Third-Generation Portfolio Management

The Evolution of Portfolio Management in the Biopharmaceutical Industry

By Tom Keelin and Bill Shew

Portfolio management has progressed through three generations in the biopharmaceutical industry, ranging from early management science tools in the 1980s, through resource allocation techniques in the early 1990s, to the high-powered, value-adding business processes that some companies are using today. The third-generation processes have several requisite elements that ensure success and that distinguish them from second-generation implementations that have been hit or miss. In addition, several third-generation implementations are supplemented by best practices that result in even greater competitive advantage.

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Three generations of portfolio management

For most large pharmaceutical companies, first-generation portfolio management was an isolated staff function that emerged during the 1980s and continued through the mid-1990s. Those pioneers experimented with decision analysis, quantitative and qualitative models, and other management science methods in hopes that they might one day be helpful to setting priorities within R&D portfolios. The staff members had little visibility with line management, and the methods they used, however elegant, had no impact on decision-making or resource allocation.

Second-generation portfolio management emerged in response to the period of abundant scientific opportunity and constrained resources in the industry beginning in the early 1990s. R&D portfolios had become more complex. Investment tradeoffs could not be avoided and were not effectively handled by traditional approaches. Most companies established formal portfolio management processes and functions. Staff, often supported by consultants, engaged with line management to support analyses and decisions about resource allocation. The landmark *Harvard Business Review* article "How SmithKline Beecham Makes Better Resource Allocation Decisions" showed how one company approached it. Others approached it differently. The results were mixed. Some companies added significant value to their pipelines through portfolio management; others did not.

Third-generation portfolio management contributes real value and sustained competitive advantage. Portfolio management is an established business process that is linked with other business

Making Better Resource-Allocation Decisions

In 1998, Harvard Business Review published "How SmithKline Beecham Makes Better Resource-Allocation Decisions" by Paul Sharpe and Tom Keelin, a case study that outlined a more rigorous and transparent approach to portfolio management. The situation that SmithKline Beecham (SB) faced in the mid-'90s was similar to that faced by many in the industry. The patent on its blockbuster drug, Tagamet, was about to expire and SB was tightening R&D budgets in anticipation of the earnings squeeze. Management agreed that the new product portfolio would need to be cut back to provide for other corporate priorities. Having tried a variety of portfolio management approaches and finding all wanting, SB sought a better way. Its goal was to design and implement a decision-making process that was both technically sound and credible to the organization and built commitment to action across business areas, organizational levels, and geography. The result of their efforts was a business process and valuation approach that enabled SB to transparently achieve better decisions.

When these were applied to SB's late-stage portfolio of 20 major projects, the resulting decisions were a major departure from the momentum. Only four projects received the momentum funding, while ten received increased funding, and six were cut back. The result was a 30 percent increase in the overall value of the portfolio without an increase in R&D spending and a threefold increase in investment productivity of the lowest productivity project within that budget.

The increased investment productivity was great enough to make additional investment in the portfolio more attractive relative to other corporate uses of capital. Ultimately, this led SB to increase development investment by roughly 50 percent. "In the end, we estimated that our portfolio was worth $2.6 billion more than it was when we started. This was powerful confirmation that our efforts were worthwhile," said Paul Sharpe, then vice president and director of SmithKline Beecham.

Figure 1: Three generations of portfolio management

	First Generation	Second Generation	Third Generation
Purpose	Learn	Solve problems	Create new value
Perspective	Experiment	Minimize cost	Maximize return on investment
Impact on decision-making	None	Very little for most companies	Significant, identifiable directional changes
Value added	None	Rarely measurable Mixed perceptions	Real, measurable Sustained advantage
Role of staff	Isolated	Provide "useful inputs"	Lead decision-making process Fully engage key players
Line management engagement	Not visible to line management	Choppy seas	All key players committed
Business process	None	Established, feeds budgeting	Well interlinked with business and TA strategies, budgeting…
Era (for most)	1980s through mid-1990s	Mid-1990s to present	Now emerging

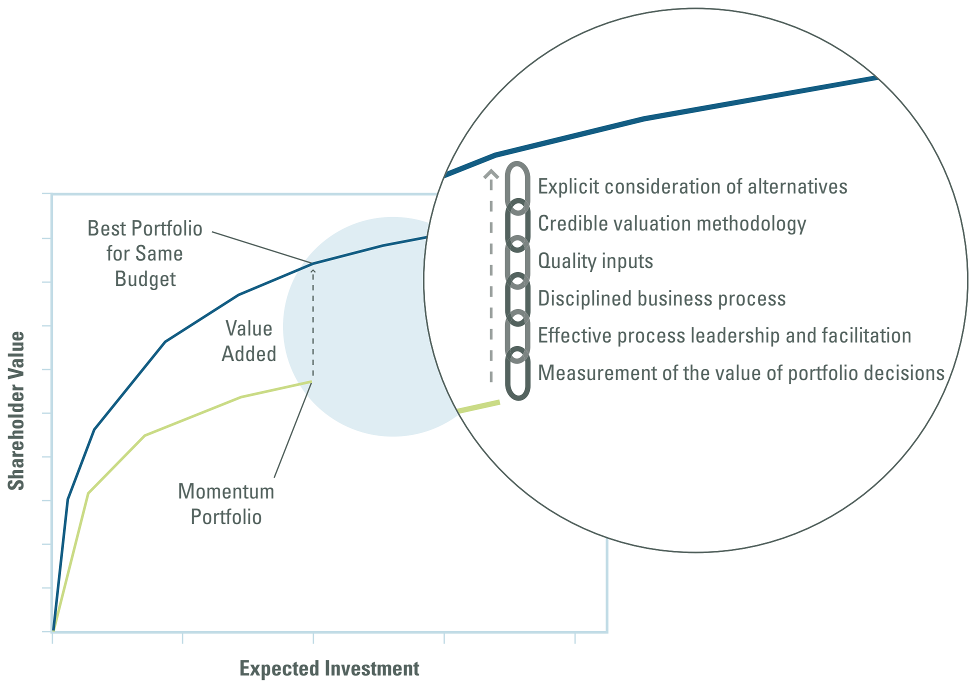
processes including strategic planning and budgeting. Decision-making and resource allocation are measurably improved. Efforts devoted to portfolio management are justified by hundredfold returns on investment. The third generation captures the best of what was learned during the second generation and applies it more broadly to marketing, therapy area, and business portfolios. Figure 1 depicts the evolution of these generations of portfolio management. This paper defines the third generation.

Mixed results

In the second generation, the value added by portfolio processes was remarkably different across companies. Some leading pharmaceutical and biotech companies repaid the investment in portfolio management hundreds- or thousands-fold through improved portfolio decisions. Others also invested significantly but achieved little in terms of improving the quality of decision-making. Why is it that second-generation portfolio management at some companies contributed significantly to better decisions and increased shareholder value, while at others it did not?

In our experience, the unsuccessful companies have not been comprehensive in their application of the fundamental elements of effective third-generation portfolio management. As shown in Figure 2, these act together like the links of a chain. If any one link is weak or missing, decision-

Figure 2: Links in the chain of success for portfolio management



The fundamental elements of effective portfolio management act together like links in a chain. If any one is missing or weak, the result is significant lost opportunity to improve the pipeline's value.

making typically reverts to what it would have been without portfolio management, and little or no value is added by this potentially critical function. The result is a significant lost opportunity to improve the pipeline's value potential.

In the two sections that follow, we describe these fundamental elements of success in third-generation portfolio management and identify a number of additional best practices used by current industry leaders. These are based primarily on the industry's experience in the late-stage portfolio, where the earliest activity in portfolio management has focused. We conclude by describing other portfolio management areas — discovery, portfolios of businesses, therapeutic areas, and marketing investments. Our experience suggests that the fundamental principles, to varying degrees, are critical for success in these other portfolio problems as well.

Links in the chain of success

Explicit consideration of alternatives

The most frequent source of failure in portfolio management continues to be the insufficient consideration of alternatives for individual assets. In organizations where decision-making is the goal of the portfolio process, the lack of alternatives generally results in the status quo being maintained with few, if any, real decisions made. The explicit consideration of alternatives promotes decision-making by providing management with an understanding of the options that are realistically available and the ability to make tradeoffs across the portfolio.

The alternatives need to reflect each asset's strategic challenges and opportunities, along with the overall corporate or therapeutic area strategy and any organizational constraints. For example, an organization with significant budget constraints might ask teams to identify alternatives with a range of resource levels:

- Minimal: How can we capture value from this asset while minimizing further investment?
- Buy-down: If resources are cut, how could we modify the program to preserve as much value as possible?
- Momentum: Given anticipated resourcing, how can we create as much value as possible?
- Buy-up: If additional resources become available for this asset, how could they best be applied?

"High-quality valuations remain the foundation upon which effective third-generation portfolio processes are built."

In this situation, considering resourcing alternatives enables senior management to gauge whether funds devoted to one project might create higher value if shifted to another, thus ensuring optimal use of a limited budget.

In addition to simply not considering alternatives, organizations encounter a number of failure modes:

- Alternatives are created by only one side of the organization and thus do not adequately reflect cross-functional perspective.
- Alternatives are template driven and do not sufficiently reflect the asset's specific strategic challenges to be actionable or compelling.
- Alternatives are too similar and do not provide senior management with real choices or ability to make tradeoffs.
- Alternatives are reflective of the asset's situation but are unrealistic in the face of broader strategic priorities or financial considerations.

Credible valuation methodology

High-quality valuations remain the foundation upon which effective third-generation portfolio processes are built. The degree of analytical rigor and sophistication varies, but all such processes involve a valuation methodology that adequately captures the risk and value associated with each potential investment. Uncertainty — both commercial and technical — is also explicitly captured and reflected in the valuation to provide decision-makers with more than just a view of the world in which everything goes exactly as planned. Understanding the range of possible outcomes and associated key sources of uncertainty provides management with a key tool to manage and balance the portfolio.

Common frameworks for all assets within a portfolio are also needed. This does not imply that a "one size fits all" approach should be used but that the underlying logic and principles are shared, ensuring the comparability of analyses. The key is not to create the most technically complex or precise analysis, but to apply sufficient rigor so that senior management has an analysis that it feels is credible and that yields the strategic insight needed for decision-making.

Quality inputs

In order to be credible, the valuations need to incorporate input from the most informed sources, with the underlying assumptions captured and easily interrogated. It is insufficient to simply gather expert assessments of the key inputs. Recording the information source and the assumptions that form the basis of the input is equally important. These inputs then need to be challenged through a peer review process, in which other knowledgeable individuals validate or revise the inputs in an open forum to help ensure the accuracy, consistency, and comparability of analyses across franchises or operating companies. Additionally, external views, where available, are often important to confirm or challenge internal opinion, particularly for inputs with the potential to change decisions.

"To be effective, the portfolio management process must be actively managed."

Disciplined business processes

The companies using third-generation approaches effectively implement disciplined decision processes that involve stakeholders at key points throughout. They clearly define governance structures, ensuring that all involved — from the asset teams to the senior decision-makers — understand their role and responsibilities, agree on the decisions to be made, and agree on the requirements for quality decision-making. Interactions between teams and management are structured and staged so that key issues are identified and addressed early, allowing sufficient time for corrective actions to be taken.

Common weaknesses of portfolio management processes are:

- Excessive focus on the analytics and insufficient attention to ensuring quality conversations about key issues and to gaining organizational alignment and commitment to action
- Charter primarily by one part of the organization and lack of sufficient cross-functional perspective and commitment to action
- Failure to ensure interaction between the teams and management at key points, risking that key issues will remain unaddressed until the final decision meeting
- Insufficient senior management sponsorship, so that teams do not view the process worthy of significant effort.

Effective process leadership and facilitation

To be effective, the portfolio management process must be actively managed. It is insufficient to send out spreadsheets or templates for teams to complete and then gather and summarize the output using clever analytics. Knowledgeable leaders need to facilitate the process by working directly with both the asset teams and senior management, challenging their status quo thinking and actively ensuring that those involved understand the process and invest enough time at the right junctures to build in quality.

The process leaders need to communicate clearly with the organization, defining timing, deliverables, and objectives while setting expectations for quality and rigor. It is essential that this communication is two way. The leaders need to actively measure how much of the process the organization understands and supplement official communication as needed to minimize confusion and ensure time is spent on the value-added activities. They must be visible and accessible throughout the process and alert to situations that require additional judgment and guidance, either providing it themselves or seeking help from senior management. Finally, they must be adept at promoting communication at both the asset team and senior management level to ensure that the right conversations occur and that senior management has the information it needs to make quality decisions.

"Functional ownership of portfolio management is much less important than the capabilities of the people who lead it."

Measurement of the value of portfolio decisions

Another step that companies with effective third-generation portfolio management approaches take is to measure the implications of portfolio decisions and demonstrate the value added. The measurement format varies, depending on the focus and decision frame of the organization's portfolio management approach — is the organization more forward looking (how do we measure up against our goals?) or backward looking (how did we do over the last year?). Some of the representative approaches that we have observed are:

- Comparison of value between the chosen portfolio and the portfolio of momentum plans for each asset
- Measurement of portfolio performance relative to corporate aspirations
- Comparison with the prior year's portfolio.

Regardless of approach, the intent is to provide insight into the impact of portfolio decisions, enabling the organization to make more effective decisions in the future.

Leading practices

Beyond the fundamentals, a number of additional practices are frequently used to add greater value through third-generation portfolio management. These include:

- Ensuring appropriate ownership of portfolio management
- Implementing both real-time and periodic processes for portfolio decision-making
- Incorporating multiple value measures into prioritization and resource allocation decisions
- Ensuring alignment and integration with other organizational planning and decision processes
- Associating value with choices
- Aligning internal and external perceptions of value.

Ensuring appropriate ownership of portfolio management

Many companies have struggled with where to base portfolio management — should it reside within the R&D, commercial, or finance organization? The best answer differs by company (Figure 3). Functional ownership of portfolio management is much less important than the capabilities of the people who lead it and the style with which they interact with other functions within the company. Most important, the leaders must be respected by all functions for their neutrality, supportive facilitation approach, and integrity. Senior management must also respect their perspective and ability to communicate clearly, in a way that continuously improves the quality of conversations about decision-making.

Figure 3: Implications of portfolio management organizational position

Organizational Reporting	Typical Advantages	Typical Disadvantages
Commercial	• Greater alignment with business planning process, operating companies, regional organizations • Direct linkage to commercial strategy drivers — e.g., competitive profiling, positioning strategy	• Can lack traction or influence in R&D • Achieves highly value-focused analyses but fails to drive toward decisions relevant to development programs
R&D	• Greater alignment with R&D process and resource allocation • Closer linkage to technical possibilties — e.g., clinical program design, risk management strategies	• Can lack traction or relevance in commercial • Options tend to be "science driven," rather than "market driven"
Other	• No need to pick champion or bridge divide to the other side • Neutral affiliation potentially powerful in certain cultures	• Potential for sidelining – can lack decision influence/relevance in any quarter of the organization • Tendency to become focused on analytical churn, rather than surfacing portfolio choices

Implementing both real-time and periodic portfolio processes

Initially, most portfolio management processes are periodic, typically annual or semiannual reviews. Stage-gate decisions for individual assets, however, need to be made throughout the year in "real time." These funding decisions often have major portfolio implications and thus need to be considered in the context of the entire portfolio.

Our experience indicates that companies with the most effective third-generation portfolio management processes are utilizing portfolio management both in real time and periodically. Real-time consideration of major investment decisions and their potential impact on the portfolio is essential for portfolio management to have organizational traction, especially with time to market as a critical consideration. A common failure mode is to make these decisions "deli-counter style," as the head of a major pharmaceutical company once described the allocating of resources to projects on a first-come, first-served basis. Individual decisions can and should be considered in the context of the broader portfolio: How well do the investments being considered stack up against other ongoing and potential projects? How much funding is available? What are the implications on other upcoming funding decisions? What are the portfolio tradeoffs that may be required if the program is funded? Good real-time processes ensure such important considerations are part of the decision-making context.

Even when effectively implemented, real-time processes are not sufficient, as they typically miss the broader strategic view that more periodic portfolio analyses can provide. A periodic review is particularly useful in enabling management to step back and take stock of the portfolio and its forecast performance, reprioritizing or redirecting effort if necessary as the portfolio changes. These periodic meetings can also be effective and efficient forums for considering additions to the portfolio (e.g., new program initiations). Without an explicit request to bring new ideas forward, the many new ideas that exist at any one time in most organizations would languish. Without a common forum for comparing them, the flow into the portfolio is largely by what comes along, rather than the best ideas prioritized by management for risk mitigation, investment, or acceleration.

"The goal of a portfolio analysis is to enable senior management and teams to have better conversations about important decisions."

Software can be a valuable enabling system, particularly in real-time processes, to ensure that management has the full set of information it needs in a timely manner. Software systems have the potential to reduce the analytic burden, serve as an efficient means for capturing inputs and pedigree, and provide historical tracking of asset valuations and overall portfolio performance. They are, however, only tools, not stand-alone solutions, and often lack the flexibility needed in most companies to respond to the evolving environment. Companies that have framed portfolio management as primarily a software solution have failed to achieve significant added value because of insufficient attention to strategic, organization, and process challenges.

Incorporating multiple value measures

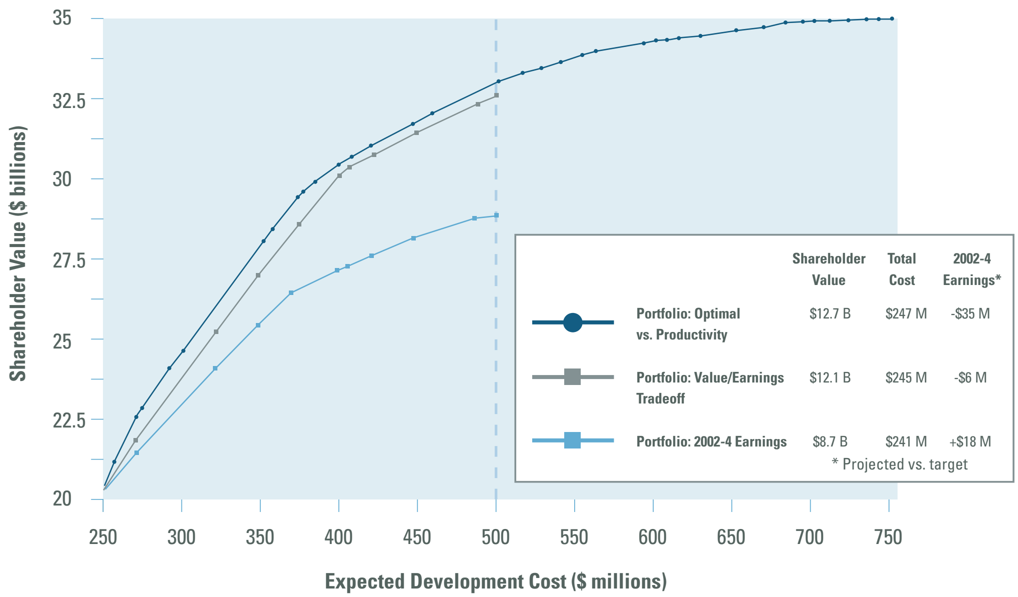
A key component of effective third-generation portfolio management processes is portfolio prioritization and resource allocation. Effective portfolio analysis can identify the optimal portfolio in terms of value creation for any given constraint (for example, efficient frontier analysis). Over the last five years, the industry best practice has evolved further to explicitly consider multiple value measures, enabling a richer set of tradeoffs for the optimal portfolio. Consider, for example, three possible portfolios for a company (Figure 4). The "optimal" portfolio — the portfolio that creates the most value potential for a specific amount of investment — has an expected shareholder value increase of $12.7 billion for a $250 million incremental investment but a negative impact on 2002-2004 earnings of $35 million. If the portfolio that maximizes near-term earnings is selected, the result is an $18 million increase in 2002-2004 earnings but only $8.7 billion in shareholder value. A third alternative — preferable to the management team striving for long-term shareholder value creation while also needing to ensure near-term earnings growth — creates $12.1 billion in shareholder value with the same investment but has a significantly smaller negative impact on near-term earnings.

The goal of a portfolio analysis is to enable senior management and teams to have better conversations about important decisions, not to provide management with THE answer. Other considerations —strategic, financial, or organizational — will naturally be part of this conversation. By providing management with an explicit understanding of its options and clarifying the extent of the tradeoffs involved, portfolio management can help align different perspectives and significantly improve senior management's ability to select a portfolio that best delivers on the broad set of corporate goals.

Ensuring alignment and integration with other organizational processes

When initially implemented, portfolio management processes are often independent from other organizational planning processes. Because of their very nature, early attempts at portfolio

Figure 4: The consideration of multiple value measures can surface broader tradeoffs and support corporate objectives.



In making portfolio choices, there is an "optimal" portfolio that maximizes value but will have a negative impact on short-term earnings. Another choice maximizes near-term earnings but creates little additional long-term value. A preferable alternative is represented by the middle line — one that achieves long-term shareholder value creation while minimizing the impact on near-term earnings.

management are often pilots, and energy is not expended to link a pilot process to other existing processes until it has become more established. So long as established portfolio processes remain largely disconnected from other planning processes, however, the result is significant loss in value and unnecessary increases in workload.

The goal should not be full integration of all processes, as each process serves different organizational needs. Rather, processes should be designed to reduce overlap, use consistent frameworks, and ensure that ideas build from one process to the next so that senior management has a full set of information to make decisions. All too often, the insights from one process are lost or even contradicted in the next, resulting in second-guessing of decisions or in lost opportunity. The best companies are overcoming organizational complexity, uniting different processes to both meet the specific needs of each process and maximize their overall value contribution.

Associating value with choices

Leading companies move beyond the standard definition of portfolio value, that is, linking value directly to individual assets. For these organizations, value is created not by the asset itself, but by the choices that the organization makes about the asset. This is a subtle but critical distinction. The focus is on strategies and plans that provide information and create options. There is a clear distinction between the decisions that need to be made now and the decisions that can and should be made later, when more information is available. These organizations ask, How can we design the clinical trial to provide us with the information to make a smarter choice? What actions can we implement that will expand our possible options, not narrow them? When do we need to make this decision, and what is the range of information and choices that will be available to us then? The focus becomes one of information, options, and decisions — and the linkage between them — rather than specific plans that prescribe specific downstream clinical or marketing investments, particularly when long time horizons or considerable risk are involved.

This subtle shift in frame enhances the strategic thinking of an organization and improves its ability to anticipate and act proactively. These organizations are able to identify sources of value more quickly and dedicate sufficient investment to respond to evolving sources of risk and opportunity and to help focus management attention on the most valuable issues and choices. Most important, they create more value than companies in similar situations with similar assets, because of their greater ability to create options that enrich their pipeline both now and in the future.

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Aligning internal and external perceptions of value

An important shift in the biopharmaceutical industry is the equating of internal perceptions of value (e.g., expected NPV) with the perceptions of external stakeholders and financial markets. The market bases the value of a company primarily on near-term expectations for growth and profitability. The task for portfolio management is not just to identify and align the organization with a value-creating investment strategy, but also to portray this strategy in the light of the metrics markets pay attention to. In other words, the leading companies are not simply identifying an optimal portfolio strategy, but finding a way to achieve maximum value while meeting the expectations of the investment community for consistent growth and profitability as well. For some companies, using portfolio analysis to convey the value of their pipeline to investors has resulted in a more accurate reflection of pipeline potential in their stock price.

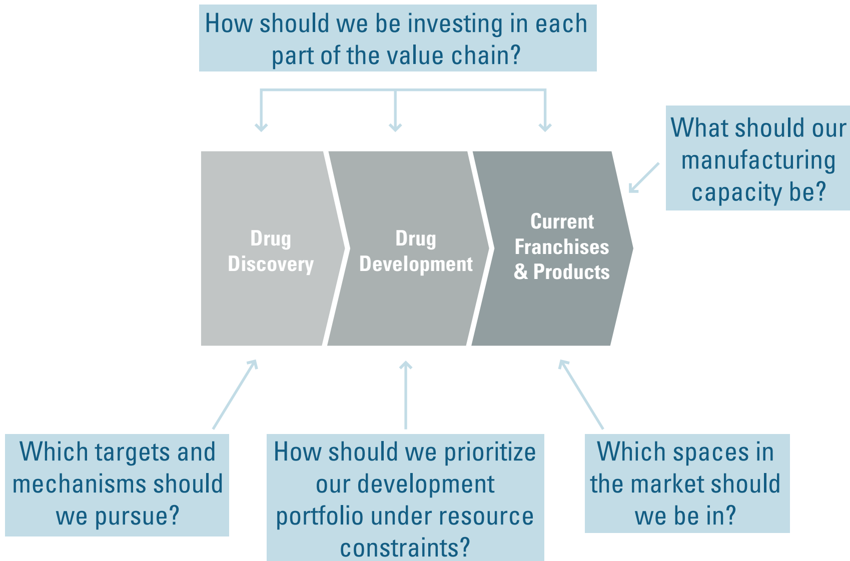
Evolving portfolio management challenges

Over the next five years, we expect to see broader application of the principles of third-generation portfolio management both across the value chain — e.g., discovery and sales and marketing — and up the value chain, elevating portfolio management to a more strategic level (Figure 5).

To date, the vast majority of successful applications of portfolio management within the industry have been in the late-stage portfolio. The reasons for the focus here are clear — the individual investments are large, cross-functional involvement and alignment are essential, and the potential tradeoffs more difficult. Yet our experience is that third-generation portfolio management can add significant value by improving decision-making and resource allocation in a variety of other settings in biopharmaceutical companies, including:

- Corporate portfolio of business units and/or therapeutic areas
- Sales and marketing investments
- Licensing and mergers and acquisitions
- Discovery and early development.

Figure 5: Portfolio challenges are present in all areas of the pharma value chain.



While most applications of portfolio management have been in the late-stage portfolio, there are opportunities to improve decision-making in drug discovery and sales and marketing portfolios.

Portfolio management approaches can also be effectively applied to manufacturing and decisions about investment levels across the entire value chain (for instance, how much should we invest in discovery versus development and sales and marketing?). The tradeoffs within these portfolios are very different, but the underlying concepts are common to each.

These broader applications will be particularly critical in the coming years as companies struggle further with less productive pipelines, patent expiries, and an increasingly competitive global market. The economics of the entire value chain may change, driven by a combination of regulation, technological innovation, and advances in personalized medicine. Portfolio management techniques can be the difference between survival and thriving in a difficult period by helping to ensure that resources are allocated to the most valuable assets and components of the value chain.

Corporate portfolio of business units and/or therapeutic areas

Even in many companies with effective portfolio management approaches for the late-stage portfolio, comparatively little analytical rigor goes into the decisions about resource allocation across the company's business units. Often these decisions are based on minor adjustments to the previous year's budget or set at a fixed percentage of sales. Each business unit is then left to allocate resources however it sees fit, regardless of how the potential returns on each project compare with opportunities in other areas of the company. With business units typically having different growth prospects, profitability, and investment opportunities, this approach commonly results in suboptimal allocation of resources. All too often, mature businesses are overfunded because of their historical success and organizational power at the expense of burgeoning areas with greater growth and profit potential.

Applied to the corporate portfolio of business units or therapeutic area franchises within the pharmaceutical business, third-generation portfolio management approaches can significantly upgrade the quality of resource allocation decisions in every business unit. Explicit consideration of the strategic alternatives for each business unit, the investment required, and the associated risk and shareholder value creation provides senior management with a significantly greater depth of understanding about options and potential tradeoffs. For example, is continued investment in each business unit in the best long-term interests of the company, or should one or more be spun off or sold? What is the minimal level of investment sufficient to maintain competitiveness and a continuous earnings stream? What additional growth could be generated by higher investment? Portfolio management can help answer these questions and ensure optimal and resource allocation across the businesses.

"Portfolio management techniques can be the difference between survival and thriving in a difficult period."

Sales and marketing investments

Sales and marketing scale and global presence have become increasingly critical to success. In many companies, sales and marketing expenditures now exceed R&D budgets. The commercial options that are available have also expanded in recent years, creating a potentially rich and valuable portfolio problem: how does the company optimally invest in its commercial activities to create the greatest shareholder value? Companies need to allocate resources across many different sales and marketing channels — details and samples, formulary rebates, Phase IV studies, direct to consumer advertising, conferences and symposia, etc. — and across many different therapeutic areas, products, and geographies. Sales and marketing decisions can be as critical as development decisions, particularly for new product launches. While the feedback loop is shorter than it is for R&D investments, the uncertainty in the return on investment in sales and marketing is often as large. Yet as complex as the set of sales and marketing investment decisions can be in a global biopharmaceutical company, few companies use a rigorous, disciplined approach to manage this portfolio.

We are seeing a small but growing number of companies utilize a disciplined portfolio process for sales and marketing decisions, enabling them to improve upon many common practices:

- Allocating sales and marketing investment based on current product sales rather than in terms of expected return on investment
- Allocating budgets by making minor adjustments to last year's spend as opposed to zero-based allocations
- Focusing on the wrong metrics for a product or market's stage of maturity
- Not understanding the return or response curve for each marketing channel
- Lacking a systems perspective on the investments.

Third-generation portfolio management approaches will help these companies gain greater return on investment for their sales and marketing decisions through better resource allocation, leading to greater growth in sales, earnings, and shareholder value. While late-stage portfolio management typically contributes to mid- and long-term growth and value creation, it is often unable to have a significant positive impact on near-term sales and earnings. The sales and marketing budget typically provides the best opportunity for short-term impact. With many companies struggling to meet their aggressive growth goals, portfolio management activities that evolve to help this complex and increasingly urgent issue will be a source of significant value.

Licensing and mergers and acquisitions

In many companies, business development activities work outside existing portfolio and decision-making processes. Portfolio management traditionally focused on optimizing the company's existing portfolio of assets within a given constraint. However, many companies are now struggling with an insufficient number of attractive internal opportunities and are aggressively looking externally for investment opportunities. The cost and competition for these deals have increased significantly, making it all the more important for companies to make smart decisions. Yet the discipline that companies apply to internal portfolio decisions is often nowhere in sight when decisions are made about external opportunities. This is partly due to the different quality of information available and the shorter decision time frame (although in our experience the urgency of many L&A timelines is overstated when compared to the actual time it takes for decisions to be finalized). The reason that external development is outside portfolio management processes is primarily a cultural one; senior management does not usually require, expect, or reward dealmakers for being disciplined decision-makers.

"Companies need to make intelligent decisions on all their assets, regardless of how well they fit with the broader strategic goals of the company."

Nonetheless, given the increasing competition for deals and the low R&D productivity across the industry, we believe that the most successful companies will use third-generation portfolio management both to help inform L&A and M&A activities — Where do our gaps exist? How large are they? What time frame? Which therapy areas? — and to provide the standard against which to judge the quality of external opportunities — How does this investment compare with internal opportunities? Decisions on external opportunities should be made in the context of the overall portfolio and judged in a similarly disciplined fashion against the broad set of other external opportunities.

Companies need to make intelligent decisions on all their assets, regardless of how well they fit with the broader strategic goals of the company. Traditionally, biopharmaceutical companies, particularly large ones, have not done an exemplary job in managing assets with low strategic importance or commercial value potential. However, we see an increasing importance for companies to extract the full value from these assets, including investigating out-licensing opportunities. Portfolio management can contribute significantly to these efforts by appropriately valuing the assets, helping identify candidates for out-licensing, and by targeting companies that would place a higher value on these assets.

Discovery and early development

Just as in late-stage development, decision-making in discovery involves choices and tradeoffs between many competing investments, but most companies lack structured approaches. Why is this the case? The reasons commonly given are all fair: individual investments in discovery are much smaller than in late-stage development, very little information is available, scientific innovation cannot be measured or analyzed in a meaningful way, etc. Generally, however, we find that the misgivings are more about how portfolio management will be applied in discovery (e.g., inappropriately rigorous analysis and processes) than about the concept of discovery portfolio management. We believe that there are effective approaches to implementing portfolio management in discovery, and the value that they can provide outweighs these concerns:

- Truly innovative medicines are needed and highly valued; the rising cost of in-licensing in recent years reflects the level of competition.

- Opportunities abound, along with a flood of information and a plethora of choices — diseases, mechanisms, targets, technology platforms, etc.
- Intense competition and well-served segments make choices even more critical.
- The pace of innovation and productivity in discovery has strained the resources of development organizations in many companies.
- Consistency on direction and funding for development and discovery has become increasingly important.

"With the rise of stronger and more focused therapeutic area franchises, instances of conflict between strategic and portfolio processes are increasing."

Framing the portfolio problem in discovery can take many different shapes and needs to reflect the organization's challenges and opportunities. Specific examples include:
- Therapeutic area focus — which TAs and how many should discovery focus on?
- Target focus — which mechanisms, molecular targets, and drug classes should the organization focus on within a therapeutic area?
- Technology platforms — what technologies should we invest in and at what level?
- Staffing resources — what level of staffing in different functions to support an overall strategy? How to assign priorities under resource limitations?

Leading companies will utilize third-generation portfolio management to create a competitive advantage in discovery. This will require new approaches and thinking — for example, in most cases the compound frame appropriate for the late-stage portfolio breaks down in discovery — but underlying principles similar to those used in late-stage portfolio management:
- Valuation processes that yield transparent, comparable results but with much less detail and implied preciseness
- Processes that involve both the experts and decision-makers, building buy-in and commitment to action throughout
- Explicit consideration of alternatives.

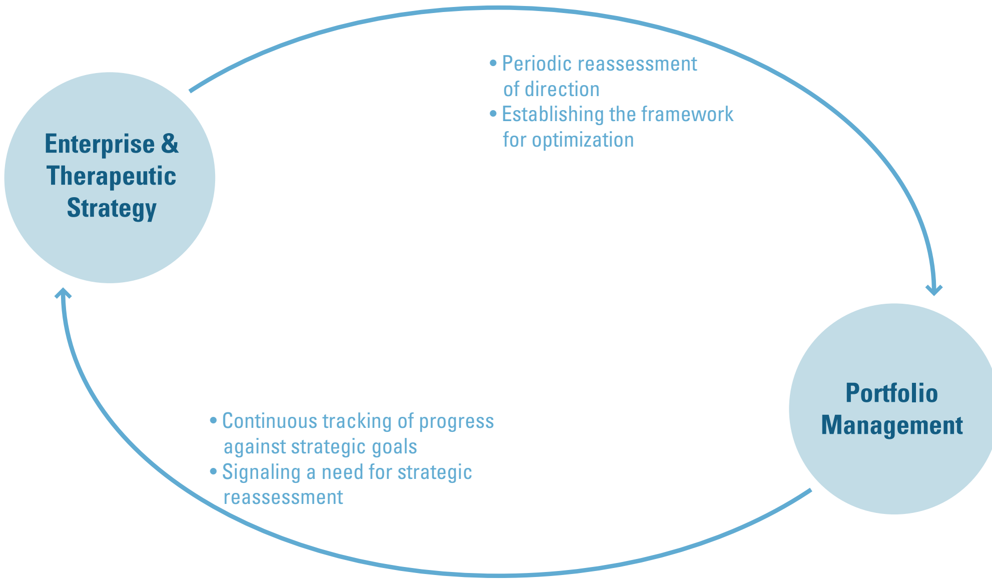
While effective management of the late-stage portfolio is a must in the biopharmaceutical industry, so is ensuring a supply of valuable assets to manage.

Aligning portfolio management and strategy

Almost every significant biopharmaceutical company we are aware of has both portfolio management and strategic planning processes. The degree of alignment between these processes, however, varies significantly. Strategy is generally about setting direction and achieving competitive advantage — providing a top-down perspective to decision-making — while portfolio management is typically used to help optimize existing assets — driving bottom-up decision-making. Confusion arises where both strategy and portfolio processes provide input to resource allocation, particularly if the recommendations that are produced are in conflict.

With the rise of stronger and more focused therapeutic area franchises, instances of conflict between strategic and portfolio processes are increasing. Companies have the strategic goal of leading in a particular therapeutic area but often lack the quality pipelines to achieve this goal. Portfolio management processes — focused on individual assets — can point the company in directions that are inconsistent with the stated strategy. Tradeoff decisions are a constant: Should

Figure 6: Strategic ("top-down") and portfolio management ("bottom-up") processes need to function together — iterating with and informing each other.



the company invest in an opportunity that is not as attractive as other internal opportunities projects but is a priority for achieving a leadership position? Or should it invest in the project with a high return on investment in an area of secondary strategic importance? What about projects that help build a new franchise, even if the investment required is high when considered in isolation? Should the company invest in an internal compound that does not have a natural fit with one of its leading therapeutic areas or in-license an intriguing compound with greater strategic fit? Or does the company need to rethink its broader strategic goals?

Third-generation portfolio management will need to evolve to better support these broader strategic decisions and tradeoffs. The goal is not for portfolio management to replace strategic planning, nor is the answer necessarily in more sophisticated portfolio analytics. What is needed is much closer communication between the two processes, particularly in terms of the insights, choices, and tradeoffs that each process tees up (Figure 6). Senior management attention should focus on situations when the processes deliver conflicting messages; this is where better information and deeper insight are required. The processes need to be linked both in concept and specific design. Strategy should offer a statement of direction and goals that guides the organization and sets the framework for operational processes. The portfolio process should judge progress against strategic goals and, when appropriate, signal a need for reassessment of strategy. Integrated, mutually supportive portfolio and strategy processes can work together to provide senior management with a more complete picture of value potential and a decision framework that clarifies when directional or optimization challenges are most acute.

Summary

Portfolio management has evolved over the last decade, driven both by the challenges faced within the industry and the availability of more effective analytic and process approaches. Some companies have utilized portfolio management to dramatically increase the value of their portfolio and contribute to attaining a position of leadership in the industry, while others have implemented portfolio processes that have had little impact. Much of this difference can be attributed to their mastery of a small set of best practices, without which portfolio management efforts add little or no value.

The challenge of portfolio management will continue to shift as the industry evolves and new issues and tradeoffs emerge. The leaders in this next evolution will be the companies that can leverage existing expertise in third-generation portfolio management — valuing complex, highly uncertain assets, proactively considering alternatives, and building processes that generate commitment to action — and apply them effectively to a new set of decisions and challenges. The fundamental goal remains the same: increasing shareholder value by improving the ability of the organization to make high-quality portfolio decisions within a complex environment.

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