

Finding your balance: Insights into world class portfolio management

Findings from Arthur D. Little's R&D Management Best Practice Study



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ADL's study: Perspectives on R&D Best Practices

In 2013, Arthur D. Little (ADL) completed its 8th Global Innovation Excellence Study (GIES), a global, cross-industry survey of trends and best practices in innovation management. Drawing on over 1,000 responses across the last two GIES, it shed new quantitative light on the key question: What innovation management techniques achieve the best return on innovation investment? In 2014–15 ADL followed up with a study to gain more in-depth qualitative insight into emerging R&D management practices. Twenty-three case studies were developed, with fifteen companies identified as innovation leaders. These global participants have average revenue of \$30 bn and are spread across a broad range of technology-intensive industries (including medical devices, pharma, consumer goods, specialty chemicals, food and beverage, oil & gas and industrial equipment). The firms are evenly split between those headquartered in the US and those in Europe. From the rich material that these companies shared with us, we identified common challenges and insight into how these innovation leaders are responding. Anonymized case studies and quotes from our interviews and meetings have been used to illustrate best-practices.

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Executive summary

In the current era of technological disruption and global competition, it is more important than ever to have a clear grip on how the full intent of corporate strategy is manifested in the R&D portfolio. Allocating resources in line with that strategy achieves better results – yet all too often, companies rely on stage gate controls at individual project or program levels. This is not sufficient to achieve the dynamic R&D portfolio management and resource allocation that global corporations need to stay ahead.

The aim of ADL's recent study on R&D best practice was to acquire in-depth qualitative insight into emerging approaches to R&D management. Twenty-three case studies were developed, with fifteen companies identified as innovation leaders, spread across a broad range of technology-intensive industries including medical devices, pharma, consumer goods, specialty chemicals, food & beverage, oil & gas and industrial equipment. We have further validated and refined the findings through a program of interviews with participating study members.

Based on the results of the study, this article focuses on what is considered world class in R&D portfolio management and what companies can do to achieve a seamless integration of corporate strategy, innovation strategy, and R&D portfolio management.

We found that some of the leading companies are rising to the challenge of portfolio management by adopting best-practice principles such as:

- **Developing a clear portfolio structure that is linked to corporate strategy.** They have a clear idea about the axes against which the portfolio should be balanced and the levers that can be used to do so. This requires clarity of thought and alignment on the target structure, before the portfolio review process can take place.
- **Using portfolio reviews to make decisions.** Rather than using portfolio review just as a reporting mechanism to get senior management sign-off, they use it as a process to support alignment of activities with corporate strategy and build consensus across the business.

- **Using portfolio balance needs to drive ideation.** Rather than pushing the “best” new project ideas into the stage-gate process and then reviewing performance later on, they use the portfolio review to drive ideation and create and select new opportunities that will contribute to achieving the intended portfolio balance.
- **Embracing risk and creating a portfolio of options.** They include some high-risk projects, and select some “wild cards” to hedge against likely scenarios, creating a set of diverse options and developing resilience to uncertainty.
- **Using active discussion to achieve alignment on the portfolio.** This typically results in better understanding among senior leaders and better decision making than from relying solely on pages of bubble plots and net present value estimates.
- **Manage the flow of information.** They target reviews at multiple levels to avoid senior management drowning in the detail.

Portfolio management

CTOs often tell us about ‘bubblefest presentations’ in key meetings – seemingly endless reviews of the company’s R&D activities. The box has been ticked, but the process feels lacking to both R&D staff and top management. The R&D department has explained its plans, but how well do they really align with the company’s strategy? Do they represent the best route forward for the company? The answer is often less than convincing. Perhaps the alignment between the BUs and Corporate just doesn’t seem to fall into place, and an integrated, coherent strategy doesn’t emerge. Often there is a feeling of just doing the same as last year – the inevitable inertia in a large corporation can be tough to overcome. However, value is seldom created by sticking with an unwanted status quo.

“We need to avoid endless 2D graphical bubblefests...” – Director, R&D

In finance, the role of a portfolio is to diversify risk by picking a collection of assets that lower the portfolio’s combined risk profile, while providing good returns. This works because assets respond to underlying events in a different way. With information on the co-dependence of different assets, modern portfolio theory argues that it is possible to build a financial portfolio that maximizes return for a given level of risk. However, beyond setting an acceptable degree of risk, the portfolio is strategy free – its construction is based only on the co-dependence (or lack of) between different assets.

For R&D management it is much the same – the activity portfolio serves to diversify risk, but here the portfolio concept is also the means through which resources are allocated to deliver the corporate strategy. And there are further differences:

- Each project is unique and constantly evolving;
- There is often little information on the correlations between projects, yet there may be significant interdependencies that are not well understood or articulated;
- There are significant transaction costs in starting and ending projects; and
- There is a limited number of realistic investment options given the existing level of technical capability. Large organizations can’t turn on a sixpence, and this notion of path dependence means that future capabilities are always limited, to some extent, by the firm’s current capabilities.

Portfolio management is at the heart of ADL’s approach to R&D management, first set out nearly 25 years ago in *Third Generation R&D Management*.¹ The approach has stood the test of time and is further corroborated by a number of recent studies identifying portfolio management as a critical factor to achieving innovation success.² As a result, the principles of *Third Generation R&D Management* continue to form the core of our approach to R&D (and, indeed, it remains a core reference for many industrial R&D managers).

Portfolio management plays a critical role, as it structures a strategic process that allows management and R&D to make joint decisions that impact the range of R&D projects in the development funnel. (See Figure 1). The pooling of insights drives better decisions on the allocation of scarce technical resources based on the needs of the business and its capabilities (see sidebar on portfolio management). Portfolio management creates a dynamic capability to react purposefully to changes in the market, whether strategic, technological or competitive. This requires clearly articulated projects that can link back to corporate strategy.

Around the same time, Cooper³ published what is now the most widely accepted project development methodology, depicting product development as a process that needs managing, with the aim of improving efficiency and effectiveness while reducing the number of failed development projects. Each stage gate requires an ever more challenging list of deliverables to individually act as “quality control” before opening up the next tranche of funding. Despite portfolio management and stage-gate management operating as distinct processes on different “levels” within R&D, the interactions are crucial, and we will explore how they can best be joined up in practice.

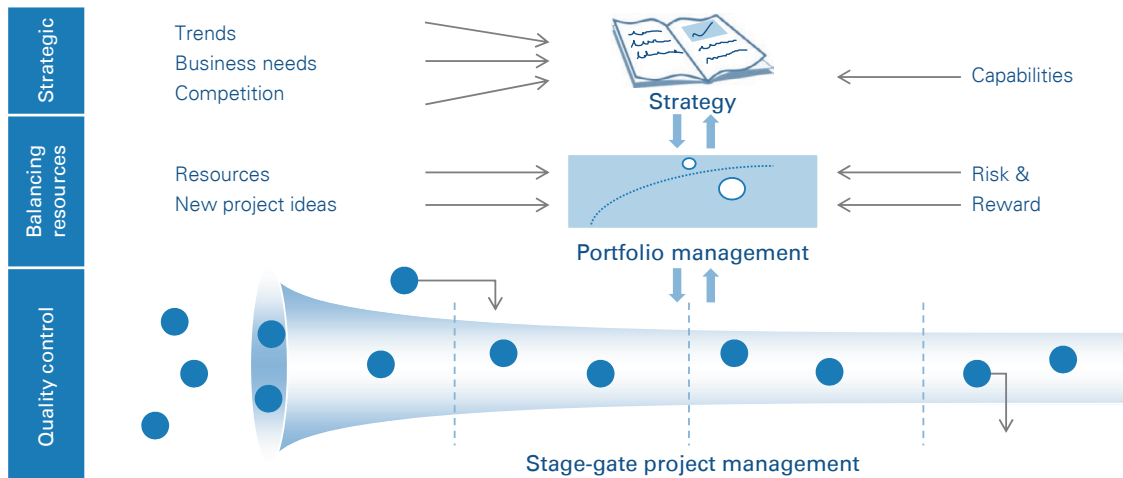
In 2013, Arthur D. Little (ADL) completed its 8th Global Innovation Excellence Study (GIES), a global, cross-industry survey of trends and best practices in innovation management.

1 Rousel, Saad and Erickson, 1991, *Third Generation R&D: Managing the Link to Corporate Strategy*. ADL Inc.

2 Thuriaux-Aleman, Eager and Johansson 2013, *Getting a Better Return on Your Innovation Investment: Results of the 8th Arthur D. Little Global Innovation Excellence Study*.

3 Cooper, 1990, *Stage Gate Systems: A New Tool for Managing New Products*, Business Horizons 33(3):44-54.

Figure 1: Portfolio management provides the link between a company's strategy and its implementation through development projects being managed in a stage-gate process



Source: Arthur D. Little

Drawing on over 1,000 responses across the last two GIES, the study shed new quantitative light on the key question: What innovation management techniques achieve the best return on innovation investment? In 2014–15 ADL followed up with a study to gain more in-depth qualitative insight into emerging R&D management practices, as sometimes the real insight only emerges in conversation. Twenty-three case studies were developed, with fifteen companies identified

as innovation leaders. These global participants have an average revenue of \$30 bn and are spread across a broad range of technology-intensive industries (including medical devices, pharma, consumer goods, specialty chemicals, food & beverage, oil & gas and industrial equipment). The firms are evenly split between those headquartered in the US and those headquartered in Europe.

What is portfolio management?

In the context of R&D management, if **strategy** defines the corporate objectives and the areas and manner in which the company will compete in terms of new technology and its contribution to new products and services, then **portfolio management** is the process through which the company reviews the allocation of its resources and ensures that the combination of its project-level activities will allow it to meet its objectives. The portfolio review process therefore aligns project-level activities across projects (each project has a role to play) while also ensuring that the inherent risks and rewards of individual projects are balanced in the portfolio. The portfolio management process steers the allocation of resources in a systemic manner by deciding which new projects should be launched and reallocating resources between existing projects. **Project management** provides quality control within the project – it is essentially concerned with meeting targets that are bounded by *Quality, Timelines and Resources*.

Both portfolio reviews and stage-gate reviews affect the resources available to a project (by terminating it or increasing resources). As a portfolio review makes allocation decisions

across projects, there is often tension between project-level decisions and portfolio review decisions, which arises because project teams feel that they have “met the project goals” and so should be allowed to continue. They also feel that if a project has been successful, more work should be done in this area.

The issue is that stage gate decisions provide optimum solutions for individual projects, but they cannot take a systemic view across all activities. R&D naturally tends to develop new projects in which the company has established capabilities – this is efficient and effective, but tends to mean doing more of the same. Stage-gate decisions are often based on quality reviews and meeting well-understood project targets, and therefore struggle to provide a test of strategic relevance or resource efficiency.

Portfolio management is all about providing a strategic perspective and achieving balance in resource allocation. It looks to ensure that the resource allocations are in line with corporate goals, and to minimize the overall risk within the R&D portfolio by seeking balance across a range of dimensions – including by “pulling in” new activities if these can provide a better balance.

What do companies struggle with?

Companies often struggle to achieve balanced portfolios that are aligned with company strategy. There is often a lack of breakthrough innovation and a tendency to fill the portfolio with incremental innovation, often with continued investment in legacy technology platforms that are no longer aligned with the strategy. In our study we identified four main challenges in developing and maintaining a balance in the portfolio.

Finding the right portfolio structure. The core issue is often not a lack of desire to balance the portfolio (or the absence of a strategic target), but the absence of a process to create that balance. The high-level split chosen for many portfolios is a range of programs, each centered on a technology. This is a useful split to consider, but needs to be complemented with a range of dimensions to achieve the required balance (e.g. breakthrough versus incremental) that ties the portfolio to strategic ambitions.

Lack of decision making. Portfolio management is fundamentally a decision making process, but too often the reporting aspect dominates. Do you sometimes fear your organization has mastered the adjective but not the verb? The question this raises is how best can senior leadership orchestrate the right individuals, organizational structures, tools and mechanisms to deliver innovation? It's a complex problem.

“Portfolio management takes too much effort – reporting takes too much time and I can’t digest the lengthy reports!” – Global Product Manager

Linking the portfolio to the corporate innovation strategy. All too often, companies’ portfolios are built largely “ground-up” from R&D projects that arise at BU level. As a result, such portfolios tend to poorly reflect the corporate innovation strategy and inadequately support the development of core cross-BU capabilities that underpin long-term competitiveness. Typical underlying issues include:

- Poor definition of the innovation strategy itself;
- Lack of clarity on future target markets;
- Poor understanding of cross-BU capabilities and platforms;
- Inadequate or unclear resourcing of non-BU projects; and
- Poor communication of the value of cross-BU projects.

Link to stage-gate process. Often, when we have been asked to support a portfolio review exercise, we have been surprised by the lack of quality of the data available from the stage-gate process. Stage-gate reviews should be a key input into the portfolio management process. Alignment between these review processes is essential for senior management to holistically manage the portfolio’s direction and shape.

Clearly, the portfolio balancing process can only be as good as the data used. Simple and effective IT tools can channel data from stage-gate reviews to update a master data set are needed. Without these resources, the portfolio management process is forced to operate with significant amounts of missing or incorrect data (which exposes the process to claims that it is unfair), or else an inordinate amount of effort is required to gather the data for a review.

What insight into best practice emerged?

Overview – The three-step process

In principle, the portfolio management process should consist of three sequential steps:

1. **Link to strategy.** Develop clear guidance and expectations for the portfolio structure based on a strong and transparent link to strategy.
2. **Optimize the existing portfolio.** Make a “go, accelerate or stop” decision for all existing activities to optimize activities towards meeting balance targets.
3. **Select new projects.** Determine residual portfolio requirements for balance, renewal and option creation, and “pull in” required projects from the idea-management process.

As shown in Figure 2, steps 2 and 3 are iterated as required in each review, with the entire process repeated during high-level reviews of the portfolio. In stage 1, the portfolio design requires a revisit as the strategy is updated or when challenges emerge in achieving consensus for better portfolio balance.

Going in this order may seem obvious, but organizations continue to struggle with it. We often see the inverse: ideas

developed from the bottom-up with top-rated ideas pushed forward into the portfolio, followed by reshuffling of resources to achieve a measure of balance. The link to strategy is then post-rationalized.

Proceeding in this order may generate some pain, as it relies on achieving consensus, strong senior leadership and good portfolio discipline from the outset. However, it produces a more balanced portfolio of activities, with both top-down and bottom-up influence, and ensures that portfolio has a stronger link to customer needs with a higher focus on target markets.

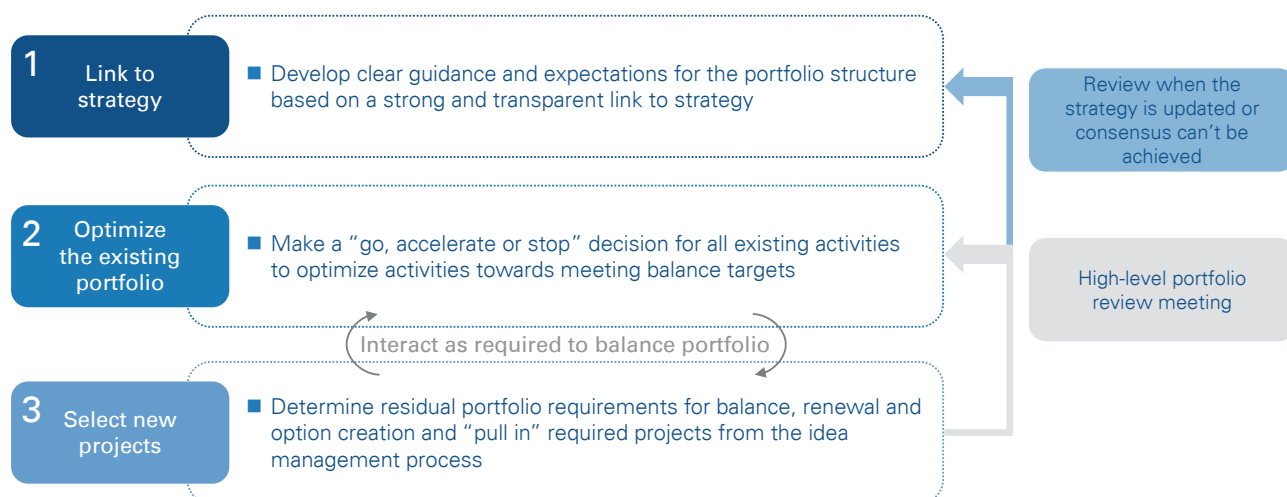
Step 1 – Link to Strategy

Define “what good looks like”

A target portfolio structure provides a strong anchor for decision making and creates a common expectation about what should be achieved in portfolio reviews.

Best-practice companies structure their portfolios to set out what they expect to achieve in a way that is clearly aligned with corporate and product strategy. Defining “what good looks like” for a target portfolio structure is not a trivial exercise, but it generates a strong mechanism that avoids ill-defined responses

Figure 2: ADL’s high-level Portfolio Management Process



Source: Arthur D. Little

to generic strategy statements – such as “we will exploit emerging African markets” – and forces a much closer link to market and customer needs. To implement the strategy, the expected R&D portfolio structure should reflect:

- The organization’s strategy;
- Technology and product roadmaps;
- Expectations about market growth and market share data for targeted segments;
- Needed capabilities; and
- Available resources (funding, talent and access to infrastructure).

Organize by platforms – not disciplines

A first decision to consider is the highest level of structure within the portfolio. Organizing around technology probably makes sense to R&D, and likely reflects the organization in which most of the work will be performed, but it may not be the best way to communicate the work to other stakeholders especially marketing. Often the market linkage itself can be very unclear under this approach. As senior engagement is critical, a significant challenge in organizing around technologies and the language of R&D is that it makes it difficult to ensure that key decision makers understand the potential opportunities currently on the road to commercialization.

The concept of “platform capabilities” can be leveraged successfully in this context. These are defined as “a combination of technologies and other components that can create significant and durable business value.” These should be rooted in solid aspirational customer needs (e.g. sugar-free and artificial-sweetener-free cola) that will serve as more of a rallying point for alignment with senior leadership than a technology-structured portfolio. These needs should be “enduring” and cross-BU in nature, and have a range of technologies associated with them. The company’s business and innovation strategies should describe what these platform capabilities are and, as with other elements of portfolio design, set explicit targets for the proportion of effort that should be devoted to each platform development.

Determine the right balance

The need to balance a portfolio is fundamental – but it is vitally important to consider the dimensions against which the portfolio is balanced. Case study 1 describes one company’s approach to refreshing its portfolio structure, targets and review process. Typical dimensions for analysis (often called portfolio “cuts”) included:

- Different business areas (including new areas);
- Launch timing for new products, services and processes;
- Balance of incremental (sustaining) versus breakthrough (disruptive) products/services;
- Different business models, e.g. products versus services;
- Development time frame (perhaps framed as short term, medium term, far future); and
- Development risk level.

The actual selection of “cuts” from the sample shown above is less important than ensuring that reflect the desired breadth of ambition in the strategy – though, where possible, choose “orthogonal” measures to avoid overly constraining the portfolio. You are trying to spread out the portfolio across a range of performance on each “cut,” so the axes/lenses used to present the data need to be as independent as possible. A lot of companies produce reams and reams of analysis presenting the portfolio across different criteria – but the material from our case studies shows that there are only a few combinations that actually give insight.

Whatever the chosen dimensions for balance, they should have explicit targets – set in the strategy – to provide clear guidelines on the desired shape of the portfolio. Setting these targets is, to an extent, subjective: industry benchmarks are useful to set the scene, but industry and company-specific considerations will influence the final choice. A poor selection of targets for balance in the strategy often manifests itself as failure to achieve alignment around a balanced portfolio. The only solution is to revisit the strategy to achieve alignment before consensus can be found in the portfolio management process.

The conflict this opens is normally between the long-term cross-BU focus of senior management (and Corporate R&D) and the shorter-term focus of strategic business units. Too often the corporate strategy is cascaded down to set BU-level strategy, with a portfolio assembled from existing programs and projects, and then the bridge to link the two is post-rationalized. Two options can support decision making in this instance:

- BU-level decision making with senior-level buy-in or perhaps “over-ride” to ensure balance across the company; and
- Enforcing strict portfolio “bucketing” with funding ring-fenced at corporate level and cascaded down.

The particular role of Corporate R&D, its links to the BUs and the implications for the portfolio’s focus are explored further in case study 2.

Build resilience by “hedging your bets”

Analyzing the major risks that are manifested in the portfolio often brings insight – often several key projects will depend on assumptions rooted in certain market shifts or technology development.

What if these fail to materialize and an unforeseen swing occurs? Clearly laid-out portfolios include visible correlations

between project success and key assumptions, particularly when their interdependency is high. As this is identified, it is prudent to consider what bets could be hedged against the current portfolio to create options for the future to ensure diversification of risk. Typically, even very limited investment can provide a reasonable foothold to support new product development, should expected market and technical developments not materialize.

Case study 1: Decide the Portfolio Structure

Company L is in the chemicals industry (turnover of around \$5 bn) and has refreshed its portfolio structure.

Get a single view across the company

- Previously decision making was distributed, and it was hard to get a good overview across the company and ensure that all decisions were undertaken on the same basis and with the same diligence. An Innovation Group under a single VP was formed to resolve this.
- The portfolio is considered in terms of platforms, each of which has knowledge and projects associated with it, though some projects can span multiple platforms. Strategy is crafted at a platform level. Each platform has a roadmap that considers a three-to-five year view for that area of activity, defining what new technology or knowledge is needed to deliver on the strategy.

Consider funding priorities

The BUs have strong input into the strategy and technology roadmaps. Budgets are set yearly and correspond to a percentage of revenue. This is delivered directly and not via the BU. The Innovation Council is responsible for allocating this budget to achieve the desired segment and market strategies.

A small portion is allocated to real “blue skies” thinking, which is external to current core business, to capture potential future needs that BUs and even customers may not currently appreciate. The benchmark aims to make a greater portion of this early-stage foundational research external to access a broader range of input.

“You need ideation and exploration to find ideas no one else has thought of” – Global Head R&D

Select the desired balance

The portfolio balance is considered with respect to:

- Risk profile (high/low);

- Time frame (short/medium/long term); and
- Type of innovation (see panel below).

The Business Strategy dictates the target portfolio balance. The targets were set following a benchmarking exercise, with further consideration of industry- and company-specific challenges, e.g. typically 25% of the budget is on disruptive innovation. The benchmark targets 10–15% of resources at early-stage science-based R&D projects, but this can peak at 40% for high-growth areas.

Balance is sought across four types of innovation:

1. **Sustainability and Cost Innovation** – sustainability of raw materials, process or cost improvements.
2. **Incremental Innovation** – next generation of products.
3. **Disruptive Innovation** – projects and solutions with the potential to create new markets or value networks.
4. **Commercial Innovation** – use existing tools or technologies to address a specific customer need.

Actively manage to achieve the desired balance

Two key mechanisms are used:

- **Portfolio Governance and Oversight:** the Innovation Council meets twice a year, and most members are at SVP level. One meeting focuses on strategy and how that feeds into the roadmap, and the other on the efficiency and effectiveness of commercializing technology and delivering against this roadmap.
- **Monthly Decision Making Council:** the monthly working group is a sub-committee of the Innovation Council. It has more of a tactical role and is involved in barrier busting. The sub-committee reviews a high-level snapshot of the whole portfolio, with a focus on projects with issues or those approaching a stage-gates.

Step 2 – Optimize existing portfolio

Align stage-gates and portfolio-review processes – but be clear that portfolio-review decisions are final

The portfolio management- and stage-gate-review processes need close alignment, as they depend closely on each other for success. Projects no longer in alignment with corporate strategy or that do not contribute to the desired portfolio balance should be stopped – **even if they meet gate-review criteria.**

Many organizations that provided case studies found that this process worked best when implemented on two levels, both of which were empowered to make decisions. For example, company L in our study approached the portfolio-review process as follows:

- **A high-level strategic review** – many organizations find that a semi-annual senior stakeholder review is the right frequency. Senior executives will review the balance and direction of the portfolio’s main components to ensure alignment, often also considering sufficiency and readiness to meet business targets. As discussed, it is critical that this process operates with a **common perspective on a target structure** for the portfolio. Often reviews alternate between a focus on the future (i.e. looking at consumer trends to focus resource allocation) and measuring the performance of delivery against this plan. This helps to build senior buy-in to the portfolio by providing influence over the structure. However, they must have – and use – the power to redirect resources to maintain alignment with the strategy.
- **A deeper review with closer alignment to the stage-gate process**, including the power to terminate individual projects. The review does not set strategy, but identifies whether activities are in line with strategy. It is not a deep dive into each project, but instead a review of the overall health of the portfolio with a deliberate focus on making some healthy “pruning” decisions. Portfolio management is not, however, a substitute for the quality control that stage-gate management reviews bring. Senior involvement is an often-stated key success factor; however, the practicalities of aligning diaries is sometimes underestimated. Based on best practices, implementing a fixed-date review on a monthly basis (“jour fixe”) can yield significant results, as it can make it easier to align diaries. There are also considerable overheads in collecting the required data and arranging meetings on a case-by-case basis. A central function allows better management of this process and injects the necessary discipline.

Manage resource allocation

Companies (and sometimes academics) frequently spend a great deal of effort developing rigid processes to allocate resources across various dimensions when a purely mechanical approach is not appropriate. Available resources, project budget requests and financial project valuations can guide the process, but the final decision must be subjective, driven by consensus on priorities.

Early in the development process, there is a natural limit to the number of projects that can be monitored and sensibly reviewed. (See Figure 3.) Allocation of priority between early-stage projects (and therefore resources) should not be the primary focus, as costs are low and there are still reasonable levels of uncertainty and risk: many parallel projects can be pursued. Instead, the aim should be to investigate rapidly and terminate any projects that are not suitable for development through to commercialization.

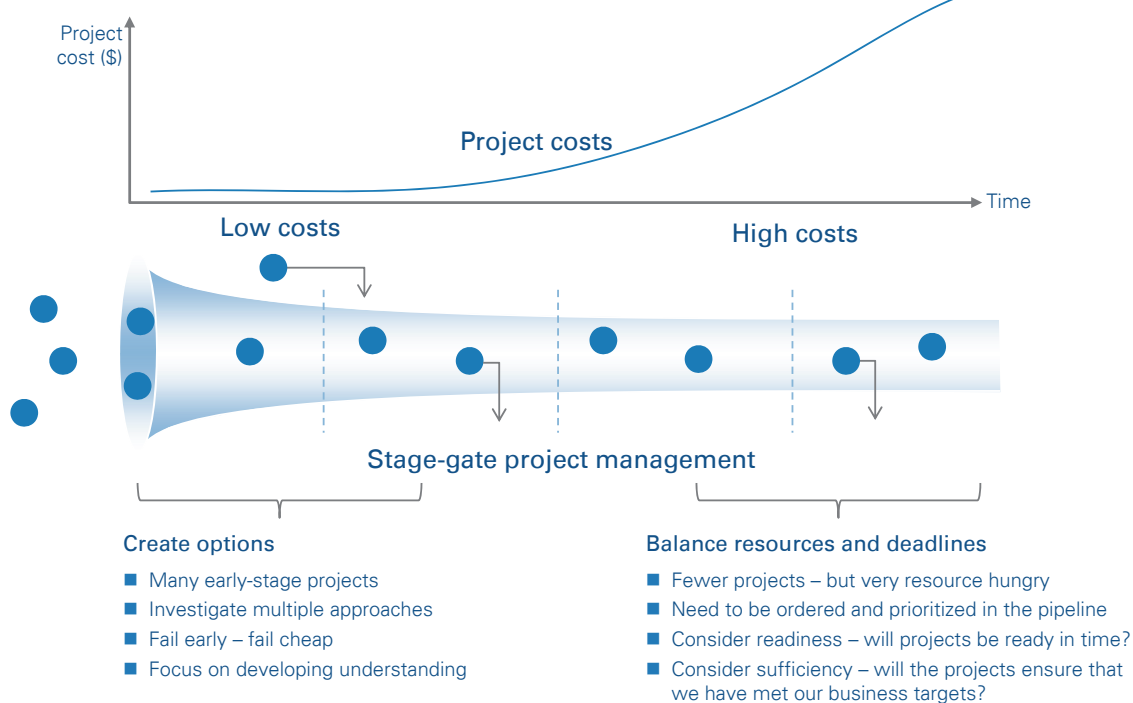
Later in the development process, projects are better characterized, inherently better aligned with the strategy, and carry more accurate (financial) valuations. At this stage, the nature of the projects shifts as resource needs and other costs dramatically increase, with progress more directly linked to the effort expended. Selection between them as part of a portfolio review is limited more by resource allocation and budget constraints, so prioritization becomes more appropriate.

At this point it is instructive to consider both **readiness** of your pipeline (will your projects be delivered on time?) and **sufficiency** (will your innovation projects enable you to meet business targets?). Companies typically have limits on the number of late-stage projects they can support simultaneously, which prompts prioritization and ordering of launches. It is normally possible to reallocate resources from project to project to ensure near-term readiness targets, but this often impacts sufficiency.

Project resourcing within a portfolio is often presented as a *fait accompli*; but it should not be, as one of the key tasks of portfolio management is to balance resource allocations. Many companies expect to take decisions between readiness and sufficiency at the portfolio level. To support this planning, it is useful to require project-level information about:

- What would happen to the project if 20% of resources were removed from the annual budget;
- The resources needed to accelerate delivery by 20%; and
- What would be required to crash the project and commercialize as rapidly as possible.

Figure 3: Early on the focus should be on creating options, ensuring failures are early and cheap. Later stages focus on managing a pipeline of comparatively few resource-hungry projects through to commercialization



Source: Arthur D. Little

Force resource allocation decisions to be made

Compelling evidence shows that firms that actively allocate and align their resources with their strategies have better performance than firms that maintain similar resource levels in the same areas over time.

A portfolio must be dynamic – changing and evolving with time, tracking the progress of R&D projects while following changes in a company’s strategy. Avoiding or postponing decisions can be as dangerous as making poor ones. Difficult decisions often have to be made when selecting where to apply effort, with attached opportunity costs for each possible choice. It is the portfolio management process, guided by the strategy, that provides the discipline to overcome this and have an element of appropriate competition between projects.

Frequently the greatest challenge around the management of portfolios is not defining what must be done in the future, but dealing with what has gone before. Cleaning the portfolio, removing legacy or failing projects, requires regular action – too often the failing figurehead projects of yesterday are left redundant, blighting the current portfolio by sapping limited resources. Removing these and streamlining the portfolio to avoid “boiling the ocean” ensures application of adequate resources to each project, which provides greater momentum, improved efficiency and much reduced time to market.

Company C’s experience during a review of Corporate R&D’s role in relation to BU R&D is described in case study 2. The aim was to avoid Corporate R&D becoming clogged with failing, high-risk projects not relevant to company strategy, and to free up resources for developments that were in line with company strategy but not suitable for BU R&D.

“Always ask, ‘Why should this remain?’ and not ‘Why should this be removed?’”
 – Innovation Director

One last – and often ignored – consideration is measuring flow through the portfolio. Maintaining an element of high-risk or radical projects is appropriate, but these must show tangible progress towards commercialization. A collection of high-risk projects that can provide balance but will never be delivered may meet short-term KPIs, but in the long term will not deliver the necessary growth and profit – a stagnant portfolio is a failing portfolio. Consolidating the portfolio and increasing resource allocation to accelerate projects often serves to make this flow (or lack of) more apparent.

Companies that consider the flow of activity through the portfolio tend to have a more dynamic perspective on making changes – they expect and track progress and expect the portfolio to evolve; and as projects mature they naturally

Case study 2: Focusing the Portfolio

Company C is in the chemicals industry with a turnover of around \$10 bn. It undertook a review aimed at cleaning up the portfolio and determining the correct portfolio balance – including where corporate R&D should focus.

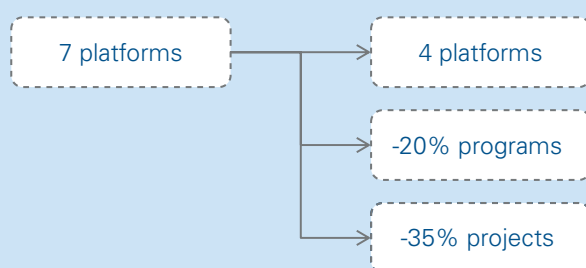
What is the role of Corporate Research?

- *What should it focus resources on?* Projects that support technology development across divisions.
- *How should it complement BU research efforts?* It must complement BU research efforts by addressing research that delivers transformational results across multiple BUs.
- *Are resources available to focus on the right projects?* It must periodically reprioritize its portfolio to avoid ivory-tower syndrome and achieve a high level of focus.

“The key question is what is Corporate Research bringing to the organization that is transformation?” – Innovation Director

Free up resources by killing projects

To avoid resources being spread too thinly, the first stage is to clear up the portfolio. Typically, targets are failing flagship projects from legacy activities and “troubled children”, in this case, the benchmark reduced the number of platforms and cut a significant number of programs and projects in doing so.



Decide where R&D should engage

The key question to ask is: *“What will be important in the next decade?”*

In doing this, consider two main clusters of opportunities:

- Market driven; and
- Technology driven.

When communicating ideas, portfolios and progress, Corporate Research moved from considering platforms in their entirety with BUs to considering the elements of a platform that were directly relevant to the BU and from the perspective of the BU, even if this was not how the research was structured in Corporate Research. Senior engagement from the BU – a key success factor, regardless of who controls funding – is much harder if the direct benefits are not clear.

Should Corporate R&D engage in a certain project?

- Initial decision authority lies with BU – are they interested?
- Can Corporate Research leverage competence that BUs do not possess?
- What is the relevance to the BU and Group Strategy?
- What is the return? – Consider feasibility and ambition.

The role of Breakthrough Innovation*

There should always be some element of R&D resources applied to innovation that is not incremental in nature. Perhaps counter-intuitively, incorporating an element of breakthrough innovation in the company portfolio can reduce the overall collective innovation risk for a company.

Despite the projects themselves typically carrying higher levels of risk and uncertainty, inclusion of radical projects better enables a company to respond to disruptions and unexpected market developments and increases the likelihood of maintaining growth and margins in the future.

Ultimately, this is just another portfolio bucket that must be balanced but, nevertheless, we devote a separate section to give it the attention it deserves. Breakthrough innovation is hard, and other ADL studies show that although more than 85% of companies are dissatisfied with their breakthrough innovation performances, it is also where most companies expect to see much of their future growth. Often we see R&D portfolios that are far too heavily weighted towards incremental innovation. This is unsurprising, as radical innovation requires stepping outside your comfort zone and carries a greater risk of failure.

“Ask yourself what will be important in the next decade” – Innovation Excellence Manager

Since businesses generally find it uncomfortable to accept higher than necessary risks, it is the portfolio management process that needs to inject the discipline to achieve the stated balance. There is still, of course, a sensitive management point here around project failure – senior doors should be open to discuss why projects have not been selected to be continued. The pressure to deliver will always be present, but needs to be balanced by framing the R&D portfolio as an exercise in discovery, with insights and platforms for future success valued as much as short-term outputs.

* Source: ADL Breakthrough Innovation Survey 2014

anticipate the need to think about “what next” and to renew the early-stage ideas that are being pulled into the portfolio. Some top-performing companies try to avoid this situation ever occurring and encourage turnover to refresh the portfolio by mandating that a portion of the funding be reallocated every year.

Don't be too constrained by valuation

It is important not to be too constrained by (financial) project valuation. This is often used as the main selection portfolio metric. On the surface this seems reasonable, but it can choke innovative ideas – particularly those in new areas or that are radically different from previous approaches (see sidebar on Breakthrough Innovation).

A more forgiving set of selection criteria and a space to thrive early on in the development process are essential to ensure that potential gems are unearthed. Some innovation leaders provide protected early funding that is time rather than goal limited for promising projects, to provide the appropriate freedom to flourish without risking the creation of irrelevant “white elephant” projects. The focus should be on developing knowledge rather than products (or services). Project assessment and management will need to take this into account.

Later on, more focus on valuation is reasonable – but it is worth noting that many leading innovators use a blend of different methods and, as discussed above, many non-financial considerations may be key – e.g. the link to strategic aims, market entry timing and other considerations. It is beyond the scope of this article to explore valuation methods in detail, but this is covered in other Arthur D. Little publications.⁴

4 How to Manage Your Return on Investment in Innovation, 2014 [http://www.adlittle.co.uk/prism_uk.html?&view=417]

Step 3 – Select new projects

“Pull in” required projects from the idea-management process

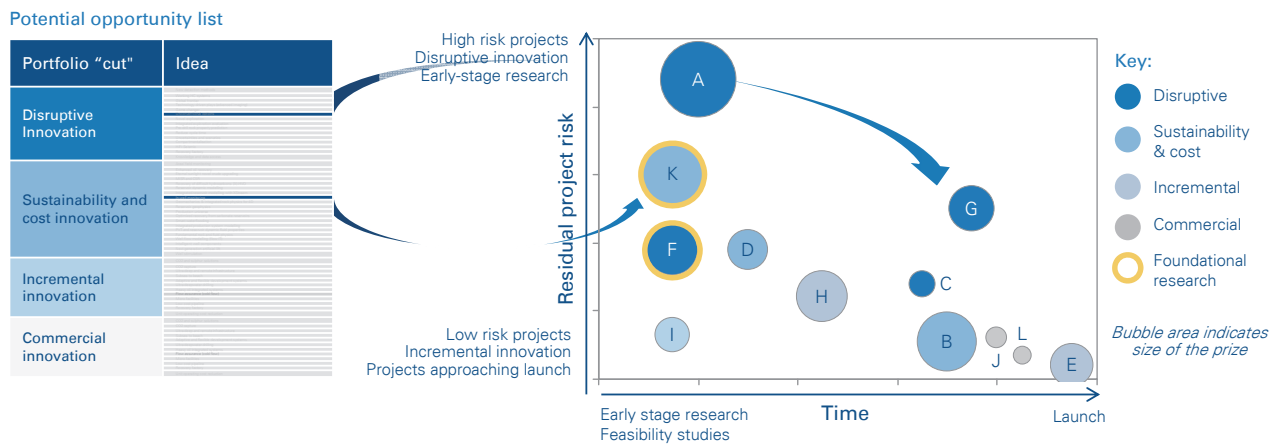
Many organizations select their best ideas and push them forward to the stage-gate process, and by default into the R&D portfolio. Given a strong link to strategy in the ideation and idea-enrichment processes, a steady stream of ideas that are well aligned with corporate goals should result. As shown in Figure 4, this approach can be enhanced by pulling ideas forward into the stage-gate process based on portfolio needs, rather than pushing them based only on the assessment during the idea-management process. This can be a cause of conflict, as ideas are no longer selected purely on the basis of quality, but on the basis of a more explicit link to the strategic needs of the company.

Have a final sanity check

In the end, it is important to reflect and consider whether the portfolio “feels” right. If not, then look back at the process and challenge the assumptions to explore and understand why.

“Stand back and ask ‘Does this portfolio look right?’” – Head of R&D

Figure 4: Projects pulled forward from the list of potential ideas to fill perceived gaps in the portfolio and achieve balance – rather than just pushing the top-ranked ideas forward



Portfolio balancing		
<p>What is the portfolio structure?</p> <p>In this example, benchmark L (see case study 1) seeks suitable balance between:</p> <ul style="list-style-type: none"> Level of risk Time frame Type of innovation: <ul style="list-style-type: none"> Commercial innovation Sustainability and cost innovation Incremental innovation Disruptive innovation 	<p>What does good look like?</p> <p>A series of explicit targets are set in the corporate strategy and innovation strategy e.g.</p> <ul style="list-style-type: none"> 25% of effort should be invested in disruptive innovation Foundational projects (early-stage science) should account for 15% of resources but this can peak at 40% for high growth area 	<p>What projects are pulled in for balance?</p> <ul style="list-style-type: none"> Project G is disruptive innovation focussing on changing an established business model. Timelines to resolve key issues are short but risks are high. It balances the portfolio to increase effort on disruptive innovation Project K is a sustainability and cost reduction innovation that requires developing a new catalyst system. It could have a major impact on reducing costs in a growing area but requires a university collaboration and forms part of the early-stage foundation research target

Source: Arthur D. Little

Portfolio management: the broader picture

Placing the portfolio on the CEO's agenda

A strong portfolio management process is at the core of being a strong innovator in R&D-focused, technology-intensive industries. Much more is required, however: the right organization, leadership, governance, decision making, execution, control and follow-up must also be considered. Managing the portfolio is therefore just one item on the CEO's agenda – but the CEO still plays a key role in the process because, in the end, the CEO should have the final responsibility for making sure that the portfolio aligns with his or her vision of corporate strategy. Managing this web is complicated! Strong decision making and oversight are essential.

Case study 3 describes how one company took a holistic view across many aspects of innovation tools, systems, and approaches when refreshing its portfolio management process.

Portfolio governance

Finally, none of this can work without proper portfolio governance. Active management of resources contributes to enhanced performance. But many firms lack sound governance structure for portfolio management and this undoubtedly contributes to the relatively low level of portfolio decision making and *ad-hoc* decisions.

Recent research⁵ on innovation governance suggests that the most effective approach to innovation governance is to use a high-level, cross-functional steering group to govern the portfolio. The key to making this work is to ensure that:

1. The steering group has cross-functional representation. In line with the principles of third generation R&D, it must be a collaborative effort with good representation of the relevant parts of the company. This enriches the conversation and makes for more effective decisions.
2. It is limited to six to nine core members, selected for their intrinsic motivation for innovation, as well as their functional or business expertise. The chairperson should be drawn from the top management team to provide heavy-weight support. Other members can be from the level below top management.

3. There is tight alignment with strategy and a clear remit for achieving medium- to long-term goals. This provides some protection against the ever-present temptation to divert resources to fire-fight current problems.
4. There is a clear and rigorous process for the portfolio review. Participants are prepared, the ideal target portfolio balance is set out in advance (in line with strategy) and the criteria used in the review support decision making. The process should force decision making and allocation of resources.
5. There is sufficient time commitment. Time commitment from senior team members is critical, and also signals the importance of the process. The review schedule must be planned and committed several months in advance.
6. The portfolio steering group selects new ideas to be included in the portfolio through active selection of (qualified) new projects.

One final suggestion that seems obvious but is rarely used is to borrow from corporate governance principles and involve trusted non-executives or external reviewers with suitable experience. This can help you to challenge and question decisions, and often brings a much-needed external perspective.

Figure 5: The CEO agenda is broad – and consideration of this wide perspective is needed to make good decisions within the Portfolio Management Process



⁵ Deschamps and Nelson, 2014, Innovation Governance: How Top Management Organise and Mobilise for Innovation.

Source: Arthur D. Little

Case study 3: Take a holistic view

Company P is in the packaging industry (turnover around EUR 11 bn). It has recently reviewed and refreshed its governance structures and, at the same time, revamped many of its innovation tools, approaches and systems.

The company felt it was being constrained by four issues that commonly impact CTOs:

- Fighting fragmentation – lack of integration and sharing across BUs.
- Fighting orthodoxy – fear of the threat of innovation on the current installed base.
- Fighting short-term focus – one year plan takes all funding.
- Fighting specialization – lack of generalists with experience across multiple markets and technologies.

Tackling these meant implementing a series of initiatives across the company to ensure joined-up thinking, with a focus on involving and engaging senior leadership in decision making around linking the strategy to the product and technology portfolios.

“A process is not enough – leadership with vision and the right culture are required”
– Global CTO

Implement the right initiatives

To support this change, a number of initiatives were introduced across organization structures, processes, and tools and measurements.

Organizational structure

<i>Innovation Board</i>	<i>Product Review Board</i>
<i>Technology Strategy Board</i>	<i>Centres of Expertise</i>
<i>Product Managers</i>	<i>Fast track Project Stream</i>

Process

<i>Business Intelligence</i>	<i>Technology Intelligence</i>
<i>Idea Management</i>	<i>Product Development</i>
<i>Strategy & Planning</i>	<i>Technology Resource Development</i>

Measurements and tools

<i>Innovation network</i>	<i>Return Map</i>
<i>Performance Indicators</i>	<i>Risk management</i>
<i>Company Academy</i>	<i>Creativity training</i>
<i>Audits</i>	<i>Tech. Intel. database</i>
<i>Prioritization templates</i>	<i>And many more</i>

Governance and leadership – Who decides what?

Innovation Board – How will innovation be realized? How is the link to business strategy maintained?

Product Review Board – What portfolio of products will enable the business strategy?

Technology Strategy Board – What portfolio of technologies will enable the business strategy?

Global Leadership Team – What is the right level of investment across product and technology development?

Conclusion

Quality is not sufficient in your R&D development projects – you also need to be tackling the right projects. You need the discipline provided by setting and achieving quantitative targets to ensure that your R&D portfolio is balanced and focused on strategic goals – without this, the usual tendency is to creep towards the safe zone of incremental innovation, with the risk that the market will shift in a few years and you won't be able to respond. Portfolio management is central to ensuring that strategy is reflected in the mix of projects arriving at stage-gates.

However, to be effective, portfolio management must also guide and take input from the ideation and idea-management processes, as well as interface with both short-term resource allocation and long-term competence management.

In the current era of technological disruption and global competition, it is more important than ever for your portfolio management approach to ensure that corporate strategy is manifested in the R&D portfolio. Relying on the stage-gate process to achieve this is dangerous, as only proper consideration and management of your entire R&D portfolio will deliver the desired innovation results.

Key questions

So what must you do on Monday morning to make the journey towards world-class portfolio management a reality? The first step is to ask yourself how healthy your current portfolio management process really is:

- **What does “good look” like?** Is the link between intended portfolio structure and corporate strategy clear? Do you have guidance on what a “good” portfolio looks like ahead of the review? Are there quantitative targets for balance? If not, what needs to happen to correct this?
- **Make decisions, not reports.** To what extent is your portfolio management process a decision making forum versus a reporting channel? Are the right decisions made?
- **“Pull” to achieve natural balance.** Does the portfolio review help to “pull” in new projects to balance the activities or can it only kill or accelerate existing activities?

- **Engage the top leaders.** How involved is your senior leadership in portfolio management? Is it merely a cursory overview, or are they deeply engaged?
- **Time for a clearout?** Is your portfolio delivering against the strategy, or does it need a clear out?

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How do you achieve the right balance in your portfolio?

In the current era of technological disruption and global competition it is more important than ever to have a clear grip on how the full intent of corporate strategy is manifested in the R&D portfolio. Allocating resources in line with that strategy achieves better results – yet all too often companies rely on stage-gate controls at individual project or program level. Dynamic R&D portfolio management and resource allocation are required for global corporations to achieve the required balance in their portfolios.

Further studies and benchmarks

Global Innovation Excellence

- [Innovation Excellence Benchmark \(innovation diagnostic benchmarking\)](#)
- [Getting a better return on Your Innovation Investment: results of Results of the 8th Arthur D. Little Global Innovation Excellence Study](#)

Breakthrough Innovation

- [Systematizing Breakthrough Innovation](#)
- [How to create breakthroughs in nine months](#)

[R&D management best practice study](#)

- From idea to results: insights into world class idea enrichment
- Your most valuable asset: insight into resource and competence management
- Finding your balance: insights into portfolio management

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