



The Thought Column with Bob Cooper. Creator of the Stage-Gate Idea-to-Launch Process



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A few years ago, I was alerted by the editor of the PDMA *Visions* Magazine to the most recent study done by the Product Development and Management Association. It revealed some rather shocking information, namely, that in spite of all of the hype around product innovation and product development, new product productivity in America was down. The editor challenged me to find out what was going on and investigate the causes. This investigation ultimately resulted in the article, "Portfolio Management May be Dangerous to Your Health."

My colleagues and I discovered that, sure enough, productivity in new product development (NPD) is down when measured by output over input. Companies are still spending the same amount of money on R&D as a percentage of sales that they always did; but the percentage of sales from new products was down from about 32% to 28% over a 10-year period. That is about a 14% drop in NPD productivity, which is a significant cause for concern.

We looked at a number of potential causes ... maybe we're not doing as good a job at product development ... maybe we're doing bad launches, etc. These, however, did not seem to be the answer. The quality of execution in NPD has pretty well remained unchanged for two decades. There is quite a bit of data going back several decades, which shows that we are doing just as good a job today, but unfortunately, no better on NPD activities.

We finally discovered that the important difference today, which is driving NPD productivity down, is the *lack of blockbuster projects* in companies' development portfolios. When you look at the typical company's current development pipeline, the cupboard is bare! The pipeline in the mid 1990s contained about double the percentage of truly innovative development projects and truly new product projects. Product development in the US is shifting towards the low-hanging-fruit type of projects.

The Root Causes

In order to take action to correct the situation – to fix the shortage of blockbuster, game-changing and high value development projects -- it is important to understand the reasons:

1. The financial community has driven many companies into a short-term focus business model. There is not a huge appetite for doing some of the more venturesome and game-changing, high-value projects. We wish we were seeing more of these game-changing new products, not just from Apple and Proctor & Gamble, but from every company.

2. The emphasis on operational excellence in the 1990s, which was great for some folks, but probably not such a good thing for innovation, led to a significant resource crunch. We have measured that resource crunch over the years and it is getting worse. There are simply too many projects in most firms' development pipelines for the limited resources available. The result is that most new product projects are starved for resources, and are typically underfunded and understaffed, leading to a host of other problems.
3. Many companies don't have much of a strategy for innovation. Without a strategy, they really have not thought about setting aside the necessary resources and talent to get these big projects done. Big, game-changing projects demand large resources, and only through a strategic commitment are these significant resources likely to be made available.

Our most recent best practices study, done with the APQC (American Productivity and Quality Center), reports that about 60% of US companies do not have the key elements of a product innovation strategy in place. This is quite remarkable.

Curing the Malaise

When there is a malaise across the land, there is no one easy fix. We have to look to a multi-faceted solution here because the problem is multi-faceted.

One solution, obviously, is for businesses to develop *an innovation strategy*. I constantly emphasize the fact that an innovation strategy is absolutely critical to success. One part of this innovation strategy is focus. You cannot keep extending your troops over thousands of miles and expect results. One must pick one's battlefields or arenas – areas of strategic focus – and concentrate the R&D effort there.

Another part of strategy that must be emphasized is spending. Strategy becomes real when you start spending money! So resource commitments are a key facet of strategy – how much money and people are you prepared to commit to different strategic areas and to different types of developments?

The second major theme that we emphasize – and it's a solution that some of the other authors whom you've interviewed also highlight -- is the notion of *feeding the innovation funnel*. If the goal is a steady stream of major new product winners, then one must begin with some robust new product ideas. Our view is that there are multiple sources of ideas, two of them being disruptive technologies and open innovation.

Yet another source of good ideas, with which we have had considerable success over the years, is voice-of-the-customer research (VoC). The proposition is: your customer or user has the seeds of your new great breakthrough product, but he or she doesn't know what it is, nor do you. So, it is vital that you work with your customers and users – walk in their shoes, understand their problems and what they see as value, gain and critical insights, and figure out what their unmet and articulated needs really are.

These customer insights only come through in-depth voice-of-the-customer research. And most companies pay lip service here, according to the APQC study I mentioned before. If you want to study gorillas, you don't hold a few focus groups or phone three sales people and *ask them* all about gorillas. You buy a tent and move into their village. *That* is the way you study gorillas. It's much the same as cultural anthropology, and in NPD is called "ethnographic research". Sure it takes time and effort, but the pay-offs are huge.

An example: I have worked with a major pump manufacturer that is embracing voice-of-the-customer research. They spent a lot of money to train their design engineers on VoC, and now they camping out in customers' factories to understand how they use, misuse and abuse pumps and valves. Take an item like a pump – it's been around for hundreds of years -- you would think there would not be much to innovate. By spending a lot of time at their customers' locations, however, these design engineers and marketing people have identified all kinds of user points of pain, and, as a result, have come up with some revolutionary products, for example, in the area of energy saving.

We also see companies tapping into the creative abilities of their own employees much more effectively. For years, companies have half-heartedly encouraged their own employees to submit innovation ideas. Very few companies have done it well. Recently, however, I have seen a handful of companies becoming very aggressive in terms of going after their own internal ideas.

For example, a company in Europe that keeps coming out with great new products in the crystal jewelry business is Swarovski, a family-owned business headquartered in Austria. They have implemented a system to draw in ideas from every employee in the company. It's much like a huge electronic vacuum cleaner. Let's say you are an employee who thought, "Gee, wouldn't it be nice if this crystal tennis bracelet that I just purchased could light up and send messages across the bar to my friends ... if there were little messages in the crystals of my bracelet." That idea is keyed into this large electronic vacuum cleaner funnel. A small group of people at headquarters, working in what is known as i-Lab, immediately receives the idea and does a strategic pre-screen to make sure it is within Swarovski's business definition. Then a handful of people in the i-Lab work on the idea and do what is called "visualization" ... a couple of very simple, quick electronic sketches. Using software called i-Flash, the visualized idea is then sent to a group of handpicked employees in the company for evaluation and feedback. With the feedback in hand, the i-Lab people continue to flesh out the idea until it is ready to be presented at Gate 1 – the Idea Screen – in Swarovski's Stage-Gate new product process. And the idea moves forward.

Change the Culture

Two additional elements must be in place in order to promote game-changing ideas and projects. One can generate ideas until the cows come home, but if the company's culture and climate are dead and there is no appetite to do these innovative projects because of a risk-averse, conservative management, or there is no organizational capability to do them, then the company is in real trouble. In the APQC study, we found that the top-performing companies who were getting these hot ideas through the pipeline -- the key is getting them *through* the pipeline, not just generating them -- were doing some very innovative things in terms of climate and culture.

Changing the measurement system of senior management seemed to be one step --measuring and rewarding senior management for new product results, not just for quarterly profits. Innovative companies also have unusual organizational designs that allow project teams to operate outside of the normal bureaucracy of the company. We see a lot of evidence in innovative companies of skunk works, projects in the cellar, Friday projects, scouting time, and so on.

A good example of this is another company for whom I have done work, the toy company MegaBlocs. What a bubbling organization that is ... there are clusters of people here and clusters of people there and completely open architecture in the offices. It is just a beehive of bubbling activity, and is very innovative and creative. Everyone has a gung-ho, let's go, let's move things kind of attitude. You can just see it as you walk through the place ... the culture and climate, the way you organize and senior management being supportive and spending a lot of their time on the topic.

Next Generation Stage-Gate®

As you know, I created and introduced the Stage-Gate® idea-to-launch process a number of years ago, and it has evolved and improved over time. Today it's become the dominant tool or methodology by which companies conceive, develop, and launch new products. About 75% of all U.S. companies who are involved in product innovation have adopted one form or another of Stage-Gate according to both the APQC and the PDMA studies I mentioned, as have many European and some Japanese companies.

Stage-Gate was originally conceived as a game plan -- a playbook – consisting of best practices designed to enable a team to move the ball down the field to score a goal – consistently, effectively and quickly. I liken Stage-Gate to North American football in that you have a group of cross-functional players on a team – players who play different positions and have different roles... Marketing, R&D, Operations, Sales, etc. At the beginning of each play, the players move out of a huddle (we call these "gates"); they line up, the whistle blows, and bingo, a whole set of

moves and tasks are executed fast, in parallel, and with precision. These activities in a typical new product project include tasks such as undertaking a market study, doing a cost analysis, putting together a business case, defining the product, etc.

Stage-Gate breaks the game into discrete stages – much like successive plays in a football game -- each stage consisting of a set of prescribed activities. We then put together a playbook that lays out best practices that project teams should seriously think about doing – these activities, tasks and best practices thus define the stages.

The gates came later. The gates are like the huddles in a football game where the team gathers, in this case, with management, to make decisions about whether and how they should move the ball forward. The gates are the Go/Kill decision points, and thus are in effect the quality control check points – the betting points – where you decide whether or not you're still in the game.

The Stage-Gate® process has worked superbly for many companies. For example, the APQC study I mentioned earlier found that every top performing company they studied in new product development in the US uses some form of a Stage-Gate process. And one conclusion of a recent PDMA conference was that “many companies have dramatically improved development cycle time and efficiency by implementing formal Stage-Gate™ systems”. Finally, exemplary companies, such as Procter & Gamble, Exxon Chemicals and Emerson Electric, have employed advanced versions of Stage-Gate for almost two decades.

Unfortunately, as in any good model or system, not everyone gets it right. For example, in the last 10 or 15 years, many companies have built an awful lot of bureaucracy, rigidity and make-work activities into Stage-Gate. I am horrified at times when I walk into a major company and they show me their Stage-Gate process. I look at it and say, “That’s not a Stage-Gate process. That is a bureaucratic nightmare! What you people have designed is a Velcro-lined pipe here. Try to get something through that and to market – it’s almost impossible.” In short, they’ve missed the whole point of Stage-Gate, which was originally designed as an enabler to speed new products to market and make them big winners. Instead, too many folks have rendered their innovation processes cumbersome, rigid and bureaucratic, hence big time wasters – this was not the original intent of my Stage-Gate system!

To overcome this, we have introduced our lean or next generation version of Stage-Gate. What we are currently advocating is what we call “lean, rapid, and profitable product development” – accelerating the process, improving productivity in NPD, and getting Stage-Gate slick and fast again. Here are the seven principles to make this happen:

1. The first principle is “keep it customer focused all the way through.” The voice-of-the-customer must be built in at every stage in your idea-to-launch system. The *number one key to success* and profitability in NPD is creating and delivering a unique, superior product – a product that is differentiated, meets customer needs better than competing products, and offers a compelling value proposition to the customer or user. And most often, this competitive advantage comes from a thorough understanding of the customer’s or user’s unmet and unspoken needs, gained from listening to the voice of the customer throughout the idea-to-launch process.
2. Second, the process must be front-end loaded. Do the homework up front. Due diligence pays off -- ask any venture capitalist. By contrast, most companies get an idea and move far too quickly into the Development phase. But they have not done their up-front homework – the essential market, technical, source-of-supply and business analyses are missing. So they overestimate sales revenue, get the product definition and design wrong, under-estimate technical difficulties, and sow the seeds of yet another underperforming new product. Smart managements emphasize and get solid up-front homework done on NPD projects!
3. The third lean principle is spiral development. This has evolved from folks in the IT industry and their notion of “agile development” to deal with fluid and unstable data. It entails building in a whole series of spirals, each spiral consisting of a “build, test, feedback and fix” iteration with the customer or user. You take a very early version of the product – perhaps a

virtual product -- and get it out there fast and in front of the customer or user get their feedback ... then back to the lab ... develop the next version of the product, and so on. What these fast-paced project teams have been able to do is move very quickly to the finalized product design much faster than the old-fashioned linear process.

4. A fourth principle is holistic cross-functional teams. Unbelievably, some companies still have not mastered the team aspect of product development -- they don't have real cross-functional teams. Most of the project work is dominated by one or two functional areas -- technical and marketing -- often with one or the other area "owning" the project. Key functions such as Operations and Sales are not fully engaged or they join the project far too late in the process. It gets worse. Often it's not even clear who is on the project team; project leaders have no power, and keep changing as the project progresses, and so on. It's essential to adopt a true cross-functional team approach -- a clearly defined project team and leader, from beginning to end of the project (no hand-offs), with authority and resources, and fully accountable for the end result.
5. The fifth principle is metrics, accountability and continuous improvement. We keep emphasizing that Stage-Gate is an evergreen system. The idea-to-launch process that you had five years ago is probably completely different today, or should be. Why? Because you've been doing continuous improvement on it. But in order to do continuous improvement, you must first have metrics in place, and project teams must commit to achieving certain results when measured on these metrics -- the notion of team accountability. The way it works is this: early in the life of a project, the project leader and team stand in front of management at a gate meeting, and say something like, "My team and I commit to achieving the following: we will have the product on the market in six months; first year sales will be 100,000 units; and we forecast profits to be \$3 million." That declaration defines the success criteria. And these success criteria are checked at every successive gate, and most importantly, they are checked at the "post launch review" one year after launch.

In the old days, many companies operated from a philosophy of "launch and leave." The project leader could make promises, get his or her project approved, launch the product, and then walk away. There were no metrics and there was no accountability.

Companies that build in metrics and a post-launch review achieve several things. First, they hold their teams accountable for the end result. Submitting some fictional sales or cost projections in a business case and walking away from the end result is no longer acceptable. Secondly, this approach leads to an understanding of why we keep missing the mark and hence is the starting point for continuous improvement.

6. The next principle is focus and portfolio management. We are really emphasizing this principle, and it takes us right back to that "dangerous to your health portfolio article". The rule is "do fewer projects, but higher-value projects" in order to maximize the productivity or yield from your R&D portfolio. We see a lot of evidence that suggests that while *doing projects right* -- for example, employing the five principles I outlined above -- is one way to improve productivity in NPD, there are huge gains to be made another way, namely *doing the right projects*. And that's what portfolio management is all about -- making the right new product or R&D investment decisions.

Techniques that we promote, and are outlined in our most recent PDMA *Visions* article "Ten ways to make better portfolio decisions" include the use of strategic buckets to ensure the right balance and mix of projects, and employing scorecards at gates along with the productivity index -- a financial metric -- in order to pick high value-to-the-corporation development projects. These portfolio management methods are proven techniques designed to yield much more robust development portfolios, and should be part of every company's repertoire of best practices.

7. The final principle is adopting and implementing the NexGen Stage-Gate system, into which of course are built, the six principles I outlined above. But, there is more. Stage-Gate has morphed into a much more *flexible and adaptable* innovation process, one that adapts to

changing conditions and fluid, unstable information. The notion of *simultaneous execution* is also built in, whereby key activities and even entire stages overlap, not waiting for perfect information before moving forward. The cost of delay must obviously be weighed against the cost of beginning wrong.

NexGen Stage-Gate is also a *scalable process*, scalable to suit very different types and risk-levels of projects -- from very risky and complex platform developments through to lower risk extensions and modifications, to handling even simple sales force requests. Each of these projects has risk, consumes resources, and thus must be managed; but the nature of your Stage-Gate process will vary greatly depending on the project type. One size of Stage-Gate does not fit all types of projects!

Stage-Gate has also been modified to *accommodate open innovation*. For example, P&G has just released their SIMPL 3.0 version of their Stage-Gate system. It's designed to handle external ideas, IP, technologies and even fully developed projects – all with their sources outside the corporation.

NexGen Stage-Gate is also *automated*. Increasingly, companies are utilizing software to underpin their development process and pipeline. And there are indeed some excellent software tools designed to accommodate and support a Stage-Gate system.

Finally, Stage-Gate is *lean*. By analyzing the current development process, and using methods such as "value stream analysis" imported from Lean Manufacturing, we have seen significant reduction in waste and cycle times in product development. In value stream analysis, one analyzes the development process and systematically removes all non-value-added activities in order to streamline and accelerate development projects to market.

These principles are explained in our book, "Lean, Rapid, and Profitable New Product Development." And the premise of our latest book "Creating Breakthrough New Product Ideas: Feeding the Innovation Funnel" just released in February of this year, is that there are a number of proven ways to overcome the shortage of major new products in the development portfolio and to feed the front end. The books can be ordered through the Product Development Institute <http://www.prod-dev.com/books.shtml>

Velcro Points

1. Product development in the US is shifting towards the low-hanging-fruit type of projects.
2. Aim to feed the innovation funnel through processes which generate insight into customer problems and needs.
3. Think in terms of Spiral Development with customer focus and many touch points built in to the process.

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