Your most valuable asset: insight into resource & competence management

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

The ever-increasing pace of technology development and the emerging requirements for new cross-disciplinary competencies, especially in converging industries, places increasing demands on resource and competence management in R&D. If companies fail to develop, or target the wrong areas, the consequences can be significant and it can be hard to recover. Our study of R&D best practices shows that some of the leading companies are rising to the challenge by ensuring that they **develop resilience in their resourcing** plans to avoid bottlenecks, take a long term view on what **competencies will be required in the future,** and put plans in place to develop these, often with **external partners.** Lastly they seek to **develop knowledge by investing in capability building projects** and by **linking internal and external networks.**

Why is resource and competence management so important?

It is common to see people proclaimed as a company's number one asset – in fact it is rare for this not to be the case – but do companies always manage this resource effectively? How often is this more a celebration of talent rather than a statement of intent? Early on in ADL's recent study of R&D Best Practices it became clear that participants were uncomfortable discussing resource and competence management – it was not immediately obvious whether this reflected a lack of interest or a tacit admission that all was not well.

Resource and competence management operate over different timescales. Resource management deals with allocating personnel to R&D projects – this could form part of an annual budget planning exercise held alongside a major portfolio review, or be as tactical as week-to-week 'firefighting' to meet deadlines. Competence management is more longer term – it deals with the development of a firm's technical capabilities, determining "what we know how to do" and is essential to ensure competitive advantage in the future.

What do leading companies struggle with?

Three main challenges emerged from the study.

Short term bottlenecks: These remain very common in R&D. Companies often descend into messy firefighting as deadlines approach. Essentially the root causes here are overly optimistic plans, and *sufficiency* (i.e. having enough projects to demonstrate you can reach business targets) being prioritized ahead of *readiness* (actually delivering targets on time). This

over-commitment combined with prioritization issues results in resources spread too thinly across many projects and not optimized for meeting core launch targets. Often the resulting bottlenecks arise from the presence of a few key individuals or specialist groups on multiple critical paths, whilst many other resources remain under-utilized.

ADL's Study: Perspectives of R&D Best Practices

In 2013, Arthur D. Little completed its 8th Global Innovation Excellence Study (GIES), a global, cross-industry survey of trends and best practices in innovation management. Drawing on over 1000 responses across the last two GIES it shed new quantitative light on the basic 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. 23 case studies were developed with 15 companies identified as innovation leaders. These global participants have an average turnover 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 Europe.

From the rich material that these companies shared with us, ADL 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 practice.

Lack of deliberate capability development: Companies generally have well-established processes for developing products, but less so for developing knowledge and capabilities. New capabilities are often an accidental by-product of new product development. This can mean that most strategic decisions are framed around a single product rather than a portfolio of capabilities, which can result in over-invested positions in particular technologies. Structuring R&D by discipline groups can also result in restricted thinking that limits the bigger picture, and can also mask the need for additional groups to expand capability.

Lack of clarity on required long term competencies: Capabilities are *path dependent* - what companies can do in the future is significantly constrained by what they have been able to do in the past. However, too often, no explicit plan for developing future competence exists, and even rarer is a plan that links back to the corporate strategy. Cumulative learning and investments in existing technologies lock firms into an existing trajectory, because this is less costly – financially, but also emotionally and creatively – than investing in new ones. Overcoming the issue is difficult because longer term capability building has a more tenuous and uncertain business case than concentrating on shorter term business targets.

"What will be important in the next decade? How will we deliver the required innovation? What competencies will we need?"

- Innovation Excellence Manager

What insights into best practice emerged?

ADL's synthesis of the case studies revealed four practices which can help to address the challenges:

1. Develop resilience and agility in resourcing: It was von Moltke the Elder[1] who coined the phrase "no plan survives contact with the enemy". All too often the plan trumps reality – resources are spread too thinly across projects and not adjusted to take corrective action. The answer is not in putting more effort in up-front planning or making those plans more definite, but instead building dynamic flexibility in a number of areas.

Unexpected issues often arise during the normal course of R&D but these issues need to be effectively dealt with. As a result, many consider resources to be fully loaded at 80% in order to provide some flexibility. Some progressive organizations go further and use a maximum loading of 50% for senior technical staff – the rationale behind this low utilization is their limited interchangeability compared to junior resources and they often have a critical, decision-making and firefighting role in innovation, and need the freedom and flexibility to respond as required.
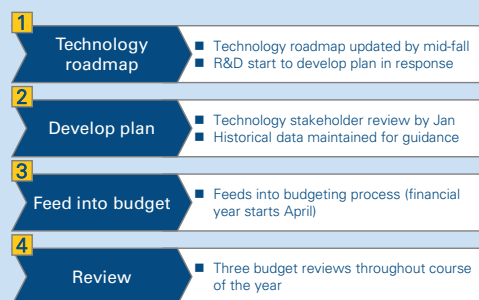
---

1   He was instrumental in developing 'mission type tactics' or 'mission command', a style of command which requires a set goal to be achieved within certain constraints but provides freedom around *how* it is achieved.

Case Study 1: Resource Management

Benchmark Company D is in the medical device industry with a revenue of around $2 Bn. It has a multi-level process, managed over a range of timescales, for resource allocation.

Annual planning cycle

The annual planning process is cascaded down from the corporate planning process.

1	Technology roadmap	■ Technology roadmap updated by mid-fall ■ R&D start to develop plan in response
2	Develop plan	■ Technology stakeholder review by Jan ■ Historical data maintained for guidance
3	Feed into budget	■ Feeds into budgeting process (financial year starts April)
4	Review	■ Three budget reviews throughout course of the year

Monthly balancing

A new baseline for the resource allocation plan, with any required modifications, is created every month, and agreed with all project managers and functional managers.

Weekly 'pulse' meeting

There is also a weekly Monday morning balancing process, designed to cope with short term issues e.g. machine faults. This provides full transparency, on a 1 week timescale, of resourcing needs and allocation.

In an ideal world resources would be limited to operating on as few projects as possible (2-3) to maintain freshness of thought and manage waiting times whilst avoiding the transaction costs of shifting between tasks.

A responsive approach to resource balancing, operating on a range of timescales, is required. New baselines for resource allocation plans are often created every month or quarter, but more frequent adjustments can often be essential. Case study 1 describes one medical device company's approach to managing resource 'pulses' on a weekly basis. No matter how detailed the plans, or the frequency of updates, conflicts are inevitable in resourcing and a process is needed to manage them that involves all stakeholders meeting together to decide priorities.

2. Actively manage conflicts: Escalation for discussion is important – it is sometimes possible to find a working compromise but this requires involvement and buy-in from all senior stakeholders. Typically, activities expected to deliver far out in the future are "de-prioritized" and the focus stalls on near-term opportunities. Prioritization becomes chronological in nature. This often results in projects being crunched in the future – leading to sufficiency issues (i.e. not enough projects delivered to meet the growth targets).

Case Study 2: Competence Succession Planning

Benchmark Company P is in the food industry with a revenue of around $3 Bn. It recently undertook a strategic workforce planning review to identify issues with succession planning for key competencies.

1 Understand business strategy
- Develop business leader buy in
- Understand strategic objectives

2 Identify required capabilities
- Identify critical capabilities
- Assess current capabilities and model

3 Diagnose talent risks
- Identify talent gaps and surpluses
- Identify retention and supply risks

4 Address risks and gaps
- Develop strategy to tackle gaps
- Allocate investment and manage barriers

5 Track and review
- Measure and communicate progress
- Review plan

The output was a series of technical leadership succession risk maps over three timescales:

- **Immediate:** where is talent currently missing.

- **Mid-term:** expected issues over 3-5 years.

- **Long-term:** risk profile for 5+ years.

Sample succession risk map e.g. immediate succession:

	Technical groups in R&D					
Portfolio platforms	Analytical	Synthesis	Engineering	Modeling	…	…
New molecules						
Process Eng.						
Proprietary 1						
Proprietary 2						
Product delivery						
…						
…						
…						

Low risk High risk Moderate risk Does not contribute

People and organizations are often at their most efficient when slightly stretched but not overwhelmed. Severe resource allocation conflicts suggest a need to revert the issue to the portfolio management process for prioritization to prevent resources being overwhelmed.
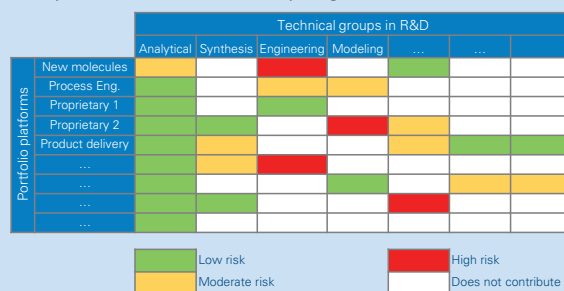
Many participating companies were not aware of the cost of delays to projects – reporting delay as costs simplifies generating a convincing business case to solve the problem. It is not uncommon for the cost of delays to escalate to the order of several USD millions per week. Most often this occurs as projects approach commercialization and costs mushroom due to investment in production equipment, extensive testing to meet regulatory and quality standards, and building the required infrastructure. Generally this spend must be maintained to avoid a terminal loss of momentum, making the costs of unexpected delays at this stage potentially severe.

3. Consider your future competence needs: The ever-increasing rate of technical progress, the need to pursue breakthrough innovation and the trend towards converging industries means companies must ensure their core competence stays relevant to the market.[2] To keep pace with desired development portfolios requires ever increasing flexibility and early planning as some inertia is inherent in competence management. Too many companies only carry out succession planning to maintain current competency but do not look to determine what they must build or change. It is important to review what new skills are required based on the business and technology strategy in order to complete "as-is" and "to-be" competence maps to guide recruitment, acquisition and training. Most importantly, champions can then be identified to lead the creation (and exploitation) of these new capabilities. Case Study 2 describes a competence planning strategy to identify required capabilities based on current and expected capability maps.

Funding external R&D brings rapid access to new growth areas aligned with corporate strategy, but it is important to internalize those new skill sets. It helps to frame external collaborations as opportunities to develop internally as well as acquiring technology. Often this will mean funding internal work alongside external R&D to develop internal competence in parallel to build the uptake capacity necessary to absorb external knowledge.

"You need to tap into advancement of work externally and simultaneously create the ability to internalize new required capabilities"

- Innovation Excellence Manager

4. Focus on knowledge development: Given this rate of change, companies need to develop an understanding of new technologies and markets more often and more rapidly than ever before. We found that innovation leaders tend to:

- Ring-fence effort in the R&D portfolio for capability development projects (as opposed to product development projects) and ensure that these are managed appropriately (i.e. different assessment criteria).

- Encourage formal and informal, internal and external networking – often the ability to 'connect the dots' is non-trivial and generating understanding takes time and effort.

- Build an ecosystem by developing strong relationships with partners. Early stage exploratory work is often beset by project failures and changes of direction and it is often simply not time or cost efficient to perform in-house.

2   Härenstam, Thuriaux-Alemán and Eagar, 2015,
    http://www.adlittle.com/breakthrough

We found several examples of benchmarks actively building networks and internal databases of useful partners to support this process. Several had organizations dedicated to building links with the external ecosystem focused on either early-stage or radical innovation, with flexibility in the nature of the partner and style of engagement (rather than a group focused on academic relationships or only on links with start-ups). These groups normally saw their role to be as much about helping the external world find routes into a complex matrix-based, multi-BU organization as about helping their own organization link to the outside world.

"Our goal is to have world class expertise on how to source different types of expertise – basically anyone we can use to help us think or do"

- Director, New Ventures

Conclusion

Resource management is a vital, if sometimes neglected, R&D management discipline. One of the greatest sources of inefficiency in R&D is short-term bottlenecks. Delays in getting products commercialized hit companies hard. Furthermore, the pace of innovation is accelerating and the advent of the digital era requires renewed focus on competence management and knowledge development. It may never feel like the most urgent topic address today but the risk is that one day there will be nothing more important. Anticipation is key – but a plan must follow.

Although the rewards are potentially great, none of the practices we have discussed here requires great effort to implement but these practices do require application:

■ Do you experience bottlenecks in development? Can you quantify the impact these have?

■ How effective are your knowledge gathering procedures? Do you always make decisions from a position of understanding?

■ Will you be in a position to compete throughout the next decade? Do you have a succession planning process in place? Does this extend to considering how you will acquire competencies that will be important in the future?

Contacts

Belgium
Frederik VanOene
vanoene.frederik@adlittle.com

Central Europe
Fabian Doemer
doemer.fabian@adlittle.com

China
Antoine Doyon
doyon.antoine@adlittle.com

France
Eric Kirstetter
kirstetter.eric@adlittle.com

Italy
Katia Valtorta
valtorta.katia@adlittle.com

Japan
Yusuke Harada
harada.yusuke@adlittle.com

Korea
Daesoon Hong
hong.daesoon@adlittle.com

Netherlands
Michaël Kolk
kolk.michael@adlittle.com

Nordic
Daniel Roos
roos.daniel@adlittle.com

Spain
Carlos Abad
abad.carlos@adlittle.com

UK
Richard Eagar
eagar.richard@adlittle.com

US
Robin Hunter
hunter.robin@adlittle.com

Authors

Colin Davies is a manager in the London Technology & Innovation Management Practice and took a lead role in the R&D Management Best Practice Study.

Ben Thuriaux-Alemán is a principal in the London Technology & Innovation Management practice. He led the R&D Management Best Practice Study.

Charles Boulton is an associate with ADL and works as R&D Director with a mid-sized engineering firm in the Czech Republic.

Robin Hunter is a principal in the Boston Office with extensive experience of technology and innovation management.

Arthur D. Little

Arthur D. Little has been at the forefront of innovation since 1886. We are an acknowledged thought leader in linking strategy, innovation and transformation in technology-intensive and converging industries. We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organization.

Our consultants have strong practical industry experience combined with excellent knowledge of key trends and dynamics. Arthur D. Little is present in the most important business centers around the world. We are proud to serve most of the Fortune 1000 companies, in addition to other leading firms and public sector organizations.
For further information, please visit **www.adlittle.com**
Copyright © Arthur D. Little 2015. All rights reserved.

www.adl.com/R&Dbestpractice