Technology Sector—Software

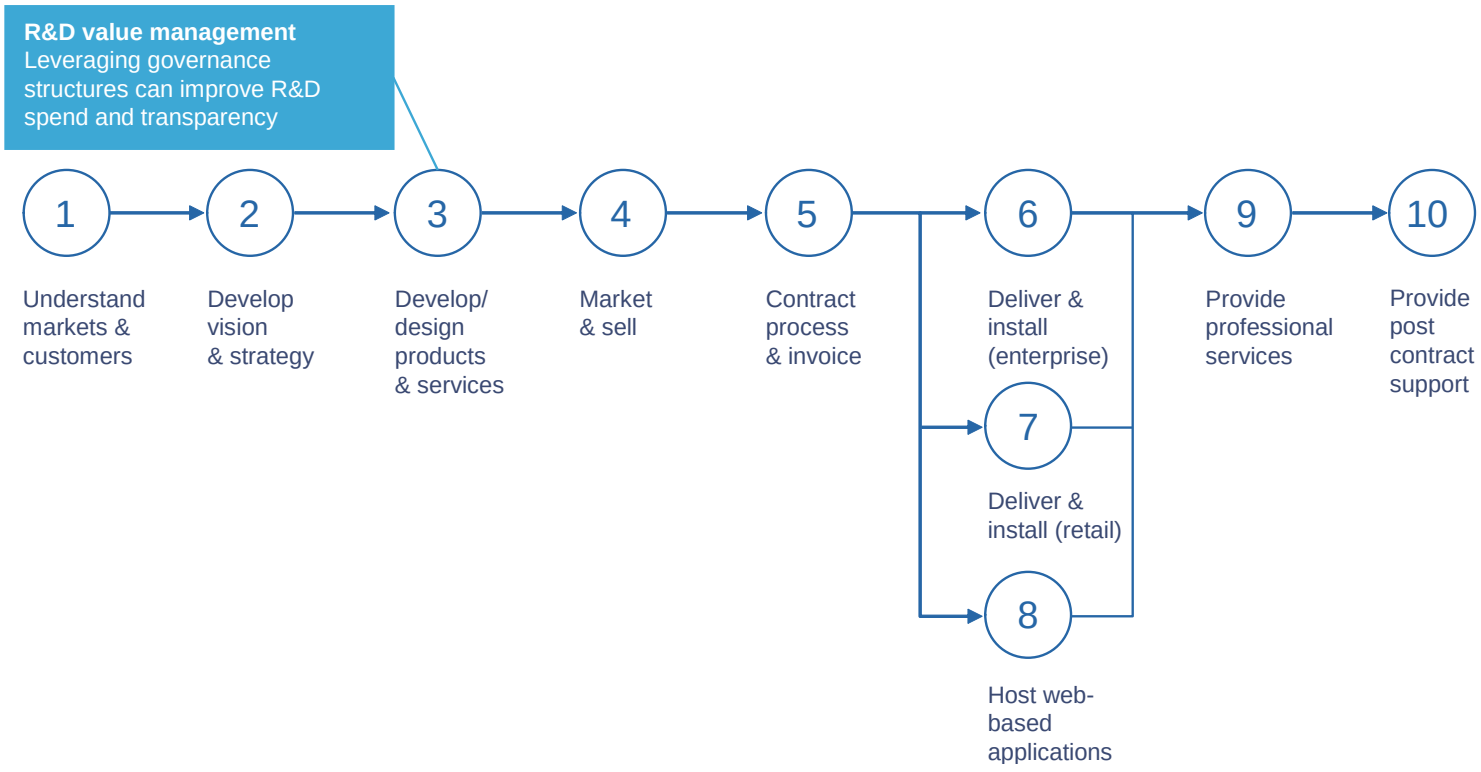
How to capture value through software R&D*

*connectedthinking

PricewaterhouseCoopers

PricewaterhouseCoopers presents a series of papers to identify and discuss value leakage points across the software supply chain. Our interest is to provoke meaningful conversations, shift staid perspectives and, ultimately, enable long-lasting change. While the core audience for this series is executives and senior management of software companies, we believe other key stakeholders—suppliers, customers, channel partners, shareholders and regulators—will find our points of view insightful. In this first article in the series, we turn the spotlight on software R&D business operations.

Figure 1: Value leakage points within the software supply chain



For more information, please visit our Global Best Practices website at globalbestpractices.com.[1]

1 PricewaterhouseCoopers, LLP Global Best Practices®

How to enhance your bottom line and shareholder value through R&D value management

A software company's lifeblood is research and development (R&D). It generates the product set for the company's sales and has an ongoing relationship with the product post-release through patches and upgrades. It is not uncommon for R&D shops to wield considerable power within a software company. However, while once insulated in laboratories, R&D departments are increasingly exposed to industry pressures. Management must take steps to adapt to the changing development conditions and provide enhanced transparency and value to its key stakeholders.

The software industry—strained by economic, market and technology trends—copes with shortened version cycles, open-source models that feed competition, customers with fewer dollars to spend on technology, and pricing structures that favor service fees over more lucrative license fees.

New pricing and delivery structures—such as Software-as-a-Service—will result in the adoption of new business models as well as changes to vendors' practices in the areas of economics and finance, research and development and sales. Details on pricing and how it affects software companies can be found in the recently released PricewaterhouseCoopers (PwC) Software Pricing Trends* report.

External forces have driven productivity and flexibility within company sales and marketing teams. The same outside forces prompt chief financial officers to seek transparency in the governance and monitoring of resources allocated to R&D. Meanwhile R&D leaders must improve their structures and processes to gain economic efficiencies while delivering on the company's technology roadmap.

To foster innovation and remain competitive, we believe software company leadership must acknowledge R&D's vital role within the organization, and partner with R&D to achieve transparent accountability for its projects. To efficiently execute on the R&D project portfolio, companies should take steps to drive R&D value management through increased awareness, governance, business process improvement and optimized accounting and tax considerations.

Making a case for R&D transparent accountability

Transparent accountability demands a new level of cross-company trust, cooperation and inter-dependence that is championed by your company's leadership. For example, efficient allocation of short- and long-term budgets can only be achieved through accurate and timely information about activities within an R&D organization. This provides greater assurance that resources will be available for the programmers who code upgrades and the think-tank visionaries who conceive future software solutions.

The need for transparent accountability is heightened by a growing trend of offshoring and outsourcing of R&D projects, which creates a physical and sometimes legal structure disconnect between R&D departments and the rest of the company.

With enormous expenditures—R&D spending generally ranges from 11% to 21% percent of revenues—even small improvements in R&D value management can yield sizable returns. If we consider a hypothetical $1 billion revenue company, a 1 percentage point improvement in post-tax spending could translate into a $124 million dollar increase in shareholder value, as shown in the following table.

Translating R&D efficiency gains into shareholder value[1]

Company	2006 revenue (millions)	R&D spending in 2006 (millions)	% of revenue on R&D	Price to cash flow multiple (ttm)[2]
Microsoft	$44,282	$6,584	14.9%	19.00
Oracle	$14,380	$1,872	13.0%	18.50
SAP	$12,543	$1,781	14.2%	19.60
Google	$10,605	$1,228	11.6%	44.50
Symantec	$5,199	$867	16.7%	13.40
CA	$3,943	$715	18.1%	19.00
Cadence	$1,484	$460	31.0%	12.50
Adobe	$2,575	$540	21.0%	24.20
Intuit	$2,293	$386	16.8%	16.80
Autodesk	$1,537	$302	19.6%	16.50
BMC Software	$1,580	$213	13.5%	15.60
Novell	$967	$186	19.2%	50.10
BEA Systems	$1,200	$182	15.2%	96.30
Citrix	$1,134	$153	13.5%	22.50
Sybase	$876	$150	17.1%	11.60
Median	**$2,293**	**$460**	**16.7%**	**19.0**

Example case	
Hypothetical revenues	$1,000 M
R&D savings (16.7% to 15.7%)	1%
Change in cash flow (pre-tax)	$10 M
Change in cash flow (post-tax)	$6.5 M
Median P/CF ratio	19.0 x
Market cap increase	**$124 M**

1 Revenue data and R&D spend retrieved from information published by individual companies.
2 Cash flow multiple obtained from publicly available financial data in November 2007.

The key caveat is that management must continue to deliver the same level of R&D output within a tighter budget. How can software companies achieve this efficiency gain? One source of inspiration comes from outside the software industry—the life sciences sector.

Learning from the Life Sciences R&D experience

Life science R&D is generally regarded as the "gold standard" of technical research and product development, and software companies can benefit from the lessons learned by this more mature industry. Prior to making improvements, life sciences R&D organizations failed to provide authoritative project information (milestones, activities, status, etc.) from which stakeholders throughout the organization could make informed planning decisions. Additionally, the existing process lacked the responsibility and accountability frameworks to generate trusted, real-time data and integrated planning.

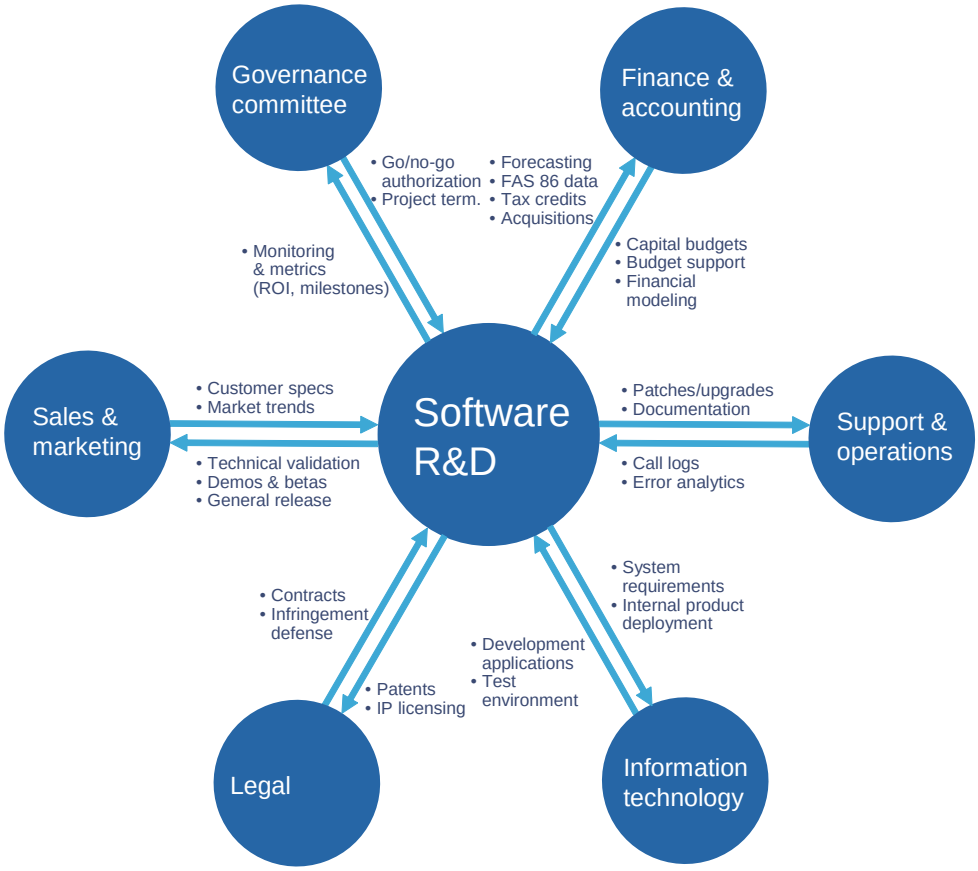
Through a systematic effort of assessment and evaluation, better processes and financial models were developed that capture costs associated with managing project portfolios undergoing simultaneous development. Cycle times for getting drugs to market were reduced through the development of key performance indicators (KPI) focused on cycle time, cost, customers, quality and productivity. Further, R&D productivity increased as evidenced by metrics that show research output outpacing budget growth.

While there are distinct differences between life sciences and software R&D, PwC bridges sectors and geographies to bring its clients leading practices in governance, process alignment and financial accountability.

Achieving balance through awareness

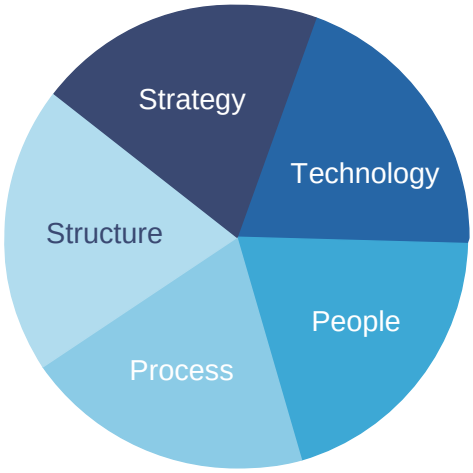
To improve effectiveness, software companies must first understand the full scope of interactions and expectations which R&D has with the rest of the organization. Although R&D is often structured as a cost center and a standalone department, it exists within an internal network of suppliers and customers. For example, marketing pushes customer needs into R&D while finance pulls out time and expense data for accounting purposes. Legal departments assist with filing patents and protecting intellectual property. These interactions can create synergies between departments which in turn leads to cooperation, organizational efficiency and, ultimately, effective value leakage management.

Figure 2: Software R&D network



Attaining an awareness of R&D processes helps balance company expectations. There is no magic formula here — program managers will always need to find the right balance between writing reports and writing code. However, the informed creation of a governance structure can shift some internal network interactions from R&D line managers to a steering committee. The following section describes some leading practices that will enhance organizational agility while unburdening R&D management through transparent accountability.

Figure 3: PwC guide



R&D value management

PwC uses a framework guide to drive lasting improvements throughout the R&D organization and to ensure the issue is defined from multiple points of view. It is based on a set of five dimensions: strategy, structure, process, people and technology. We have employed the guide here to holistically understand and recommend actions that create value.

- Align business strategies within the organization

  Software companies must link R&D strategies with those of the entire organization such that product development drives business value throughout its functional departments. R&D business leaders are ultimately responsible for maintaining this strategic linkage while driving efficiencies within their organization. The finance department—as a willing participant in supporting strategic and process initiatives—benefits from the improved exchange of financial information.

- Establish a governance structure

  The CEO should drive a governance structure committee that is comprised of executives who represent the company's stakeholders including, for example: legal, marketing, sales, finance, IT and, of course, R&D. The committee's mission is to ensure that R&D meets company objectives through a careful selection of leading-edge projects, monitoring of software development activities and appropriate rationing of resources to support the current install base. In some software companies, R&D may also partner with marketing for the care and feeding of their open-source community.

  A common complaint from R&D line management is the seemingly endless "interruptions" from outside the current project focus. Managers may be asked to tweak the code for a particular customer, document IP for legal

protections, provide a different rollup of time and expense reports for tax credits or dozens of other non-R&D requests. A strong governance committee serves as a filter between R&D and the rest of the organization. R&D line management can then focus on their workplans and deliver on other demands in a prioritized, consistent manner.

Too often software companies embark on forward-looking projects without the benefit of forecasting, which can cause companies to miss targets and Wall Street projections. With a structured method in place to effectively monitor and allocate resources, this pitfall can be mitigated.

- Optimize process, people and technology

  Using a stage-gate process helps companies execute projects efficiently via prioritized project selection, early failure detection, close cross-functional communication and shortened development cycles. Composed of structured stages and review gates, this framework reduces risk and adds discipline to the process by clarifying expectations for project teams, simplifying and standardizing work processes, and closely monitoring activity stages. The result is a systematic way of building in best practices, leading to a more balanced trade off between cost, time and performance. In the end, the company enjoys enhanced productivity, improved communication and strengthened controls.

- Enable tax and accounting strategies

  Software company finance organizations benefit when there is a free flow of information from the R&D department. With this information, finance executives can capture the key metrics required to show a positive Return on Innovation (ROI) for R&D projects. “Return on Innovation” incorporates not just the traditional investment-based financial metric, but also the wider inputs and outputs that R&D embodies such as reputational benefits, increased mind- and market share, competitive advantages through IP creation, and resource allocation to support developer and user communities.

  When project-based information capture is implemented, R&D is better able to effectively manage its portfolio of projects. If the system is properly designed with the needs of accounting (FAS 86) and tax (R&D credits) in mind, there are often limited additional reporting requirements from R&D to fulfill these compliance demands. Leading companies accomplish this dual objective—efficient project management and compliance—through the pervasive use of project accounting applications.

Next steps

Elevating the transparent accountability of an R&D function is a significant undertaking. The first step on the path to R&D excellence is to conduct a current-state assessment. An honest and thorough assessment will expose organizational challenges, process hurdles, control and data deficiencies, as well as lay the groundwork for a desired-state roadmap. This assessment phase has the added benefit of revealing divergent goals and strategies across your stakeholders. The following figure is an example assessment framework.

Figure 4: Next steps

	Strategy	Structure	Process	People	Technology	Outputs
Governance & change mgmt.	How are projects greenlighted vis a vis company strategy?	Are the right stakeholders represented on the R&D governance committee?	How are projects monitored for continued relevance?	How to enable and incent the entire organization to innovate?	Can you accurately report R&D costs by initiative?	More effective allocation and monitoring of resources
Process assessment	Does the company have a coherent strategy for outsourcing or offshoring?	Do reporting structures enable or hinder R&D processes?	Are the R&D processes standardized across development teams?	Are incentives and MBOs aligned with dev project, product and corporate goals?	How to leverage collaborative tools such as wikis and team coding?	Enhanced productivity, communication and controls
Accounting & tax considerations	What are the implications of various R&D improvement opportunities?	How do changes in the R&D structure affect R&D tax credits?	Are there clear, consistent milestones for achieving technological feasibility?	How best to balance compliance requirements with productive coding?	Is your ERP projects module capturing needed FAS 86 data?	Optimization of tax savings and reduced G&A cost

This assessment phase has the added benefit of harmonizing goals and strategies throughout your organization. Outputs from the assessment will include organizational challenges, maturity hurdles, control efficiencies and a desired-state roadmap.

After your assessment is complete, initiate the transformation through workshops with key representatives from affected company departments. Drive toward a consensus on prioritized opportunities to improve R&D effectiveness through output gains, cost reductions and agreement on key metrics.

Navigating the software industry's current transformation can become a make-or-break kind of challenge. By taking steps to increase awareness, improve business processes and enable tax and accounting strategies, companies can capture lasting value from their R&D operations and strengthen the bottom line.

Acknowledgments

Principal authors
Thomas Archer, Ira Hall

Contributors
Rupert Yip, Kendall Fox, Glenn Ricart

Project team
Joe Evans, Kathy Robbins, Lauren Wendel, Steve Berry

For further information, please contact:
Thomas Archer
thomas.archer@us.pwc.com
408-817-3836

Ira Hall
ira.hall@us.pwc.com
650-387-4785

or visit
www.pwc.com