

## Portfolio management for the product lifecycle

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best practice brief

- ▶ The majority of today's business executives are dissatisfied with the business results they receive from their innovation investments. They realize that how they spend is much more important than how much they spend. Portfolio management addresses this disconnect by helping decision makers focus on the right investment projects and ensuring that the operational execution of these projects is properly aligned with a clearly established strategic business direction.

# PLM Software

Answers for industry.

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## ► Overview of portfolio management

### ***Are you moving in the right direction or are you just moving?***

Most executives are dissatisfied with the results they receive from their innovation initiatives. They have learned from experience that doing the right things is just as important as doing things right.

Traditionally, executive decision makers used portfolio management to focus their company's energies on innovations that really count. Today's latest innovation methodologies now provide a top-down approach to portfolio management to enable companies to clearly articulate their strategic direction and leverage this strategy through the product pipeline.

When portfolio management is leveraged in a product lifecycle management environment, it enables your decision makers to:

- *Make the right innovation investments* by identifying, prioritizing and selecting new product development (NPD) projects that are best aligned with your strategic direction
- *Drive the operational execution of your NPD projects* by ensuring that adequate budgeting, scheduling and resources are available to deliver the business results you expect

### ***How you spend is far more important than how much you spend***

**Today's realities.** Almost everyone wants to adopt impressive sounding improvement initiatives and develop more products faster than they've ever been able to before. But pursuing these objectives by themselves is not enough to ensure success in today's demanding global marketplace.

Many people lose sight of strategic planning and fail to understand the importance of leadership in their mad dash to latch onto the next big thing. High rates of growth, innovative new business models and ever changing technologies constantly shake the ground around us.

Too often, business processes cannot keep up with today's relentless pace. By the time we make a decision, its foundation may have changed completely. Armed with an executive decision, vast swathes of our operations often move onward to attack...the wrong target.

Portfolio management is a business initiative that focuses on doing the right things. It asks deeper, more probing questions about what you are actually doing and why you're doing it.

The real goals you want to pursue – economic gain and competitive success – are delineated as much by doing the right projects as they are by doing projects well. There is rarely a shortage of “cool” ideas; unfortunately, the same cannot be said of the resources needed to execute these visions and secure their expected results. As Steve Jobs indicates in a recent interview with Business Week, “Among other practices, it is saying ‘no’ to a thousand things (that enables us) to concentrate on the really important creations.”

Of course, choosing the right projects is much more difficult than it sounds. Manufacturers often make decisions that involve a dizzying array of brands, product lines, product offerings, product options, technologies and investment opportunities. These decisions are complicated by the need for multiple stakeholders – including marketing,

### **In brief:**

Today's top-down approach to portfolio management allows companies to clearly articulate their strategic business direction and leverage this strategy through a rigorously managed product pipeline.

Portfolio management enables decision makers to make the right innovation investment and drive the operational execution of their NPD projects.

Economic gain and competitive success are the real goals that companies want to pursue. These objectives are achieved as much by choosing the right innovation projects as they are by executing these projects well.

development, manufacturing, sales and a wealth of suppliers – to reconcile their goals and perspectives and effectively collaborate on bringing a product to profitable reality.

Where to focus, how to focus and what to measure are key factors affecting every manufacturer's success.

Investments in R&D, technology and product development must drive profit and revenue growth for today's enterprises. Unfortunately, research indicates that a majority (51 percent) of executives are dissatisfied with the financial returns on investment (ROI) they receive from their innovation initiatives. This anxiety is warranted. Additional research reinforces this conclusion by indicating that "there is no correlation" between R&D spending levels and sales growth, earnings or shareholder returns.<sup>1</sup>

This disconnect between R&D spend rates and business results suggests a lack of maturity in the processes used to oversee investment. In fact, research from AMR indicates that 69 percent of companies admit that their product introduction processes are not under financial or strategic control.<sup>2</sup> As this study indicates, creating ideas and technology is one thing – leveraging those elements in the marketplace is another.

At the end of the day, it would appear that "How you spend is far more important than how much you spend."<sup>3</sup>

Successful companies recognize the crucial importance of managing their product and process investments on a systematic and repeatable basis. They understand that investments need to be carefully planned, managed and coordinated with due diligence and a strategic eye on company goals.

However, too many companies bog down as they strive to meet these goals. Frequent changes, data gathering and aggregation difficulties, jurisdictional differences and process misalignment can conspire to lead operational organizations in the wrong direction.

With these issues in mind, portfolio planning/management initiatives provide a key learning tool that you can leverage to raise margins and deliver marketplace advantage.

**Where portfolio management fits in the wider product lifecycle.** According to the Product Development Institute (PDI)<sup>4</sup>, companies adopt portfolio management to establish a dynamic design process that allows them to constantly consider and revise their new product development projects from the following perspectives:

- Evaluate, select and prioritize new projects
- Accelerate, kill or de-prioritize existing projects
- Allocate and reallocate resources to active projects

The portfolio decision process is characterized by uncertain information, dynamic opportunities, multiple goals, project interdependence and multiple decision makers.

The portfolio decision process encompasses – and sometime overlaps – numerous decision-making processes within a company's business, including periodic reviews of all projects in the total portfolio (i.e., examining all projects holistically, as well as evaluating them against each other), making go/kill decisions about individual projects on an ongoing basis and developing new product strategies for the business (complete with strategic resource allocation decisions).

#### **In brief:**

Where to focus, how to focus and what to measure are crucial factors in influencing innovation success. The disconnect between R&D spend rates and business results suggests a lack of maturity in the processes used to oversee investment.

How you spend is much more important than how much you spend. Companies adopt portfolio management to regularly assess and revise their NPD projects. These evaluations require decision makers to systematically review all projects in their company's product portfolio, make no/no-go decisions about individual projects and develop their new product strategies as business condition change.

Taking all of these considerations into account, it seems obvious that portfolio management plays a fundamental role in the product lifecycle – in the same way that new products are crucial your company’s future revenues and new product investment is central to your overall business strategy.

The Product Development Management Association (PDMA) provides a variety of guidelines with respect to new product development. As Robert G. Cooper indicates in the *PDMA Handbook for New Product Development*, “having a new product strategy... is clearly linked to positive business performance.”

PDMA recommends that you and your company weigh the following factors when considering a new product development (NPD) strategy.

**New product development considerations<sup>5</sup>**

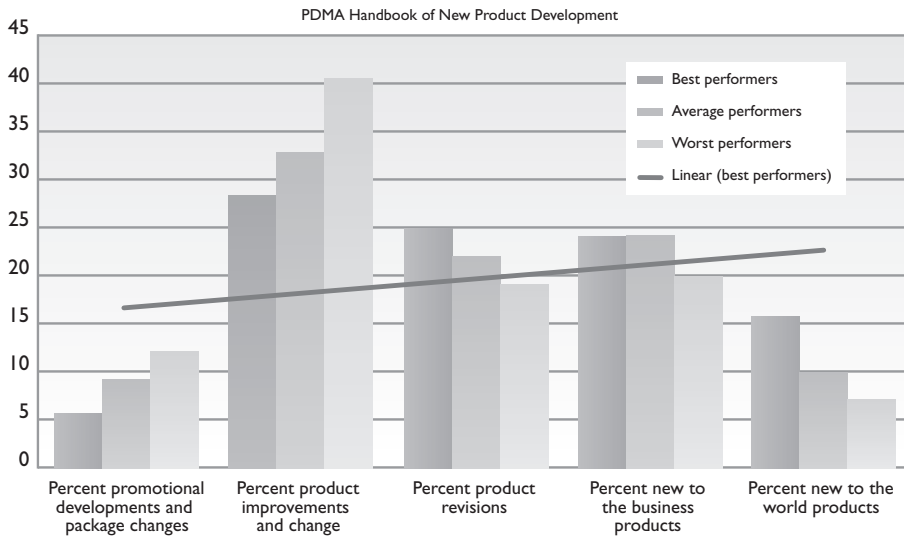
Consideration	Implications
Role of NPD in your overall business objectives	Link your NPD goals to your overall business goals so that the role of NPD in achieving these objectives is clearly articulated and understood.
Clearly defined NPD goals	Carefully define the long term goals that you expect your new products to achieve; for example, what percentage of your sales or profits will come from your new products over the next 3 to 5 years?
Strategic focus definition	Define your strategic focus by identifying what factors are crucial for enabling your company to achieve its NPD objectives; typical areas of focus might include targeted markets, product areas, industry sectors and technologies.
Strategic bucket definition	Identify buckets of resources that target different project types or different strategic arenas; this approach aligns your NPD strategy with your established business goals. Best performers (41.1 percent) clearly differentiate themselves from worst performance (15.4 percent) by their ability to adopt a strategic bucket approach.
Product roadmap	Establish an attack plan with specific initiatives indicating how you intend to get from where you are now to where you want to be.
Long term commitment	Establish a long term view for your NPD activities that indicates how individual projects will contribute to your long run objectives; only 38.1 percent of all companies have a long term product strategy.
More innovation	Include a high mix of innovative NPD projects in your overall project list. As the accompany diagram illustrates, best performing companies undertake a higher proportion of innovative NPD projects in contrast with poorer performers who have a timid project portfolio.

**In brief:**

Successful strategies for introducing new products require you to address several key business factors, including:

- Role of NPD in your business strategy
- Clearly defined NPD goals
- Strategic focus
- Strategic bucket definition
- Product roadmap
- Long term commitment
- High mix of innovation

## Breakdown of project by project type Best versus worst



### In brief:

As the accompanying diagram indicates, the best performing companies adopt more innovative NPD projects than their poorer performing counterparts.

Collaboration and project management are key technology-driven capabilities that influence the success of NPD projects.

**Stakeholders in portfolio management.** Product innovation is very much a team effort. Recent research from the Aberdeen Group indicates that 75 percent of all companies surveyed indicated that collaboration and project management are very important to their NPD process. The accompanying table lists stakeholders who have essential responsibilities and a vested interest in portfolio management.

## Portfolio management stakeholders

Stakeholder	Role in portfolio management
Operational executives	<ul style="list-style-type: none"> <li>• Coordinate/balance the needs of sales, marketing, development, R&amp;D, manufacturing and production</li> <li>• Review product lines with respect to profitability, scheduling and risk</li> <li>• Ensure information availability</li> </ul>
Program management leaders	<ul style="list-style-type: none"> <li>• Obtain/manage resource and scheduling data</li> <li>• Communicate project schedules</li> <li>• Identify and resolve resource gaps</li> </ul>
Product marketing leaders	<ul style="list-style-type: none"> <li>• Objectively and realistically score/balance the portfolio's products, lines and brands</li> <li>• Objectively and consistently identify and detail requirements that pertain to new areas of growth</li> <li>• Realistically analyze expected returns and market risk for new/old products, lines, brands</li> </ul>
Product management leaders	<ul style="list-style-type: none"> <li>• Identify resource availability for new projects, products, lines and brands</li> <li>• Determine product mix based on defined constraints</li> <li>• Balance key project deliverables against established strategy</li> </ul>
Finance leaders	<ul style="list-style-type: none"> <li>• Define/calculate appropriate NPV, CAGR and margin measures that will be used to evaluate a given product/program against its established targets</li> <li>• Calculate profitability and perform margin analysis by product, line, brand and platform</li> </ul>
R&D, product development, manufacturing and production leaders	<ul style="list-style-type: none"> <li>• Forecast resource needs for new projects</li> <li>• Balance and optimize resources</li> <li>• Perform technical risk scoring</li> </ul>

### In brief:

Strong leaders are key to bringing together the primary stakeholders in successful portfolio management initiatives, including operational executives, program managers, product marketing managers, product managers, financial managers and managers within your R&D, product development, manufacturing and production operations.

## ► Challenges

**Portfolio management's objectives.** For most companies, there is a big difference between expected growth and the growth that NPD can actually deliver. Top managers can close this gap by identifying families of strategic opportunity and populating them with new or improved products.<sup>6</sup>

Effective portfolio management addresses the need to close this gap by facilitating four main objectives.

### Portfolio management's four main goals

Goal	Advantage
Investment maximization	In most companies that value new products for their ability to drive business success, products are viewed as the result of investment decisions. In these companies, revenues and profits are regarded as the sum of the investments and costs aggregated across all products, product lines and brands as marketing, R&D, development, manufacturing, procurement and the supply chain bring these deliverables to market.
Investment alignment	Investments are considered to be properly aligned when your company is assured that its business/sales strategy is actually reflected in the products and services that it offers. In a perfectly aligned state, the costs and speeding of all projects, geographies, markets, brands and R&D programs are directly associated with your company's strategic direction.
Investment focus	There is no shortage of ideas in today's corporate cultures. In fact, most companies find it difficult to focus their limited resources on the few ideas most likely to make a real marketplace difference.
Investment balance	Few companies have the luxury of a concise set of corporate goals. Most companies require a delicate balance to meet multiple objectives that include revenue, profit, cost, market position, delivery and technology agendas.

#### In brief:

Your company can adopt portfolio management to ensure that project and program goals actually deliver the strategic growth required of them. More specifically, you can implement portfolio management to:

- Maximize the business value of your NPD investments
- Align your NPD investments with your overall business strategy
- Focus your NPD investments on ideas likely to make a marketplace difference
- Balance your product portfolio to meet multiple business objectives



**Pitfalls to effective portfolio management.** Many challenges impede even the most progressive companies from attaining their portfolio management objectives. As you might expect, almost everyone involved in the NPD process has a strong desire to make decisions based on up-to-date information and business-driven metrics.

However, gathering information from multiple systems spread across today's finance, marketing, sales, product development and manufacturing domains is not an insignificant task. This is especially true when you realize that this data not only has to be captured and integrated, but also needs to be understood and analyzed through clear and concise methodologies.

Even when good information is readily available, other factors come into play, including inertia, corporate politics, background differences and confusion at the leadership level. While today's managers are more than capable of embracing and executing their own organization-driven perceptions of the company's business strategy, a unified cross-discipline understanding of that strategy is harder to achieve.

But unified understanding is crucial to a successful business strategy. Without it, your company's underlying operations will not be able to understand what mix of projects they are supposed to deliver – or how they are supposed to collaborate across the project's various stages and thereby ensure overall strategic alignment.

Paul O'Conner cites research from Adept Group in the *PDM Toolbook for New Product Development* that outlines the top challenges that managers face in adopting effective portfolio management initiatives.<sup>7</sup>

- No explicitly stated unified understanding of strategy
- Poor data/metrics on project characteristics (too old, not reliable or no match to decision needs)
- Lack of criteria for guiding decisions toward an optimal product mix
- Changing organization structures; key people leaving
- Inadequate or outdated resource assignment and usage data
- Inability to forecast resource bottlenecks
- No historic data for establishing norms
- Poor foundation in project management
- Unknown project and commercial risk
- Project task uncertainties (outcome, workload, duration)
- Poor financial forecasting
- No tools to efficiently gather, analyze or share data/metrics
- No central data repository
- Lack of management involvement
- Inadequate development processes (phase gate, front end)
- Conflicting organization structure
- Poor implementation concepts

**In brief:**

A variety of challenges can impede your ability to implement portfolio management effectively. It is difficult to gather and integrate portfolio-related information from widely dispersed systems spread across multiple domains. In addition, this information needs to be understood and analyzed in a way that facilitates a unified cross-disciplined understanding of your business strategy.

## ► Best practices

**Best practice components.** PDMA outlines a seven layer model to identify and categorize the more crucial factors that need to come together for an effective portfolio management initiative.

### Crucial portfolio management components

Component	Related functional activities
Mix management	To select projects for your product portfolio that optimize your company's business value, you need to: <ul style="list-style-type: none"> <li>• Establish project selection criteria</li> <li>• Define the portfolio's mix criteria</li> <li>• Group and allocate projects into "strategic buckets"</li> <li>• Identify project impact dependencies</li> <li>• Analyze and optimize project mix</li> </ul>
Throughput management	To actually execute work identified in an NPD project, you need to: <ul style="list-style-type: none"> <li>• Establish a project management foundation</li> <li>• Prioritize projects</li> <li>• Assign resources to each project</li> <li>• Forecast resource use</li> <li>• Identify the project's critical chain</li> </ul>
Measures	To provide crucial stakeholders with quantitative feedback for making informed and coordinated decisions, you need to: <ul style="list-style-type: none"> <li>• Define project metrics</li> <li>• Establish financial priorities</li> <li>• Assess project risk</li> </ul>
Software/data	To extract and aggregate decision-support data from existing business systems and apply it to portfolio management, you need to: <ul style="list-style-type: none"> <li>• Identify current enterprise systems with related portfolio management data</li> <li>• Capture relevant data from these systems</li> <li>• Leverage a viewing solution to integrate this data and foster collaboration</li> </ul>
Processes	To effectively manage projects and portfolios as process-driven hierarchical objects that frequently change across a definable lifecycle, you need to: <ul style="list-style-type: none"> <li>• Implement portfolio object management</li> <li>• Facilitate stage-gate redesign</li> <li>• Account for front end concept generation in your lifecycle</li> <li>• Map the product line to its market and technology influences</li> </ul>

### In brief:

The PDMA seven-layer model for portfolio management identifies the following essential components as being crucial for business success.

- Mix management
- Throughput management
- Measures
- Software/data
- Processes
- Management support
- Focus

Management support	To ensure that the NPD project has the support of the company's business leaders, you need to: <ul style="list-style-type: none"> <li>• Involve top management</li> <li>• Facilitate top management proficiency</li> <li>• Focus top management visibility</li> </ul>
Focus	To facilitate a unified, cross-company understanding of your product and project strategy, you need to: <ul style="list-style-type: none"> <li>• Identify current organizational challenges</li> <li>• Implement team-driven processes that focus all organizational levels on the larger strategic context</li> </ul>

**In brief:**

Mix management techniques enable you to select specific NPD projects for your product portfolio for the purpose of optimizing the portfolio's business value.

Throughput management enables you to plan the execution of your NPD projects by ranking their priority, managing their resource and cost levels and anticipating their shortfalls or excesses.

**Mix management.** Mix management and throughput management are the primary pillars of portfolio management. Companies employ mix management techniques to select specific projects for their product portfolio with the goal of optimizing the portfolio's business value. Typically, these efforts begin when your company groups and allocates its projects into "strategic buckets." Then, you establish guidelines (mix criteria) to indicate how the portfolio should look when it is fully populated.

Detailed criteria also should describe the selection/screen process that will be used to evaluate projects during given phase-gate reviews. Mix management also requires you to identify and describe each project's dependences and the impact that these dependences can have on the project's success. Once the mix management process is complete, portfolio stakeholders should be able to identify, prioritize and blend projects to match your company's strategic objectives.

**Throughput management.** Sometimes called "pipeline management," throughput management enables companies to effectively execute any work identified as an NPD project. Without establishing a connection to the actual work, stakeholders leverage throughput techniques to understand and question the effectiveness of any portfolio management tool.

Implementers can begin by ranking your projects in priority order so that stakeholders can assign resources to these projects in accordance with your strategic objectives. Once resources are mapped to given projects, stakeholders can more effectively manage resource and cost levels. Stakeholders can use these mappings on a proactive basis to forecast resource use and predict when specific projects will need resources and when shortfalls or excesses will arise. These capabilities allow program managers to account for task uncertainty and the dependency of given tasks on certain resources.

**Measures.** Metrics constitute a cornerstone for portfolio management that provides stakeholders with the quantitative feedback they need to make informed and coordinated project decisions. The effective use of metrics is often cited as one of the key differentials that distinguish successful NPD projects from failing efforts. While examining this issue in detail, AMR Research discovered that although 79 percent of all surveyed companies said they had formal NPD processes, only 52 percent actually applied metrics to these processes.<sup>8</sup>

Most companies typically require financial priority listing at the portfolio level to rank projects on the basis of commonly applied measures or calculations, such as IIR, NPV and EVA.

Regardless what specific metrics you choose, applied metrics provide stakeholders with an effective tool for viewing and modifying behavior up and down an organization structure. Sometimes called the metrics hierarchy, this approach enables you to use a variety of metrics to orchestrate a large organization and evaluate its improvement from multiple perspectives.

Recent research indicates that multi-dimensional measures are particularly adept at outlining success and quality at various levels throughout an enterprise<sup>9</sup>. These measures also are able to detect subtle changes in NPD descriptions from simple linear, stage-gated processes to more recursive processes that reflect concurrent and multiple feedback loops – and in some instances, even from more complex models that try to bring chaos into order over time.

The types of metrics that should be applied to any project or portfolio generally depend on the impact that the portfolio has on your business enterprise. In addition, sometimes it is necessary to combine and balance conflicting metrics (for example, applying development cycle times against quality improvement metrics that measure mean time between failures).

Today's measures often need to be accompanied by risk assessments that try to determine whether a desired outcome will occur (e.g., a task, metric or even the commercial success of a project).

**In brief:**

Measures provide you with the quantitative feedback you need to make informed and coordinated NPD project decisions.

These metrics enable you to view, understand and modify operational behavior throughout your organization structure. Multi-dimensional measures are especially valuable because they enable you to predict success at different levels in your operations.

**Software/data.** Many companies rely on a variety of systems to automate their business processes, including PLM, ERP, CRM and SRM systems. These and other systems often contain information that can be used for portfolio management decision making, including cost information that pertains to R&D projects, product design and development, material management, manufacturing, production, sales and marketing.

The ability to clearly extract and aggregate information allows decisions makers to make informed and timely decisions on the basis of information drawn from multiple sources. Once your company decides what key metrics its want to drive the product portfolio, implementers can outline what information should be extracted from these diverse systems, as well as define how this information should be collected, combined, analyzed and retained for future reference and benchmarking.

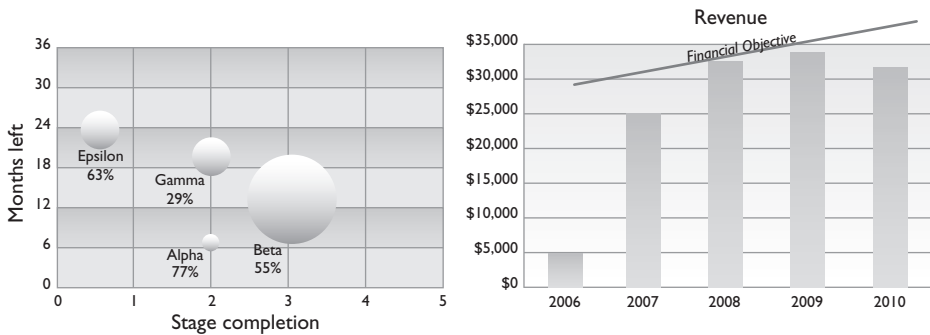
Given the nature of portfolio decision making, companies often leverage an enterprise system that can distribute information and foster collaboration among widely dispersed stakeholders. Once this enterprise software is in place, managers can manipulate the aggregated data and generate visual displays (graphs and charts) that evaluate what tradeoffs apply to each decision and its proposed alternatives.

Recent research by the Aberdeen Group indicates that top performing companies are 4 times more likely to leverage integrated data and integrated processes than lower performing companies. Similarly, the same research concluded that top performers are 4 times more likely to adopt product lifecycle management (PLM) technology than their poorer performing peers. These results tend to confirm PLM's central role as the enterprise foundation for supporting NPD and portfolio management.

**In brief:**

You need to extract and aggregate information from your enterprise's diverse systems so that you can make informed and timely business decisions. You also need to be able to distribute this information and foster collaboration among your widely dispersed NPD stakeholders.

Top performing companies are 4 times more likely to leveraged integrated data than lower performing companies. They are also 4 times more likely to use PLM systems to perform this functionality.



*Integrated data facilitating side by side revenue, timeline and risk evaluation*

**Processes.** Process management needs to be implemented at various levels in the portfolio management model. At one level, your company needs to manage its projects and portfolios as process-driven hierarchical objects that can be cross referenced as they evolve across a frequently changing lifecycle. PDMA identifies the following projects (objects) as suitable candidates for process management.

- Products in development
- Products in the market
- Product innovation charters
- Product mapping processes
- Cost reduction projects
- Special customer request projects

Larger organizations often need to manage projects by accounting for their change and leveraging their workflows to ensure buy-in and sign-off from multiple stakeholders throughout a full and complete pipeline. Typically, the pipeline includes processes that range from front-end idea generation to R&D technology and concept generation through product line mapping.

Ideally, these processes should be linked to operational execution – so that the project is updated (along with the program and portfolio of which it is part) whenever a specific task is initiated. This approach ensures up-to-date visibility for all stakeholders.

As project execution evolves, your company will need a continual and regular solution for visually mapping project performance to the product line's market and technology influences. This ongoing mapping and monitoring ensures that process-related information is as readily available and up-to-date as possible.

**Management support.** The involvement of top management is essential for ensuring the success of any NPD activity. Research by the Aberdeen Group indicates that approximately 60 percent of today's successful companies employ high level executives as their chief product officer (as contrasted with other, less successful companies, where only 25 percent of all respondents met this criteria).

Clearly, higher level executive oversight is needed to ensure that your portfolio level strategies map to business level strategies. A portfolio management initiative's initial procedures, selected portfolios, strategic direction and scoring models need to be closely vetted by senior management.

Ultimately, these executives should make sure that the right framework is in place to drive successful portfolio decision making. Just as importantly, senior operational level managers require visibility to key performance indicators. This visibility is key for determining whether your company's decision-making process actually works and whether your operating organizations follow through and execute your portfolio decisions.

#### **In brief:**

You need to manage your NPD projects and product portfolios as process-driven hierarchies that can be tracked as they evolve across a frequently changing lifecycle.

To account for your NPD projects as they change, you need to manage their workflows to ensure complete stakeholder buy-in and sign-off. Equally important, your projects should be linked to their operational execution so that the project is updated as specific work tasks are initiated and completed.

Top management needs to be actively involved in defining your portfolio strategy and monitoring its operational execution. Executives need to closely vet your portfolio management initiative and its related the strategic direction, portfolio mix and scoring models. They also need systematic and repeated visibility to your portfolio's key operational performance indicators.

**Focus.** Successful portfolio management initiatives require a unified cross-company understanding of your product and project strategy. Thorough collaboration is key to improving NPD on many fronts – especially when diverse stakeholders need to understand your strategic priorities and their interconnected roles/responsibilities.

However, many organizational factors challenge enterprise collaboration including inertia, company politics, different background/perspectives, conflicting leadership direction and a lack of up-to-date and meaningful information. A unified and understandable product/project strategy enables your company's stakeholders to collectively outline an appropriate mix of products capable of meeting your strategic objectives.

To establish this unified strategy, companies sometimes need to map their organizational structures to appropriate authorization and communications guidelines. It is especially helpful to differentiate the way your company actually works from the way people think it should work. Once these differences are clarified, many companies find it easier to address their real-world organizational challenges.

For example, once you identify these challenges, you can map the right processes to the people who actually execute them. You also can drive key metrics down through your organization's hierarchy to influence group behavior and drive project success. By providing local groups with a unified focus, individuals are able to evaluate and hone their performance within a larger, more strategic context (instead of pursuing tactical considerations that miss the forest for the trees).

**Key steps for ensuring success.** Numerous best practices have been devised to ensure the implementation of effective portfolio management initiatives. Most of these practices were identified by comparing the differences between successful implementers and lagging performers in an attempt to understand what specific actions might be taken to ensure portfolio management success. However, other best practices adopt derivative techniques from the Carnegie Mellon Capability Maturity Model (CMM), which provides a more formal methodology for identifying specific actions that should be undertaken.

Based on its research on portfolio management, the Aberdeen Group summarizes a set of general guidelines for improving portfolio management performance that starts with process change.<sup>10</sup> Aberdeen's interviews and benchmark studies indicate that successful portfolio management relies on good processes to a significantly higher degree than many other improvement initiatives.

Aberdeen's research confirms that technology should be applied to capture, enforce, extend and facilitate the portfolio management process. Equally important, Aberdeen places a high priority on a vendor's process knowledge in addition to the technology it provides.

#### **In brief:**

In order for portfolio management to be successful, your portfolio and product strategy needs to be understood on a unified basis across your company. To establish this unified strategy, you need to map the strategy to your organization structure so that people who are responsible for executing the strategy understand their roles and the performance metrics they are expected to achieve.

Several best practices have been defined for ensuring portfolio management success. One best practice uses techniques suggested by the Aberdeen Group for comparing the differences between successful and unsuccessful initiative adopters. A second best practice leverages Carnegie Mellon CMM techniques.

Aberdeen contends that companies should focus their portfolio processes by considering their organizational maturity, need and opportunity for improvement. Specifically, your company should pay particular attention to the processes you use to select product opportunities, improve your product development pipeline, execute your projects and assess/monitor product value. Aberdeen's conclusions include the following recommendations.

- Evaluate business process to ensure that you are using common criteria to value, select and manage your product portfolio and its directly related decisions
- Standardize your portfolio processes and expand the use of portfolio management to most of the participants in your product innovation process
- Coordinate your portfolio management initiative throughout your enterprise
- Measure product value and portfolio performance frequently across your portfolio planning and product development execution activities
- Look for enabling technology that allows you to deliver best practices, as well as standardize, scale and extend your portfolio management processes

The *PDMA Toolbook for New Product Development* cites another best practice for improving portfolio management performance called the “spiral up” approach. As outlined by the Adept Group, the spiral up approach leverages CMM to establish a five-level maturity model (described in the accompanying table). By addressing one level at a time, implementation teams can execute the portfolio management process more effectively and accelerate its deployment.

Companies that implement CMM go through three steps to execute the components associated with each stage in the model. These three steps enable implementers to draw specific lessons from each stage's components and facilitate consistent use across different organizations.

**In brief:**

The Aberdeen approach studied successful portfolio management adopters and found that good processes, good technology and vendor experience are crucial. This approach stresses the importance of selecting product opportunities, improving the product pipeline, executing NPD projects and assessing/monitoring product value.



## CMM maturity levels

Level	Function
Maturity level 1 – Establishing the groundwork	Encompasses activities that apply to the overall planning process, including defining a strategic front end or engaging in wider product line planning. Existing processes sometimes include stage or phase-gate considerations that apply to the product development organization. During this stage, companies often experiment with different techniques and planning tools. Top management's approval and commitment are important factors in successfully completing this initial step.
Maturity level 2 – Setting up decisions	Includes those actions that drive the organization, as a whole, to unified agreement about the portfolio management process' requirements. Companies normally apply their project management and planning skills at this point so they can focus on establishing strategic buckets for the initiative's projects, delineating criteria for each bucket's project mix and defining the process flow. Attaining political agreement from all stakeholders and participating organizations is critical at this stage.
Maturity level 3 – Anchoring the process	Involves establishing and managing resource assignments, as well as concurrently defining the portfolio mix. Arguably the most important level in the CMM model, this stage requires companies to combine mix management techniques with throughput management. Companies integrate project data with resource use/availability data while also making certain that the process' up-front planning and product line planning are in place.
Maturity level 4 – Turning up the gains	Enables companies to secure a degree of comfort with the portfolio management initiative by defining expected organizational benefits. A full, front-to-back product development architecture should be in place at level 4. The establishment of a central data repository is essential for this architecture. Stakeholders should be ready to explore how the initiative's systems, processes and practices can be optimized and improved. For example, the project's characterization and resources can be modeled by Monte Carlo simulations while critical chain buffer management can optimize product development's supply chain operations.
Maturity level 5 – Automating the flow	Involves automating the improved processes with real time data and other information. Implementers need to work out the mechanics of the automated system and build consistency with its use. Information from the company's widely dispersed and diverse systems needs to be captured and managed in an enterprise system so it can be integrated and aggregated. This information is vital for enabling companies to simulate various NPD processes.

### In brief:

The spiral approach leverages the CMM 5-step maturity model as a best practice for driving portfolio management success. This model emphasizes the need to:

- Establish the groundwork for your overall planning process
- Set up the decision making process for driving a unified portfolio strategy
- Anchoring your portfolio management with mix management and throughput management capabilities
- Turning up your initiative's gains by implementing a front-to-back development architecture and a central data repository that will allow stakeholders to optimize and improve your initiative's underlying systems, processes and practices
- Automating the workflows associated with your NPD processes and their ability to integrate and aggregate relevant metrics-related business information

The PDMA toolbox recommends that implementation teams monitor the following milestones as the CMM process evolves:

- 80 percent barrier, which defines a critical mass for effective portfolio management. In essence, business benefits are greatly undermined when less than 80 percent of all projects are included in processes managed by the CMM model
- Portfolio mix, which requires you to establish and consistently use the portfolio mix criteria and guidelines
- Resources and pipeline, which requires you to consistently use resource/pipeline information to forecast potential bottlenecks
- Data repository, which requires you to establish and consistently use a central data repository that allows your enterprise's distributed teams to easily submit and retrieve portfolio-related information

**In brief:**

PDMA recommends that adopters of the CMM-based spiral approach pay particular attention to four key issues:

- The critical mass needed for successful implementation
- The implementation's portfolio mix criteria
- Resource and pipeline data that you can use to forecast potential implementation bottlenecks
- Establishment of a central data repository that allows implementation end-users to easily submit and access portfolio-related information

## ► Key Siemens solution capabilities

### **How Siemens solutions support portfolio management best practices.**

Siemens PLM Software is the world's leading supplier of product lifecycle management (PLM) software and services with 5.5 million licensed seats and 51,000 worldwide clients. Siemens' vision is to enable companies and their partners to collaborate using global innovation networks to deliver products that meet today's most compelling business initiatives.

Siemens' digital lifecycle management, digital product development and digital manufacturing solutions allow companies to manage all of the product lifecycle's diverse processes, including processes that pertain to the planning, development, manufacturing and service/support operations in today's extended enterprises.

At a high level, Siemens provides you with the tools needed to implement numerous interdependent initiatives, including:

*Strategic portfolio management*, which allows you to capture the voice of the market and align it with your own business needs. You can leverage this initiative to prioritize the right investments and outline key requirements to direct your R&D organization.

*Program execution management*, which enables you to control and manage projects by identifying and resolving program and development team complexities – as well as establishing performance milestones and measurements to keep project execution on track. You can leverage this initiative to establish consistent and repeatable product development stage-gate and change management processes across your global development operations.

*Strategic product development*, which you can leverage to develop systems and technologies that imbed market and customer requirements directly into your product architectures. You can use this initiative to align product concepts with strategic requirements and simulate/validate these factors as a basis for detailed development.

*Manufacturing planning and validation*, which you can use to synchronize your product manufacturing and sourcing processes with the rest of your development processes. You can leverage this initiative to ensure flawless product launches and smoothen ramp up, as well as to validate your manufacturing processes and line designs against established quality and compliance metrics.

These solutions are supported by Teamcenter® software – Siemens' set of digital lifecycle management solutions and the industry's de facto standard for deploying PLM on an enterprise basis. Teamcenter is able to bring all Siemens solutions together into a cohesive framework that you can leverage to manage your planning, development, manufacturing and service/support processes.

### **In brief:**

Siemens provides numerous tools that enable you to implement highly effective portfolio management solutions. These tools provide you with capabilities for:

- Strategic portfolio management
- Program execution management
- Strategic product development
- Manufacturing planning and validation

**Teamcenter's portfolio management capabilities.** Successful portfolio management initiatives require effective processes for both strategic decision-making (mix management) and program execution management (throughput management) that span the entire product lifecycle. Siemens is the only software provider capable of linking strategic portfolio management processes to the detailed operational execution of the product lifecycle.

This Teamcenter framework allows you to outline your company's operational and product structures and relate them to best practices at the operational level and strategic objectives at the business planning level. As a result, your company can drive its operational processes using strategic business metrics. For example, as your company undertakes a specific task, you can use Teamcenter to update its related project – as well as the program and portfolio that contain the project.

The Teamcenter framework is especially valuable for companies that value strategic management. By outlining high level strategic objective and key performance indicators, Teamcenter is able to drive execution while keeping track of the current state of the portfolio pipeline.

These capabilities facilitate up-front portfolio planning that further aligns operational activities to your strategic objectives. They also provide real time up-to-date visibility to all portfolio management stakeholders, while improving R&D efficiency by enabling decision makers to continuously evaluate and select the optimal portfolio.

Teamcenter's portfolio-specific capabilities (described in the accompanying table) facilitate a top-down management approach that improves organizational focus while driving innovation. This approach aligns your company's business strategy with its ability to identify, prioritize and select the right innovation projects, ultimately culminating in better investment decisions. The approach also enables you to understand time-phased demands across an expanse of innovation projects, financial requirements and their related interdependencies.

At the bottom line, Teamcenter's portfolio management capabilities enable your company to more clearly outline its strategic direction and ensure that this direction is managed and executed on a global enterprise basis. Equally important, these capabilities allow you to better focus your innovation programs on product offerings that matter – in essence, making certain that you invest the right resources on the right projects in the right areas while moving forward in a unified direction.

**In brief:**

Siemens is the only software providers capable of linking your strategic portfolio management processes to the detailed operation of your product lifecycle.

Siemens' Teamcenter drives this high-level functionality by enabling you to define your operational and product structures and then relate them to the portfolio management best practices that you want to implement.

You can use Teamcenter to define your high level strategic objectives and key performance indicators and then use these values to drive your operational execution and monitor the current state of your portfolio pipeline.

### Teamcenter's portfolio management capabilities

Capability	Value
Collaborative portfolio definition and management	Enables your company to create and agree upon enterprise and/or business unit portfolios and their related strategies
Definition of strategic objectives	Allows your company to clearly define and disseminate their strategies in terms of weighted strategic objectives, scoring models and performance criteria for scoring ideas, initiatives, portfolios and projects
Formal idea capture and consistent value scoring	Provides a consistent approach for capturing and assessing program/project candidates; leverages process templates to retain/track associated documentation, as well as to manage the review/approval process through re-usable workflow routings
Portfolio analysis and review	<p>Focuses your decision making process by enabling you to select the right ideas, initiatives, portfolios and projects; allows decision makers to evaluate new ideas and Teamcenter-managed projects against strategic objects and their constraints, including risk, budgetary and scheduling criteria.</p> <p>Combines automated portfolio prioritization and optimizations with “what-if” modeling and analytics to facilitate the rapid evaluation of alternatives and the selection of the right portfolio.</p>
Collaborative workflow and approval	Ensures the involvement and buy-in of all entitled stakeholders in the decision making process by leveraging standardized procedures and signoffs, as well as formal business case management techniques
Portfolio performance measurement	Facilitates a quantitative approach to measuring project performance, including tracking and managing the project pipeline through the use of operational program execution and its integration with Teamcenter and tools such as Microsoft Project.
Linkage between strategic planning and operational execution	Enables your company to set high level goals, focus operational performance and provide continuous real-time performance feedback within staged development-oriented processes.
Open integration	<p>Enables your company to integrate Teamcenter-driven strategic planning and operation execution management processes with other PLM processes – including processes for customer needs management, requirements management, workflow management, change management, team collaboration, document management and records management.</p> <p>Facilitates integration with key business systems, including ERP, SCM and CRM systems, through the use of standard transfer protocols that ensure up-to-date and aligned decision making</p>

#### In brief:

Teamcenter provides the following specific portfolio management capabilities:

- Collaborative portfolio definition and management
- Formal idea capture and value scoring
- Portfolio analysis/review
- Collaborative workflow and approval
- Portfolio performance measurement
- Link between strategic planning and operational execution
- Open integration with existing business systems

## Footnotes

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- <sup>3</sup> Ibid.
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- <sup>5</sup> *The PDMA Handbook of New Product Development*, Kenneth B. Kahn, George Castellion and Abbie Griffin, Second Edition, 2005.
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- <sup>8</sup> *Unmanaged R&D Spending Is the Leak that Shareholders Want Plugged*, Kevin O’Marah and Laura Carrillo, ARM Research, 2004.
- <sup>9</sup> “New Product Development as a Complex Adaptive System of Decisions,” Ian McCarthy, Christos Tsinopoulos, Peter Allen and Christen Rose-Anderssen, *Journal of Product Innovation Management*, September 2006.
- <sup>10</sup> *The Product Portfolio Management Benchmark*, Jim Brown, Aberdeen Group, August 2006.

## About Siemens PLM Software

Siemens PLM Software, a business unit of the Siemens Industry Automation Division, is a leading global provider of product lifecycle management (PLM) software and services with nearly six million licensed seats and 56,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with companies to deliver open solutions that help them turn more ideas into successful products. For more information on Siemens PLM Software products and services, visit [www.siemens.com/plm](http://www.siemens.com/plm).

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