Restructure and reinvest in innovation

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Innovation is traditionally one of the first casualties of a downturn. When companies are casting around for capital just to survive, spending on developments that may or may not pay off some time in the future is an easy target for cost-cutting. This article shows that the defensive response of killing or postponing R&D is the wrong way to deal with a downturn, and that a more forward-looking approach is to restructure R&D and reinvest accordingly. Through several best-practice examples, it shows how this approach enables companies to both optimise their short-term financial performance and strengthen their ability to compete when the upturn finally comes.

Craig Barrett, chairman of the semiconductor manufacturer Intel, said late last year: "The only way you emerge stronger from a recessionary period is by having new products, new technologies and new capabilities. It's an absolute must to continue to invest in good times and in bad… You can't save your way out of a recession; you have to invest your way out." He said – and did – the same in early 2002, during the previous downturn.

You might argue that Intel is an exceptional company and that its recipe does not apply to most others. We agree with the first part of that reaction but not with the second. Even if you do not have much fat left to cut in R&D, nor a huge war chest with which to invest your way out of the recession, we would argue strongly against adopting the instinctive and defensive R&D strategy for tough times: to kill or postpone less attractive R&D projects in an effort to save cash.

In this article we will explore why and how companies should respond to the downturn with an aggressive approach to the management of R&D spending. We call it the "restructure and reinvest" approach. With this approach, companies optimise short-term financial performance in the downturn while maintaining or even enhancing their ability to compete when the upturn comes. We will use best-practice examples to illustrate the measures put forward. While the examples relate primarily to manufacturing and assembled goods industries, the principles are valid for any industry.

The defensive approach: "kill or postpone"

Cutting R&D costs is a delicate and risky undertaking. If done wrongly, it can have a devastating effect on a company's fortunes. Consider, for example, TelQuip (not the company's real name), a telecommunications equipment manufacturer whose turnover shrank by 44 per cent in 2003 as its market collapsed. In order to slash costs,

TelQuip's management decided to bet on one "life-saving" innovation area and cut all other innovation activities. When the market recovered, it became obvious that the company had put all its eggs in the wrong basket. It never recovered and is no longer independent today.

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The above example illustrates a typical – and in this case unsuccessful – defensive approach: the company identifies the least urgent and least important projects and either kills or postpones them in order to reduce short-term R&D spending. It is apparently easy and tempting for management to default to a purely defensive approach when facing a crisis and/or acting in survival mode. The main advantage of such a strict project prioritisation approach is that you can do the analysis quickly. However, it has several drawbacks:

- It focuses on R&D spending for the current or next budget period. As a consequence, management will have to redo the prioritisation for each subsequent budget cycle until times improve, especially as projects tend to be postponed rather than killed.

- It leads to an evaluation of projects without considering portfolio consequences or interdependencies with other projects. By not following a portfolio approach, costs and business risks are likely to increase. Dependencies between projects and other commitments inevitably get in the way of realising all potential savings in practice.

- It fails to assess the impact on workload and competencies. By killing or postponing a project, core competencies needed in the future may be lost, eventually forcing the company to withdraw from attractive segments.

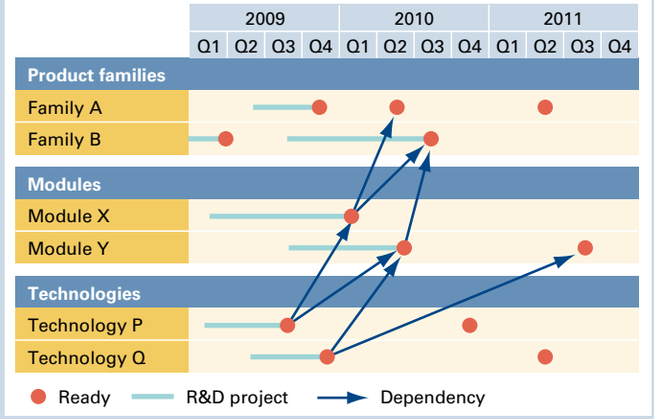
The aggressive approach: "restructure and reinvest"

The starting point for a more successful response to the downturn is to recognise that R&D projects are not an end in themselves. They are a means to realise the company's product and technology portfolio strategy, which states where, how, when and against whom a company chooses to compete. The statement materialises in the form of a

product and technology portfolio plan (see Table 1) that translates the growth and profit agenda of the company. In essence the plan is the roadmap that indicates which products will be introduced and which will be phased out at what time. Furthermore, the roadmap indicates on which proven modules and technologies the planned products depend. Changes to the plan drive changes to key technology development and supporting research activities.

The product and technology portfolio plan ultimately determines the product and technology development projects the company should undertake, and thus also determines the focus and level of R&D spending.

Table 1 **A scheme for a product and technology portfolio plan**



Source: Arthur D. Little analysis. Simplified representation.

In other words, the product and technology portfolio plan ultimately determines the product and technology development projects the company should undertake, and thus also determines the focus and level of R&D spending. As a consequence, if a downturn forces you to scrutinise your R&D spending, you should first revisit your product and technology portfolio strategy and plan. You should look for opportunities to restructure your portfolio and reinvest part of the savings in order to strengthen your competitive position in the coming upturn. We call this the "restructure and reinvest" approach, as opposed to the "kill or postpone" approach.

Before explaining in more detail how to put the "restructure and reinvest" approach into practice, let's illustrate it with the example of Intel. As mentioned above, Intel pursues an aggressive approach in response to downturns. In the wake of the dotcom bust and recession of 2002, Intel

had to cut back spending, shut down unprofitable business ventures and lay off thousands of employees. At the same time, the company increased its investments in R&D, manufacturing expansion and business development in emerging markets. Analysts did not believe in the strategy, but were proven wrong. The R&D investments resulted in the creation of Centrino and Core 2 Duo, Intel's flagship notebook and desktop products that have fuelled its competitiveness and financial performance since 2003.

Restructure the product and technology portfolio from the core

In a downturn the pressure to reduce R&D spending forces a company to revisit the core of its product and technology portfolio strategy. In fact, the crisis is an opportunity to challenge the core of the business (see Table 2). The key questions are:

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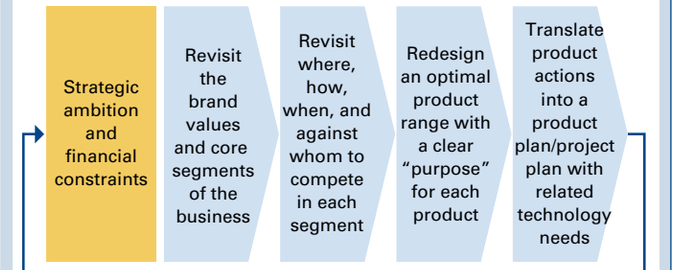
- What does the brand represent and what is the company's core business, i.e. if there is money for only one or a limited number of products, which product or products should they be?
- What are the priority segments, given the revised strategic ambition and financial constraints, and what are realistic ambitions in each of the targeted segments?
- How can the brand values be broken down and translated into features and other requirements at function and system levels, what are the targets and which are the milestones along the way?
- When rebuilding the product plan, which elements of the original product portfolio (existing products, products being developed and foreseen projects) should the company keep and reinforce, and which should it eliminate?
- Is the resulting product plan balanced with regard to resources and competencies, and is the financial contribution from the restructured portfolio meeting expected company targets?

- How do we deal with residual costs that cannot be reduced in the short term, i.e. what to do with freed-up resources (people as well as assets), and how to avoid the loss of know-how and the key people that are critical for successfully achieving the product and technology strategy?

Table 2 **Product and technology portfolio management**



Source: Arthur D. Little analysis

Compared to the cost-oriented project prioritisation analysis in the defensive "kill or postpone" approach, the restructuring analysis in the aggressive approach takes more time and effort. However, there is a higher probability of realising savings as you address the consequences properly and ground the decisions in your strategic ambitions. In this way you reduce business risk and strengthen senior management's confidence in making tough decisions.

Case study 1 describes how a particular global car manufacturer, which we have called CarCo, reprioritised its product portfolio to respond to the drastic downturn the car industry is currently experiencing. Case study 2 describes how an agricultural equipment manufacturer, which we have called AgriQuip, managed to both reduce the number of R&D projects by 20 per cent and exploit new market opportunities.

Case study 1: CarCo

CarCo, a global car manufacturer, had enjoyed a good journey from 2001 until 2007, with increasing sales and successful new product launches. In the spring of 2007, however, the company started to see the first signs of a downturn. Yet it wasn't until the fall of 2007 that it responded to the downturn: it cancelled one major programme and started restructuring its product portfolio, as it realised that it would not be able to accomplish its ambitious portfolio given the new harsh financial reality.

The portfolio restructuring work started with defining the brand value - asking what the brand represented and how the car reinforced it. CarCo then moved on to defining the core of its business, i.e. the musts and nice-to-haves. In defining the core, CarCo's management asked themselves: "If we can make only one car, which one should that be?" It took a lot of discussion, but when they finally agreed they continued with the question: "If we can make only two cars, …", etc. CarCo's third step was to define the targets for the year 2020 in terms of the product portfolio and product features (such as CO2 emission levels), broken down by function and system. Management then worked their way backwards from the 2020 targets to set important milestones for the period between now and then.

Thanks to the modularised set-up of the product program, CarCo was able to reduce the complexity of both the product programme and the product plan, i.e. the projects that will deliver the product programme.

Once you have completed the "restructure" part of the "restructure and reinvest" approach, you will have reduced R&D spending and freed up resources.

Case study 2: AgriQuip

AgriQuip, an agricultural equipment manufacturer, needed a new product portfolio plan, as its current plan consumed 25 per cent more resources than were available.

It started with the development of a world-wide market segmentation that was completely different from the industry standard and unveiled new market opportunities. Next it developed a product portfolio strategy describing where, how and when it would compete in the identified segments. It built a new product portfolio to better leverage the new market opportunities it had identified.

In parallel, AgriQuip developed a new product plan with a dual objective. First, to reduce the number of projects by 20 per cent and get the plan in balance with the resources available. Second, to develop a new highly competitive strategy-based product portfolio. The process also provided better transparency for everyone, allowed focusing and facilitated communication between marketing and R&D. With the new product plan in place it was evident that several projects serving the same purpose could be closed, saving €4 million up front – money that otherwise would have been wasted.

Reinvest to gain pole position for the upturn

Once you have completed the "restructure" part of the "restructure and reinvest" approach, you will have reduced R&D spending and freed up resources. You can then leverage these resources to:

- Improve efficiency and reduce time-to-market of prioritised projects;
- Reduce the cost of both current and future products;
- Redesign the R&D organisation (which may anyway be required as a direct consequence of the restructuring);

- Look for new innovation and growth opportunities by exploiting competitors' weaknesses.

Reduce time-to-market

You can reduce time-to-market (or even better: time-to-cash) by analysing the efficiency and effectiveness of project activities in the product creation process, from product need identification up to product launch. The analysis highlights all sources of waste:

- inefficient use of time (delays or unnecessary serial work);
- organisational weaknesses;
- process deficiencies;
- lack of resources (skills and number).

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You can quantify the potential lead-time gains on the basis of real activities and realistic assumptions. You can also identify the changes that must be implemented to reach the lead-time reduction targets. Case study 3 describes how an electrical equipment manufacturer, which we have called InDrive, managed to reduce both time-to-market by 45 per cent and development man-hours by 25 per cent.

Case study 3: InDrive

InDrive, a manufacturer of frequency converters and industrial automation equipment, was facing fierce competition from a smaller but more efficient competitor that was stealing market share. InDrive realised that, in order to halt the competitive erosion, it had to reduce time-to-market drastically and increase development throughput.

InDrive had the whole product development organisation and relevant interfaces audited and benchmarked. The resulting improvement programme consisted of detailed improvement concepts that were based on best practices observed at other companies yet customised to InDrive's specific needs. The programme also identified quick wins.

The use of product platforms, better project staffing and more focused and market-oriented specifications had the biggest effect on time-to-market and throughput. InDrive cut the specification phase in half from six to three months, and the design-to-prototype phase from 16 to nine months. In addition it reduced development project man-hours and project cost by 25 per cent.

Reduce product cost

There are several methods of reducing product cost: design-to-cost, modularisation and idea-to-cost (see Table 3). Which method is best depends on your time horizon and the root cause of excessive product cost. For example, a world-leading filling and packaging machine manufacturer managed to reduce the cost of the targeted systems by 20 per cent through the design-to-cost method.

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Table 3 **Methods of reducing product cost**

Design-to-cost	Modularisation	Idea-to-cost
■ Analytically determines both the value and the costs of the functions of the product in order to refine the design and lower product cost ■ Considers customer requirements, supplier integration and competitor products analysis ■ Is useful when the design is not optimal from a cost point of view	■ Strategically builds up the product portfolio structure in a modular way in order to reduce the cost of complexity ■ Determines with which modules to create product variants and which to "standardise" ■ Is useful when a large number of variants are needed in order to deliver the products customers want	■ Reduces cost by generating and moving cost reduction ideas through a structured process with increasing levels of maturity and confidence ■ Enhances the creative process in the company and manages the idea flow to implementation stage ■ Is useful when the opportunities to reduce costs come from many sources, e.g. design, production, purchasing

Source: Arthur D. Little analysis

Redesign the R&D organisation

The redesign of the R&D organisation can take many forms, with varying impact on the employees. The key questions to consider are:

- Where should R&D take place in order to optimise R&D efforts, and does the overall structure of the R&D operations enable the company to reach the set strategic ambitions efficiently?

- Will the company have the right people and right competencies on board when the upturn comes, and what are the core competencies that the company should look after specifically in a downturn? If lay-offs have to happen, which competencies should nevertheless be kept in-house?

- How does the company best get access to the competencies required to increase speed, share the risks or costs of investments and fill gaps in competencies?

- How can relationships with important suppliers and partners be secured during the downturn so that the company can leverage these in the coming upturn?

- Is the allocation of R&D resources consistent with the downturn/upturn strategy, and how does the company best staff R&D projects to realise the set priorities?

Look for new innovation and growth opportunities

Any downturn presents windfall investment opportunities for the audacious company. You can acquire new technologies more cheaply. Experts and engineering talent are more accessible. And, as a consequence of lower capacity utilisation in the supply chain, you can take restructuring initiatives that otherwise would interfere with ongoing production requirements.

The reinvestment strategy can have objectives that range from moderate to revolutionary (see Table 4):

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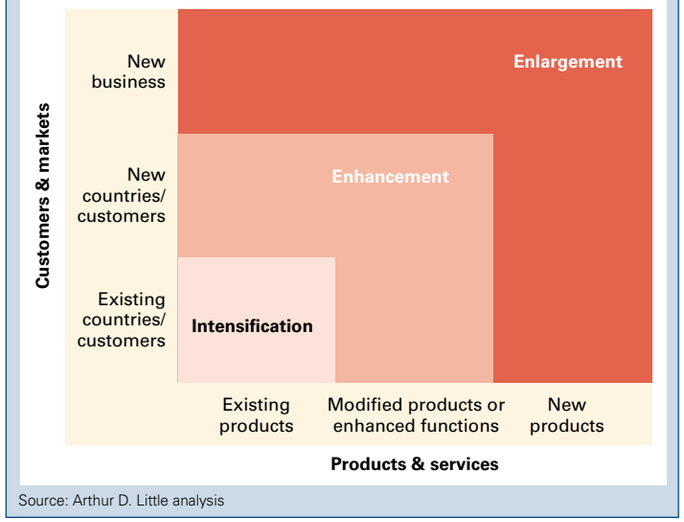
- Intensification, when you stay with known markets, products and technologies but use innovative channel or account management to recover or stimulate revenues;

- Enhancement, when you enter new markets (whether customer, region or country) with known or modified products (such as new variants, different price points, etc);

- Enlargement, when only the sky is the limit, ranging from acquiring novel technologies to introducing new business models.

Table 4 **Examples of innovation and growth initiatives**



Source: Arthur D. Little analysis

Redirecting some of the resources released toward future growth and innovation initiatives helps to avoid causing damaging "salami slicing" effects and the loss of critical know-how. Case study 4 describes how a pump and valve manufacturer (which we have called PumpCo) first restructured and cut costs, and then redirected part of the redundant resources toward innovation and growth initiatives, quintupling its EBIT.

Experience shows that a purely defensive response based only on cutting R&D costs is harmful: you will find yourself having to repeat the whole exercise again, and you seriously damage your long-term competitive position.

Case study 4: PumpCo

In the period 2001 to 2004, PumpCo, a pump and valve manufacturer, found that its markets were flat and profits were eroding. It had to improve efficiency yet avoid cutting costs in the wrong places, and invest in innovation and sales growth activities. PumpCo also faced shortages of skills and talent in some specific future technology areas. Furthermore, most of the company's workforce (especially in R&D and engineering) was employed in European countries such as Germany where lay-offs were very costly. It needed a smart approach to reduce costs through lay-offs while simultaneously shifting resources to promising growth and innovation initiatives.

PumpCo initiated two programmes: an efficiency improvement programme to identify and implement cost reduction measures, and a growth and innovation programme to increase turnover at a growth rate double that of the market. By combining these two programmes, PumpCo was very well prepared for the upswing in the period 2005 to 2008. Its revenues grew twice as fast as the overall market, and its EBIT quintupled.

Insights for the executive

When a downturn strikes, it is only natural to be defensive and instinctively kill or postpone R&D projects in order to save cash. But experience shows that a purely defensive response based only on cutting R&D costs is harmful: you will find yourself having to repeat the whole exercise again, and you seriously damage your long-term competitive position.

Instead of following the defensive "kill or postpone" approach, we recommend the aggressive "restructure and reinvest" approach (see Table 5):

- **Restructure:** before reducing R&D costs, revisit your product and technology portfolio strategy and plan, and build it up from the core – do not just eliminate projects that are less urgent and less important in the short term.

- **Reinvest:** use part of the resources that are freed up as a result of the restructuring to gain a competitive starting position for the upturn, for example by reducing time-to-market of prioritised projects, reducing the cost of both current and future products, redesigning the R&D organisation and looking for new innovation and growth opportunities.

Table 5 **Key differences defensive and aggressive approach**

	Defensive approach: "kill or postpone"	Aggressive approach: "restructure and reinvest"
Philosophy	■ Cut down from 100% to 80%	■ Build from the core, i.e. from 0 up to 80%
Basis for R&D project portfolio optimisation	■ Strict project prioritisation based on importance vs. urgency	■ The product and technology portfolio plan
Scope of actions	■ Pure cost-cutting focus	■ Restructure and reinvest part of the freed resources
Attitude	■ Hunker down and wait until the storm is over	■ Use the crisis to capture windfall investment opportunities

Source: Arthur D. Little analysis

If carefully applied, the "restructure and reinvest" approach will deliver improved cash flow from reduced R&D spending, reduced product cost and increased revenues by building a strong competitive starting position for the upturn. In retrospect, the top and bottom-line benefits will make you wonder why you waited to take action until the downturn struck.

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The authors whish to thank Per I. Nilsson, Richard Eagar and Markus Achtert for their contributions in creating this article.

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