, maintenance, and operation of the IT infrastructure, so that the outsourcing vendor truly becomes a long-term, strategic partner to its client organization.

But because the outsourcing activity has become so large, expensive, complex, and mission critical, the risks have grown also. Several mega-deals have collapsed, leaving both the client and the outsourcing vendor embarrassed and frustrated. Even a medium-sized outsourcing project is prone to problems and outright failures. As a result, it has gradually become more evident that careful management of expectations — by both parties — is crucial before, during, and after an outsourcing contract is signed. This issue of the *Cutter IT Journal* looks at those management issues from several perspectives.

Mah points out, for example, that in order to have an effective outsourcing contract, measurement and benchmarking are crucial. As he observes, "If you didn't have a successful metrics program before, you'd better get one now.... These issues will be represented in your contract, and it's vital that the goals be both reasonable and quantifiable." He also notes that industry benchmarks and baselines can be useful, as long as the data is current and validated. Indeed, a competent outsourcing vendor should have its own baseline data from the last several projects that it has managed.

Howard Rubin continues the discussion of measurement-based outsourcing management and warns that many of the outsourcing failures have been caused by a set of performance measures that did not align properly with the business needs of all parties, were so inflexible that they could not be changed to adapting needs, presented unrealistic performance targets, or did not cover the complete scope of work covered by the agreement. He also notes that some outsourcing metrics act as "lagging indicators" by reporting results reactively instead of providing a "look ahead" view of performance. And he concludes by arguing that "metrics information must be used as a common currency of communication and not viewed as overhead. Therefore the collection of information that feeds the measurement system must be nonintrusive and highly automated."

Next, Norm Hammock discusses the Software Engineering Institute's CMM as the basis for negotiating contract requirements and managing outsourcing. Rather than discussing it in the abstract, he provides a brief overview of a real outsourcing project at BellSouth in which the CMM was used as the basis for determining which software practices would be defined and practiced in an organization of 2,000 practitioners. The "lessons learned" portion of Hammock's discussion will prove valuable for anyone else who may be thinking of using the CMM as the basis for an outsourcing relationship.

In recent years, there has been a great deal of interest in offshore outsourcing. It's still a relatively small part of the overall

industry — India, for example, generated $2.7 billion in outsourcing revenues in 1998, when the overall market was approximately $100 billion — but it has been growing at a rate of more than 50% per year for the past six years. Our next author, Marty McCaffrey, reviews a number of alternative forms of outsourcing, ranging from unsophisticated "body shop" services to offshore development centers and joint ventures. He also discusses some of the outsourcing countries. While India continues to have the highest visibility, the outsourcing industry in countries such as Ireland, the Philippines, and Israel is now growing rapidly. And as McCaffrey points out, "China, Russia, Brazil, Ukraine, Egypt, Malaysia, Pakistan, and several Eastern European countries are in the early stages of developing an outsourcing industry."

Next, we look at two examples of offshore outsourcing, one supplied by Roger Gaunt and the other by Prins Ralston. Gaunt describes the experiences of an unnamed *Fortune* 50 company that blundered badly in its first attempt to outsource a legacy application overseas. Several years later, a second effort was undertaken, with Gaunt in charge. As with Hammock's article, Gaunt's list of "lessons learned" and summary of cultural issues in offshore outsourcing are enormously helpful for anyone about to embark upon a similar venture.

Finally, Prins Ralston discusses some reactions to government outsourcing policies in Australia — and in so doing, points out that we should remember the "law of unintended consequences." In theory, one can establish an outsourcing relationship with a vendor of any size; a small project, for example, might be well-suited to a small vendor that operates in the same geographical vicinity. But the trend, as in the case of the Australian government, is toward outsourcing for mega-projects and mega-deals,

which encompass large numbers of projects over a long period of time. The result is that outsourcing vendors are going through the same consolidation process that we've seen in a number of other areas. Vendors like EDS, IBM, CSC, and Andersen have been growing ever more gigantic, while medium-size vendors have been struggling to align themselves with the giants and/or to reach a critical mass so they won't be stepped on by the giants. Meanwhile, the small 10-person, 50-person, and even 100-person shops are getting swallowed up — or, in the case of Ralston's homeland of Australia, fading away.

There is no question that the giant outsourcing vendors have the advantages of size, sophistication, global presence, and financial strength, but the smaller vendors are often more flexible and responsive and can sometimes provide a level of innovation that the stodgy giants cannot or will not. The Australian government's approach to outsourcing, which favors the multinational outsourcing giants, has stifled its own up-and-coming "native" outsourcing industry. The Australian experience may serve as a cautionary tale for the IT industry in New Zealand, Canada, and even England and certain regions of the US. If client companies continue to favor the outsourcing giants, small and medium-sized vendors — the "innovative edge" of the industry — might well wither and die.

After looking closely at outsourcing this month, we'll turn our attention in November to knowledge management. As always, we welcome your feedback and comments; you can reach us by phone, fax, or e-mail.

Ed Yourdon
yourdon@acm.org
www.yourdon.com
www.cutter.com/consortium/

Letters to the Editor

To the editor:

I was delighted with Richard Zultner's article on Critical Chain Project Management (CCPM) in the July 1999 issue of the *Cutter IT Journal.* The principles behind this approach address current concerns of project managers and appear to provide some hope for relief. In practice, small tasks with strict deadlines only tell us when it's time to panic and start doing the work. They do not ensure that the project is going to be delivered on time, nor do they provide a reliable estimate of when it's going to be delivered. CCPM advises: compress your tasks' duration, and get rid of deadlines and multitasking!

But will this magic work? I think there are at least two issues worth considering very carefully. First, it is widely accepted that many projects experience considerable overruns because of already excessively compressed schedules (especially in the early stages of architectural and component design). Why this late rework? According to analyses carried out in real projects using system dynamics (SD) simulation models (which are particularly effective at diagnosing this phenomenon), late rework is primarily due to poor quality in the early stages. Among other factors, schedule pressure works as a major "catalyst" in this process of hurting quality. Now, if you apply CCPM to your project, you will be compressing your tasks' duration even more — say, by 40%. Couldn't this lead to even lower quality, more late rework, and a never-ending Critical Chain?

Secondly, CCPM focuses on ensuring that the work progress never stops in the Critical Chain of tasks (which is derived from the resource-constrained critical path of the CPM network). However, what if the Critical Chain changes throughout the project? While CCPM gives low statistical probability to this event, it can happen in the real world. I believe that the perspective of a static single Critical Chain can be dangerous. If a noncritical chain to which little priority is given in early planning later becomes critical during implementation, it can easily jeopardize the whole project. While a dynamic view of a changing Critical Chain is not considered by CCPM (unlike CPM, which promotes near-critical path analysis), in practical project planning this phenomenon should be considered.

CCPM addresses some important outstanding issues of project planning. It draws our attention to some of the limitations of the traditional PERT/CPM approach. However, I believe that CCPM needs to be checked against the arguments that motivated both the old approaches and the new ones, such as the SD-based approach. Perhaps it can even be combined with these.

I look forward to hearing more about practical results, lessons learned, and further improvements of CCPM.

Sincerely,

Alexandre G. Rodrigues
Department of Information Systems
University of Minho, Portugal

Richard Zultner causes still more comment with his treatment of benchmarking in the 4 August 1999 issue of the Cutter IT E-Mail Advisor. *There Zultner observes that organizations can find many, if not all, of the "best practices" an expensive benchmarking study would recommend in a simple college textbook. He writes:*

"Recently, I was at a client who had just finished a major benchmarking study. I was curious to see if the findings could possibly be worth the time (and expense) the study had cost them…. That evening, I went to the university bookstore in town … [and] purchased the textbook used for their primary software engineering course…. Back in my hotel room, I went through the text and managed to locate all the best practices the benchmarking study had so laboriously (and expensively) 'discovered.' It took me less than three hours."

To the editor:

The same situation that Mr. Zultner describes with IT benchmarking could easily occur in other disciplines. Prior to entering the software field, I used to edit medical literature for the US Public Health Service. If Mr. Zultner had undergone a full annual medical examination, it is very likely that every problem the physician and lab analysis found would be described in standard medical texts. If the conditions were fairly common, the recommended therapies would be available from the literature also.

The point Mr. Zultner seems to miss is the ancient medical aphorism that only a fool would try to diagnose his own condition. It is very hard for personnel who work in a company to carry out an objective self-diagnosis. This is why doctors go to other doctors when something serious occurs. This is why lawyers hire other lawyers to defend them in major lawsuits.

Benchmarks and assessments are diagnostic studies. After such a study, it is normal to follow up with a therapy program. This is true for medical practice as well.

What a benchmark can reveal is the specific set of client problems that need remediation. This is what a medical exam reveals: exactly what problems need therapies.

In both benchmarks and medical diagnosis, the clients are not likely to be objective and careful in analyzing their own conditions.

Sincerely,

Capers Jones
Software Productivity Research
Burlington, Massachusetts, USA

Managing Outsourcing Expectations:
Productivity Benchmarks, Baselines, Service Levels, and Other Quandaries

by Michael C. Mah

"CAN SOMEONE DO I.T. BETTER THAN WE CAN?"

That is the question for many corporations. Understanding IT alignment and productivity issues is becoming increasingly vital in helping CEOs and CIOs decide on whether to outsource and, if so, what should be outsourced. If they pursue the course, expectations will be high. These expectations are likely to manifest themselves through specific service level agreements (SLAs) within an outsourcing contract. It is vital to get these expectations right and effectively manage contractual promises and their associated risks.

IT outsourcing can be broken into three general categories, in descending order of "ease of predictability" and ascending order of risk:

- IT infrastructure (data center and other hardware assets)

- Maintenance of existing legacy (i.e., mainframe) applications

- Application development, comprising new systems and major releases

The above three categories exhibit a broad span of work. This ranges from what can be described as production-like work to creative work. In this regard, IT infrastructure might be described as routine and standard, new application development as highly creative, with legacy maintenance falling in between.

In short, if an organization were to consider outsourcing, a safe course would be to farm out that which is routine and repeatable. This would free up a company's internal intellectual resources to concentrate on its core competencies: the new systems to meet the future IT needs of the corporation, in what is becoming an increasingly competitive marketplace.

In one example of the role of IT as a core competency, Fred Smith, CEO of FedEx, has frequently described the company's computer systems as perhaps being more important than its planes. He marveled at the work done by IT designers: "You're talking about people who are worth a fortune," he said.

COMPANIES ARE TURNING TO OUTSOURCING IN DROVES

Like it or not, outsourcing is here to stay and is growing. International Data Corporation's (IDC) *U.S. and Worldwide Outsourcing Markets and Trends, 1998-2003* [1] report states, "Worldwide outsourcing services is fast on its way to blowing by the $100 billion marker. In 1998, spending topped $99 billion. By 2003, it will explode to more than $151 billion. The majority of the spending was in the US, which accounted for 52% of the total at $51.5 billion, expected to rise to $81 billion by 2003."

If IT is essential to your competitiveness, then outsourcing must be done with great care. In moving toward outsourcing application development and maintenance, some CEOs and CIOs are turning over the systems that run their companies to an outside entity. This action may be justified by those who do not see IT as a core competency. Some might argue that this incurs a certain risk; others might say that if they don't outsource, the world will leave them behind.

Some of the reasons for outsourcing are:

- The driving down of costs, the conversion of fixed staff costs to variable costs, or some other aspect of cost flexibility/reduction

- The need for additional IT systems-building capacity (e.g., the service provider brings in a team of 500 people to reduce the backlog)

- Faster access to staff resources trained in new technology, without having to hire additional inhouse personnel

- A barter arrangement, whereby the client and vendor swap some mix of services and assets

- Shortened schedules, lower defect rates, or some combination of the above; in short, "higher productivity"

By outsourcing, executives who may have been frustrated with their own IT efforts might be saying they'd rather "switch than fight." Perhaps sitting at SEI CMM Level 1, they've had a crisis of confidence in their own IT group, having experienced firsthand the overruns described in studies like the oft-quoted Standish Group "Chaos Report." As Michael Dell once observed, "Outsourcing is almost always a way to solve a problem a company hasn't been able to solve itself." He continued, "Nobody knows what [IT

people] do, and why they do it. The solution — outsource IT to a service provider, and hopefully they'll fix it."

So along comes a supplier promising lofty productivity gains that will bring the client to "best in class." "We'll deliver the same or more IT services for 20 percent less," a vendor might say. And the expectations are set into motion.

GETTING AN ADVOCATE TO HELP NAVIGATE THE RISKS

In an article entitled "Outsourcing: The Great Debate" [2], Rob Thomsett of the Thomsett Group articulates several key points to consider before outsourcing. Among his recommendations, Thomsett counsels:

- If you can't measure it, don't outsource it.

- If you can't manage it yourself, don't outsource it.

- If you can't make it legal and binding, don't outsource it.

- If you can't understand it, don't outsource it.

- If you can't lock the outsourcer into profit sharing, don't outsource it.

Another way to phrase the above is:

> If you do decide to outsource IT, measure, manage, and understand it. Make your agreements and service levels legal and binding, and negotiate an agreement that shares both the profits and the risks.

How to do this? A few things become readily apparent. The mix of required skills will change, and new, critical disciplines might need to be put in place. Issues are complex and multidimensional, and you

may need an advocate in several areas. These include:

Software Measurement

If you didn't have a successful metrics program before, you'd better get one now. You'll need to understand how to measure IT and software productivity and communicate it effectively to senior management. These issues will be represented in your contract, and it's vital that the goals be both reasonable and quantifiable. The phrase, "If you can't measure it, you can't manage it," is even more true with outsourcing.

You'll need to benchmark supplier performance, year over year. You'll need to quickly establish your own project database. This will enable you to quantify your IT supplier's performance and ensure that productivity goals are being met over time. You don't want to experience your productivity going down — you hired experts to move it *up*.

You'll need to acquire valuable skills in software estimation and tracking/control. Even if this is primarily the responsibility of the supplier, you'll need your own capabilities for strategic planning and to verify the vendor's promises. You need to know if it's padding its estimates or overpromising. This will help you negotiate deadlines.

Contract Negotiation and Contract Governance

A good contract and a good governance structure are critical. You'll need to have an effective team that is knowledgeable about both sourcing issues and negotiation report to the senior executives. In short, there must be a strong sourcing function and an effective relationship management framework. Be sure you have access to strong accounting and legal resources. Remember that some of the world's largest sourcing suppliers emerged from the industry's

> **If you didn't have a successful metrics program before, you'd better get one now.**

dominant accounting and legal firms. In order to keep a balance and not be disadvantaged, you'll need equal contract, legal, and sourcing advice.

In certain cases, the relationship might become strained, especially if there was a poor relationship management framework in place initially. You'll need skills in dispute resolution and mediation. This will promote communication and collaboration in two-party, multi-party, and multi-issue negotiation, leading — one hopes — to resolution.

Technology

If the outsource deal is large, and most of your former IT staff now wear badges that say something like "KPG Computer Global Data Services Consulting," be aware that much of what used to be your IT "intellectual capital" has been transferred to your supplier. The risk is less if a smaller percentage of your IT was outsourced.

Your remaining team will need different intellectual capital, including subject matter expertise in technologies current and future, addressing such areas as client-server, distributed computing, Web-based e-commerce, mainframe COBOL, frame engineering, and reuse. One IT manager, whose *Fortune* 100 employer outsources programming but retains all else, noted that critical business and IT knowledge of the division's core system had to be kept close to the company. This system and its architecture had been the heart and soul of the division's manufacturing, marketing, and distribution chain. It had people with 15 or more years of that subject matter expertise. That kind of intellectual capital, knowledge of the "blueprints," absolutely could not reside offshore with programmers in Bangalore. It had to stay in house.

Project management skills will be vital, but at the level of comanaging the direction and

strategy of your critical projects with your supplier/partner. You and your supplier are pilot and copilot. The instruments and displays you need will have to be sophisticated, not like the management frameworks of the old days. It's a whole new outsourcing world.

In all these areas, it's wise to enlist the help of specialists to serve as your advocates. They are valuable sources of this expertise. As your advisors, they should assist with the evaluation, assessment, selection, and implementation of an outsourcing strategy, both before and after a supplier is selected.

With regard to metrics and productivity benchmarking, your goal should be to quickly implement measures to support service levels in order to make your contracts reliable. An advocate in this area can serve as an independent third party to assist both client and provider with an objective assessment of year-over-year productivity. Some can even furnish reference benchmarks from industry that can be placed "on the desktop" of both client and service provider, providing an "enabling" metrics technology that can save you from having to reinvent the metrics wheel.

If a service provider suggests that you "just use our benchmark method," look closely. You have too much at stake to leave it to a "trust me" method on a multi-million- or billion-plus-dollar outsourcing deal while you're in the infatuation phase. I hate to say it, but these kinds of "marriages" might call for a prenuptial contract with a trusted advisor to assist.

"YOU CAN TEACH A BUSINESS PERSON ABOUT I.T., BUT YOU CAN'T TEACH AN I.T. PERSON ABOUT BUSINESS"

As I discussed above, a new body of skills is required to effectively manage an outsourcing deal. Along these lines, someone once observed, "From experience, we've learned that it's easier to teach business professionals about IT than to teach IT professionals about business." One company even explored training its business people about IT, using a 10-day "IT certification" course.

In response, one IT contracts management specialist came right out and said, "I think that's plain wrong." Another IT manager, who now heads up a team of IT metrics and estimation specialists that oversees his company's supplier, added, "Sure, you can do that, *if you want to get run all over*." Both are involved in an outsource contract of over 1,500 IT staff, valued at roughly $4 billion over 10 years. They spoke from first-hand experience.

These IT professionals went on to describe that the skill mix changed, and that although one might not find all the desired skills in a single person or couple of people, you could assemble a balanced team with the critical knowledge of IT architectures and contract and supplier management skills.

OUTSOURCING LEGACY MAINTENANCE

IT applications outsourcing generally focuses on two areas: maintenance of legacy systems and development of new applications/enhancements. Outsourcing legacy maintenance is considered the less risky of the two.

Certain prerequisites might be valuable to maximize the chances of success in outsourcing legacy maintenance. For example, if it is assumed that this "routine" work falls into a classification of a service commodity, then it should be well-defined, structured, well-documented, and operating within the status quo. In fact, some have described legacy maintenance as keeping systems running until they're retired.

If a service provider suggests that you "just use our benchmark method," look closely.

Therefore, if you intend to take this route, first "tidy up your shop" or have the outsource supplier work with you to achieve this. Contract with the supplier for an initial period to assess your process and perform a "root cause analysis" of process bottlenecks, before signing on to a long-term deal. Perhaps the initial deal could be a one- to three-year contract with an option to renew.

It's been my observation that most legacy maintenance contracts focus on cutting costs as a primary goal. These are known as "headcount deals" — that is, do the work of 100 people with 80, with no schedule slips. The intent is often to shrink the percent of IT maintenance from some figure like 60%-65% down to perhaps 50%, 40%, or lower. If this is your goal, the resultant savings may be staff hours that can be redeployed to build new systems.

Benchmarking Legacy Maintenance

Any organization considering outsourcing should get a productivity baseline that quantifies the organization's proficiency, whether it's legacy maintenance or applications development. Ideally that happens before outsourcing. If not, it should be initiated before or during the due diligence phase, when contractual commitments such as scope, productivity targets, and pricing are established.

For the type of "factory" work encompassed by legacy maintenance, certain metrics with linear dimensions (read: ratios) may be useful. Factory classes of work, such as light bulb manufacturing, banging out steel rods on a production line, automobile production, and the like, lend themselves to being described in units such as output produced per person-month of effort, or per unit cost. IT help desk requests, broke-fix requests (operations support, when those beepers go off at 2 a.m. if a batch system goes down),

and maintenance work requests might also be described in these units of efficiency.

However, where the nature of the work overlaps to "enhancements," there is a progressively higher degree of this type of work having R&D, or problem-solving, attributes. This is due to the iterative aspects of identifying a problem, identifying a root cause, designing a solution, implementing that solution, and testing. In this arena, the simple ratios of productivity may begin to break down, and more sophisticated mechanisms are required.

In the meantime, for routine maintenance, ratio-based metrics may be useful. The numerator of this ratio, amount of functionality, is sometimes represented in function points (FPs). However, it is a myth to believe that this measure is the sole valid measure of system size. Some IT organizations become disheartened due to the notion that they must use function points. They do not.

While FPs can be useful, other measures of system size might be: the number of work orders, change requests, modules and percent changed, components, frames, objects, or the amount of new, modified, or deleted source lines of code. However, to obtain productivity in this manner, all of the function points or all of the code or all of the broke/fix or change requests for a given time frame (say, a year) would have to be counted. Measuring all of this output is a daunting, labor-intensive overhead task.

A viable alternative might be to perform some form of statistical sampling, gathering data on a select group of projects in the portfolio. The objective would be to verify that costs are going down, schedules are shortening, functional throughput is rising, or some combination of the three, with the same or better system availability and reliability.

"Peopleware" and Loss of "Goodwill"

The issues discussed above are just some of those facing organizations considering the outsourcing of legacy maintenance. However, there are a few other points worth thinking about.

Inhouse IT departments often have an unwritten degree of "goodwill," or common loyalty, in place within the organization. That is, there are inevitably those requests, "favors," and wishes that are accommodated by an IT staff that is part of the corporate "family." These relationships produce what could be considered "invisible products." They are the day-to-day fixes and enhancements that come from a tightly knit group of people on the same team, with a long-standing relationship and shared history from years of working together.

Outsourcing carries a risk of this going away. You'll need to consider that people being outsourced might view this action as a betrayal. After years of loyal and dedicated service, the company they considered "home" shoved them into an uncertain and possibly destabilizing situation with regard to their professional and financial future.

After outsourcing, there might be little goodwill left. There might be outright hostility. Requests that, in the past, would have been accommodated under goodwill might now be subject to debates as to whether they are contractually in scope, during which valuable time is lost. Loss of this reaction time might be critical in a rapidly changing industry. The claimed benefits of outsourcing, such as "depth on the staffing bench," access to numerous tools and techniques, and highly mature processes, might be offset by time lost from in-scope versus out-of-scope debates.

On the flip side, an incoming service provider can offer personnel in smaller IT shops a chance to blend with a larger, cutting-edge firm, bringing new opportunities for learning and professional advancement. In this case, outsourcing might be a positive experience.

OUTSOURCING APPLICATION DEVELOPMENT

If outsourcing legacy maintenance is complex, outsourcing new applications development can be geometrically more so. The challenge stems from the fact that you are now moving from what is considered routine and repeatable to the exact opposite.

Indeed "project work," as described by Thomsett [2], is not routine. It is unique. It has a long time frame (usually months). It is creative, nonstandard, not easily measured, and intended to change the status quo. It would include building the next "killer app" that could propel a company into new arenas or elevate its competitiveness in its line of business. In short, project work is R&D.

Partly for this reason, while outsourcing routine maintenance can lend itself to the "megadeals" observed in industry (usually 5 to 10 years long), new applications do not. In many cases, corporations are choosing to keep new development in house. If they do choose to outsource, many elect to do so on a project-by-project basis, allowing themselves flexibility.

Project work might also involve the research and selection of packages to be purchased and modified to meet required functionality. While not likely to be in the "killer app" category, this means of IT delivery might be appropriate in certain instances. In this respect, you're essentially implementing software reuse — reusing someone else's "off the shelf" code. The R&D aspect of this

> **People being outsourced might view this action as a betrayal.**

work is slightly different. There will likely have to be new functionality written, plus modifications, plus bridge and interface code to other applications. Keep in mind that, in some ways, changing and testing someone else's code might be more difficult and complex than doing the same type of work on your own systems.

Why Productivity Ratio Metrics (Functionality per Person-Month) Don't Work for Application Development

The quick answer is that ratio metrics with linear mathematical relationships break down when applied to R&D-like projects such as application development, which exhibits nonlinear behavior.

What is this nonlinear behavior? Put simply, it means that you can't cut time in half by applying twice the people, for example. This notion only works for factory-like activities that are simple and repeatable. It breaks down when applied to research-intensive, problem-solving engineering disciplines like software applications development. These applications are deadline and time critical. Traditional metrics like output divided by units of work effort or cost omit time!

Studies by the QSM organization using modern-day data on application development projects (not just the industry data of yesteryear) demonstrate this fact. Here's a summary-level finding: data shows that doubling a team from, say, 10 to 20 members does not cut time in half. The nominal time compression is about 20%, all other things (such as scope) being equal. But this speed comes at a price in reliability. Defects rise as much as six-fold. This 6x rise is not surprising, given that every doubling of staff results in a 6x rise in communication complexity, when mapped to the number of communication paths between members of the team. More communication complexity means more risk of miscommunication,

which manifests itself in the design and the code. In summary, there is a "20/200, 6x" rule, which states that doubling the staff may cut the time by 20%, but with six times the number of defects.

This makes for complex scenarios when dealing with SLAs for application development. In short, there are four key parameters to manage in a balanced fashion:

- The amount of functionality.

- The time to complete the building of this functionality.

- The effort in work-hours, work-months, or work-years. (This is related to cost.)

- The reliability of the system in the initial one to three months of deployment.

It's no surprise that these represent what is known as a "minimum data set," put forth by both QSM and the Software Engineering Institute.

WHAT ALL THIS MEANS TO A BALANCED SCORECARD

This means that if you're an organization looking to outsource, you need to prioritize where you want your "productivity" gain. I note this in quotation marks deliberately, because a productivity gain means different things to different companies. To one, it means get to market faster. For another, it means keep time the same, just cut costs. To another, it might mean lower costs, but raise quality and system availability. To yet another, it means all three. You get the picture; it can mean many different things.

Once you decide what it means to you, research on software life cycles tells you that it is much harder to shorten schedules than it is to lower costs. Time is stubbornly difficult to compress. Even more so when we experience the three-headed dragon of

applications development: scope growth, requirements change, and staff turbulence. Anyone experience those lately?

So if it's, say, three times more difficult to shorten schedules for a fixed amount of functionality than it is to lower costs or effort, then consider that weighting when creating your balanced scorecard. You might reward this level of performance more so than cutting costs. Many companies want to operate at "Internet speed," but when you look at their SLAs, all the incentives are on cutting headcount and lowering costs. What's your priority?

IF INDUSTRY BENCHMARKS ARE THE ANSWER, THEN WHAT'S THE QUESTION?

The question is, "How does our performance compare against other companies that build and maintain software?" Indeed, if competition is the name of the game, then answering that question might be of interest to you. If so, there are a number of metrics firms that will provide this type of information.

If you obtain statistics like these, make sure that they're current. Older data is not very useful. Ask the firm how the data is obtained, how it is validated, and how consistently the measures have been used.

Some firms will even make industry trendlines, or benchmarks, available to you on your own desktop. That might be important to you if you want to easily compare your own data against the competition.

Better yet, build your own productivity baseline and trends. Say that at the beginning of an outsource agreement you want to have a productivity baseline that represents "the state of the business" at the time of contract signing. It's possible to baseline your own schedule, cost, and reliability

performance. "But we don't have any data...," you say. Chances are that it's there, you might just need a jumpstart from a firm that knows how to help you. From there, you can compare how well your service provider meets target service levels on cost, schedule, and reliability every year. While these aren't the only elements of a balanced scorecard, you're in the dark on critical performance criteria if you decide to omit them.

If you really find that there is no information available on your own projects, try and make the best of it. Ensure that this sad state of affairs doesn't continue, especially now after you've decided to hire someone who's supposed to improve something. Agree on common measures moving forward. Set a framework in place. Measure starting now. Then, when the numbers start coming in, you'll know if you're seeing performance results in the top quartile, second quartile, or, heaven forbid, the lower third or last quartile.

Keep in mind that it's unreasonable to expect a service provider to hit "best in class" in all dimensions. It's more reasonable to expect that if it cuts costs, for example, it may not easily demonstrate "Internet speed" during this time. When's the last time you saw a staff reduction of 30% and had shorter schedules be the result? Again, what's your priority?

THE PRODUCTIVITY J-CURVE AND SERVICE LEVEL AGREEMENTS

The J-curve, for those who have not had the pleasure of experiencing it firsthand, is a drop in productivity after some event, such as an outsource transition, followed by a gradual rise. This can happen for various reasons, including staff churn, a momentary drop in morale, root cause analysis of process bottlenecks, requirements

> **Many companies want to operate at "Internet speed," but when you look at their SLAs, all the incentives are on cutting headcount and lowering costs.**

> **Long and deep J-curves can be excruciating.**

turbulence, or a combination of these. Short and shallow J-curves can be tolerable, with short-term pain acceptable in the interests of the long term. On the other hand, long and deep J-curves can be excruciating.

The J-curve may initiate its downturn before the actual signing of an outsource agreement. Some theorize that during early outsource forays by a company, the J-curve drivers might start in motion. The bottom of the curve is seen sometime during the actual transition, which may last anywhere from several months to a year or longer.

The issue with regard to service levels is to be consciously aware of the J-curve's potential existence and to tailor the initial service level targets accordingly. Your outsource provider might have the most optimistic and positive intentions when it promises something like "immediate productivity gains of 17%, starting on Day 1." However, if during the transition productivity actually takes a short-term dive of 17%, then both you and your provider suddenly have a 34% shortfall dispute on your hands. There will be screams on both sides of the table. During this time, cool heads will have to prevail. You'll need to rely on all the negotiation, relationship management, dispute and mediation, and productivity benchmarking and metrics skills you can muster.

Work hard to not get yourself in this difficult position in the first place. The shockwave of the J-curve may be less likely when legacy maintenance is outsourced, when the team that is outsourced is less than 25% of IT, or some combination of the above. It is more likely — perhaps guaranteed — on applications development and major enhancements, and when most if not all of the IT staff are outsourced, with a major transition of staff from the client to the incoming outsource provider.

CASE STUDY: ONE ORGANIZATION'S DECISION ON A MAJOR APPLICATION DEVELOPMENT PROJECT

Moses Levy, a general manager of supply chain and logistics systems at a major retailer, described an interesting scenario that illustrated several of the key decisions on "project level" outsourcing of a major new application. This scenario involved potentially hiring an outsource vendor to build the system, with the vendor supplying an incoming team of its own professionals to provide additional capacity for this particular project. Another outsourcing approach is for a vendor to supply a specified number of IT professionals on an ongoing basis. These skilled professionals can then be utilized to build whatever the client wants them to build (or maintain) over the course of, say, a year, two years, or five years.

In this case, the project was the creation of a new system that involved a massive change to many of the company's core systems, under a brand-new technology platform. The system had to be done quickly. Outsourcing was a valid option for several reasons. The company did not have all the necessary skills in house. Not outsourcing would have required ramping up the skills. By the time this ramping would have occurred, it would have been too late. The risk of ramping up and possibly doing things wrong was too high. And there was a need to get started as soon as possible.

Good, Fast, Cheap. Pick Two!

Levy faced two potential scenarios: (1) outsourcing the entire project to the service provider (vendor), or (2) partnering with the vendor and comanaging the project. In the first option, the supplier offered to meet a 12-month deadline, deploying a staff of over 100 people. While this was intended to make the deadline (assuming everything went right the first time), it was deemed too

expensive, in the range of $27-$30 million. Furthermore, Levy's company anticipated that reliability would be inadequate during the first critical months of the system's being placed into service.

How did the company know this? By evaluating the supplier's proposal with a computer model. The development strategy put forth by the supplier was "cloned." The project's desired functionality was "sized," and the staffing, schedule, and cost attributes were duplicated on a screen.

From there, critical parameters such as phase times, overlaps, peak staff, ramp rate, and effort expenditures were benchmarked against industry trends. Levy compared the metrics to industry data to determine if the promised schedule was faster, on the norm, or longer. He did the same for effort, cost, peak staffing, and quality. This gave his team a framework to explore all of the implications on multiple dimensions and sanity-check them, assessing the risks in each domain.

Sometimes this proactive "forward analysis" results in the client and supplier consciously choosing where to accept the risks and making the deal. In the end, this deal was not made. It was deemed too expensive; the promise of achieving a 12-month delivery was offset by the high cost and risk of poor reliability. Most importantly, outsourcing would not have provided the level of control that the organization wanted on this very critical project.

The outsourcing that Levy's company chose in the end involved a team of providers, each of which had a demonstrated expertise on specific pieces of the required system. Levy and his IT organization retained the role of integrator and systems management.

And while speed and time to market was important initially, the question arose as to whether the first supplier could really have performed at that aggressive pace. When pressed as to whether it had achieved anything at that level before, the supplier replied that it didn't have any past metrics data. In the end, the question was, "Does this really make sense?" All emotions aside, common sense had to rule. There were too many uncertainties to bet the company on, in spite of the allure of a vendor promise to make something happen fast.

GETTING THE CRITICAL INFORMATION YOU NEED

Given the reality of the J-curve and dubious vendor promises, what can you do to achieve the productivity gains they seek from outsourcing?

- **Create a strong sourcing group.** Outsourcing is tricky terrain; it is most likely to succeed when an "A team" with good skills is in place to look at all the angles, whether you outsource or not. This team needs to report directly to senior management.

- **Get an advocate.** Strengthen your team and save time by bringing in expertise from firms with proven knowledge in evaluating sourcing, including its contractual elements.

- **Know your IT capability and get your own productivity baseline.** How can you assess whether someone can do IT better than you if you haven't benchmarked your own productivity? Measure quickly on a select group of applications that are critical to your business. Again, having an advocate that can empower you with proven methods and serve as an outside advisor can give you the numbers you need to make an informed decision and save time.

Michael Mah is managing partner with QSM Associates, Inc., specialists in software management, productivity benchmarking, estimation, and project control. As a principal with QSM, Mr. Mah has lectured in North America and the Far East. He is also a senior member of the Cutter Consortium IT Alignment Team and Year 2000 Services Team, headed by Ed Yourdon. His lecture topics include outsourcing, reuse, software process benchmarking, process improvement, metrics, risk management, and software estimation.

With over 17 years of industry experience, Mr. Mah has advised Fortune *500 companies, commercial organizations, and government agencies and has been a contributing author for publications such as S*oftware Development Magazine, American Programmer, Cutter IT Journal, Year 2000 Journal, *and* Application Development Trends. *He holds a degree from Tufts University, Medford, Massachusetts, USA.*

Mr. Mah can be reached at QSM Associates, Inc., ClockTower Business Park, 75 S. Church Street, Pittsfield, MA, USA, 01201. Tel: +1 413 499 0988; E-mail: michaelm@qsma.com; Web site: www.qsma.com.

- **Assemble an internal "SWAT Team" on metrics.** It doesn't take a lot. Get the team trained on how to do a benchmark. Typically you'll need a group composed of 0.5% to 1% of the IT organization. Therefore, an IT department of 300 persons could be served by 2 to 3 full-time measurement personnel. This is small pence to provide senior executives with critical information on a $36 million IT department at prevailing rates. Their work will form the basis for multi-million-dollar contractual service levels if you do decide to outsource.

- **Get your own baseline and update it year over year to assess whether your contractual goals are being met.** You can do it yourself; some of the better metrics firms can teach you how to do this. Or you can call a firm in on an as-needed basis to serve as an independent advocate.

- **Ask your service provider to show you *its* baseline.** Hey, the vendor wants your business, so have it prove its track record to you with *its* metrics. Say what? The IT supplier replies that it doesn't have any metrics data? Hmmmm.

- **Pick your priorities.** What do you want to encourage? Is "Internet speed" your goal, or is it reducing costs, or having stellar reliability? Do you want all of one, or some of all three? How does each of these priorities weigh against the other? Based on your answers, tune your balanced scorecard and service levels accordingly. Beware the J-curve!

- **Take it one step at a time.** The least risk involves outsourcing a portion of legacy maintenance. The other extreme is to outsource both maintenance *and*

all of new development, transferring *all* of your IT staff to an outsource provider. Know the degrees of risk for these scenarios and everything in between. Make an educated and informed decision.

ADDITIONAL READING

DeMarco, Tom. *Why Does Software Cost So Much, and Other Puzzles of the Information Age.* Dorset House, 1995.

Mah, Michael C., and Lawrence H. Putnam. "Software by the Numbers: An Aerial View of the Software Metrics Landscape." *American Programmer*, Vol. 10, No. 11 (November 1997).

Mah, Michael C. "Software Metrics for Winning Proposals." In *Proceedings of the TPI Outsourcing Conference.* TPI, 1997.

Putnam, Lawrence H., and Ware Myers. *Industrial Strength Software.* IEEE Computer Society Press, 1997.

REFERENCES

1. International Data Corporation (IDC). *U.S. and Worldwide Outsourcing Markets and Trends, 1998-2003.* IDC, July 1999.

2. Thomsett, Rob. "Outsourcing: The Great Debate." *Cutter IT Journal*, Vol. 11, No. 7 (July 1998), pp. 11-21.

An Effective Strategy for Managing Outsourcing with Measurement

by Howard A. Rubin

Lessons learned through outsourcing successes and failures of the past indicate that a "critical failure factor" of an outsourcing agreement is the selection of a set of performance measures to manage the agreement that:

- Do not align with the business needs and objectives of all parties

- Are so inflexible that they cannot be adapted to changing needs

- Present unrealistic performance targets

- Act as lagging and not "leading" indicators, in that they report results reactively instead of providing a "look ahead" view of performance

- Do not cover the complete scope of work covered by the agreement

- Do not consider the natural performance evolution of an agreement from transition to maturity/steady-state evolution

In short, the measures selected to guide an outsourcing agreement essentially play the role of "performance engineering targets" that reflect the time-varying needs and performance opportunities of the business and technical communities that are parties to the agreement. In this context, an appropriate metrics set is one that:

- Reflects the entire set of metrics specified in the company's own balanced scorecard

- Uses a scoring algorithm that focuses on continuous performance improvement across all scorecard dimensions

- Incorporates an internal performance target adjustment that is aligned with the evolutionary life cycle of the agreement itself — ranging from transition goals, to performance management goals after transition, to flexible "engineered" performance targets after "steady-state" goals are achieved

- Incorporates a parallel work output metric such as ITWUs (IT work units)

THE CONTEXT FOR MEASUREMENT

Furthermore, for an outsourcing agreement to be deemed successful, all parties to the agreement must accrue the expected benefits — business leverage for the client and economic and relationship success for the provider. To enable the benefits to accrue, a proactive, forward-looking oversight mechanism must be in place to ensure that the outsourcing provider is operating in a performance "zone" that will provide the client with the business value it expected in entering the outsourcing agreement.

Outsourcing oversight metrics — key performance-monitoring parameters that must be built into the outsourcing agreement and assessed on an ongoing basis — are the answer (see Table 1). These metrics form an end-to-end measurement system embodied in a measurement architecture that addresses all critical issues linking technology organization performance, key contract parameters, and business

Table 1: The role of metrics in outsourcing

Workstream	Activities	Outcome(s)
Perceptual mapping and rapid baselining	■ Construct list of measures needed as perceived by both parties ■ Inventory currently available data/assess data quality ■ Analyze contractual agreement business value goals/assess measurement coverage ■ Create baseline	Metric baseline of current performance established in minimum time frame
Benchmark analysis	■ Identify industry groups/company types to be included in benchmark ■ Construct benchmark analysis by overlaying baseline data on external performance data ■ Analyze and report on current performance vs. external performance	Assessment of degree of "stretch" of contractual goals; potential for identification of additional performance improvement opportunities
Measurement system design	■ Link internal IT measures to business outcome measures ■ Identify progress/navigational measures ■ Create overall measurement system incorporating contractual performance measures, progress/navigational measures, linkage to internal business measures, linkage to external business measures ■ Identify and define all measures, data sources, collection and analysis tempos, and end uses ■ Create system dynamics simulation	Organizational IT "flight deck" designed for monitoring and management of contractual performance parameters from both technical and business perspectives; expectations of business outcomes of the agreement fully charted; simulation environment available for "what-if" analyses (optional)
Implementation	■ Definition of roles and responsibilities for enacting measurement system ■ "Wiring" the organization	Mechanism for contractual reporting and proactive performance management in place
Continuous support	■ Ongoing acquisition of data based on required data collection tempos ■ Ongoing tracking against contract targets and "trajectory"; assessment (using model) of impacts of deviations from performance expectations ■ Ongoing comparison against benchmark database ■ Data-driven performance coaching ■ Monthly analysis of progress/performance ■ Quarterly management briefings ■ Annual assessment/report	Third-party continuous analysis, assessment, and coaching in support of contractual objectives

performance. Such a measurement system provides all parties to the agreement — ranging from those running the business to those in the development, maintenance, and operations organizations — with indicators and gauges to assess their current position relative to their own goals. This involves providing needed information on key metrics that shows their rates of change and how their performance links and relates to metrics for the other stakeholders.

Companies embarking on outsourcing should apply measurement in the context of:

Contract initiation actions

■ Baselining current performance

■ Benchmarking current performance against industry performance

Contract "goal-seeking" activities

■ Designing and implementing a measurement system that will provide the necessary "telemetry" (i.e., collection of metrics as part of the natural work processes) that will enable the parties involved in the agreement to actively monitor, manage, and navigate

to its performance targets from both technical and business perspectives

Performance target attainment actions

- Continuous measurement support for the entire duration of the agreement in the form of real-time updates of performance data as it is generated

- Creation of a continuous, forward-moving baseline

- Real-time monitoring of position relative to the attainment of and movement toward contractual goals

- Periodic (monthly) formal management reviews on progress

- Quarterly benchmark analysis against external industry performance

- Production of annual performance report

THE OUTSOURCING "LIFE CYCLE"

In addition, measurement must be applied in the context of the outsourcing "life cycle." This is the series of stages that an agreement/contract goes through from its initiation to steady-state operation. The stages are as follows:

Initiation/Transition

This is the first stage of an outsourcing agreement. During this stage, asset turnover and personnel transition take place. Typically, a new management structure and a new management team are put in place. Such transitions are also typified by personnel turnover and loss of organization intellectual capital; there is also a potential for performance degradation. This is a period of intense learning — therefore, learning curve effects have a major impact on organizational performance. The learning that takes place has to do with both

the assimilation of an organization and its personnel into a new management structure along with the learning required by the organization to adopt and adapt to new processes.

From a measurement perspective, the performance objectives of this life cycle stage are to:

- At minimum, maintain base performance levels

- Establish a performance baseline

- Show positive movement toward performance improvement in alignment with the goals of the overall agreement

A general failure of many agreements is the creation of unattainable and unrealistic targets for this period as a result of neglecting to consider the characteristics of this life cycle stage.

Performance Managed

At this stage in the life cycle, assimilation of assets and staff is complete. The new management structure and requisite processes and practices are also in operation. By getting "beyond the learning curve," the organization is ready to develop the ability to enact performance improvement targets that have specifically been set in the post-transition context.

From a measurement perspective, the metrics in this life cycle stage should be focused on:

- Articulating performance targets in all dimensions

- Providing a "moving snapshot" of key performance indicators

- Identifying current status

- Assessing position relative to targets

- Tracking movement toward targets

- Providing "alerts" to identify critical action areas

- Using leading, not lagging, indicators

- Identifying expected bands of acceptable performance

- Communicating quantitative aspects of organizational goals in terms of targets and performance improvement

The key aspect of this life cycle stage is that it is where the organization learns how to manage its performance and track movement toward its performance targets.

Performance Engineering

As outsourcing agreements mature, it is typical that performance targets set in the initial agreement will no longer be valid because of the potential for both business change and technology change that were unforeseen in the initial agreement. There is therefore a need to be able to establish a linkage between business performance and technical performance on an ongoing basis and, through this linkage, to develop new technical performance focus areas and targets. This is performance engineering.

From a measurement perspective, the metrics focus at this stage is to:

- Establish a linkage between business and technical performance

- Identify key metrics focus areas and the rate of performance change needed to sustain the desired business performance outcomes

- Shift the metrics focus to rate of change and not absolute targets

By enacting performance engineering through metrics, the organization's focus is on business alignment, outcomes, and change itself. The result is an agile IT

> **By enacting performance engineering through metrics, the organization's focus is on business alignment, outcomes, and change itself.**

organization with the innate ability to repeatedly attain the level of performance required by the business.

AN OUTSOURCING OVERSIGHT MEASUREMENT ARCHITECTURE

In terms of the measures themselves, the core outsourcing oversight measurement architecture provides for three fundamental levels of metrics that are tracked in three planes (the levels can be extended to provide greater granularity for more complex organizational structures and their interfaces). The three measurement levels are:

- **Business performance measures,** which focus on the key indicators of overall business success and relate to the business vision and strategy

- **Internal business IT customer measures,** which focus on the performance of the IT organization in terms meaningful to the internal business customers and link to the key business performance measures

- **Internal IT measures,** which focus on (1) the IT technical performance measures that link to the internal IT business customer organization, and (2) the internal or causal factors that impact technical performance itself

The three measurement planes are:

- The **target** plane, in which goals are specified and rate of movement toward goals is tracked

- The **causal** plane, in which the measures that must be tracked to reach the goals are tracked

- The **external calibration** plane, in which internal measures can be compared against external benchmarks

The top level focuses on business performance and provides the basis for the measurement of business value. A typical framework used at this level is the Balanced Business Scorecard, which focuses on financial measures, customer measures, organization learning and improvement measures, and internal process measures. Quite simply, the highest-level metrics are indicators focusing on enterprise objectives from the financial/shareholder, customer, internal process, and organizational learning viewpoints. The internal customer measures and the internal IT measures must be aligned with the goals embodied in the highest level of the architecture.

DEFINING THE METRICS

Identifying the right metrics requires a measurement design process:

Step 1: Identify all audiences for measurement and all measurement stakeholders.

Step 2: Analyze the measurement needs of each audience and stakeholder. Determine how they would assess whether productivity and quality has improved — do they focus on a business perspective, a technical perspective, or both?

Step 3: Produce a map cross-referencing audiences to needs. Produce a map cross-referencing needs to candidate metrics. Produce a map cross-referencing candidate metrics to acquisition methods.

Step 4: Trace from top-down and bottom-up.

Step 5: Organize the metrics into stakeholder groups or "dashboards."

As stated earlier, the second and third levels of the architecture address the views of the internal IT customer, the consumer of IT services within the enterprise, and the internal IT measures themselves. Each of

these levels is typically segmented into six measurement areas. These are productivity measures, quality measures, workflow and process measures, cost measures, alignment measures, and human resource (people) measures.

However, the measurement system must contain more than targeting or destination measures to be meaningful and have an impact. It is the "causal" measures — the second dimension — that are critical for enabling and making change happen. The causal measures relate to the things that must be monitored/managed to reach the goals on the targeting indicators. For example, to increase productivity and quality, rework must be monitored. In the targeting dimension, the current level of productivity and quality will be represented by indicators. In the causal dimension, those things that influence productivity and quality will appear. For example, in software development, rework is a major productivity drain and is an indicator of quality. Therefore, in this dimension, rework and the elements that drive it should be tracked.

A GENERALIZED OUTSOURCING OVERSIGHT METRICS CONTROL PANEL

The basic control panel contains "gauge clusters" that address nine critical dimensions of outsourcing oversight. These areas for measurement oversight are equally applicable to all the dimensions of outsourcing — from the data center, to desktop management, to application development and support. The areas covered are:

- **Finance/budget:** focuses on cost management and on-budget delivery of services and work products and the ability to deliver on budget

- **Customer satisfaction:** focuses on the critical attributes that generate satisfaction

MEASURING IT "THROUGHPUT": IT WORK UNIT METRICS

Measuring the amount of work done by an application development and support organization and measuring the amount of "product" produced/delivered by such an organization have proved in the past to be both difficult and elusive. Such measures are critical, however, because in the world of IT, perhaps the most commonly asked executive questions are related to them. Examples of these questions are:

- Are we using our IT organization effectively?

- Is the IT organization efficient?

- Are we spending the right amount on IT?

- Are we getting value for our IT dollars?

- Are we doing more work than last year?

- Are we doing more with less — or less with more?!

- Are we doing the right work?

While function points may be useful for quantifying the work product size and change in size for a particular set of classes of systems, they don't cover all aspects of "work." Among other tasks, IT organizations provide user support and help desks — clearly activities for which function points are not the most useful measure.

There are also many other places where function points may not apply, such as object-oriented development, component-based development, or small maintenance

tasks that involve computation changes. Do function points even pick this up? How do technology updates (e.g., moving from one database or operating system to another) fit in?

Clearly, the "capture ratio" of function points is low. Capture ratio relates to the amount of coverage of IT work types that can accurately be counted by function points. The lines of code (LOC) metric faces similar problems. And if you move to the world of objects, specialty metrics such as Chris Kemerer's Metrics for Object Oriented Systems Environments (MOOSE metrics) don't cover the rest of the "territory."

There does not seem to be a way to use a single metric to express the amount of work done by an IT organization. There also does not seem to be a way to express the amount of work products produced by an IT organization. If we can't compute either of these, we cannot compute overall efficiency and will definitely have difficulty analyzing effectiveness.

However, if you accept the nature of the problem — an IT organization performs many different work types and each may have its own "natural" sizing measure — the problem can be solved

using measures of work output.

Work Output Measurement

Focus for the moment on the notion of "throughput." Throughput is defined as the amount of material put through a process in a given period of time. View throughput as something that is discernible or visible to the customer or user of a process in terms of process inputs and outputs. From a customer vantage point, these inputs and outputs are really requests and results (work products delivered in some form to the customer).

Figure 1 expresses this idea in a way analogous to the way that an application boundary is drawn around an application
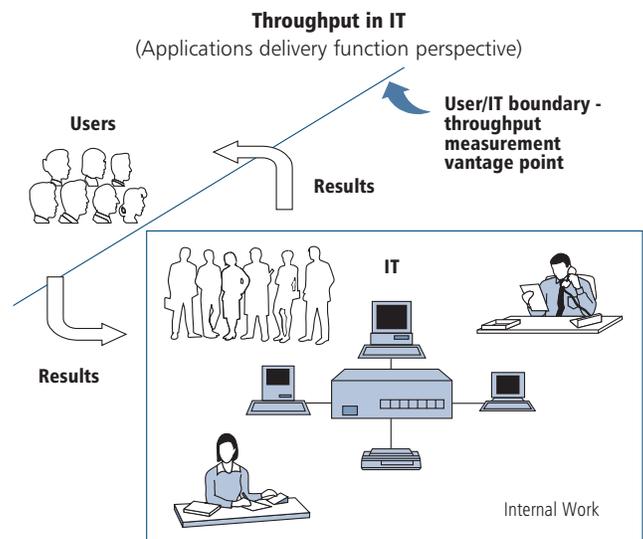
Figure 1: Throughput in IT

with IT services and work products by internal business customers

- **Work products delivered:** focuses on the quantification of the amount of service or work products provided in a given time period

- **Quality:** focuses on the objective and measurable aspects of quality of services and products

- **Time/schedule:** focuses on critical service, product, and project time frames and the ability to deliver on time

- **Business value:** focuses on measuring the attainment of the outcome of the outsourcing agreement in terms of the financial/shareholder view, the external customer/marketplace view, the organizational learning and improvement view, and an internal process improvement view

in traditional function point analysis. What the customer sees represents only a portion of what goes on. "Inside the box" internal work, which is not visible to the customer (although the customer may be paying for it), is also performed.

From a customer perspective, this internal work should not be measured. However, from an IT organization's perspective, the ratio of customer-visible work, or throughput, to internal work clearly relates to IT efficiency and its overall process yield.

Let's return to the definition of "throughput." The amount of material put through the process in Figure 1 is essentially the total volume of work performed. The volume of work performed is a function of the types of work requested and the size of the requested work expressed as some sort of units.

Possible work types include new systems development, platform migration, adding of new functionality to existing systems (adaptive maintenance), improving existing functionality (perfective maintenance), fixes/repairs (corrective maintenance), report generation, preventive maintenance, support functions, production support, and more. Remember, these are categories of work that may be requested by a customer. It is important to note that work types are not static. New ones may emerge over time.

Internal work types, by the way, include release control activities, technology upgrades, disaster recovery, and so on.

This list, too, may grow over time.

Using this simple work type based model we get:

$$\text{Total Work Performed} = \text{Volume of Work Requested (Executed)} + \text{Volume of Internal Work}$$

$$\text{Throughput (as viewed by the customer)} = \text{Volume of Work Requested (Executed)}$$

Computing Throughput

The previous equations are not really "satisfying" in that they are too high-level to be useful. To be able to compute "volume of work requested," more detail is needed.

Before going on, let's review the proposal proposed. First, draw a "box" around IT and called it the IT/User Boundary. Then identify all work types (requests and results) that move across the boundary and also those that don't.

Using insight gained from the function point measure, it appears that a logical next step and parallel would be to be able to count the number of occurrences of each work type and multiply it by a weight to get an overall throughput score or volume. This, in effect, is what is done in function point counting — identify each function type, multiply by a weight, and do the overall computation.

However, in this case we do not have "weights," and just counting the number of occurrences of each work type does not do justice to the varying size of each requested work type. What can be done?

The function point method, particularly the work of Charles Symons on MK II Function Points, provides the needed insights to enable the completion of the computation framework for throughput measurement. Tackling the problem backwards, let's first concentrate on the "weights." In the traditional function point measure, the weights used were determined by trial and error. In Symons's method, the weights are calibrated.

Therefore, I propose that for each work type, the weight used should be the average delivery rate per size unit of the work type. Of course, this approach requires us to come up with a size unit for each work type. To deal with the issue of a size unit for each work type, I use the concept of a "natural size" unit. In simple terms, this is the size unit that best fits the work type — it is discernible, measurable, and auditable. This means that for some work types, the size unit is function points. In other cases, it could conceivably be lines of code. In another — the help desk perhaps — it may be the number of hours spent on serving the request.

In essence, computing throughput involves, at a high level:

1. Identifying all the natural work types

2. Establishing a size unit for each work type

3. Establishing a delivery rate for each work type to be used as a weight (hours per size unit)

4. Computing the weighted sum of all the work volumes (this is size times rate)

■ **Operational service levels:** focuses on critical service tempos, availability, and delivery of work products

■ **Human resources:** focuses on changes to the skill inventory and internal job satisfaction

■ **Productivity:** focuses on the efficiency of the production and delivery of work products

As a direct byproduct of the creation of an outsourcing agreement, each gauge cluster must have target or destination measures. These indicate the goals of the agreement and may focus on a single value or multiple values, each linked to a point in time.

Each gauge cluster must have rate measures. These focus on the direction and rate of movement toward the aforementioned targets. These direction and rate

Howard Rubin is a pioneer in linking IT investment to business value. His current research is focused on using metrics in models to produce business and software process flight simulators and navigation systems for software projects. Dr. Rubin is chair of the Department of Computer Science at Hunter College, president of Rubin Systems Inc., editor of Cutter Information Corp.'s IT Metrics Strategies*, and a member of the* Cutter IT Journal *Editorial Advisory Board. He has published major software engineering books and papers on metrics and quality. Dr. Rubin is internationally recognized for his work in the areas of software process dynamics, software metrics, the business value of technology, and project navigation. He has provided expert advice and analysis on large-scale project management, oversight, and outsourcing.*

Dr. Rubin has collected data and organized it into what may well be the world's largest information technology database — more than 18,000 projects across 5,000 companies. Many of his findings are summarized in his book The Software Engineer's Benchmark Handbook*, and in his annual* Worldwide Benchmark Report*. In the area of software measurement, Dr. Rubin is the creator of the IT measurement dashboard and flight deck concepts.*

Dr. Rubin can be reached at P.O. Box 387, 450 Long Ridge Road, Pound Ridge, NY 10576, USA. Tel: +1 914 764 4931; Fax: +1 914 764 0536; E-mail: howard_rubin@ compuserve.com; Web site: www.hrubin.com.

measures are, in fact, the navigational measures that are essential for monitoring.

By codifying outsourcing objectives (the business value measures) and the underlying targets and measures in each of the other areas, an organization will be positioning itself for success.

SCORECARD STRATEGY/EVALUATION ALGORITHM

The typical outsourcing scorecard focuses on comparing results sampled either annually or, on occasion, quarterly, with performance targets or service level agreements specified in an outsourcing contract. A risk in using this approach is that it is relatively easy to construct a scorecard (with its associated scoring method) that would allow targets to be hit or exceeded in some areas, while in other areas targets are not met at all.

Organizations should use an approach that focuses not on the targets and variances from them, but on demonstration of performance improvement itself across the key performance areas. The scoring algorithm should be based on the percent of performance measurement areas in which a positive performance change has occurred. By establishing a high threshold for a passing grade (again based on the number of areas in which demonstrable improvement has occurred), the measurement methodology forces us to focus on multidimensional performance improvement. This is in essence a metrics realization of the overall performance engineering approach.

Also, focusing outsourcing monitoring and management efforts on the rate of performance change itself avoids one of the major pitfalls of outsourcing measurement — using reactive measures that show underattainment of goals after the goals have not been met. The performance engineering

approach, in contrast, puts the focus on the forward-moving rate of positive performance change. This approach makes it possible to manage performance improvement from a proactive posture. By monitoring the performance improvement rate itself, IT management is in a position to do the necessary extrapolation to take corrective actions as needed.

MEASURE FOR OUTSOURCING SUCCESS

It must be remembered that the primary purpose of the measurement system described herein is communication and coordination. It is not an "end" unto itself. To ensure success, metrics information must be used as a common currency of communication and not viewed as overhead. Therefore the collection of information that feeds the measurement system must be nonintrusive and highly automated — essentially it must be telemetry. And, for each metric, a data source, acquisition mechanism, and refresh rate must be determined.

The true challenge in managing multi-year outsourcing agreements is to be able to articulate goals in business terms, to be able to chart a course toward those goals, and to have the ability and flexibility to make midcourse corrections. Using measurement as a tool for communication, coordination, and organizational navigation may be the only way to ensure success in outsourcing.

Using the CMM for Contract Requirements and Managing Outsourcing

by Norm Hammock

In early 1998, BellSouth outsourced its software development and maintenance center, primarily a CMM Level 1 organization, to Symphony Alliance (SA), a joint venture between Andersen Consulting and EDS. BellSouth wanted to gain the benefits of an outsourcer that had software development process expertise. The primary reasons to outsource were not just to cut costs, but also to achieve more control, flexibility, and predictability.

Outsourcing an IT shop with more than 2,000 practitioners was a tremendous undertaking, and BellSouth's contract management group worked for more than a year to define and negotiate the deal. This effort included defining how BellSouth would work with SA and documenting that agreement in a contract. The contract group worked with all the groups within the development shop to identify what would be needed to select and manage a vendor. It gathered input from project planners, project managers, metrics specialists, analysts, designers, programmers, testers, implementers, process specialists, and quality personnel.

Each function developed a list of products and processes that it would require in order to be comfortable with managing an

outsourcer that was doing the software development and maintenance. This produced over 50 pages of product and process requirements. It was difficult for us internally to agree on these requirements, much less reach agreement with the outsourcer on this much data, especially since we knew the outsourcer could not be compliant on "day one."

SIMPLIFYING REQUIREMENTS WITH THE CMM

At this point, CMM personnel were asked to participate. Since both BellSouth and the outsourcer had personnel who knew and understood the CMM, and each party had adopted the CMM as its IT process improvement goal, the software process development and project management requirements in the contract were reduced to a couple of pages. The key process areas (KPAs) of the CMM define key practices that must be defined and carried out. Thus compliance with the defined industry standard ensured that the desired requirements would be met.

But convincing everyone within BellSouth to accept this approach was not a trivial task. The CMM personnel had to show the contract management group and the individual groups how their defined needs would be met. In fact, we found that there were no requested contract items that were not covered in the CMM! We also had to satisfy BellSouth senior management that the CMM would meet its requirements. The managers were somewhat familiar with the CMM, but not in this possible use.

Basically, rather than specify details of *how* an outsourcer should perform the work, the CMM personnel urged using the CMM as a model to define *what* the sourcer should do. This gave the sourcing company the flexibility to provide the expertise it was

engaged to provide by performing the work the way it wanted. This approach also gave BellSouth confidence that it would have visibility into the products and processes throughout the systems development life cycle.

After getting agreement within BellSouth, we were ready to discuss and finalize the contract wording and commitments with SA. This required having the BellSouth contract team as well as the CMM personnel meet with the SA contract team and SA's CMM personnel. Having as our model the CMM, which both sides understood and recognized as an industry standard, was a tremendous advantage in working through the contract details. This advantage is what allowed us to reduce the 50-plus pages to a couple of pages for this portion of the contract.

Meetings of the contract personnel and the CMM personnel also allowed BellSouth and SA to make sure that each side had a consistent understanding of the CMM, of using the CMM for process improvements, and of interpreting the CMM. While the CMM is a well-documented industry model used by thousands of corporations, CMM assessment teams, led by an SEI authorized lead assessor, have to apply professional judgment when performing assessments. Thus, some room for interpretation exists.

ENSURING CMM COMPLIANCE: FROM STICKS TO CARROTS

Negotiating the process compliance section of the contract seems to have been one of the saner efforts in the development of the contract. It seems that, although there was room for interpretation, starting with an industry-defined model proved very

advantageous. Otherwise, we would have had to try to get both sides to agree to the wording and interpretation of the 50-plus pages that the different groups produced. Additionally, we would have had to define how audits or reviews would be conducted to determine if the outsourcer was in compliance with the stipulations.

Basically, it was agreed that SA would operate as a CMM Level 2, and eventually Level 3, shop. We would verify compliance through CMM assessments led by a mutually acceptable third-party lead assessor, with the participation of BellSouth and SA lead assessors. Both parties realized that the SEI doesn't "certify" the results of assessments, but we both understood and agreed that we needed some way to confirm that the vendor was operating within the model. In early negotiations of the contract, penalties were assessed if the vendor failed to comply with the CMM commitments. Because of the penalties, we chose to use a third-party lead assessor to perform the compliance assessments. However, late in negotiations, penalties for noncompliance with CMM Levels 2 and 3 were replaced by profit-sharing opportunities once CMM Level 3 was achieved.

The rationale for dropping the penalties for not reaching CMM Levels 2 and 3 was that performance measures, such as productivity and defects, were the real objectives and, thus, what should be measured and rewarded. Both sides agreed that CMM compliance should remain part of the contract, as both agreed that CMM compliance would be the vehicle for obtaining the productivity and defect improvements. Industry and BellSouth internal measurements show a high correlation between CMM maturity levels and these measures.

MAKING PROGRESS?

As with any large effort that takes a long period of time, we had to have some interim checkpoints. To meet this requirement, we agreed that BellSouth lead assessors would participate in the initial CMM assessments to be performed within SA. Also, the lead assessors would verify that process improvement action plans were developed to address the assessment findings and that the process improvement activities were managed as a project; that is, that the process improvement plan was actually implemented and the status was tracked and communicated.

After a year of working with the contract, there are some areas that have worked well and some that haven't. One of the biggest obstacles has been the transition period. It was easy to say what we expected, but how long do you give the vendor to get there? How can you be comfortable it is on track? For instance, do you allow the full time that you gave the vendor to reach CMM Level 2 for the basic functions of software development to be in place and working?

A challenge in this area has been that in order to have visibility into the work efforts, BellSouth wants certain work products and measures in the process immediately. To meet these requirements, SA must implement certain things quickly. The expedited items may or may not fit into its longer-range plans of process definition and implementation. Since this has the potential of requiring rework and since there is no longer a penalty for not reaching CMM Level 2, there may be more incentive for SA to meet BellSouth's immediate requests and less incentive to concentrate on the longer-term commitment of improving the processes and reaching CMM Levels 2 and 3.

ASSORTED LESSONS LEARNED

There are a number of other lessons learned. One of these is that you should concentrate on building relationships and working together. That is, you should define and implement a process in which both sides can sit down and work out issues. There are many reasons that issues will arise. There may be a turnover in personnel, and people who were not involved in contract negotiations will interpret the wording in the contract differently. Also, in any effort of this size, there may be items that just aren't thought of. This is analogous to defining a change control process for software projects; that is, you should agree on how you will negotiate changes and/or misunderstandings as part of the original agreement, before such changes arise.

Another lesson learned would be to allow various internal groups to review different parts of the contract. For instance, as a CMM process person, I saw only the process and project management sections of the contract and was not allowed to review other parts of the contract. After the contract was signed, the process group was asked to be involved in monitoring parts of the contract in addition to the sections it helped define. It turns out that the process group could have added value in several other areas of the contract, just as it did in helping collapse the 50-plus pages for process and project management to 2 pages. There are redundancies in the various sections that could have been caught by allowing the various groups to review all sections of the contract. However, there is a tradeoff here. Protecting the proprietary nature of the contract before it is finalized would definitely be harder if you allowed more people review privileges.

It was easy to say what we expected, but how long do you give the vendor to get there?

Norm Hammock is a software development process manager and SEI authorized lead assessor with BellSouth Telecommunications in Birmingham, Alabama. He began his career at BellSouth in 1975 as an applications programmer. He has also worked in electronic data processing (EDP) auditing, where he earned his Certified Information Systems Auditor (CISA) certification; financial analysis and planning; and as an internal consultant, where he led application development teams through the entire systems development life cycle.

Mr. Hammock has led the process improvement program at BellSouth since it started using the Capability Maturity Model (CMM) for process improvement in 1994. During this time, he has participated in or led more than 40 CMM assessments, including assessments in the US, Germany, and Denmark; four CMM assessments at Level 5; and work with eight companies outside of BellSouth. Mr. Hammock is currently listed as one of the SEI's most active lead assessors. He has been selected to give presentations and tutorials at the last three annual US and last two European Software Engineering Process Group (SEPG) conferences.

Mr. Hammock holds a bachelor's degree in accounting from Auburn University and a master's degree in business administration (MBA) from the University of Alabama at Birmingham.

Mr. Hammock can be reached at BellSouth, E8B1, 3535 Colonnade Parkway, Birmingham, AL 35243, USA, Tel: +1 205 977 1334; Fax: +1 205 977 1300: E-mail: norm.hammock@bellsouth.com.

It is awfully difficult for even a relatively large contract management group to have the expertise needed to address all areas of a contract covering such a large and complex outsourcing arrangement. Our contract group periodically brought in people from different areas to help define and negotiate the various sections of the contract. It was definitely a challenge to coordinate input from multiple functions during contract negotiations, and it is proving to be just as challenging during the ongoing management of the contract. This seems to be an area where an opportunity for improvement exists.

The CMM is a good model for measuring the capability of a potential software development partner. However, you must realize that you are measuring the capability of a vendor's shop that has been in existence for some time. It may not be easy for the vendor to define and implement its processes and discipline in your development environment with the same degree of success that it achieved in its own development shop. Remember that the vendor is starting with a majority of the same personnel and processes (formal or informal, good or bad) that were in place prior to outsourcing.

Rather than the selection of a capable vendor, the harder part of outsourcing may be managing the vendor's performance. You can demand and get commitment to the CMM, which requires the vendor to have a process improvement program and to measure to ensure that improvements are actually occurring. However, defining these measures in a way that is agreeable to the client company and the vendor it has chosen to develop and maintain its software is difficult, to say the least. Productivity is hard to measure. Measurement programs often take a very long time to define, implement, and mature to the point where the data is reliable. And if you don't have a baseline that has integrity and is agreed upon by both parties, it's hard to show improvement. In the CMM, for instance, a formal and reliable quantitative metrics program is not required until CMM Level 4. This is due in large part to the fact that while data gathering and measurements actually begin at Level 2, it takes time to develop integrity of the data, understand the measures, and evolve to a legitimate measurement program in which the data measures actually are used and add value.

In summary, the CMM was used as a model to help select a vendor and to concisely and effectively define what the outsourcing vendor should do while meeting the requirements of the sourcing company for visibility and management. Even though the CMM defines what both sides desire, the biggest challenge in achieving this seems to be managing the transition period. BellSouth seems to want processes in place and visibility immediately. SA has to balance its efforts to meet BellSouth's immediate desires and to improve its processes for the longer term. Managing outsourcing, even with a well-written contract based on an industry model, has proven to be challenging. We are one and a half years into the contract, and it's still too early to tell the real degree of success or failure in the area of process improvement.

Offshore Outsourcing:
The Alternatives, Key Countries, and Major Challenges

by Marty McCaffrey

Offshore outsourcing. It's a term we hear more frequently these days, and a growing industry. In India, which is the largest supplier of IS outsourcing services, the industry's export revenues have grown from US $30 million annually in 1989 to over $2.7 billion in 1998. Growth has been compounding at a rate in excess of 57% per year for the past six years.

Business demands for IT solutions have never been greater or more complex. They include client-server, data warehousing, ERP implementation (both back office and front office), sales force automation, knowledge management, and the blockbuster — the Internet (intranet, extranet, e-commerce, World Wide Web). The majority of IS managers know that there is a tremendous shortage of key qualified IT workers in the US and that it is growing significantly worse each year. Given the demand and the worker shortage, offshore outsourcing may provide the solution.

There are usually several factors that clients cite for offshore outsourcing. At the heart of all of them is the inability to find qualified IT personnel. Clients also mention accelerated delivery/time-to-market factors, higher productivity and quality (often significantly better then they can deliver themselves), fixed price contracts, and significantly lower costs.

AVAILABLE OUTSOURCING OPTIONS

Companies have several approaches they can choose from when deciding to outsource offshore. Often companies use two or three of these alternatives simultaneously.

Professional Services

Under this approach, an offshore vendor provides the client an on-site software engineer who is then assigned to fill a staff opening. This approach is frequently termed "body shopping." Major offshore vendors make substantial investments in training and screening their personnel prior to assignment. Today, professional services staffing is a major part of many offshore companies' business. For Indian companies, it has been the largest segment of their business and accounts for over 45% of the industry's export revenues. Contracting for these services involves companies' obtaining an H-1B visa for the worker. It should be pointed out that US companies do not save any money on the engineers they hire under this visa. By law, they are required to pay the prevailing wage in the geographic area or within their company for the position filled. There are hefty penalties and restrictions for companies that do not comply.

Individual Software Project Outsourcing

In this case, clients outsource the development of a specific application. Reasons for this type of project vary from time-to-market urgency, to lack of inhouse expertise, to cost savings. These projects typically run for several months and entail several person-years of effort. Part of the project work will be done offshore, and there will be an on-site team that is often 50% to 60% of the overall project loading. These are not the most efficient projects because of the contractual resources and effort required for each separate project. From the vendor's

> **A key advantage of joint ventures is that the client doesn't have to do everything from scratch itself.**

perspective, these efforts offer the opportunity to get its "foot in the door." They may be a good approach for the initial client experience with offshore outsourcing, to evaluate a vendor or as a precursor to a larger effort in the future.

Offshore Development Centers

For this type of project, the vendor provides all the infrastructure requirements and a specified number of full-time IT personnel to a client center. Part of the vendor team will be located on site at the customer's facility. The client typically only furnishes unique hardware and software to the vendor. The processes, methodologies, and standards of the offshore center may be those of either the vendor or the customer. These are longer-term commitments of at least three years or more and generally require a minimum ramp-up to 50 software professionals within the first year. Some clients have expanded their centers to several hundred software engineers. This is the fastest-growing segment in offshore outsourcing, and it is the approach preferred by most vendors.

Joint Venture with an Offshore Vendor

This approach entails setting up a separate legal company in the vendor's country to produce a product. A 100-person company is about the minimum size. Financial and start-up expenses in the first three years can run $3 million or more annually. Clients typically bring the first work to the joint venture. A key advantage for the client is that it doesn't have to do everything from scratch itself. The client can leverage off the vendor partner's existing infrastructure, experience, processes, and local reputation. The client also avoids much of the bureaucratic hassle with local and state governments in developing nations. Joint ventures were especially popular in India in the late 1980s and

early 1990s, when foreign majority ownership of a company was prohibited.

Wholly Owned Subsidiaries

These centers typically require several million dollars in investment. The client must meet all the legal and business requirements, deal with the bureaucratic authorities, and develop the infrastructure resources. Wholly owned subsidiaries can take from two to three years to be up and running if a factory is built. Several countries, including the Republic of Ireland, Northern Ireland, and India, have favorable investment and tax policies for such plans. For example, over 60 high-tech US companies have established wholly owned subsidiaries in Ireland. Some of these centers are dedicated to leading-edge research and development for their companies.

THE OUTSOURCING VENDOR COUNTRIES

At present, four countries are leaders in offshore outsourcing: Ireland, India, Israel, and the Philippines. The outsourcing industry in these four nations is mature and of substantial size, the infrastructure resources required for success are in place, and the governments are frequently supportive. There are several other countries where a few innovative companies have gone and set up shop to tap the available software talent or recruit for staff augmentation purposes. Many of these new countries are initiating government-supported projects.

But first, a brief caution before I proceed. It has proven difficult to gather data on the various countries' software industries. I've used documents, reports, business and news periodicals, and Internet Web sites, in addition to personal interviews with industry and government representatives. Some available data may be statistically unreliable, biased, or skewed. Therefore, I

recommend that the reader use these figures only to get a rough sense of the state of the industry in each country.

Republic of Ireland

A $5 billion software industry has sprung up in the Emerald Isle. It is the second largest exporter of software in the world. There are over 100 multinational-owned software companies in Ireland, and the government provides incentives for companies locating there. These include employment, training, capital, and R&D grants, as well as tax incentives.

The Irish software industry has an excellent reputation for quality. Much of the Irish work is localization and manufacture of business software. Localization consists of adapting packaged application software (often developed in the US) for French, German, Italian, and other markets. Ireland has 60% of the European business application software market.

With a highly educated technical work force of over 15,000 English-speaking software professionals, Ireland is culturally the closest to the US and logistically easiest to access. There are about 10 Irish service companies, of which several have 150 or more employees. At present, only a few companies are doing business in the US. Approximately 3,000 graduates with computer and technical school degrees enter the work force each year. Over the past two years, the labor market has gotten much tighter, and there presently is little excess capacity. The cost for a software engineer just out of college runs in the $20,000-$25,000 range.

Northern Ireland

Northern Ireland is looking to expand its outsourcing business. Several multinational companies have recently set up centers there. The government provides tax, training, and R&D incentives. Northern Ireland presently graduates about 2,000 computer graduates each year, and its software industry only absorbs 1,000. Thus there is an excess of 1,000 per year, many of whom leave the country. The industry has a reported turnover rate of less than 10%, one of the lowest worldwide.

India

When it comes to IS offshore outsourcing capabilities, India is the superpower. The National Association of Software Companies (NASSCOM) lists over 750 software export companies. Many of these are small, but the top 25 companies have approximately 59% of the total market. There are over 250,000 software professionals throughout India, with at least half most likely working in the software export industry. Approximately 60,000 new computer science and engineering graduates enter the field each year, with starting salaries of $4,000 to $6,000. About 25% of graduates enter the export software industry.

For the past decade, the Indian national and state governments have played a visionary role for the software industry. They have liberalized most software business policies, exempted software and hardware for the export industry from import duties, developed software technology parks for start-up companies, provided world-class satellite telecommunications capabilities at competitive rates, and even provided incentives for ISO 9000 and SEI Level 3 certification. None of the other countries discussed here has a central point of reference or data on its software industry that even closely compares with that provided by NASSCOM, the Indian software trade organization.

The Indian software export industry has made a concerted effort to become a world

When it comes to IS offshore outsourcing capabilities, India is the superpower.

leader in quality. Earlier this year, 109 companies had received ISO 9000 certification, and an additional 76 companies expect to be certified by December 1999. Many companies are now aggressively pursuing SEI-CMM certification. In fact, India has had five companies reach CMM Level 5, out of 10 total companies in the world. These five companies thus are in the top 1.2% of over 800 companies that have been assessed since 1993.

The US is the Indian industry's biggest customer, accounting for 58% of the market. Europe is second, with 21%. Leading Indian companies provide comprehensive training programs. English is widely spoken and the language of education and business. India falls in the Asian area culturally. Infrastructure in the country as a whole is substandard, but the software industry has taken the necessary steps to ensure its basic requirements.

The Indian software export industry faces some serious challenges. One is the continued high rate of growth. Will the industry be able to sustain its high quality initiatives and reputation under growth of 50% or greater per year? Another problem already evident is finding experienced and qualified project and program managers. This is perhaps the most serious challenge facing the industry. The high rate of project personnel turnover is a third serious issue. Officially estimated in the high teens, many sources acknowledge it is probably around 30% per year.

Philippines
There are a number of Philippine software service companies that have entered the US outsourcing market. These are firms that have been service providers for Philippine businesses and are generally several hundred professionals in size. They have built a good reputation for quality work. The Philippines has 30,000–50,000 software professionals, and it is estimated that another 10,000 are working overseas. A bright spot for this industry is that approximately 17,000 people with associate or B.S. degrees in IT are entering the work force each year. This should ensure a good foundation for industry growth. College graduates generally command a salary of $6,000 to $8,000.

Philippine companies have developed excellent training programs, and their English communications capabilities are excellent. English is used in higher education and in business. Infrastructure capabilities are good. Culturally there are strong ties between the US and the Philippines, but it is first an Asian culture. High personnel turnover, rapid growth, and adequate capital funding for growth are all challenges for this industry. At present the government has played only a minor role in promoting the industry.

Israel
This country's software industry has been booming. It has a work force of 20,000 programmers, 10,000 of whom are working for software houses. Salaries are near US rates. Former Soviet Union immigrants provided a major influx of engineering and scientific talent in the early 1990s and have provided some excess manpower. English is widely spoken.

The Israeli software industry had sales of over $1.5 billion in 1988. Software exports were estimated at $700 million and growing at 25% per year. These exports tend to be packaged and custom application products. There has been much work on leading-edge products and technologies. Israel has become a major center for multinational corporation software centers, and the Israeli government has supported joint ventures. Infrastructure is excellent, and the industry has good financing.

Other Potential Countries and Nearshore Companies

China, Russia, Brazil, Ukraine, Egypt, Malaysia, Pakistan, and several Eastern European countries are in the early stages of developing an outsourcing industry. They have primarily been sources for recruiters seeking experienced and trained software personnel for staff augmentation/professional services staffing. In many of these countries, the national governments are taking steps to support and expand the software industry. Many countries have small software companies of 25 to 100 people seeking to provide outsourcing services. Some are tied to small US service companies. They have helped to address the tremendous shortfall of qualified IT professionals in the US and Europe, and some have the potential to play a much larger role in the future.

Nearshore outsourcing involves software work that is being done by companies in Canada, Mexico, and the Caribbean islands. The Canadian national and provincial governments are promoting their software companies as well as themselves as a place to locate. Some US service providers have located facilities in Canada. Because of the currency exchange rate, there is the potential for about 30% in cost savings. Mexico also has a few service companies that have entered the US market. One company has over 2,000 employees, with more than 500 dedicated to US projects. In addition, a few Indian companies have been considering locating facilities in Mexico. Both Barbados and Jamaica have seen outsourcing software facilities spring up.

Work can be done at nearshore facilities at a significant cost savings over US rates. Another big plus is that, with their geographical closeness, clients are often able to fly in and out the same day for meetings. This will usually facilitate more face-to-face meetings, which improve communication richness and are critical in software development.

Another alternative is to consider one of the several US service companies that have established offshore development centers.

THE CHALLENGES OF OFFSHORE OUTSOURCING

Many of the general challenges in outsourcing have been well documented and apply to offshore outsourcing as well. In addition, there are three major issues for offshore outsourcing that should be addressed. The first is dealing with language differences, both written and spoken. Software development is all about good communications, and English has become the standard for offshore software development projects. Even for vendors from English-speaking countries, communication can be challenging. There are different meanings of words and usage. But the biggest challenge is if your vendor is from a nonnative English-speaking country. You must keep in mind that each encounter with your vendors' employees requires enormous concentration and is difficult for them. This includes even those who have attained a relatively good comprehension of English. A critical component of spoken communications is the body language that accompanies it.

Body language is associated with the second major challenge: cross-cultural differences. This is a huge and complex topic. Zareen Karani Araoz and Craig Storti gave a fascinating presentation on cross-cultural issues in the Offshore Track of the May 1999 DCI IT Outsourcing Conference. Key issues included the impact on negotiations, decisionmaking, conflict resolution, time, dealing with superiors, desire to save face, and others. Most client personnel do not fully understand or consider these

> **The biggest challenge is if your vendor is from a nonnative English-speaking country.**

Marty McCaffrey is the founder and executive director of Software Outsourcing Research, a company focused on research into the outsourcing of software. Offshore outsourcing is a special area of study. Mr. McCaffrey is the founder and chairman of the Offshore Outsourcing Track at the semiannual DCI IT Outsourcing conferences. For the past 11 years, he has also been a visiting assistant professor and research associate at the Naval Postgraduate School (NPS) in Monterey, California. His teaching and research have focused on software engineering and program management. In recent years, Mr. McCaffrey was the program manager for the development of the largest expert system ever developed and deployed for the US Navy. Prior to joining the NPS, he was a Marine officer, pilot, and program manager. He has a master's degree in MIS from the Naval Postgraduate School.

Mr. McCaffrey can be reached at Software Outsourcing Research, 17582 Winding Creek Road, Salinas, CA 93908, USA. Tel: +1 831 455 1818; E-mail: martymccaffrey@ibm.net.

crucial issues. Cross-cultural differences present a major challenge for most offshore outsourcing projects.

The third challenge for the client is a willingness to fully commit to the offshore relationship. This will take leadership from the top down. Everyone who has some responsibility for the outsourcing deal or has contact with the outsourcing vendor's personnel has to know why the company has outsourced, the extent of the outsourcing, and the benefits to the company. Each has to be fully committed to making the deal a success. Commitment will mean gaining an understanding of the language and cross-cultural issues. It entails meeting your vendor halfway on many matters. For management, it requires taking up to two weeks twice a year to visit your vendor's offshore site and to meet with its management and the vendor employees who are dedicated to your efforts. That's a challenge!

A question I'm frequently asked is, "Do offshore projects fail?" Yes, they do. Language and cultural differences often lead to serious misunderstandings on a project. And without full commitment on the part of all the client's participants, it just won't work. These are the three primary factors for offshore project failures, and they should be addressed in making your decision whether or not to outsource offshore.

OFFSHORE OUTSOURCING TODAY

Many base their views and decisions on offshore outsourcing on rumors, hearsay, or experiences that occurred several years ago. What you should know is that today there are literally hundreds of companies that have successfully outsourced projects offshore. NASSCOM has noted that 158

Fortune 500 companies were outsourcing with Indian companies last year. By the end of 1999, one *Fortune* 20 company is expected to be utilizing 3,000 software engineers provided by several offshore vendors. Of these, 2,000 are located at overseas development centers. Because of the offshore workers, this company's cost savings are estimated to be in excess of $100 million per year. It is also unlikely that the company would have been able to recruit this number of qualified software professionals in our tight US labor markets. Would such a major company have continued to expand its commitment if it wasn't successful?

Offshore outsourcing is challenging. It is more difficult to manage and will require more commitment than a normal outsourcing project. But the benefits can be many. It may offer your company the key to getting the critical IT solutions that it needs to be competitive and to do so in a timely manner. The cost savings may be critical to your company's bottom line. The decision to outsource offshore will require comprehensive planning, leadership, and commitment to be successful, but the benefits are worth it.

Over the past several years the offshore outsourcing industry has matured, and today it offers world-class software development opportunities. The necessary telecommunications capabilities and collaborative communication tools are in place. Project capabilities have expanded from legacy maintenance projects to state-of-the-art e-commerce, data warehousing, Internet, and ERP implementation and support. Offshore outsourcing is an alternative you should seriously consider and evaluate in making any outsourcing decision.

Offshore Outsourcing:
"They Lived Happily Ever After"? *or* "Something Wicked This Way Comes"?

by Roger N. Gaunt

I entered the world of offshore outsourcing with the naiveté of the uninitiated. After all, offshore outsourcing was the answer to our prayers: quality coding at inexpensive prices with no additional headcount, no personnel issues, no expensive benefits or overheads. Engage a vendor, deliver specs, and receive in return bright, shiny, production-ready code at an unbelievably low price. What could be easier? Even knowing that the vendors were from such exotic places as India or South Africa was not daunting. This is the age of global communications, virtual handshakes, and shrinking cultural differences. Right? Right!

Come, take a trip with me to the land of offshore outsourcing — a place populated with good intentions, smoke, mirrors, and here and there a genuine gem.

THE FIRST PASS

Offshore outsourcing was not new to my company, just to me. There had been an earlier effort to send an application offshore, but it had ended with my company taking its marbles and coming home. While the good intentions of that first pass paved my way, in retrospect I should have remembered

the ultimate destination of a road paved with good intentions…

The available documentation on that first effort was sketchy — after all, how often do you write down your mistakes for the world to review? Having undertaken that limited review, I realized the first problem: that project had been undertaken in a "business as usual" manner. Some details are in order.

Often we Americans, when engaging in a new endeavor, believe we are infallible and that anything we turn our hand to will have at least a margin of success, particularly at the "get go." We also tend to believe that all "business" people, regardless of their nationality, will act just like us in every "business" situation. Armed with this unshakable faith, my company had waded right into offshore outsourcing.

We were the first account for the vendor we chose — hey, we were giving the little guy a break! (The fact that it was the breathtakingly low bidder was only a side issue.) We let our new vendor do its own staffing. Unfortunately, our vendor was skilled in client-server but not mainframe technology, and ours was a legacy application.

But bodies were hired, not all of which stuck around to even get their first assignment. World markets are very tight for good programming staff. No individual need sit on his or her thumbs offshore waiting for a company to make up its mind on a direction and get going — not when there are opportunities to come to America. So we lost the good, the bad, and even the ugly to other companies, projects, and countries.

In retrospect — which is always the best view — we did not have a clear, specific operational plan put together before we began the first effort. It was our intent, give

> **I discovered early on that not all of my dragons were in a land far, far away. Several were within the upper management ranks of my own company.**

or take, to have the offshore staff do both maintenance and development work. We knew how to measure development milestones: the code either works or it doesn't, and when it doesn't, you have metrics to measure quality.

But maintenance milestones are more elusive and very subjective depending on which side of the ocean you are on. Maintenance also requires more one-on-one knowledge transfer. This is OK, providing you keep your old staff around long enough to effect the transfer. Which we didn't. We immediately redeployed staff, reduced the budget, and then sat back and waited for the magic code to arrive. And we waited. And we waited. And we waited. No worry about smoke and mirrors here; there wasn't even an illusion.

We never had a functional liaison group in the US, and now we had no core technical group in the US. What we did have was a very confused offshore vendor and equally confused end users in the US. Both groups were on their own regarding communicating with each other, without a common frame of reference. *And neither side listened*.

The offshore vendor staff (trained in 19th-century British English) often didn't understand US slang, and the US slang slingers had no patience for translating. Offshore vendor personnel thought users were illogical, and users thought the vendor staff were slightly "thick." This situation does not make for timely, usable code. In the end, both groups were angry, and the differences were nearly irreconcilable.

At that point, a decision was made to send an expatriate knowledgeable about the application and about project management offshore to see if he could make a difference. My view is that this was a major improvement and could in fact have been a critical

success factor: he knew what was wrong and how to fix it. Unfortunately, it was a day late and a dollar short. The situation was beyond recovery, so as I said before, my company took its marbles and came home.

THE SECOND PASS

Several years later: same *Fortune* 50 company, same issues, different application, and now we have Sir Roger on the job — the new knight errant of offshore outsourcing — ready to slay the musty old dragons of bygone days. (There is a saying about people who rush in where angels fear to tread.) Nevertheless…

I felt and still feel that there is a definite place in IS resource planning for offshore outsourcing. Offshore outsourcing can allow access to additional programming capacity, scarce skill sets, niche competencies, new technology, and low costs, and it can shrink deadlines. The trick is to overcome the mistakes of the past and move forward based on those lessons learned.

Interestingly, I discovered early on that not all of my dragons were in a land far, far away. Several were within the upper management ranks of my own company. Although given the go-ahead to once again try outsourcing, organizational changes caused commitment at the top to wane before long — but let's not cut to the chase so quickly. Once again, some details are required.

I had been given a charge that I felt capable of delivering; I was on a mission, so no windmill (or dragon) was too big an obstacle. It never occurred to me that I wasn't supposed to succeed (or, that not everyone was so eager for offshore outsourcing to succeed as I was).

Learning from the past, we:

1. Chose a vendor with experience

2. Chose a mid-sized firm — big enough to deal with the foreign government bureaucracy, yet small enough to consider us a major client

3. Chose a vendor based on quality and time considerations instead of just price

4. Chose an application with a functional end-user liaison group in place

5. Retained an onshore technical support presence of our own staff

6. Arranged for the vendor to keep a minimal staff on site in the US to interface with the offshore staff

7. Made infrastructure improvements, including:

   - A backup satellite link for our main terrestrial fiber-optic data line

   - Diversely routing the two 64KB lines, so that there was no single point of failure

   - A shared WAN, so that files could be shared between shores (the drive seen on offshore workstations is the same drive seen on our workstations)

   - Arranging for voice over data multiplexors so that an extension in our building could ring at the offshore site

   - Cell phones for the offshore production support staff so that they could be easily reached by US-based production support personnel

   - A guest house 10 minutes from the offshore facility so that staff on production support could easily get to work when the severity level of the breakage demanded it

8. Relocated the offshore site to the vendor's corporate headquarters instead of at a remote branch

9. Advised the vendor regarding changes that it needed to make in its offshore operations (the vendor was oriented more toward development projects than application maintenance)

10. Developed an offshore staff attraction and retention strategy

11. Developed a hybrid time and material/fixed-cost contract that provided a balance of rewards and penalties and tried to naturally encourage behavior that would produce outcomes of benefit to both companies (win-win)

12. Sponsored a trip to the offshore location by the IS application manager every six months to motivate staff and observe the operational readiness of the offshore facility

13. Advised the vendor on key staff appointments

14. Instituted the use of formal project management tools

15. Utilized a "follow the sun" methodology, whereby the code was being worked on 6 days a week, 24 hours a day[1]

16. Developed a paradigm of onshore analysis and offshore development that worked well

[1]Offshore personnel developed and modified a prototype each US night, which US-based personnel tested the following day. At the end of the US day, they sent any desired changes via e-mail to offshore personnel. The following morning, the code was back, changed, and ready for more testing. *This process cut time by one-third.*

Ignoring the past, we:

1. Began by outsourcing an entire application instead of a small controlled development project (this decision was made before I came)

2. Decided by default that we could not afford offshore representation ("Pay how much? For what? Are you serious?") (see sidebar below)

REWARD CANNOT BE SEPARATED FROM RISK

An offshore representative (often called an "expatriate") can help reduce risk substantially, but such persons are expensive, and this support cost clouds the incentive to consider offshore outsourcing in the first place. The problem is how to justify the cost during the start-up operation (when expatriates are a very critical success factor) until the offshore volume allows the cost to be spread over multiple applications.

Because the benefits of this position are qualitative in nature, it is hard to justify it from a cost-benefit perspective, and thus management is frequently unwilling to fund it. A list of the roles and responsibilities of the offshore representatives can be found below, but probably the greatest value this person adds has to do with the fact that US contact personnel are typically not available during the normal offshore work day. As a result, nearly all communication between the shores is via voice mail, e-mail, or by someone in the US participating in a conference call in the middle of the US night. Unbelievable communication difficulties result from:

1. The lack of immediate feedback associated with voice mail (and commensurate delay in achieving resolution)

2. The loss of access to body language (often considered 40% of the communication) when using e-mail

3. The fact that the Indian communicator's command of English and understanding of the application are often less than perfect and the American communicator is irritated and half asleep

With access to a former colleague serving as an expatriate at the offshore development center, US-based personnel can communicate effectively and efficiently with that individual via voice mail or e-mail, and they can be sure that their concerns will be understood, addressed, and reliably responded to on a timely basis.

In capsule form, the major roles of the offshore representative are to:

1. Provide corporate presence offshore

2. Provide single point of contact for IS Security

3. Manage contract terms and conditions

4. Provide project management consulting

5. Provide early warnings and independent assessments of developing situations before they escalate or become surprises

6. Facilitate clear communication between the parties

7. Reduce cultural gaps

8. Most importantly, serve as a member of the onshore management team posted offshore to serve as a point of offshore leverage when, as, and if problems occur

---

3. Stayed with legacy system outsourcing instead of utilizing our vendor's open system core competency (no reason to make this too easy!)

4. Never achieved upper management ownership of the objective (The commitment to offshore outsourcing was individual, not organizational — nice concept, but will it work in Peoria?)

5. Never dealt well with the cultural issues, which can have major project implications (see sidebar on facing page)

Have we been successful with this second effort? Yes. No. Kinda/sorta. A key application was successfully outsourced offshore, an ongoing relationship with an offshore vendor was maintained, and a great deal of money was saved initially.

But we were never able to leverage this success to other applications or projects, and without ongoing organizational commitment to such new processes, things revert back to the Way They Were.

OBSERVATIONS

Based on my experience, in addition to addressing 100% of the lessons learned, organizations must be willing and able to overcome the following additional obstacles for offshore outsourcing to truly be successful:

1. Fear of loss of control of projects/applications. (Power brokers don't like to share.)

2. Real or perceived cultural issues. (Perception is reality.)

3. Fear of the unknown. (Something wicked this way comes.)

4. Fear of job loss by inhouse staff (un-American).

THREE MAJOR CULTURAL ISSUES

1. Nonnative English speakers who are expected to speak English will often stay silent rather than ask about phrases they do not understand. To fix:

   ■ Distribute agenda in advance to allow for discussion among offshore staff before conference calls.

   ■ Have offshore staff issue draft conference call minutes documenting action items and owners, requesting feedback within one business day.

2. Assuming that the offshore staff will volunteer information when there are unresolved problems is not wise. To fix:

   ■ Ask follow-up questions.

   ■ Offshore staff should answer implicit questions, providing more than a "yes" or no" response.

3. Eastern cultures operate under different time concepts than the American culture. To fix:

   ■ Be more precise — use "COB Today" rather than "ASAP."

   ■ Do follow-ups before the due date.

   ■ Offshore staff should promise what it can deliver and then deliver what it promises, providing early warning of change factors.

5. Fear of loss of intellectual property/ proprietary info. (Uncle Sam's rules don't apply the same way offshore.)

Do I still champion offshore outsourcing? You bet. Global partnerships are the future, with each culture utilizing the best traits the other has to offer. However, the road will not be easy, nor free from obstacles.

But for those brave souls who can capture the vision at the right levels of management, the rewards can be tremendous. For it can be done, God willing and the creek don't rise!

Roger N. Gaunt earned his Ph.D. from the Graduate School of Arts and Sciences at the University of Virginia in 1980 and his master's certificate in project management (PMI Curriculum) from George Washington University's Graduate School of Business and Public Management in 1998. In the intervening period, Dr. Gaunt rose through the ranks to top leadership positions in finance, information systems, and telecommunications at several large commercial and nonprofit organizations.

While the India project described above was his first love, he left when it stalled because the parties involved could not agree on a variety of process and cost allocation issues. He remains active as a consultant in the offshore outsourcing area.

Currently, Dr. Gaunt is a Fortune *50 company group manager for a 400,000-hour aggressive time-line software development project, enhancing 22 applications systems using inhouse resources. When not at the office, he enjoys canoeing and his Model A Ford Roadster Pickup.*

Dr. Gaunt can be reached at P.O. Box 47163, Kansas City, MO 64188, USA. Tel: +1 913 707 0548.

When Outsourcing Costs More Than It Saves

by Prins Ralston

When the Australian federal government and some of the state governments first looked at the possibility of outsourcing their information technology and telecommunications (IT&T) business in the early 1990s, much was made of the potential to use their considerable buying power to boost development of the Australian IT&T industry. Easily the largest purchaser of IT&T products and services, with around 40% of the domestic market, the federal government recognized that by providing contracts to local suppliers, it could grow the industry and provide a springboard for Australian IT&T companies to export their products and services overseas.

At least, that was the theory.

In practice, the outsourcing exercise has been less than successful when considered in terms of industry development. This is largely because it has been administered by economic rationalists whose primary objective has been to reduce government outlays with little consideration of the industry impact of such an approach. While some Australian suppliers have benefited from government outsourcing, these appear to be the exception rather than the rule. Most small to medium enterprises (SMEs) have been bypassed or squeezed out by the new process. Contracts have been awarded almost exclusively to large multinational companies, which have been able to leverage their existing worldwide resources to achieve better economies of scale than their smaller Australian competitors could hope to match.

REPORT CONFIRMS SMES' PAIN

While anecdotal evidence has long supported concerns within the IT&T industry about the deteriorating prospects for SMEs, this situation has been highlighted by a recent federal government report. Prepared by the Department of Communications, IT, and the Arts (DCITA), the report surveyed 233 local technology companies representing some 7,000 employees and a combined annual revenue of $1.2 billion. While recognizing SMEs as the "engine room of IT&T innovation" in Australia, the document outlined their various concerns about the outsourcing program, stating that "the state and federal outsourcing agenda is perceived to be inconsistent with the interests of IT&T SMEs."

According to the report, "IT&T SMEs believe there will be few winners and many losers as a result of government outsourcing policies," mainly because outsourcing makes it more difficult for SMEs to maintain a direct relationship with existing customers while competing against global alliances. "Outsourcing can have a fundamental impact on the SME/customer alliance, breaking long-established relationships and causing the SME to access the customer through the outsourcer," the report continues. "The trend to outsourcing non-core IT&T systems is having dramatic effects on industry relationships."

While SMEs recognize that external IT contracts can open up new opportunities for local business, only a small number of Australian SMEs rely heavily on partnerships with multinationals, which to date have shown a preference for forming alliances

with other multinationals. "The majority of relationships with outsourcing providers relate to the provision of services. Other forms of strategic alliances are desired by SMEs but are seldom offered by outsourcing providers," said the report.

Exactly how the Australian government intends to respond to the findings of the report was not known at this writing, although IT Minister Richard Alston did comment that SMEs "face an uncertain path to success as they have to compete with much larger companies to be accepted in the wider IT&T market."

GOVERNMENT TO BLAME FOR POOR IMPLEMENTATION OF OUTSOURCING

The government has come under heavy criticism for the way it has handled IT&T outsourcing, and there are many who believe the policy must be changed to provide for and more clearly favor SMEs when awarding tenders. One of the most vocal critics has been Federal Labor Opposition IT spokesperson Kate Lundy, who claims SMEs have been locked out of winning major outsourcing contracts by the way they are designed. She said the cost of submitting a tender can exceed A$1 million, which is far more than an SME can afford to invest, only to be overlooked. "The outsourcing program has been plagued with problems, including impossible tendering timetables, discrimination against small and medium-sized enterprises, dubious savings claims, canceled tenders, and allegations of conflicts of interest," Senator Lundy said.

While no one would question the desirability of a significant multinational presence in Australia, there is need for greater balance to be achieved between the interests of the multinationals and the needs of domestic players. In many cases, multinationals have not only come in and taken contracts away

from Australian-owned suppliers, they have proactively done so with the view to obtaining skilled people, intellectual property, and valuable assets and resources as part of the contract. What's worse, the various governments have provided them with a guaranteed revenue stream for their trouble. In the process, the Australian government knowingly threw away the chance to create local service companies of international size by granting the multinationals these strategically significant contracts. Perhaps naively, the federal and state governments opted for the "level" playing field and ignored the national and industry needs.

While governments should be concerned about, and accountable for, how responsibly they direct their IT&T purchases to ensure a beneficial impact on the local industry, a third-party outsourcing company does not have this responsibility unless it is specifically and contractually defined. By giving control of a large slice of the IT&T market to a comparatively unconcerned third party, and a multinational at that, the federal government has removed the sense of responsibility for the effect of purchasing decisions on the local market and lost the ability to manage the industry impact. Many of the SMEs that previously had a supplier relationship with various government departments have been shut out of the new outsourcing contracts under clustering arrangements and have either gone to the wall or been forced to find new markets.

One SME that has prospered against the odds is Queensland-based Technology One, which supplies leading financial software to Australian corporations. According to Managing Director Adrian Di Marco, "The most disappointing thing for us is to witness the fall of our industry over the last 10 years. Once we had many Australian competitors.

The Australian government knowingly threw away the chance to create local service companies of international size by granting the multinationals strategically significant contracts.

Now, all our competitors are multinationals. Once, many Australian companies invested in software R&D and brought new products onto the market — now, very few.”

Di Marco believes the lack of sponsorship and support by government is a major contributor to the local industry’s decline. “Governments must realize there is a significant difference between large multi-nationals and the indigenous software industry. The multinationals have no real long-term commitment to Australia, plus their profits are remitted back overseas, as is any intellectual property created. Thus it is essential to create the indigenous soft-ware industry,” he said. From an Australian point of view, the role of SMEs as the “inno-vative edge” of the IT&T industry means that our failure to encourage and support these companies has potentially significant consequences.

ASSESSING THE DAMAGE

To its credit, the current federal government has announced a range of measures to try and stimulate growth in this sector through initiatives such as the Building on IT Strengths (BITS) program, which will be funded by the sale of an additional 16.6% of Telstra, Australia’s national telecommunica-tions carrier. But while plans for incubator centers, test beds, and experimental networks are to be commended, one must question the wisdom of spending millions of taxpayer dollars to rebuild an industry damaged by the government outsourcing policies themselves. This is particularly ironic in light of the fact that outsourcing itself might have achieved these growth objectives if greater attention had been paid to ensuring that the process was packaged appropriately and that local SMEs were given the right “incubation” to be able to compete effectively.

One of the problems facing the Australian industry until now has been the lack of documented evidence about the impact of outsourcing. The study released in July by the federal government was the first to comprehensively assess the effect of out-sourcing policy on IT&T SMEs in more than 10 years. The government has promised a more proactive approach to monitoring its one-year-old cluster arrangement, and the Australian National Audit office is working on a report, which is expected later this year.

Despite the previous lack of evidence for or against outsourcing, a brief comparison of the top IT software and services companies operating in Australia in 1988 and 1999 provides an interesting picture. In 1988, the leaders were, in order, Computer Power, Mayne Nickless, Paxus, CSA, AAP, Andersen Consulting, and ACI (Ferntree), of which four companies were Australian and one was from New Zealand. Over the past 10 years, this situation changed dramatically. In early 1999, the top seven IT companies operating in Australia were IBM GSA, EDS, Computer Sciences Corporation, SAP, Interim, BHP IT, and Unisys, followed by Oracle, AAG, Qantas, Mincom, Axis, Computer Associates, DMR, and Praxa. Multinationals with outsourcing as a significant activity now dominate the top spots, leaving Australian companies, which earned 55% of revenues among the Top 15 in 1988, accounting for only 19% of those revenues in 1999.

Throughout history there have been nume-rous instances of stronger nations or entities taking full advantage of lucrative situations in other countries, resulting in arrangements that have retrospectively been labeled exploitative. The challenge facing our more enlightened society is to move to a model that encourages real partnering between international entities and local

---

One must question the wisdom of spending millions of taxpayer dollars to rebuild an industry damaged by the government outsourcing policies themselves.

organizations/governments to maximize the advantages for all parties. Historically, the Australian government has taken the view that market forces will provide equal opportunities for all. In retrospect, this fairly simplistic view has not been beneficial for the local industry, and it is perhaps time for a stronger stance that ensures more favorable conditions for Australian organizations.

WORKING WITH — NOT FOR — MULTINATIONALS

This is not to say that multinationals are unwelcome. Far from it. But the way in which multinationals operate within Australia needs to provide more opportunities for the domestic industry to play a significant role.

The argument that we now live in a global marketplace does not absolve multinationals from their corporate responsibility to "give something back" when they enter another market. While companies are in business to make money, there needs to be greater recognition of the fine line between profit and exploitation. In recent years, the pendulum has swung too far in the direction of exploitation, and it now needs to move back to a more balanced position.

Clearly, if we in Australia want to grow our local industry and give it equal footing with multinational companies, our governments must provide targeted opportunities for domestic organizations. Governments must change their outsourcing policies to enable smaller, innovative IT&T companies to compete for and participate in outsourcing contracts. The long-term goal is to help these companies grow and eventually be able to compete for work on a global basis.

This approach could mean repackaging the contracts into more appropriately sized chunks that local players could handle, or promoting and facilitating the creation of SME consortiums that could work cooperatively to meet the requirements of larger projects. Whatever approach the government takes, industry development must become a higher priority in the outsourcing of IT&T projects.

This refocusing by Australia should not be seen as a threat to the multinationals, which will continue to have an important role to play in supplying products and services. However, their role will be expanded to give them the opportunity to partner with and assist innovative companies in their development and growth.

History shows that the bright ideas come from the smaller, more creative end of the market. At the end of the day, we will need a diverse range of companies — both multinationals and thriving SMEs — to deliver the technology innovations that will power Australia in the global knowledge economy. My hope is that multinationals operating in Australia will actively encourage and work with local SMEs as part of that necessary diversity — partnering rather than consuming — in a process that finally produces the benefits outsourcing always promised but has yet to deliver.

Prins Ralston is a consulting solicitor and barrister in e-commerce and information technology and telecommunications (IT&T) with the national Australian commercial law firm Clayton Utz. He is also the managing director of Business Management Consulting (BMC), which provides management consulting, e-commerce consulting, business process reengineering, and project management services in Australia and the Asia Pacific region. He has worked in IT&T for the past 18 years, the last 12 in various chief information officer and consulting roles in business and government.

Mr. Ralston is national president of the Australian Computer Society (ACS), the professional body for 16,000 Australians working in IT&T. He is international president of the South East Asia Regional Computer Confederation (SEARCC), which represents 15 member countries and has a consolidated membership in excess of 300,000 professionals. Mr. Ralston is an active member of various government and industry committees and is a sought-after speaker and commentator on IT&T issues.

He holds a bachelor of business degree (computing), is a fellow of the Australian Computer Society, and a Practicing Computer Professional. He also holds a bachelor of business degree (accounting) and is a Certified Practicing Accountant. In addition, Mr. Ralston has a bachelor of laws degree, has completed his master of laws degree specializing in international trade and electronic commerce law, and has been awarded an Australian Postgraduate Scholarship to complete a doctor of judicial science degree in electronic commerce.

Mr. Ralston can be reached at P.O. Box 40651, Casuarina, Northern Territory 0811, Australia. Tel: +61 8 8947 4330; Fax: + 61 8 8947 2879; E-mail: prins@bmconsult.com.au.