

SUPPLY and DEMAND

To manage resources, first know your people and their skills; then how many hours the workload will take. **By Eugene Kania**

Engineering managers wear many hats on the job. And if the job is to head a product development department, the resource manager's hat is one of the most important to wear.

You can think of it as a traffic cop's hat. After all, resource managers stand in the middle of the critical intersection where the vision of strategic goals meets the reality of limited resources. This is the place where every minute can be rush hour.

So when there are too many projects and not enough resources, what is a manager to do?

According to Linda Cresswell, a director at Itron Inc., a Spokane, Wash., supplier of data management systems used by utilities, this intersection was particularly dangerous for resource managers at her company.

"As managers, we had a gut feel that our development resources were overcommitted, but we couldn't prove this to our executives," she said. "When we would ask for more resources or push back on projects, the executives would ask for data to back up our actions, and we really didn't have any. On at least one occasion, this caused an unwelcome loss in credibility for a manager."

Cresswell and her colleagues looked at the problem. "We had to do something," she said. "We had too many projects, no visibility or insight into the portfolio of projects, no discipline, and no common project prioritization process." Their answer was to implement a simple, effective approach to resource management based on the immutable laws of supply and demand. The resource management process that Itron implemented consisted of four key steps: supply, demand, analysis, and decision making.

Supply is the inventory of resources. It can be identical to your organizational chart, down to the numbers of people, their names, and specific skill sets (for example,

C++ programmer or SQL database expert).

Demand is the work the department has taken on. In most engineering organizations, you have feasibility (pre-development) projects, full development projects, projects related to customer or field support, and internal quality or process improvement projects. There may be other categories in your company. Project managers prepare a timeline for each project, allowing for various phases—design, development, testing, and so on. The resource managers (that is, engineering managers) then input their estimates of how many engineers, and how much of their time, will be assigned to each phase. This is called the "effort forecast."

Analysis begins by aggregating the effort forecasts for each project into a composite picture of all the projects in the portfolio. Managers can then begin to identify resources that are overloaded with work. More importantly, this analysis will identify projects that are understaffed and, hence, unachievable as currently planned. Because a typical engineering organization has many projects and many resources, this composite picture is most easily painted using a computer software tool.

Decision making is the difficult, but necessary, final step to arrive at a portfolio of projects that does not overload your resources and clog your engineering pipeline.

According to Peter Heinrich, president of Portfolio DecisionWare Inc., a developer of resource management software based in New York, "You only have four decisions to take to remove the overload in your supply-and-demand picture: cancel projects, reduce projects in scope, postpone projects, or add resources to meet the project demand."

The four-step resource management process that Itron has implemented helps management visualize and understand the effects of their project decisions. It also helps engineering managers identify resource shortages.

The key to implementing this system, according to Cresswell, is to build solid communication processes



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(like monthly portfolio management meetings with executives), get key organizational participation, and have the

discipline to keep at it every month. This was accomplished by having a very visual and quantitative updating and reporting system that was open and transparent to all the users and stakeholders.

If you use a software tool to facilitate and enable the process, keep it as simple and effective as the process itself. According to the Cresswell, "If we were going to use a tool for resource management, we knew it would have to be relatively inexpensive, and that we would have to be able to support it ourselves (that is, no IT help). We used the 80/20 rule. We selected a tool that gave us 80 percent of what we were looking for, for about 20 percent of the effort and cost of a larger enterprise-wide system."

The result for the organization has been an achievable portfolio of projects that have run smoothly under routine review and management. It seems also to have paid off for the company. Itron's revenues in 1999, before this resource management process was implemented, were \$193 million yielding a loss per share of 18 cents. In 2003, with the new system in place, the company had revenues of \$325 million and earned \$1.20 a share.

The system has become embedded in Itron's business. "It's key to our budgeting processes and how we create our annual operating plan on the development fronts," Cresswell said. "We're better able to stage and stagger our developments so that we don't need all the same types of resources at the same time—and we are more painfully aware of how overcommitted we can become." ■

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