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BY VIKAS SEHGAL, SUNIL SACHAN, AND RON KYSLINGER

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Few companies today would hesitate to outsource routine operations like IT services, call centers, or back office functions, but farming out engineering and product development is difficult or off-limits for most companies, and rightfully so. By their very nature, engineering and R&D are mission critical. What comes out of these units — the hits or misses, the innovation or lack of it — often determines the future of the larger organization. Letting another company, particularly an enterprise thousands of miles away, handle engineering tasks could be an invitation to disaster. Everything from knowledge transfer — dispensing a company's design and development procedures and preferences to an outsourcing firm — to quality of work may suffer when the supervision of far-flung engineers in offshore locations is left to vendors often woefully ill-equipped to manage complex projects or adequately meet the client company's needs.

Yet, despite its clear downside, engineering outsourcing has been slowly gaining in popularity over the past decade and is expected to be a business worth US$150 billion a year by 2020, which would make it five times larger than it is today. In most cases, companies are seeking to cut costs for an expensive activity. Engineering R&D can run anywhere from 3 to 10 percent of revenues, depending on the industry.

Western companies are also increasingly interested in tapping local engineers in emerging nations to develop products suited in culture and language to the needs of consumers in areas of the world where sales are growing. When companies fail to outsource these activities to regional operators, wasteful errors occur that would be laughable if they weren't so expensive to mitigate. For example, a German machine tool company recently attempted to design, entirely in Europe, a product destined for the Brazilian market. As a result, drawings, service manuals, and equipment tags were improperly translated. One instruction was supposed to read, "Advance the ram," but was translated into Portuguese as "Squeeze the goat." That mistake and many similar ones ended up costing the German company dearly in reworking tags, text boxes, callouts, and service manuals and hindered sales of the new product in Brazil.

The largest engineering offshoring country is India, with about 25 percent market share, but China is also a big player and its influence in the sector will increase in the coming years; together, India and China graduate more than 800,000 new engineers each year, most of whom are willing to work at pay scales far below those enjoyed by their Western counterparts. The Philippines, Malaysia, Thailand, Brazil, Hungary, Ireland, and the Czech Republic are also notable engineering outsourcing countries. As for client firms, North American companies are the primary engineering outsourcers, ac-

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counting for 70 percent of the business, with Europe and Japan responsible for the rest.

Given that more and more companies will likely see the financial virtues in engineering outsourcing, which will overtake their hesitation about entering into such an arrangement, it's worth considering what it takes to do it right. A successful program is predicated on doing five things well.

1. Choosing the Right Project. The best candidates for offshoring are engineering jobs whose scope, roles and responsibilities, and hardware and software needs are clearly delineated; that require minimal face-to-face interaction between clients and offshore resources; that require no interaction between offshore resources and end customers; that have carefully documented task maps and testing procedures; and that do not involve proprietary or classified activities.

Many companies make the mistake of picking projects to offshore by cost or complexity — the most expensive and tedious are farmed out. Unfortunately, it is only by luck that these criteria can produce successful projects. This was borne out recently when a consumer goods company decided that only the most costly engineering activities should automatically qualify for outsourcing, in part because the company believed their high price indicated that they were arduous and difficult to manage internally. But the project failed, producing no cost savings, precisely because the company was unable to grasp that managing the complexity of the engineering tasks required significant in-person interaction between client and vendor, as well as substantial vendor-supplied on-site resources. Moreover, the offshore vendor was attempting these difficult engineering tasks for the first time, adding a greater dimension of risk to the project.

2. Identifying the Appropriate Business Model. Typically, offshoring models for IT services or business processes are either vendor-run operations or captive arrangements, in which a company opens up its own offshore subsidiary. However, because engineering is a core function, many more models are possible that give companies a bigger stake in the remote operations and more control over the R&D activities. Besides vendor and captive sites, other approaches include captive with staff augmentation resource (a company has its own remote engineering facility that employs some staff from outside vendors); closed JV (a joint venture that exists only to serve the client company); tripartite JV (a joint venture among three companies — the client, the outsourcer, and an engineering design firm); open JV (a joint venture that serves the client company as well as other outfits); BOT (build, operate, and transfer — a vendor builds, runs, and staffs the outsourcing operation for the client for a period of time before selling it to the company); and reverse BOT or R-BOT (the client builds, runs, and staffs the outsourcing operation for a period of time before selling it off to a vendor to continue to operate it).

Each model has its pros and cons. For example, although concerns about protecting intellectual capital can be allayed by choosing the captive or the closed JV model, the level of investment and management to oversee either of these arrangements is often significantly higher than a straight vendor-run approach. As a result, companies that choose vendor-run models often do so for strategic value, such as tapping into the outsourcer's mechanical engineering skills or to get access to an emerging market. In those cases, to the greatest

degree possible, the client company would likely allow only in-house personnel to access intellectual property.

3. Teaming Up with the Right Vendors. The capabilities of the engineering services company should matter even more than price in selecting outsourcing partners. A low bid by itself is a poor predictor of whether a vendor can actually meet the requirements of the project. Companies considering engineering outsourcing should do a capabilities assessment through a carefully designed request for quotation (RFQ) or request for proposal (RFP) that includes questions about the vendor's expertise in supporting the engineering processes required in the project; the number of full-time employees and the skill sets they possess; employee attrition; the vendor's business model, experience, and pricing structure; and the anticipated number of resources needed on-site at the client's facilities to learn the culture and tasks and transfer them to the outsourcing location (if many people are needed to support this aspect of the venture, it could raise the cost of the project significantly).

In a perfect example of how not to put together an RFQ/RFP, a U.S.-based Tier One automotive supplier distributed a skimpy, single-page questionnaire to seven offshore and onshore engineering vendors. Because the company showed little eagerness to have the vendors detail their true capabilities in a uniform way so they could be compared with one another, the exploratory process had little value. As a result, incumbent onshore vendors that were well known to the client won the bid and offshore companies that were considered the top experts in the field were shut out.

But the RFP is just one step in picking the right vendor. Once the top five vendors are identified through the questionnaire process, a robust interviewing and negotiating effort must follow. Companies should closely review vendor presentations related directly to the job at hand, visit vendor sites at offshore locations, and have numerous rounds of discussion relating to process, task completion, price, and ability.

4. Creating Iron-Clad Performance Metrics. Just as employees on the job are evaluated, the performance of contract companies must also be assessed. Surprisingly, in only rare instances do clients and vendors establish specific criteria for measuring performance, and when they do, the criteria are hardly ever enforced. Two approaches to metrics should be employed: service-level agreements (SLAs), which include incentives for good performance and penalties for underachievers, and key performance indicators (KPIs), which lack incentive plans. In general, it's best to limit the SLA to three or four tangible and measurable items, such as project timing and scheduling or budget performance. By contrast, KPIs should reflect aspects of the job that can be readily monitored, such as employee attrition or the length of time it takes to resolve a problem. If improvements are needed in KPIs, they should be negotiated in collegial, not legalistic or contentious, discussions.

To their detriment, many companies define SLAs loosely and leave too much to interpretation, making these agreements difficult to enforce. Alternatively, client companies feel that negotiating or determining the best metrics to track is too time-consuming, so they choose easily achievable benchmarks or agree to the performance levels proposed by the vendors. Either way, the relationship sours when a couple of projects fail and the client company attempts to penalize the contracting outfit for failing to live up to the SLAs.

It is critical that SLAs and KPIs are planned, nego-

tiated, and agreed on before the contract is signed. Contracts should include clear and concise definitions of expected work and performance levels; quantifiable and measurable benchmarks; who tracks performance, when, and how; how frequently these agreements are reviewed and perhaps renegotiated; and, in the case of SLAs, incentives and penalties.

5. Establishing a Strong Governance Structure. Governance is the most important pillar. Strategic and cost initiatives, including engineering outsourcing, are better managed when they are supervised by an executive who champions the project. In the case of engineering, the vice president of engineering or product development is the likely candidate to take on this job.

But the governance structure must go beyond just a single individual assigned to the effort. The most effective setup for an engineering outsourcing initiative includes a steering committee composed of key executives from both the client and vendor companies; a program management office made up of senior managers from IT, finance, engineering, and purchasing, among others, to review the project monthly or quarterly; and at the bottom of the pyramid, execution teams, including the client's project managers and the vendor's project team, to oversee daily and weekly activities.

One of the common mistakes that companies make in engineering outsourcing is failing to create a separate governance structure. More often than not, these initiatives are led by a vice president with multiple responsibilities and little time to pay much attention to the offshoring program. As a result, outsourcing-related issues are dealt with perhaps once a quarter under the umbrella of an operational meeting, which includes a slew of other organizational issues. The amount of time spent discussing any of these issues is usually driven by the urgency of the matter — projects in crisis get the most attention — and not its long-term importance. Such omnibus operational meetings are the wrong venues for granular discussions about outsourcing and whether it is delivering the anticipated value to the company.

A clear governance process not only increases the efficiency of sourcing initiatives but also ensures that objectives are met and financial benefits are realized. In addition, it can ensure that disputes and conflicts involving the engineering outsourcing agreement are resolved quickly, with little strain on the organization, and that the long-term relationships with contract companies are strong.

Clearly, engineering outsourcing comes with an array of risks that make it unpalatable for some companies. However, used wisely, engineering offshoring can give a company significant leverage over competitors, not only in lower labor costs but also in product and process innovation and through gaining a foothold in emerging markets. But given how critical engineering is to product design and development, offshoring and outsourcing cannot be taken lightly. By following the right steps, a robust and productive offshore engineering initiative can be built that will deliver the right outcome. ✚

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