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Speeding Development

PIPELINING

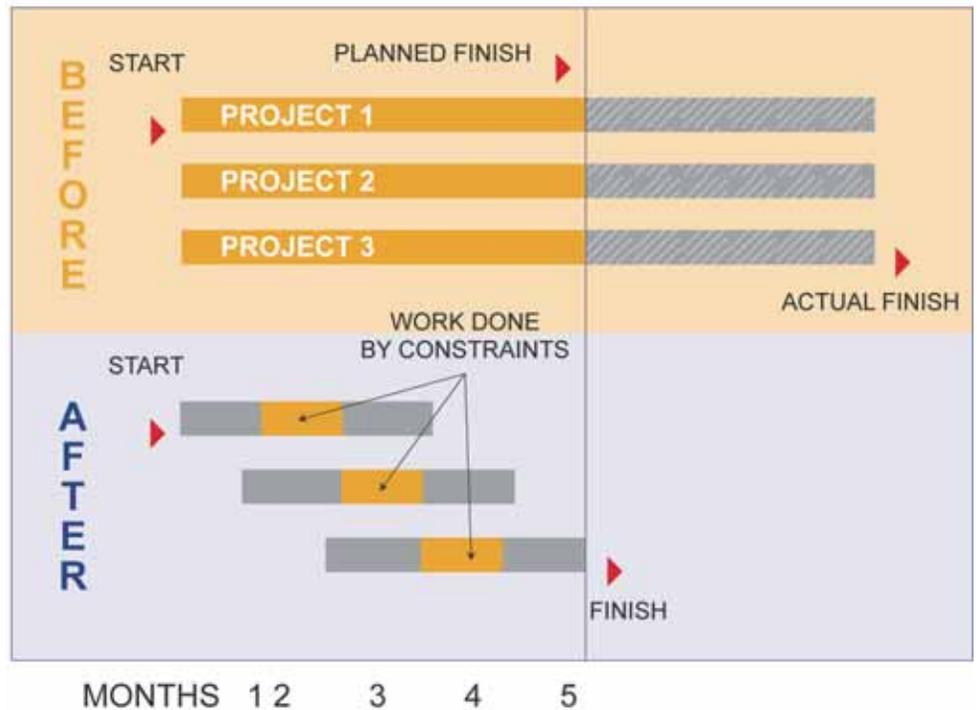


Fig. 1. Pipelining. Release projects into execution based on the most limiting resources.

*OEM finds way
to roll out flurry of new
products quickly.*

by **sanjeev gupta**

*Sanjeev Gupta is CEO
of Realization Technologies,
San Jose, Calif.*

Hyper-competition has become a cliché in the consumer goods markets, with a constant pressure to innovate on the one hand and continuously cut costs on the other. The appliance industry is no different. U.S. companies have responded by outsourcing/off-shoring manufacturing to countries like China while retaining high value added activities like product design and development at home.

The result is that New Product Development projects have become both mission-critical (that is the only differentiator) and complex, meaning that cross-company coordination is required in the manufacturing readiness phase. At the same time, the payoff is huge for companies that can master this challenge. For instance, with product life cycles having shrunk from years to months, even four weeks gained in NPD can yield a 15 percent increase in revenues.

Sometimes, the situation is even more dire: given the seasonality of demand for many appliances,

retailers like Wal-Mart will often dictate the due-dates for new products. If manufacturers cannot meet them, they can be completely shut out.

That is the situation that a \$300M North American manufacturer of household appliances such as blenders, coffee makers, toasters, clothing irons and food processors faced in 2003. The company had to bring out four new toasters in record time or lose those sales forever.

Making incremental changes was not an option. They needed a radical new approach to running NPD projects. It was imperative to increase speed and throughput by 30 percent or more. That is when the company decided to adopt Project Flow, a system of execution for doing more projects faster based on Critical Chain and Lean concepts.

At the Project Flow Conference in September 2004, the company's director of product engineering reported that it had succeeded in protecting its toaster business, and also increased its NPD across the board from 34 to 52 new products introduced

in the first year and to 70-plus products introduced in the second year with no increase in headcount. Furthermore, the number of projects coming in on time increased from 74 percent to 88 percent.

allel paths in the future.

Once everyone acknowledged that substantial acceleration in NPD was possible if only the Interruptions and Parkinson's Law could be contained, it was time to find a solution.

Senior executives in the company heard about

BUFFERING

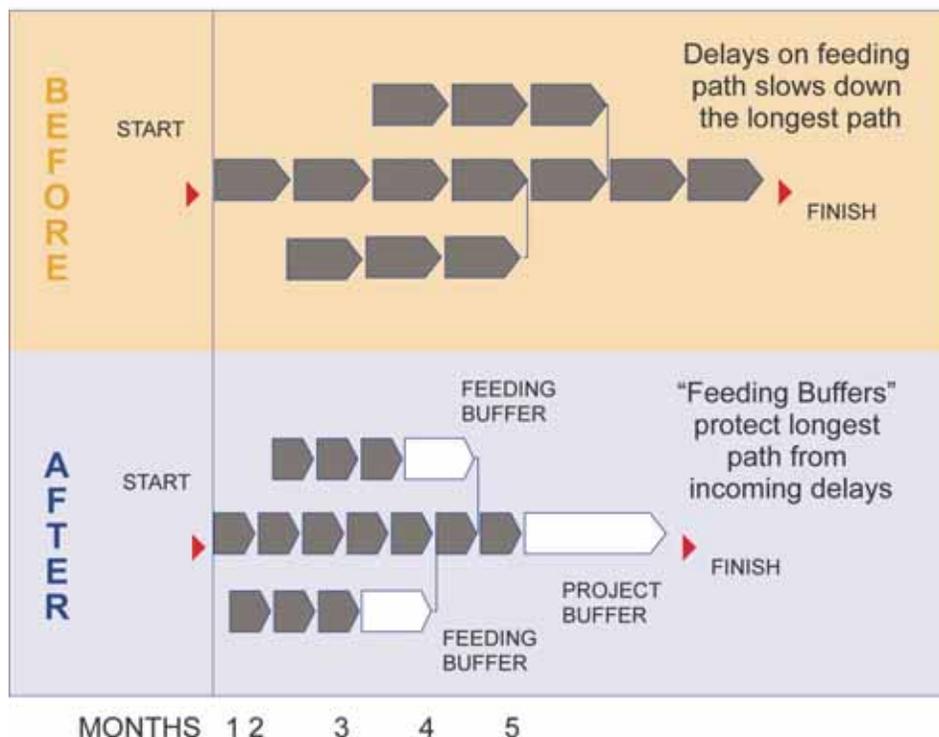


Fig. 2. Buffering. Assign buffers where they can do the most good (protect the longest path).

Execution is imperative

How can the company increase its NPD speed and throughput when it has been difficult to meet even current commitments and the engineering staff was already overworked? The appliance company decided to examine how its engineers' time was being spent in execution.

The OEM found that time spent in execution could be classified into three buckets:

Work. The time spent on actual work.

Interruptions. The time wasted on interruptions. All too often, engineers were waiting for issues to be resolved, decisions to be made, priorities to be clarified, multi-tasking on other higher priority work, waiting for materials and tooling, and other disturbances to be cleared up.

Parkinson's Law. This law describes another way time is consumed. The law states that work expands to fill the time available because people tend to continue polishing the work, or because they slow down when they expect delays on par-

a new concept called Critical Chain, and found that Realization Technologies had designed a complete system of execution called Project Flow around that concept. Upon detailed investigation, they determined that Project Flow was the way to go to achieve their objectives.

Managing multiple projects

As the appliance company director pointed out, uncertainties are what make projects valuable and difficult to manage. Everyone understands that plans are only approximate, and that projects are riddled with uncertainties that include:

- ▶ Customer requirements change.
- ▶ Technical problems found.
- ▶ Additional work discovered.
- ▶ Vendors do not deliver on time.
- ▶ Work materializes slower than expected.
- ▶ Approvals do not come in on time.
- ▶ Priorities change.

It is also a fact that contention for resources is a reality. Still, traditional methods of product management assume a perfect world, one where events can be precisely planned, and everyone knows exactly when projects will get the resources they need.

In single, simple projects, companies can accommodate these uncertainties by adding a little safety in each task. However, in contrast to single project work, with multiple projects, small uncertainties multiply as delays on one project cascade to others through shared resources.

As a result, the required safeties become very large and, all too often, tasks that should take hours and days end up taking days and weeks. Thus, creating precise schedules for people and tasks is actually a recipe for disaster in multi project situations. Yet, this is what traditional project management methods force people to do.

Moreover, as uncertainties multiply, plans go awry. Lacking a good way to prioritize resources across multiple projects, people are constantly pulled from one project to fix other projects' problems. Priorities become unclear and people start multi-tasking. The result is not surprising; delays and firefighting break out all over.

Experienced managers, such as those at the leading consumer appliance company, intuitively know the devastating effects of uncertainties and contention for resources. Therefore, they historically had responded by starting their projects as soon as possible to have any hope of meeting their commitments. Unfortunately, though, when too many projects were in execution, it only increased contention for resources.

Even though this scenario was repeated from project to project on a consistent basis, most organizations continue to be surprised by the ensuing schedule slips on present-day projects. Again and again, they shift their focus from that of delivering projects to that of explaining delays.

They find that adding more software to track and report delays does not help, nor is making project managers more skilled at negotiating resources for their projects at the expense of all other projects. To obtain the required leap in performance, old rules for managing uncertainties and shared resources must be abandoned, and that's what the company did.

System of execution

Project Flow works by defying conventional practices. That concept can be quickly observed in some of its key recommendations.

- ▶ Don't start projects as soon as possible. Unlike single projects, in which it is good to get a

BUFFER MANAGEMENT



Fig. 3. Buffer Management. Drive execution priorities based on relative buffer consumption.

head-start as soon as the project is approved, the company learned that starting all projects as soon as possible is counter-productive in the multi-project world. It creates unnecessary bottlenecks, gives rise to confusion about priorities and induces multi-tasking. Instead, multi-project success starts with acknowledging that the most heavily loaded resources (constraints!) determine how many projects can be done. Releasing projects faster than what the constraints can handle is useless.

Therefore, they followed the first rule of multi-project success – select the most profitable project mix given the constraints and release work into execution based on the availability of those constraints.

- ▶ Assign buffers to projects where they can do the most good – protect the longest path. To protect projects from uncertainties in single projects, the most typical option is to add safeties to every task. However, in multi-project environments, small certainties multiply and the safeties become immense.

Therefore, they incorporated the second rule of multi-project success – have strategic buffers placed to protect the longest path, which ensures that the overall project keeps moving despite local delays. This is much more efficient than building safeties into individual tasks.

- ▶ Don't create precise schedules for resources at planning time. Instead of creating precise schedules for tasks and resources at planning

time, the appliance NPD staff followed the third rule of multi-project success – set schedules in execution based on how much buffer is remaining. Tasks with the lowest buffer ahead of them get the highest priority. If buffers in a project are running too low, project managers and executives now have the early warning signs missing from traditional project management methods.

Breaking rules gets results

This appliance company described here was not alone in achieving success with this approach. Twelve other companies from various sectors of industry presented their results at Project Flow 2004. No matter what kind of projects they did, the results were uniformly dramatic, with all reporting a 30 percent to 50 percent improvement in project speed and throughput within six months. The only differences in their implementation was in how they adapted the rules to the specific environments of their organizations.

For example, the consumer appliances development projects at this company involved suppliers as most of the manufacturing is outsourced. General industrial design is done at the company, but detailed industrial design is completed at the manufacturer. Customers, of course, like to wait until the very last minute to commit to purchasing the newly designed product, not yet in production. As the customer requests changes to the product, changes to the industrial design follow.

The first test of Project Flow was on an aggressive program to introduce four new toasters in only nine months. Nobody felt they could do it. But the company made their dates. What followed was more success.

According to the director of product engineering, within 60 days, the company went live with 40 projects, all of them major projects, none of them derivatives. Throughput was up by 50 percent in the first year. Today, that company is executing 150 projects with the new system, which now allows them to focus on managing because there is no more firefighting.

The director also says that the system has put the company-vs.-teams approach on the shelf. If there is conflict among marketing teams, for instance, it is understood and accepted by all that the executives will make the decision best for the company.

Now that overall throughput is up by 70 percent, the executives are confident that engineering is operating at full steam and overloading them will only cause delays. It is now quite acceptable that, sometimes, one project must be moved out to get a more important one done. ■