The New Product Development (NPD) Framework

NEW PRODUCT INNOVATION

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Most executives today are deeply committed to **innovation**. Leaders understand that growth must be realized through **new product development (NPD)** and that strategic expansion is preferred over **cost reductions** and/or **risky business acquisitions**.

Yet, even with a deep-held conviction that innovation provides the path to growth, many corporate leaders are paralyzed to action in the face of such competitive challenges. NPD follows a logical, simple framework that can be easily implemented regardless of the industry, company size, or current state of business. There are seven areas in innovation to master for innovation success:

1. **Innovation Strategy**,  
2. **Portfolio Management**,  
3. **NPD Processes**,  
4. **Life Cycle Management**,  
5. Teams and Organization,  
6. **Market Research**, and  
7. **NPD Tools and Metrics**.

Innovation strategy is an overarching principle that guides all new product development activities. Portfolio management, structured NPD processes, and life cycle management are facilitating processes that lead to sustainable long-term innovation success. Supporting processes and structures are offered through teams and organization, market research, and NPD tools and metrics.
**Innovation Strategy**

Strategy is the overarching theme for all innovation efforts. At the highest level, strategy defines the corporate mission, vision, and values. Business units or geographical subsidiaries may enhance the corporate strategy to focus on specific growth needs. **Innovation strategy** further defines the specific markets, technologies, and products (categories or brands) necessary to ensure long-term returns.

A lack of an innovation strategy will result in a company losing to competition. Over 80% of companies with a strategic focus perform the best within their industry when strategy is the guiding force in new product development, releasing about two times as many successful new commercial products for each new idea as compared to the rest. NPD teams are also more focused on core innovation areas when the strategy is well-defined and widely communicated.

*How do you know if you have a well-defined innovation strategy?* First, ideas are submitted with attention to market focus, technology strengths, and product categories. Each innovation project is probed at project gate reviews for fit with strategy as well as potential for new financial revenues. **Portfolio management** (see below) reviews are utilized to select the projects with the most value to the firm, where value is defined, in part, as strategic fit.

Here are five questions any company should fully answer to determine innovation strategy.

1. What is your business?
2. Who are your customers?
3. What products and/or services will you provide to the customers?
4. Why do customers prefer your solution over the competition?
5. What are your strategic capabilities?  *(Review this related paper.)*

Again, a clearly articulated innovation strategy differentiates companies that are most successful in NPD versus those that apply an ad-hoc approach.
Portfolio Management

While identifying the markets, technologies, and products is strategically important for a firm, strategies are only successful if they are put into action. **Portfolio management** is a key tool in the new product practitioner's toolbox to ensure that the innovation strategy works as planned.

Portfolio management is the decision-making process utilized by senior management to link the overall innovation strategy to a set of *active NPD projects* that will deliver the most value with limited resources. Portfolio management decisions are future-oriented since some NPD projects are in the *idea generation stage* while others are ready for *launch*. Sales revenues, volumes, and profit margins are all uncertain until customers have purchased the new product. In addition, new and creative ideas to solve customer problems are generated on a daily basis, so that new projects are entering, exiting, and competing against existing active projects.

Product *portfolio management* is the primary tool linking active projects to the strategy and delivers three main objectives.

1. Portfolio management identifies NPD projects with the most value.
2. Portfolio management creates the right mix and balance of projects.
3. Portfolio management informs project implementation to ensure strategic alignment.

**Portfolio Management Adds Value**

Active projects are selected based upon a number of criteria. Financial metrics, such as *net present value (NPV)* or *return on investment (ROI)*, are often used as “hurdles” in project selection. For instance, only NPD projects with greater than 15% ROI are considered for inclusion in the innovation portfolio. In other cases, projects are rank-ordered and prioritized based upon NPV: those projects with the highest predicted financial value are selected for further work, while those that do not meet a cut-off threshold are rejected.

Unfortunately, financial only metrics don’t tell the whole story. For this reason, many firms supplement financial metrics with *project scorecards* that qualitatively evaluate the attractiveness
of NPD projects. Scorecard variables should be tied to strategic success criteria, such as market attractiveness, technical competency, and competitive strength. Scorecard metrics are especially effective for early stage projects for which the valuation is difficult and/or far into the future.

Portfolio Management Builds a Balanced Portfolio
The second goal of portfolio management is to ensure a strong fit with strategy by ensuring a good mix and balance of innovation projects. This means both short-term and long-term projects, high-risk and sure bets, as well as radical innovations and incremental improvements. Every firm will deploy an individualized mix and balance of project types based upon their innovation strategy as well as their level of risk tolerance. The mix and balance of active projects should reflect the preferred strategic thrust for the business.

For example, a firm that is risk-seeking and actively pursues opportunities to develop radical new products for fringe markets will establish a portfolio of new product development projects with longer-term rewards based on new technologies. In contrast, a risk-averse company will choose a new product portfolio that is skewed toward shorter-term projects supporting the base business.

Portfolio Management Aligns NPD Projects with Strategy
Note that much of the discussion regarding the implementation of the firm’s innovation strategy will occur at the portfolio review meetings. Senior management cannot delegate this task since the portfolio decisions are taken to ensure that the strategic goals are implemented as envisioned by the executive leaders. Portfolio review meetings should be held at least once per quarter, and more frequently if the company has a weak phased-gate process (see below) in evaluating the strengths of individual projects on a standalone basis.

Without an effective portfolio management process, most companies perform poorly in comparison to their competitors. Typically with weak portfolio planning, too many low quality and low value projects sneak in as active NPD projects, resulting in an unfocused development effort, increased time to market, and delayed product launches. Moreover, team members become frustrated when their truly great ideas are lost in the shuffle of less attractive projects.

If you don’t already have a portfolio management process in place, start small by evaluating whether active projects align with the innovation strategy. Later, streamline your process to sustain
innovation with more sophisticated portfolio tools and techniques (see, for example, “Choosing a Portfolio Management Tool”)

**Phased NPD Process**
A structured and defined *new product development (NPD) process* is a prerequisite for innovation success. Using distinct work phases, interspersed with decision “gates,” firms can minimize the risk from a single project failing in the marketplace. Unlike portfolio management (see above), where *all* NPD projects are prioritized as a suite, the *structured NPD process* monitors the effectiveness of an *individual project* as it is transformed from an embryonic idea to a commercial product.

A typical structured NPD process may have five stages and four decision gates followed by a post-launch review, where the phases involve the following deliverables:

1. Opportunity identification,
2. Concept generation,
3. Concept evaluation,
4. Technology development, and
5. Product launch.

By evaluating past work and critically considering future plans for each new product at each juncture in the process, risks and financial losses are minimized. For instance, bad ideas are eliminated at gate one if the opportunity cannot be fully identified as a strategic match with markets, technologies, and product categories. New product **concepts** that do not meet customer satisfaction criteria are killed at gate three after a full concept evaluation. With such an NPD process, a minimal investment is made in each NPD project with the investment increased if the
new product continues to look attractive versus strategic and financial criteria during the various design and development stages.

Most firms utilize a series of templates and checklists to ensure that gate decisions are consistent and efficient. Whereas the portfolio management decisions are largely taken by a team of senior leaders, NPD gate decisions are delegated to mid-level management. Templates and checklists thus serve to incorporate overall strategic goals so that each project delivers a tight link to the innovation strategy.

Some companies are reluctant to kill projects, however, once the project has entered the phased NPD process. This is a mistake. First, no idea is ever perfect. Second, even the best ideas may not demonstrate a fit within the present day markets or customer needs. Next, technical solutions that appear easy may be impossible to implement in a cost-effective manner. Finally, review of all projects by a cross-functional team offers insights that are not obtained otherwise.

NPD processes should be managed by the company’s project management office (PMO) and an appointed facilitator. Humans have a tendency to add layers of complexity to gate review documents to prevent the repeat of a single failure. However, “gate creep” and increased paperwork can hinder the effectiveness of the process as well as demotivating innovation staff. The facilitator should work to remove such roadblocks by continuously improving the process and by participating actively in post-launch reviews.

**Life Cycle Management**

New product development practitioners are not only responsible for the creation of new ideas and bringing them to life, but also for managing product retirements and replacements. This is called life cycle management and is an oft-missed component in innovation plans.

As new products are developed, it is important for the NPD team to consider various market conditions for the new product. Will it replace existing products wholly or in part? Will the new product expand the business by seizing market share from competitors or is it “cannibalizing” the firm’s own target market? What is the expected sales cycle? When do we plan to upgrade, replace, and/or retire this new product?
Addressing life cycle questions and concerns during the product development process can help to ensure smooth transitions within a brand as derivative products complement a prime platform product. Consider, for example, potato chips as a platform product. Companies have secret recipes to ensure crispy snacks with just the right amount of salt. Derivative products include chips with ridges, sour cream and onion varieties, as well as a low-salt, healthy version. Product development teams must evaluate a viable business case for a new barbeque flavored potato chip to understand the following information.

- Will it be successful in the market?
- Will it replace sales of other varieties in the product family?
- Will it expand our market share?

Such market questions are not isolated from the manufacturing and technical challenges of the product development effort. A truly cross-functional NPD team will also consider the impact to manufacturing, operations, and supply chain for the new product. If the barbeque chip requires special ingredients and/or special handling during the manufacturing cycle, the firm must consider the impacts on the production of other products. Clearing the barbeque spice from the factory equipment could slow production, thus reducing throughput of both the sour cream and onion chip and the low-salt version. With a reduced product volume, will the firm still be able to meet market demands?

When the degree of cannibalization becomes large enough from a marketing or operations standpoint, the NPD teams and management must address capital investment questions. Of course, financial considerations on spending will be evaluated in light of the firm’s overall business strategy and the active portfolio of attractive new product projects.

Life cycle management introduces a great number of trade-off decisions for the NPD teams as well as senior leaders. While it’s not typically the foremost discussion as you are developing a
new idea for commercialization, effective innovation systems will include steps to inform the life cycle management process.

**Summary: Sustaining Innovation Processes**

An effective innovation framework starts with the **innovation strategy**, overarching all other activities and serving as a checkpoint that the firm is moving forward as expected and as planned. Sustaining processes to support the innovation strategy include portfolio management, structured NPD processes, and life cycle management. Facilitating and supporting structures involve teams and organization, market research, and NPD tools and metrics (see below).

**Portfolio management** is the primary tool that **new product development professionals (NPDP)** utilize to align the active set of projects with the pre-determined innovation strategy. The defining aspect of portfolio management is that **all projects are evaluated against one another**. Product portfolio management ensures that the suite of projects with the highest value is actively implemented and that shorter term, lower risk projects are balanced against the more uncertain, longer term new product projects. Finally, portfolio management is used to effectively monitor that the strategy is aligned with the tactical implementation of innovation projects across the corporation.

**Structured NPD processes** reduce or minimize the risk of failure of an individual project as the phases and gates force frequent review of the NPD effort. At each gate review, the project is compared against strategic innovation criteria and the future plan is evaluated for potential success. With each stage of work, the investment increases along with the anticipated results of the new product project.

Finally, **life cycle management** is another sustaining process leading to innovation success. Early stage planning for the replacement and/or retirement of products should be incorporated in an innovation framework to ensure that smooth transitions of products within a product family. In addition, life cycle management addresses manufacturing and marketing concerns upfront, before the product is discontinued. Customer acceptance of new products is enhanced when future plans for the product line are shared in advance of changes in the marketplace.
Supporting Innovation Processes

Teams and Organization
Supporting all of the foundational NPD processes – portfolio management, phase-and-gate reviews, and life cycle management – are the people of the organization. In the innovation framework, the teams and organization element addresses how to get the work done that will result in strategic success.

A team is defined as a group of people with complementary skills working toward a common purpose. For new product development, the core group is normally six to ten people. Complementary skills are represented by cross-functional membership on the team. Each and every function necessary to convert the embryonic idea into a salable product or service is found on the NPD team.

Common functional representation includes research and development (R&D), marketing, engineering, sales, and operations. Note that ancillary and support functions need to be informed of the project, even if they do not lend core resources to the NPD effort. For instance, information technology (IT), legal, and human resources (HR) may be called upon in support roles to ensure the new product is commercialized according to plan.

Team structure and leadership will vary with the organization’s culture as well as the complexity of the NPD effort. Four common organizational structures are (4, 5):

- Support,
- Lightweight teams,
- Heavyweight teams, and
- Venture.

Support Teams
Support teams are often utilized in NPD efforts requiring more depth of knowledge than breadth of experience. These teams are excellent organizational structures for designing incremental improvements or conducting fundamental technical research. Importantly, support team members value being viewed as experts by others within the company. Many of these scientists are motivated by the reward of a better product, especially to improve and enhance technologies.
**Lightweight Teams**

*Lightweight teams* are typical in today’s business organization, as well. Matrix and hybrid reporting structures are common, and projects are conducted with part-time team members who have additional day-to-day responsibilities. *Team leaders* have little authority over team members yet hold full responsibility to get the product to the marketplace.

Team leaders with lightweight group structures normally work in a hybrid environment. They often are conducting key work on the new product project, thus serving only a part-time role as a project manager. Often, these projects have a large technical component and the team leader is in his/her first supervisory role with the new product project.

Lightweight teams introduce an element of coordination and communication that is lacking in the support teams. These lean teams are well suited for short-term projects that may launch a *derivative* or enhancement to an existing product. Normally, one of either market development or technology development will be dominant in the new product project, while the other characteristics of the product are mostly pre-determined by the firm’s competitive position.

**Heavyweight Teams**

*Integrated, or heavyweight, project teams* employ a more formal structure than lightweight teams. *Product innovation charters (PIC)* are documented to offer strategic guidance to the NPD team and to demonstrate how the project will be beneficial in meeting business objectives. Core team members and the project leader are formally identified, normally serving in full-time roles. Each functional team member may lead a sub-team since these projects typically are staffed by a great number of individuals to complete the work. Depending on the size of the NPD effort, the project leader’s authority ranges from very little (as in a lightweight team) to nearly total control of project team members and resources.

Projects with a high degree of technical complexity and market growth are best handled by an integrated team. Because of the more formal structure, a heavyweight team can design new
Platform products and manage innovations ranging from the short- and mid-term into the long run.

Team member commitment to the NPD effort is usually high for an integrated team. Similarly, management support is clear in facilitating increased communication and coordination among the various functions.

Venture Team
Finally, a venture team is a co-located, standalone organizational structure designed to “think outside the box.” These teams are led by a highly experienced project manager and are staffed by the best and the brightest the firm has to offer.

Projects that are implemented by a venture team involve products that new-to-the-world or new-to-the-company and require substantial market development along with significant technology advances. Because the company has taken a large (but calculated) risk on the new product effort, senior management may require more frequent status updates, yet the work of the team will remain largely independent.

Venture teams are often co-located at a separate campus than the rest of the organization. Team members are passionate and motivated to bring the new product to market, even if it means working long hours, heavy travel, and unpredictable schedules. For most team members, the opportunity to work on a venture team only comes along once or twice in their career.

Senior management can help to ensure new product development projects are successful by assigning appropriate teams according to project complexity. Additionally, the team leader’s experience with managing people, budgets, and schedules should be taken into account. Project managers can help to ensure that the new product development effort is successful by understanding team member roles, increasing individual team member motivation, and improving the breadth of cross-functional interactions.
Market Research

Like portfolio management, when done well market research can build and grow an innovation pipeline for success. When it is missing, the competition will win. Market research also provides a direct link to innovation strategy in that markets, products, and technologies depend upon customer needs and wants.

Market research encompasses all interactions with customers from the idea generation stage to concept testing to product launch. Customer engagement involves analyzing existing data – called secondary market research – that may be available from customer visits, benchmarking studies, and industry publications. A caution for using secondary market research is that data regarding potential customers may have been collected with a different intent than how the information will be used for the particular NPD project at hand. Data may be been assembled in a time of weaker or stronger economic conditions, from a market segment targeted for different use of the product, or through a sponsored research program.

Once a firm has verified the market conditions and competitive landscape through secondary market research, specific customer interest studies are conducted through primary market research. Much of determining customer wants and needs is specific to the particular NPD project, the potential market segment, and the firm’s competitive positions. Focus groups will probe small sets of consumers to learn whether the proposed project will meet their needs and to gather product improvement ideas through collaboration. Customer site visits and pre-market testing allow consumers to verify that the new product works as designed and will solve their problems.

Primary market research can be expensive since most firms do not have these capabilities in-house. It’s crucial for a firm to clearly and concisely define the customer insights desired so that a market research firm will be able to design a study to deliver data in a timely and cost-effective fashion. Another potential drawback of primary market research is that much of the information
is **qualitative** in nature and will involve small samples. Extending the results of select market research studies to gross customer interpretations can involve risks.

Regardless of the tools and techniques deployed in a specific market research study, customer insights must be determined *prior* to beginning new product development efforts. Likewise, market research provides a strong feedback loop to inform the innovation strategy.

**NPD Tools and Metrics**

The final piece in the innovation puzzle is a set of tools and metrics that allow monitoring and controlling of the innovation process. Some of the most common tools, such as portfolio management and life cycle management, have already been identified above. Many of the other tools utilized by new product development practitioners are the standard techniques utilized within the **project management** profession. For instance, each new product development program may include multiple, standalone projects, such as customer market research studies, R&D technology development, and design of marketing and advertising collateral. Each project sustains its own budget, schedule, and scope as an element of the overall NPD program.

Typical scheduling techniques include **critical path** analysis and a **Gantt chart** to help the team visualize the project schedule. Critical path analyses start with mapping each and every individual task necessary to complete the project on a **work breakdown structure (WBS)**. The longest pathway from start to finish (resulting in the shortest time in which to complete the project) identifies the critical path activities. If any of these tasks is delayed, the project milestones will also be delayed, leading to increased **time-to-market** for the new product. Gantt charts show both critical and ancillary tasks on a horizontal bar chart, often showing links between tasks with software enhancements (e.g. Microsoft Project or Oracle Primavera). The Gantt chart offers a detailed visual assessment of the status of each individual project as well as the overall NPD program.
Other common tools for NPD programs include meeting and status reports. These allow the team leader to ensure that the project stays on schedule and within budget while still delivering the goals of the new product effort.

Some common metrics to validate an innovation program include the number of new products launched in the past year or the number of new patents granted. Metrics must be closely aligned with strategic objectives so that the result of an innovation program clearly reflect the goals and objectives of the firm. NPD metrics vary from firm to firm and are directly tied to the innovation strategy. However, metrics must always evaluate the desired behaviors for the organization.

**Summary: Supporting Innovation Structures**
An effective innovation framework starts with the **innovation strategy**, overarching all other activities and serving as a checkpoint that the firm is moving forward as expected and as planned. Sustaining processes to support the innovation strategy include portfolio management, structured NPD processes, and life cycle management. Facilitating and supporting structures involve teams and organization, market research, and NPD tools and metrics.

**Teams and organizational structures** are critical to the successful execution of a new product development project. Team structures should be aligned with the complexity of the project, where products with more technical and market development require higher degrees of coordination among team members. The four most common types of team structures in NPD are the support team, lightweight team, heavyweight team, and venture team.

**Market research** is an entire field of itself. Without proper market research, the product will fail. Customer insights provide information on the overall competitive nature of the marketplace, technology solutions, and product categories. NPD teams will interact with potential consumers throughout the development effort, validating the new product idea and that the product works to solve the customers’ problems as envisioned. These market research studies provide an important feedback loop to the firm’s innovation strategy.

**NPD tools and metrics** vary across firms to address how well the company is meeting its strategic goals and objectives. Many of the tools in product development involve the sustaining processes within the NPD framework, such as portfolio management. Other tools are typical for the project
management profession at large. Metrics tie the firm’s accomplishments in new product development to the innovation strategy.

Without a comprehensive NPD framework, firms will fall behind their competitors. New product development is successful when there is a unique innovation strategy implemented across the organization. Strategy is facilitated by the NPD sustaining processes: portfolio management, structured NPD processes, and life cycle management. Supporting innovation structures – teams and organization, market research, and tools and metrics – are fundamental to long term innovation success.

Building Success from the NPD Framework

New product development practitioners following a structured NPD framework are able to produce more successes than their competitors. The NPD framework starts with a deliberate and overarching innovation strategy. Sustaining processes facilitate the implementation of the strategy through portfolio management, structured NPD processes (phased-gate), and life cycle management. Supporting systems, such as teams and organizational structure, market research, and NPD tools and metrics, build a strong foundation for the NPD framework, leading to further commercial successes.
Works Cited


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An outstanding author, Teresa is President of Global NP Solutions, LLC, a strategic innovation provider. She is an accomplished visionary and results-oriented professional with extensive industry experience from creative research to effective portfolio management through stream-lined new product development processes.

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