Meeting the Challenges of Agile-Stage-Gate—Part I

Blending Agile and Stage-Gate methods has many benefits, but also creates major implementation challenges.

Robert G. Cooper

One of the major challenges is finding the resources, an issue that early-adopter firms have tackled proficiently.

Summary: While Agile-Stage-Gate yields benefits for manufacturers, clearly the world of hardware development is very different than the Agile software world. Many implementation challenges exist for the developer of physical products: One of the most difficult is finding the dedicated resources that Agile methods prescribe, namely dedicated, collocated project teams. This article shows how some leading firms are tackling this resource challenge via a variety of clever and creative ways.


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uncle with an accessible and persuasive explanation of why a claim is bullshit.

Overall, Profs. Bergstrom and West state the aim of the course is to teach their students “how to think critically about the data and models that constitute evidence in the social and natural sciences.”

How many will seize this opportunity? “That’s limited by the room size,” West told us, “which at this point will be 185 students.”

References

1. callingbullshit.org


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Corporate Experience

MEETING THE CHALLENGES OF AGILE-STAGE-GATE—1

By Robert G. Cooper

“…this new Agile-Stage-Gate hybrid approach promises to be the most significant change to our thinking about how new-product development should be done since the introduction of today's popular gating systems thirty years ago!” Robert G. Cooper wrote in the Nov/Dec 2016 CIMS IMR (1).

Prof. Cooper, who introduced Stage-Gate®, reported that “reborn” Stage-Gate systems are integrating Agile methods with traditional gating approaches to yield an Agile-Stage-Gate hybrid model that can be adapted to manufactured new products—and with dramatic results (2, 3). But there are major challenges to making this happen—it’s not as easy as simply parachuting Agile methods into Stage-Gate. This first in his two-part series outlines these challenges, and how some companies are finding solutions.

More than 10 years ago, the software world began to integrate Agile into Stage-Gate: the gating model that provided strategic direction to projects, dealing with the “what” and “why,” while Agile focused on task execution within the stages, namely the “how.” Very recently a handful of early-adopter manufacturing firms such as Honeywell and LEGO began to use this Agile-Stage-Gate system for physical or hardware projects. Initial results have been dramatic, with significant increases in productivity, reductions in time-to-market, and a much higher likelihood of getting the product right.

But there are also challenges, some of which I noted in my previous article, but the “elephant in the room” for many companies is finding the resources. Agile-Stage-Gate requires dedicated project team
Finding Dedicated Teams

Limit the Projects Per Person: A major Swedish packaging and equipment firm began using Agile-Stage-Gate in one of its divisions four years ago. The company has quickly learned that Agile requires dedicated team members. The senior project manager explains, “First we tried teams with people dedicated 50 percent of their time, which did not work at all. Then we moved to 70 percent dedication, which was better but not optimal. Now, the rule is a maximum of one other project per person, taking no more than 30 percent of their time. This works, but we might even have to move to 100 percent!”

Team members on multiple projects are the norm in manufacturing firms. Unlike software development, most manufacturing new-product projects build in waiting times for test results or equipment arrival. So it makes sense for a team member to be working on two or more projects concurrently.

For Agile-Stage-Gate projects, however, the rule is dedicated team members working on only one project full time; but some firms must make compromises. If one does relax this “one-project” requirement, then limit the maximum to two projects per person, with each team member devoting the same two days per week to the one Agile project so the team can be together for two weekly scrums. By using longer sprints, as many manufacturers do, two scrums per week may be all that is needed.

Be Selective About Which Projects Use Agile-Stage-Gate: Agile-Stage-Gate is best suited to more dynamic development projects facing fluid markets and changing customer requirements—typically more innovative and ambiguous projects. Thus, not every development project is a candidate for Agile-Stage-Gate. Most manufacturing firms limit it to their most important, larger, more innovative development projects.

AGILE’S SCRUM VERSION

Agile, specifically the Scrum version, is a set of software development methodologies that breaks development into a series of short, iterative and incremental sprints, typically one to four weeks long. The development team starts by agreeing on what they can accomplish in the next time-boxed sprint, and maps out a task plan for the sprint; once the sprint is underway, the dedicated, co-located team members meet daily in “scrum” to make sure all is on course.

Product increments are developed in each sprint, which are regularly demonstrated and validated with customers and with management. With feedback in hand, the team then plans and begins their next sprint. Product requirements and technical solutions, and even the project plan, thus evolve over the development cycle.

—R. G. C.
For example, at Chamberlain (remote-controlled devices for the home), “dedicated teams are not feasible for every project, so the firm uses this Agile-Stage-Gate approach only for the larger, major revenue-generating projects—about 20 percent of the projects in their development pipeline” (2).

**Dedicated For a Few Sprints:** Non-R&D areas, such as marketing or manufacturing engineering, often find it difficult to commit dedicated effort to the project. Solutions include training, an effective change management effort, and proper project prioritization and creative resource allocation.

For example, marketing people at LEGO, who are spread thinly, commit to a dedicated effort for a single two-week sprint (that is, spend all their time on the one project, doing a market analysis or voice-of-customer study, for example). When that dedicated sprint is over, they return to their “normal” job, but continue to spend part of their time on the Agile project (non-dedicated).

**Fencing-Off Resources and Strategic Buckets**

Resources are often not available to do these larger, more innovative projects simply because resources are totally consumed by the many small projects. One solution is an organizational one, namely to fence off an “innovation group” to work 100 percent on major developments or breakthroughs.

A second solution is a portfolio approach, namely *strategic buckets*. Here, management makes a strategic decision to set aside a percentage of resources for different types of projects, including candidate projects for Agile-Stage-Gate. Various categories or “project buckets” are defined—from maintenance projects through to true innovations. Then the business’s executives make strategic decisions about what proportion of their R&D resources goes to each bucket, setting aside “resource buckets” for each major category.

Next, active and proposed projects are categorized by bucket, and ranked-ordered within each bucket until there are no more resources in that bucket. When used over time, the method ensures that *resources are reserved* for innovative projects; it causes the development portfolio to mirror the strategic priorities of the business, and it protects higher risk, innovative projects, which are not compared to predictable, smaller ones.

**Fewer But Better Projects: Gates With Teeth**

Most manufacturers have far too many projects, and often too many minor projects, for the resources available. This makes finding dedicated teams for Agile projects almost impossible. The solution: Introduce a *decision factory mentality* into gate meetings: Gates should be Go/Kill decision points where investment decisions are made, not just milestone reviews. The goal is “gates with teeth”—kill the weaker projects! More discrimination in terms of projects approved will result in better projects, more focused teams, and shorter time to market.

"Agile-Stage-Gate is best suited to the more innovative and ambiguous projects."

"The goal is “gates with teeth”—kill the weaker projects!"
Be sure to commit the resources at gates! Gates are not just project approval meetings but decisions to commit resources to a project leader and team—people and money. When projects are approved but resources are not, the result is a “hollow Go decision.”

And keep a tally: resources committed versus those available. Stop approving a project when the resource limit is reached! Putting a limit on projects consistent with resource availability prevents pipeline gridlock and means that dedicated teams will be available for Agile projects. For some useful tools see “Tools To Make Tougher Go/Kill Decisions” on this page.

No One Answer

While Agile-Stage-Gate does deliver dramatic results, it also requires some changes in how people work. Dedicated teams are a requirement, which means more focus, better project prioritization, and doing fewer but better projects. There is no one magic solution to securing dedicated teams, but several approaches applied concurrently—project limits and selectivity, strategic buckets, and tougher Go/Kill decisions—address the challenge.

CORPORATE EXPERIENCE FROM PG 8

NPV (net present value) is theoretically the correct financial method for Go/Kill decisions and does provide the impression of rigor. But reality is much different: The handful of firms that have compared predicted versus achieved NPVs find huge errors in predicted values. Further, ranking project by NPV often yields the wrong priorities. Finally, NPV does not deal with resource constraints, so that any project that “hits the hurdle” is potentially a Go!

Better—the Productivity Index: This index, an extension of NPV, is based on the theory of constraints (4). To maximize the value of your portfolio when resources are constrained, take what you are trying to maximize—the NPV, for example—and divide by your constrained resource; for example, the person-days required to complete the project. The result is the productivity index, which gauges the “bang for buck.” Then rank your projects by this index until out of resources. With discipline, the result is both a maximized portfolio value and a limit on the number of projects—the pipeline is not overloaded.

Useful—profiling or scorecards: Although scorecards are not the most popular method, they produce surprisingly good results. A scorecard is constructed using those factors that are known drivers of success—sample scorecards are in (4). Then use the scorecard at your gate meetings to rate projects. The gatekeepers (not the project team) score the project on six to ten key evaluation criteria. The score, along with the rich discussion as gatekeepers debate their scores, leads to a much-improved decision where many factors are considered, from competitive advantage to technical feasibility.

—R. G. C.

References


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**Inventor’s Voice**

**CREATING THE INTERNET...AND MORE**

“In a few years, men will be able to communicate more effectively through a machine than face to face.”

By Michael F. Wolff


The accolades for Taylor, a psychologist whose work at the Defense Department’s Advanced Research Projects Agency in the mid-1960s led to the early version of the internet called ARPAnet, also focused light on his visionary companion: his friend, mentor and collaborator J.C. R. Licklider.

‘Father of the Internet’

“In 1960 IRE (now IEEE) journal, the paper explained this interaction as follows (2):

“Symbiotic partnership will perform intellectual operations much more effectively than man alone can perform them.”

Lick’s groundbreaking “Man-Computer Symbiosis” paper envisioned “a cooperative interaction between men [it was always men then] and electronic computers.” Published in a 1960 IRE journal, the paper explained this interaction as follows (2):

“In the anticipated symbiotic partnership, men will set the goals, formulate the hypotheses, determine the criteria, and perform the evaluations. Computing machines will do the routinizable work that must be done to prepare the way for insights and decisions in technical