

Toward Sustainable Innovation:

A Progress Report

Ron Jonash, Tom Sommerlatte, and Arun N. Maira

In conducting research for our new book on the next-generation enterprise, we have found that a critical differentiator for the next generation of corporate leaders will be the ability to effectively harness and drive innovation. In so doing, these leaders will have found ways to leverage innovation to compete successfully along all three key competitive dimensions: product and technology leadership, operational efficiency and excellence, and customer intimacy and loyalty.¹ They will have found ways to sustain innovation cross-functionally and cross-culturally across their extended enterprises of lead customers, lead suppliers, institutional partners, and individual inventors – as if each organization were truly a single integrated enterprise with well-aligned strategic objectives and win-win propositions, in this article, we will outline the preliminary results from our most recent research into the critical pathways to high-performance technology and innovation management in the next-generation enterprise.

The Drive for Sustainable Innovation

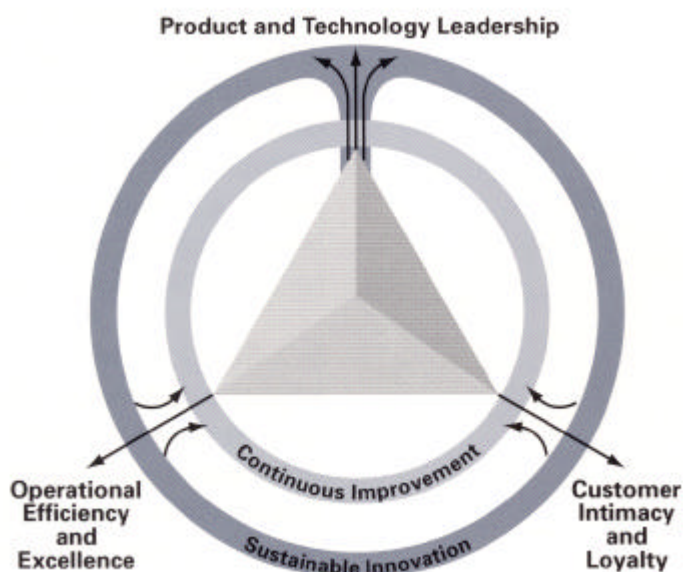
As leaders strive to gain competitive advantage, „Sustainable innovation“ has begun to eclipse „continuous improvement“ as the key to success. Competitive advantages gained from continuous incremental improvements are increasingly difficult to sustain, prompting the search for other mechanisms to establish and maintain leadership. Leaders are searching for better ways to manage innovation to create breakthrough developments, new business opportunities, and, ultimately, more Sustainable competitive advantages.

In Arthur D. Little’s recent Global Survey on Innovation,² 84 percent of the respondents „strongly agreed“ that „innovation is viewed as a much more critical business success factor than it was five years ago.“ A recent Industrial Research Institute survey found that „making innovation happen“ has now become first on the list of the 15 „biggest problems“ for technology leaders – leaping from the number 5 position just 2 years ago. „Managing innovation“ continues to be a difficult challenge for most companies (more than 75 percent report significant shortcomings), while „high-performance innovation“ is even more elusive. It appears that almost everyone is aggressively pursuing a new „circle of sustainable innovation“ that will encompass product, process, and business innovation – providing a path not only to product and technology leadership but also to enhanced customer intimacy and operational excellence. This circle of sustainable innovation represents a real opportunity to break through the boundaries of continuous improvement and change the rules of the game to enable companies to achieve across-the-board competitive leadership (Exhibit 1).

As part of our ongoing research, we have explored many of the key barriers, enablers, and drivers for innovation management in a wide variety of companies and industries. We have also examined many of the key dimensions of the next-generation enterprise, from cross-functional teams and global networks to external sourcing and partnering.

Exhibit 1

Sustainable Innovation as a Pathway to Three-Dimensional Leadership



This research has included work that is related to Arthur D. Little's global Best of the Best Colloquia in Technology and Innovation Management, recent extensive global surveys and benchmarking, and case studies involving current and emerging leaders in both high-tech and low-tech industries.

The key findings from our recent research can be clustered around what we have identified as six critical pathways to accelerated and sustainable high-value innovation and product/technology leadership.

Pathway 1. Infusing the passion and mindset for sustainable innovation across the extended enterprise

Pathway 2. Building an integrated strategic portfolio of projects, programs, platforms, competencies, sources, and partners that is well aligned with the ambition-driven strategic intent of the enterprise

Pathway 3. Energizing a seamless innovation process from concept to market – deriving its energy from both high-value product pipelines and robust technology pipelines

Pathway 4. Implementing a highly leveraged resource-deployment and investment system within the current budgeting process – accessing and deploying people, money, and intellectual capital from the extended enterprise worldwide

Pathway 5. Developing a highly charged yet fluid and networked organization – harnessing, driving, and nurturing the inherent ambiguity and complexity of innovation

Pathway 6. Creating the motivators and metrics to stretch the organization beyond continuous improvement to sustainable innovation – particularly in the areas of leadership, value creation and capture, return on assets, and innovation behavior

Pathway 1: Infusing the Passion and Mindset for Sustainable Innovation

It's hard these days to find a company that is not at least giving substantial lip service to creating an innovation mindset to fuel earnings growth and create shareholder value. From this year's strategic imperative to next year's promise of increased company value and shareholder premiums, to a vision of sustained industry leadership, virtually every annual report pays considerable attention to innovation and/or product technology leadership. Writing this in an annual report or a corporate vision statement, however, is very different from actually changing the company's mindset and fueling the passion to make it happen. In fact, we have found that premature communication of such dramatic change can actually be counterproductive to sustainable innovation – relegating it to the status of this year's management fad. This is particularly true if the shift in mindset is not backed up with fundamental change and significant movement in the other five pathways discussed in this article.

While many potentially leading firms have the requisite passion for sustainable innovation, most have not yet found ways to harness and use it. For most companies, the drive has been stymied by a cultural mindset. But, as leading companies are moving beyond a pure cost-cutting ambition to a broader set of growth and leadership oriented ambitions, they are placing a renewed emphasis on innovation and are knocking down some of the major cultural barriers to the most critical changes. Mindset changes appear most frequently in six areas:

- Moving beyond market-driven project portfolios to ambition-driven platforms
- Moving beyond best-practice and product-performance benchmarks
- Moving beyond cross-functional teams to fluid networks
- Moving beyond cost-reduction and constraint-driven R&D budgeting to innovation investment
- Moving beyond efficient stage-gate project management
- Moving beyond cost-effective R,D,&E management to high-performance T&I management

Pathway 2. Building and Sustaining an Integrated Innovation Portfolio

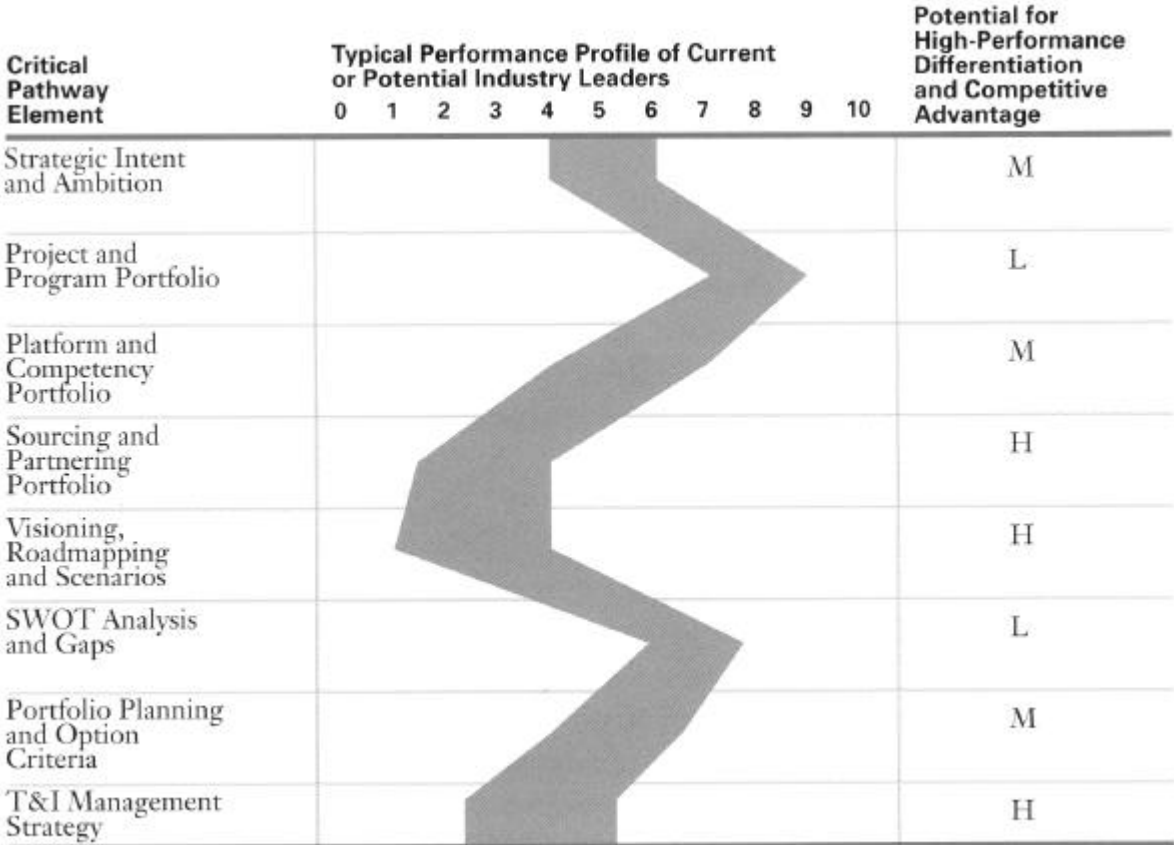
Having created the mindset for sustainable and high-value innovation that will drive competitive leadership, most emerging leaders significantly revise their approach to developing a strong strategic foundation for high-performance technology and innovation management. Whether they are in traditional resource and manufacturing industries or in faster-moving consumer electronics and service industries, leading companies are significantly expanding the scope and impact of their strategic planning activities to support innovation. They are moving beyond the traditional building blocks of research, development, and engineering (R,D,&E) project and program portfolios that are well aligned and driven by condition-based business unit strategies – moving toward a more balanced strategic focus that recognizes the critical interdependence of R&D project and program portfolios, technology platform and competency portfolios, and innovation sourcing and partnering portfolios.

The result of building these new strategic foundations for creating and capturing value from technology and innovation is that companies' strategic T&I portfolios have shifted from an 80 percent focus on internal R,D,&E projects to more of a 40/30/30 split between projects/programs, competencies/platforms, and sources/partners. The overall strategic thrusts have also shifted from 90 percent „content“ to 70/30 content/management. And finally, strategic planning activities have become more balanced among portfolio planning, fact-based analysis, and visioning (Exhibit 2).

In both high-tech and low-tech industries, companies that have successfully chosen to excel on this pathway have provided a sound foundation for sustainable innovation. These companies include such industry leaders as ABB, Alcoa, Canon, Ericsson, International Paper, Procter & Gamble, and Sun Microsystems. Fast-moving office and consumer product industry companies, such as Canon, have aggressively leveraged printing technologies and digital imaging platforms to create strong product, cost, and customer leadership positions in cutting-edge market segments. By explicitly managing its leadership positions in these platforms and by managing a well-aligned portfolio of partners and suppliers to strengthen these positions, Canon has demonstrated the power of moving beyond the limitations often associated with pure project and product development portfolios.

In more mature and capital intensive industries, such as aluminum, Alcoa is demonstrating the impact of moving beyond project portfolios. It's using its expanding portfolio of partners to increase its leadership in key technology and innovation platforms that can then be used to dramatically accelerate the pace of technology application and deployment worldwide and the capture of strategic and financial value from major new acquisitions.

Exhibit 2
Creating High-Performance Differentiation Along the Strategic Pathways



Source: Arthur D. Little Survey

Pathway 3. Energizing a Seamless Innovation Process from Concept to Market

As noted earlier, our research also indicates mat emerging leaders in many industries are striving to move beyond a highly engineered and disciplined „stage-gate“ product-development process that focuses on project management to a more integrated and seamless innovation process that extends from concept to customer.

These companies have recognized the need to develop different but parallel approaches to their technology and product/process pipelines. They are also focusing more on developing effective innovation management tools for the „fuzzy front end“ (e.g., structured idea management,³ „protocepting,“ as employed by companies such as Pepsi to replicate prototyping at the front end, and innovation-on-demand) and for downstream commercialization and rollout (e.g., technology transfer, co-venturing, licensing). The companies are also managing the more ambiguous upstream processes and the more complex downstream processes with significant participation by outside partners, suppliers, and customers. Key elements of this emerging seamless innovation process are illustrated in Exhibit 3.

While this extension of the process upstream and downstream has proven much more challenging than the management of more limited stage-gate development processes, the rewards for effectively integrating these activities into a single seamless process cutting across both technology and product/process pipelines have been great. Companies that have dramatically increased their leadership position and market share by extending their innovation process in this way include emerging leaders such as Nokia, Boston Scientific, and Lear. They have greatly increased the robustness of the top of their idea funnels through aggressive involvement of lead customers and suppliers, as well as strongly driven and proactive ideation processes. They have used this robustness to accelerate the speed and value of projects moving through their stage-gate processes and to develop global commercialization and rollout processes that leave few stones unturned in the search for value-capture opportunities from these innovations.

These companies and others that have chosen to excel on this pathway have created significant competitive advantages for themselves and powerful engines for sustainable innovation. The increased value of their „pipelines“ alone due to these process improvements has had significant positive impact on shareholder and company value.

Exhibit 3
Creating High-Performance Differentiation Along the Process Pathways

Critical Pathway Element	Typical Performance Profile of Current or Potential Industry Leaders										Potential for High-Performance Differentiation and Competitive Advantage	
	0	1	2	3	4	5	6	7	8	9		10
Innovation Sourcing and Partnership												M
Upstream Ideation and Concepting												H
Midstream Stage-Gate Development												L
Downstream Commercialization and Rollout												M
Innovation Value Capture												H
Technology Pipeline												H
Product/Process Pipeline Management												M
Knowledge Management Support												H
Planning and Resourcing Support												L

Source: Arthur D. Little Survey

Pathway 4. Implementing a Highly Leveraged Resource Deployment and Investment System

Some of the most dramatic breakthroughs in sustainable innovation are made by companies that explicitly decide to manage and value innovation and product/technology development as an investment activity (including options, insurance policies, seed and venture capital, etc.). Many of these companies have begun to value their product and technology pipelines, their platforms, and their intellectual property assets. They are now taking the next step to measure their returns on these assets and aggressively leverage their additional investments through suppliers, customers, joint-venture partners, and government institutions. Leading companies along this pathway have successfully avoided the cost-center trap that has so often plagued R&D organizations trying to justify their budget allocations. Cost-center focused organizations have invariably been driven to a focus on incremental R&D in support of continuous improvement. Organizations focused on investment, leverage, and return on total assets (both tangible and intangible) have been able to achieve high returns on sustained innovation investments, in terms of both balance sheet financial returns and shareholder value.

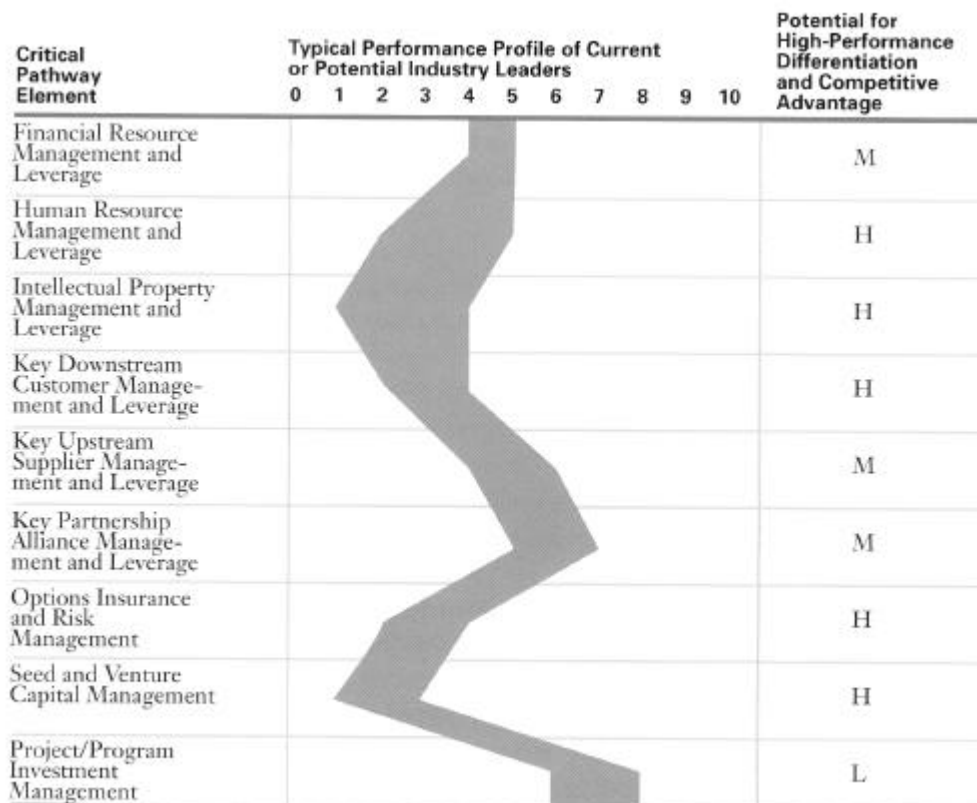
Valuation activities associated with partnering, merger and acquisition activities, and alliances are increasingly focusing on the value of intangibles, including the risk-adjusted net present values of product and technology pipelines, the value of intellectual property, and the value of product/ technology leadership. This in turn has driven leading companies to overlay a wider-reaching innovation investment framework on their traditional budgeting framework for internal R,D,&E.

As investors increasingly attach an „innovation premium“ to companies that can demonstrate sustainable innovation leadership, the importance of this investment and resourcing pathway and its potential to provide competitive differentiation increases. With many companies reporting that as much as 50 percent of their competitive technology differentiation is being derived from either external collaboration or outsourcing, the effective management of this pathway becomes even more important. The main emerging elements of this pathway are illustrated in Exhibit 4. Companies such as Chrysler, Microsoft, and Sun Microsystems have certainly demonstrated the power of this pathway in significantly altering the rules of competition and engagement in their industries.

The dramatic rise of Chrysler in both value and market position can be traced in large part to its effective leveraging of key suppliers and collaborative investment in technology and innovation activities that now make it me number-one choice as „preferred customer“ for innovation by a majority of tier-one automotive suppliers.

Exhibit 4

Creating High-Performance Differentiation Along the Resourcing Pathways



Source: Arthur D. Little Survey

Pathway 5. Creating a Highly Charged Yet Fluid and Networked Organization

Most leading companies have increased their use of collaborative organizational structures ranging from internal multifunctional teams to external joint ventures. In the process, however, many of these companies have witnessed a proliferation of task force teams and declining team productivity, as well as a disappointing track record with external joint-ventures and partnerships. Working with these companies and benchmarking their successes, failures, and lessons learned, we have identified several organizational development elements that make the networked organization work successfully. These include:

- *A shared and compelling vision of high-value innovation*, cutting across business and technology leadership and incorporating both financial and strategic leadership dimensions of product/technology leadership, operational efficiency and excellence, and customer intimacy/loyalty
- *Strong and effective enterprise-wide innovation leadership*, whether embodied in a strong CEO, CTO, CIO, CDO, Innovation Council, or Board
- *A compelling and pervasive innovation culture* – a culture that cuts across the extended enterprise of lead customers and preferred suppliers and is highly infectious for new business acquisitions and staff recruits
- *A consistent and supportive set of written and unwritten rules for innovation* that are well communicated and well understood and that recognize the inherent ambiguity and complexity of sustainable innovation
- *A clearly chartered and -well-understood array of „fluid networks“ and/or standing teams* that are accountable for key technology and innovation platforms or competencies that typically cut across businesses or the extended enterprise
- *A cost-effective network support infrastructure* involving more virtual shared work spaces, rapid communication, and energizing drivers
- *A well-organized set of partnering agreements that clearly drive win-win agendas*, reflecting the lessons learned about the company’s ability to manage different types of partnership structures with new customers, key suppliers, universities, and joint venture and alliance partners
- *A flexible structure for managing the evolution of the overall extended enterprise*, recognizing the need to have closely aligned but loosely coupled partnerships that are performance driven and thus both drive and respond to change

Even in the most successful leading companies, this pathway is rapidly evolving through increased enterprise-wide organizational development initiatives. While best practices and high-impact change levers vary from enterprise to enterprise, it is clear that this entire organizational development arena is a rich source of major enhancements in the strategic and financial value that companies are able to garner from sustainable innovation and product/technology leadership (see Exhibit 5).

Pathway 6. Creating the Motivators and Metrics to Stretch the Organization Beyond Continuous Improvement to Sustainable Innovation

The final pathway lies in the arena of motivators and metrics. This pathway, which is being aggressively developed by emerging leaders, must be carefully designed to fit the company’s evolving culture, change priorities, and current written and unwritten rules of behavior. In our research and benchmarking, we have identified four major categories of metrics and motivators that characterize emerging best practices today. These four categories are those that drive the following qualities:

- *Passion for leadership and excellence in product/technology performance, in operational efficiency and productivity, and in customer intimacy and loyalty*. These are often reflected in a range of results metrics related to market share, profitability, „brand preference,“ or „product plus,“ and related leading and in-process indicators.
- *Obsession with value creation and value capture in terms of customer value, enterprise value, and shareholder value*. These are directly reflected in results measures, such as product price premiums or share price premiums, or reflected upstream in the value of product- and technology-development pipelines, and other leading indicators.
- *Enhanced return on assets through increased leverage and productivity of both tangible and intangible assets across the extended enterprise* – as reflected in both enhanced asset value, enhanced return on these assets, and enhanced access and leverage of external assets

Exhibit 5

Creating High-Performance Differentiation Along the Organizational Pathways

Critical Pathway Element	Typical Performance Profile of Current or Potential Industry Leaders										Potential for High-Performance Differentiation and Competitive Advantage	
	0	1	2	3	4	5	6	7	8	9		10
Leadership Vision of High-Value Innovation												L
Enterprise-Wide Innovation Leadership												M
Innovation Culture												M
Supportive Set of Unwritten Rules of the Game												M
Fluid Networks and Standing Platform Teams												M
Network Support Infrastructure												H
Win/Win Partnering Agreements												H
Extended Enterprise Management												H

Source: Arthur D. Little Survey

- *Innovative organizational behavior*, including the recognition and reward of individual and collective behaviors associated with accelerated change and learning, strong and proactive risk and opportunity management, and robust and balanced ideation and concept development

These motivators and metrics are frequently arranged in a hierarchical structure, with some measures being tracked and reinforced by senior executive teams, others also being tracked and reinforced by Business/Technology Review Boards and Innovation Councils, and still others being used by businesses and functions at both the individual and team level.

Conclusion

While there are no silver bullets for sustainable and high-value innovation leadership, the most successful enterprises (both leaders and emerging leaders) in each industry do appear to be well ahead of most of their competitors along these six paths.

It is clear that today and in the future companies must explicitly focus their business strategies on growth and competitive leadership through innovation. They must develop and align key processes for generating, cultivating, and launching new ideas. They must leverage the most appropriate resources from both internal and external sources. Finally, they must rethink how they are organized to drive value creation across functions and among businesses. Those companies that do this effectively will realize unparalleled competitive advantage;

those that do not may not survive.

¹ „Customer Intimacy and Other Value Disciplines,“ Michael E. Treacy, Frederick Wiersema, Harvard Business Review, January/February, 1993.

² Findings of the Arthur D. Little Global Survey on Innovation, Arthur D. Little Research – Working Intelligence, late 1997.

³ Lucy Rowbotham and Nils Bohlin, „Structured Idea Management as a Value-Adding Process,“ Prism Second Quarter 1996.

Ron Jonash is a Vice President of Arthur D. Little, Inc., and leader of its Global Technology and Innovation Management Practice.

Tom Sommerlatte is a Vice President of Arthur D. Little, Inc. Based in Wiesbaden, he has more than 25 years of experience in helping companies develop strategies and operational approaches for the European market.

Arun N. Maira is Managing Director of Innovation Associates, an Arthur D. Little company, and a Vice President of Arthur D. Little, Inc. He has assisted companies around the globe in managing change and obtaining breakthrough performance improvement. He is the author, with Peter Scott-Morgan, of The Accelerating Organization: Embracing the Human Face of Change, McGraw Hill, 1997.