

The On-Demand Engineer

Engineering is considered a profession in most of the industrialized world. Yet unlike many other professions, engineers are usually hired as fulltime employees, more often than not, spending most of their career working for a corporation.

The prevailing paradigm

In the past, technical problems were solved by hiring engineers, in large numbers, as fulltime employees and tapping into their problem solving ability and wealth of expertise to get the job done. This approach put a man on the moon, won the cold war and fuels the current revolutions in communications and computers. No doubt it works well for large projects or when there are lots of problems to be solved.

But what happens when most of the big problems are solved and new problems are few and far between, or when the big project is completed? As we have seen recently, engineers and other employees are laid off, again in large numbers, with the accompanying rationale that business is down and the company cannot afford to keep them on staff. Managers see this decision in black and white terms; an employee either stays or goes. In their minds, there is no other option. In the process, valuable knowledge leaves with each departing employee. When the need arises again, new engineers will be hired to solve the next set of problems. Frequently time is wasted as new hires must rediscover

what their departed predecessors already knew, but this inefficiency is commonly accepted as unavoidable. A boom and bust cycle is not a very efficient way to access technical expertise, since supply and demand can become greatly imbalanced. Is there another way to approach the problem?

The paradigm in other professions

Few of us would consider hiring a doctor, dentist, nurse, lawyer, or an accountant as our own fulltime employee, even though we regularly need their services. Why not? Our need for their professional services is usually very intermittent and the cost would be prohibitive. The way the services of these professionals are currently offered makes more sense. We pay for the services rendered by the professional when they work for us, in a “fee for service” arrangement. We gain all the advantages of tapping in to their specialized knowledge and services, without hiring them as a fulltime employee.

A few engineers operate this way now as consultants and other types of independent contractors. But the percentage is small, only 43,000 of the 1,465,000 U.S. engineers are considered self-employed by the U.S. Department of Labor, fewer than 3% of all engineers, compared to 8% of all workers.

Should engineers adopt the “fee for service” model for offering their services?

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Yes, I believe they should. There are many advantages for the client and for the engineer. It is the ideal way to access specialized expertise briefly, at a very reasonable cost. Pay only for the services needed, not for a fulltime employee with intermittently-used expertise. Retaining a consultant for just one day per month is roughly one-tenth the cost of a fulltime engineer. Yet many managers remain ambivalent about using consultants, just hiring them for limited roles and special projects, using them rather narrowly. It is easy to focus on hourly rates and hesitate. But in doing so, they overlook the time and trouble a consultant can save a client. There is far more money to be saved from the wider use of consulting engineers. Often they provide quicker and less expensive solutions, without the burden of a long-term commitment.

Example One

A company purchased a rare earth metal as one of their basic raw materials. Management was convinced that all their suppliers were overcharging them. After reviewing the suppliers' prices for other materials extracted from the same ore, they were also convinced the suppliers' cost structure would be more favorable to them if only the element of interest was recovered and the rest of the ore ignored. To test their hypotheses, the company committed one engineer and a technician to the project fulltime. After a month on the project, there were conflicting data and no hope of reaching any conclusions.

My analysis revealed that the company's consumption of the element in question was significant, but not to the extent that they believed. They overlooked several other uses of the material, making their usage less than 15% of the available metal worldwide. Examining their alternate recovery schemes showed that the current industry practice of extracting all the salable rare earths is a far better way to process the ore.

The project was abandoned. The engineer and technician became available for other projects.

Example Two

A start-up company with a limited budget designed a magnetic device purely by empirical methods. They needed a way to scale the device up and down in both size and performance to be applicable in a wide variety of situations. They had data, but could not find an easy way to tie the data together into a useful model.

By considering the total energy of the system, I developed, in just a few hours, a relatively simple spreadsheet for my client to model the system. This simple tool gave them a way to enter the basic parameters and accurately determine the proper design characteristics.

This solution is working well for the client.

Could a consultant help your business? Mostly likely, yes. Please contact us to discuss your particular needs.

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