

Guide to



New
Product
Development

By Kerim Tumay



Technology Multipliers

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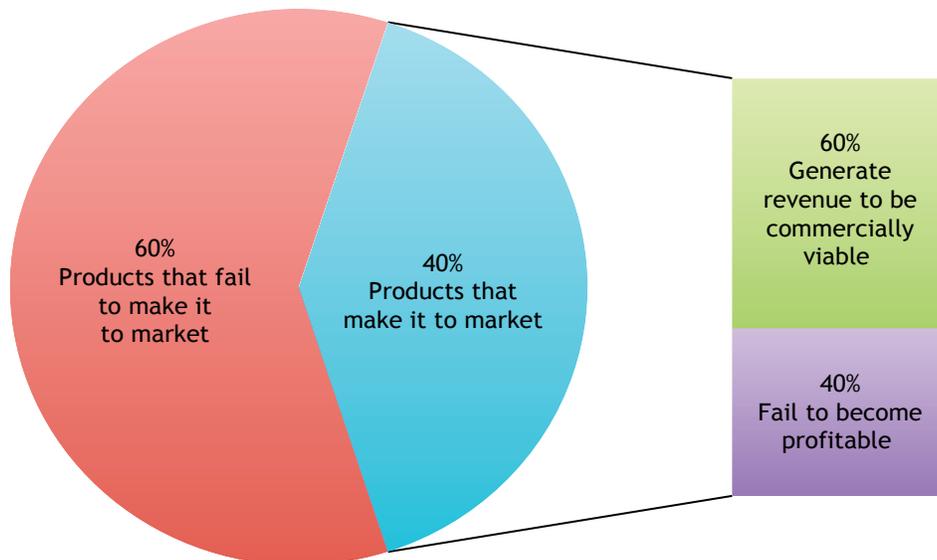
Table of Contents

What Is NPD?	2
Trends Affecting NPD	3
Business Strategy and NPD Investments.....	4
New Product Development Process Models	5
Flexible NPD.....	7
Ideation at Every Stage.....	9
Performance Measurement of the NPD	10
NPD Software	11
Keys to Success	12

What Is NPD?

New Product Development (NPD) is the overall process of strategy, organization, concept generation, product and marketing plan creation and evaluation, and commercialization of a new product. Two major factors that affect new product success are:

- 1 proper execution of front-end innovation activities that generate new product, process, and technology ideas, and
- 2 well defined product and NPD process



Only forty percent of new product development initiatives result in products that make it to market. Of those products that make it to launch, only 60 percent generate revenues for consideration to be commercially viable products. In summary, about 75 percent of the investments in new product development fail. In higher risk technology sectors, the ratio of success may be as low as one in ten.

Most large companies realize the significance of new product development, make it a strategic component of their business strategy, and invest accordingly. Small and medium size companies, while it is critical to their survival, often underestimate the value of NPD and spend more of their resources on incremental innovation such as feature enhancements.

Trends Affecting NPD



Businesses need to make NPD decisions about what they are doing on-going basis and not on calendar basis. Whether your technology product company is large or small, it's important to monitor the trends affecting new product development and how they affect your products.

Here is a list of the top eight trends affecting new product development for technology companies.

1. Globalization
2. Collaborative R&D partnerships between corporations and universities
3. Compliance with new health and safety regulations
4. Personalization
5. Six Sigma quality
6. Design for manufacturability
7. Design for sustainability of the environment
8. Design for supply chain efficiency

Following emerging trends not only helps guide NPD but also helps with product strategy and product marketing decisions.

How can you use the internet to keep track of NPD trends? Here are a couple simple ways:

- RSS, stands for Real-simple Syndication, allows you to follow blog posts from your favorite websites or blogs as they're posted. Rather than having to visit each website or blog individually, you can just subscribe to their RSS feed.
- Google Alerts is another excellent tool. You can simply set up and save queries for your favorite topics, choose the genre (news, blogs), and frequency of notifications. Google Alerts then runs searches for your alerts in real time and delivers the results to your inbox.

Business Strategy and NPD Investments

13.5

Percent of revenue on R&D spent
by large companies like IBM, SAP and Oracle

NPD does not directly or instantly increase net income, profit margin, revenue. Nor does it reduce operating cost. Yet, if a technology company is to drive innovation and profit in the long run, new product development and innovation needs to be part of its business strategy. Within one year of going public, Google restructured its resource allocation strategy to attempt to simultaneously grow existing revenue while keeping an eye towards the future (Wall Street Journal 2006).

The commitment to NPD starts with a specific NPD allocation in the capital budget. Most companies budget their NPD investment based on percentage of revenue. In the U.S., a typical ratio of research and development for an industrial company is about 3.5% of revenues. A high technology company such as a computer manufacturer might spend 7%. Large technology companies like IBM, SAP, and Oracle spend about 12-13.5 percent of revenue on research and development (which is where NPD investments appear on annual reports). Technology startups spend much more than established companies, in proportion to revenues.

NPD investments are especially vulnerable to cost-cutting during economic downturns. Companies focus on shorter term, less risky innovation. However, technology companies that can use recessionary times to do the relatively less expensive, fuzzy front end work of NPD are more likely to succeed in bringing new products to market than their conservative competitors when the economy recovers.

New Product Development Process Models

One of the most commonly used models is the Stage-Gate Process model developed by NPD guru Steve Cooper. Stage-Gate process model divides the NPD process into stages (or sub-processes) separated by management decision gates. Original Stage-Gate model has 5 stages and gates whereas a condensed version called “Xpress” has three stages and gates. The Cross-functional teams must successfully complete a prescribed set of related cross-functional tasks in each stage prior to obtaining management approval to proceed to the next stage. The five stages of the Stage-Gate process model are:

- Scoping
- Build the Business Case
- Development
- Testing & Validation
- Launch

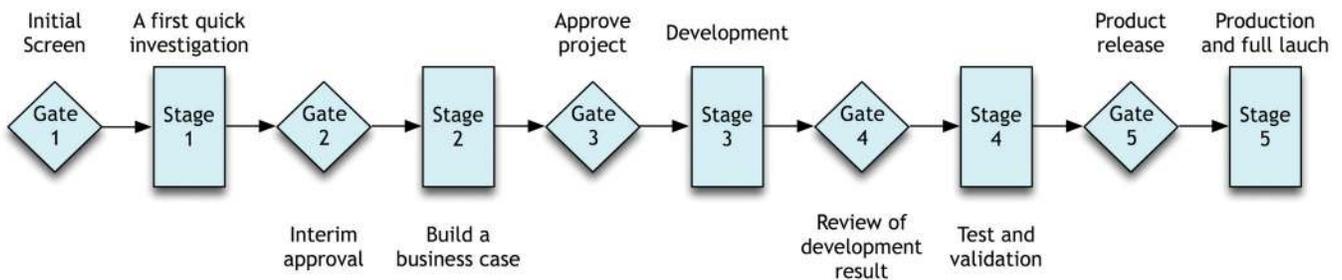


CHART 1. STAGE GATE NPD MODEL

DMADV, inspired by Quality guru Deming and became widely popular with the adoption of Six Sigma initiatives, is another model used for projects aimed at creating new products. DMADV stands for Define, Measure, Analyze, Design, and Verify.

- **DEFINE** design goals that are consistent with customer demands and the enterprise strategy.
- **MEASURE** and identify CTQs (characteristics that are Critical To Quality), product capabilities, production process capability, and risks.
- **ANALYZE** to develop and design alternatives, create a high-level design and evaluate design capability to select the best design.
- **DESIGN** details, optimize the design, and plan for design verification. This phase may require simulations.
- **VERIFY** the design, set up pilot runs, implement the production process and hand it over to the process owner(s).

Guide to New Product Development

Another popular model is PACE (Product and Cycle Time Excellence). Yet, another model created by AMS, depicts the NPD process as a funnel. The funnel process starts with the Discovery process and ends with the Delivery process.

- Discovery – Exploratory research
- Definition - Needs assessment, technology assessment
- Development – Ideation, Concept Screening, Concept Evaluation
- Design – Feature trade-offs, prototype evaluation
- Delivery – Positioning and launch

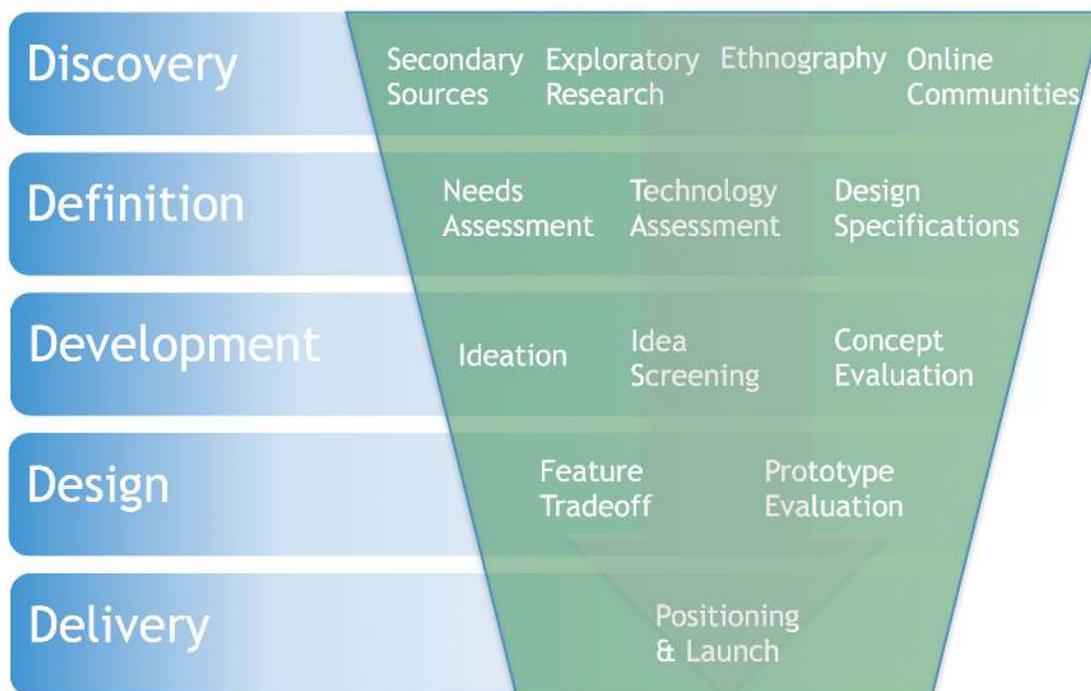


CHART 1. STAGE GATE NPD MODEL

Flexible NPD

Process models like Stage-Gate, DMAVD, PACE, and others attempt to reduce new product development to a structured, linear, and predictable process; however, in practice, technology product development is hardly a linear, static, and predictable process.

In technology markets, an actual NPD process goes through multiple iterations because each gate or sub-process may produce multiple outputs. It has parallel processes because marketing, product management, engineering, customer service and new customers are involved from the early stages to launch. It is unpredictable because companies may change resource allocation strategy, regulatory issues may impact the process, or third parties may get involved as a result of strategic partnerships.

“ the ability to make changes in the product... even relatively late in development, without being too disruptive... the less disruptive the changes are, the more flexible the process is.

Preston Smith, the author of Flexible New Product Development

Preston Smith, the author of Flexible New Product Development, describes flexible NPD as: “The ability to make changes in the product being developed or in how it is developed, even relatively late in development, without being too disruptive. The later one can make changes, the more flexible the process is. The less disruptive the changes are, the more flexible the process is.”

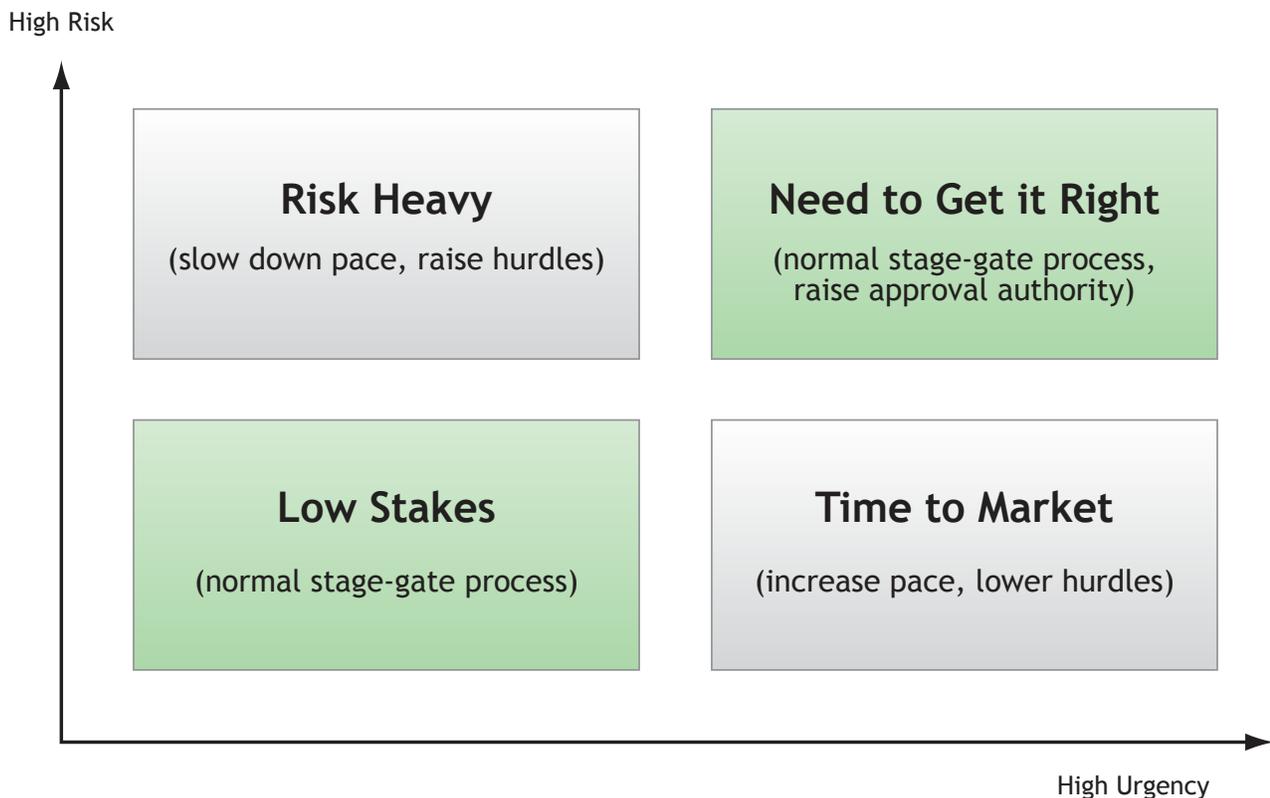
A flexible product development process should allow for iterative and incremental development. Iterations are necessary for refinement. Incremental improvement is necessary for moving forward while putting off premature decisions. However, decisions with system-wide impacts should be made early in the process to avoid late changes to high-risk, high-impact decisions. For such decisions, modular architecture, simulation, and rapid prototyping are effective tools for evaluating alternatives and anticipating the impacts and risks early on.

Management decisions still need to be made at certain critical junctions in the process and in annual R&D project reviews. So, flexible NPD should not be used as an excuse for constantly changing direction or avoiding tough decisions.

Guide to New Product Development

A modified, flexible stage-gate model is proposed by Garcia and Adams. The authors propose classification of projects in dimensions of urgency and caution and then setting the gates and stages based on that classification.

- Projects where time to market is critical and financial and technical feasibility are high, the model suggests increasing the pace for the stages and lowering the hurdles for the gates.
- Projects where financial, technical, and regulatory risks are high and time to market is not as critical, the model suggests reducing the pace for the stages and increasing the hurdles for the gates.
- For projects with high urgency and high caution, normal stage-gate process works as-is with the exception of higher authority approvals in each gate.
- Normal stage-gate process works as-is for projects with low urgency and low caution.



Ideation at Every Stage

In a flexible product development process, ideation techniques may be used in the early stages of product development to generate initial product concepts, in the intermediate stages for overcoming implementation issues, in the later stages for planning the launch.

There are four categories of ideation sources. For each source type, there are multiple ways for soliciting and capturing input into the ideation process.

- Customers – formal surveys and/or focus groups, suggestion requests, reward programs
- Partners and Suppliers – market research, suggestion requests, collaborative development, early adopter programs, partner incentives
- Company Internal Sources - Company-wide incentives, incentives to sales reps, market research with customer service reps
- Other – Market research, Competitive intelligence, Consultants

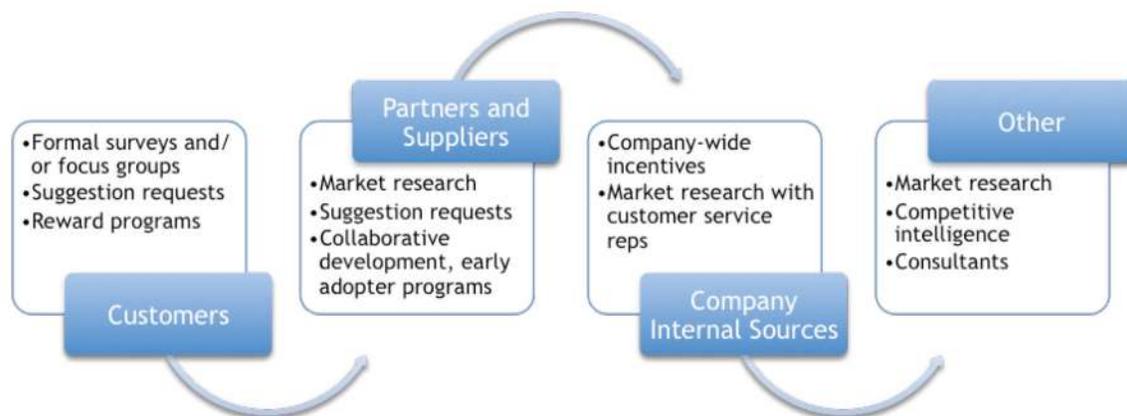


CHART 3. IDEATION AT EVERY STAGE

The internet has made it much easier to capture new product ideas on a real time basis. To leverage the internet in your ideation process;

- Encourage suggestions via the web site
- Encourage and capture feedback via online meeting and collaboration tools like GoToMeeting, Webex, and DimDim
- Monitor social networking sites like Facebook, LinkedIn, and Twitter
- Monitor user groups, chat rooms and other online customer venues

Performance Measurement of the NPD

New product development investments need to be measured against a set of hard metrics such as ROI, revenue potential or other financial benchmark for at least one year after the new product is launched. Hard metrics focus more on resources than capabilities. They are indicators of lagging or real-time performance whereas soft metrics measure capabilities and learning outcomes.

Soft metrics such as number of patent filings and awards are considered key metrics of NPD success. Even though patents are inventions, not innovations until they generate revenues, they increase the value of the company's intellectual capital assets and improve the company's ability to attract fresh talent for future NPD projects. For small and mid-size technology firms, technical publications present an inexpensive, yet effective alternative to patent filings. They create intellectual assets while encouraging employees' to demonstrate and validate their competence.

An ideal NPD performance system has the following attributes:

- captures 5-7 NPD performance metrics – hard and soft
- focuses on resources, capabilities, and innovation leadership
- covers lagging, real time, leading, and learning measures
- aligns and reconciles metrics with an overall Balanced Scorecard

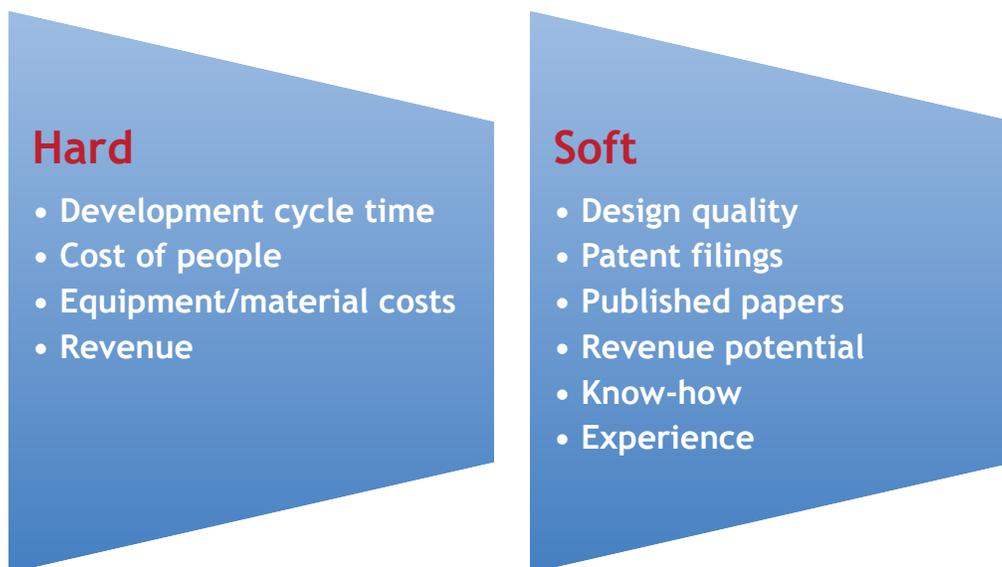


TABLE 1. NPD PERFORMANCE MEASUREMENT

NPD Software

There are various tools available in the market to aid with NPD. Some of them are complete suites. Others are niche tools with unique capabilities and applications. Here are a few worth considering:

- One of the time-tested software solutions for NPD is [PD-Trak](#) from DRM Associates. It provides tools and a common document repository to support product teams as well as portfolio management, resource management and performance measurement tools for executive management.
- [Imaginatik](#) offers a new, enterprise idea management and collaborative innovation software solution as SaaS. The crowdsourcing platform allows companies to utilize the collective intelligence of their customers, suppliers and employees at the same time. What makes this SaaS solution a strong offering is its integration with MS-SharePoint which enables private and secure collaboration and search within the company.
- [Inova](#) is a new innovation management software offered as SaaS. What makes the Inova suite unique is the correlation engine that connects ideas and people by creating a landscape map of knowledge within the organization.
- [HypeIMT](#) is a complete idea and innovation management suite with unique extensions for open innovation and intellectual property management.
- [Innovation Framework Technologies](#) (IFT) offers the most comprehensive NPD software solution. IFT's software covers all aspects of new product development from idea management to portfolio management, from stage-gate governance to project management and collaboration, and from strategic planning and roadmapping to performance reporting and analytics.
- Another complete NPD software suite is [Sophion's Accolade solution](#). This end-to-end NPD software offers an integrated set of applications that provide complete management and visibility into the NPD process from product ideation to selection, from product development to commercialization.
- [ProModel's](#) EPS is another tool worth mentioning. It is a unique simulation tool and optimization tool for Project Portfolio and Resource Capacity Planning.

Keys to Success

- Monitor key trends affecting new product development and share the information with the NPD team.
- Review resource allocation strategy regularly and keep funding NPD even during economic downturns.
- The goal of NPD is to improve the innovation capability of the business and to bring winning products to market. Whether it is stage-gate, PACE, or flexible NPD, the model is the means to the end goal. Select a process model and adopt it to your company and situation.
- Build flexibility into the NPD process and organizational culture – too much structure and rigid processes stifle creativity. Identify where more flexibility will be most beneficial and where it might be harmful.
- Encourage ideation in each and every stage of the NPD process. Identify all potential sources of ideas and develop multiple means for soliciting and capturing inputs to the process.
- NPD process maturity is a strategic advantage. Measure the NPD process in terms of quantitative and qualitative impacts and keep optimizing it.
- Leverage the internet, online communities, and idea management software tools for the ideation process in each stage.
- Give serious consideration to complete end-to-end software suites that provide all the tools for both front-end innovation management and the NPD processes. They are worth the investment.



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For further reading on product strategy, please visit our [recommended reading list](#).

