

Mastering the local-global balancing act in R&D

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Companies around the world are expanding their local R&D footprint in emerging markets in order to strengthen their market position, gain access to local resources and reduce costs. But this creates a need to orchestrate cooperation between these dispersed R&D centers. This article provides insights for executives into how this can best be done.

A recent Arthur D. Little survey among chief innovation officers (CIOs) and chief technology officers (CTOs) showed that in the coming 10 years European companies expect to double the share of R&D resources located outside Europe and North America from 12 % to nearly 27 % of their total R&D spending. They are expanding their local R&D footprint in emerging markets for a number of good reasons: to strengthen their local market position, to gain access to local resources or to reduce costs. At the same time, as they add R&D centers across the world, they sense a need to orchestrate these dispersed R&D activities better in order to avoid needless duplication, ensure adherence to corporate standards and safeguard intellectual property. Simultaneously mastering these two requirements – expanding local R&D and orchestrating global R&D – is a delicate balancing act.

In this article we will provide insights into how executives can succeed in this balancing act. First we will discuss the trade-offs that companies are faced with as they try to balance global corporate needs against local market needs when it comes to R&D. Then we will examine the three levers executives can use to achieve that balance: local market-tailored product portfolio strategies, global product platforms, and transversal governance instruments. We will also provide examples of companies that have tackled this challenge successfully. While the arguments and examples put forward in this article primarily relate to assembled products, most of the insights are equally applicable to other industries.



Understanding the trade-offs of going global with R&D

Companies from mature markets are expanding their R&D footprint into emerging markets for a variety of reasons. The first reason is market-related. By having a local R&D presence, they are in a better position to translate local market knowledge into innovations that meet customer needs. As a result of a closer marketing-R&D interface, they can react more quickly and effectively to market changes and opportunities.

The second reason for expanding the local R&D footprint is to gain access to local resources. A local presence allows a company to tap into the local supply of engineers and scientists. It facilitates collaboration with key local suppliers and knowledge institutes. It heightens receptiveness to cultural differences and divergent ways of working. It also provides an environment in which to internalize indigenous best innovation practices, such as “frugal innovation” (the practice of taking the needs of low-income consumers as a starting point and working backwards from these to develop a new product, as opposed to stripping down luxury features from a Western-developed product).

The third reason for expanding the local R&D footprint is to reduce costs. While that advantage in many industries may be disappearing, emerging markets may offer lower R&D personnel costs. In addition, to the extent that R&D is involved in local supplier selection, the cost of components and thus manufacturing costs may be reduced.

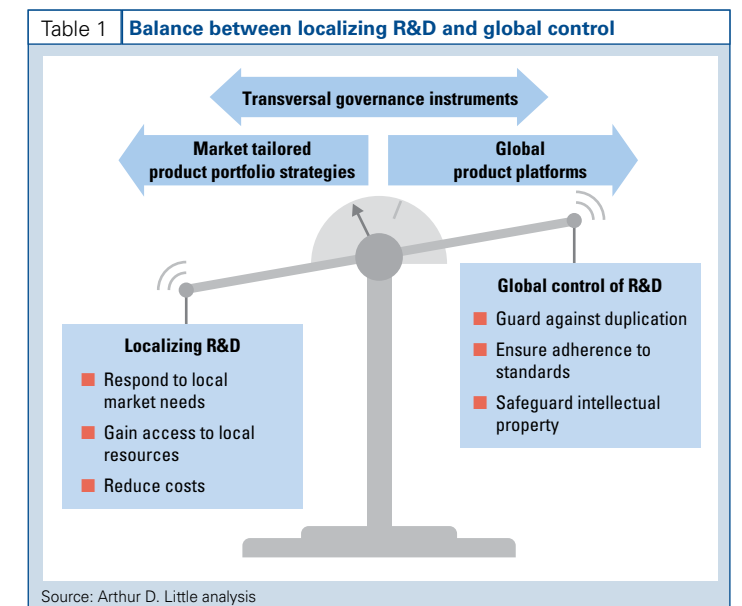
Of course, the more a company shifts and disperses its R&D activities across the world, the bigger the need to control the centrifugal forces that come into play. This need revolves around three concerns. First, the company has to guard against needless and costly duplication of efforts. A local automotive R&D center may tailor the interior design of the car to local driver tastes, but it should not reinvent the wheels. Second, the company has to ensure adherence to corporate strategies and standards, such as design rules, computer-aided design tools and knowledge-sharing systems. Third, the company may decide to concentrate R&D for certain domains in a few “safe places” in order to

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protect its intellectual capital against piracy and ineffective local enforcement of legal rules.

Many companies struggle in striking the right balance between localizing R&D on the one hand and maintaining global control over R&D on the other (see Table 1). It is indeed a complex affair. Fortunately there are proven ways to achieve the balance. We have found that executives should operate three levers simultaneously:

1. Establish, for the market served by the local R&D center, a local product portfolio strategy that is tailored to the needs of that market.
2. Establish global product platforms that enable the realization of synergies, i.e. lower development and product costs, across the local product portfolios.
3. Set up transversal governance instruments – decision rules, processes and tools – that ensure alignment, collaboration and fluidity across the boundaries of local R&D centers worldwide.



In the following sections we will examine each of these three levers in more detail.

Establish market-tailored product portfolio strategies

In order to establish and grow a sustainable innovation-driven presence in any market, a company has to have a well-defined product portfolio strategy that is tailored to the specific requirements and objectives set for that local market. A product portfolio strategy is the result of clear choices and priorities in four dimensions:

- Where to compete: for which segments will we develop and market our products?
- How to compete: on which bases will we compete in the chosen segments (e.g. by reducing product cost or improving sophistication level)?
- When to compete: what is the roadmap outlining the timing and frequency of the introduction of new product generations, extensions and upgrades?
- Against whom to compete: from which competitors targeting the same segments do we want to differentiate ourselves (e.g. a local emerging market player or other players from mature markets)?

Making the product portfolio strategy explicit is of particular importance when entering an emerging market, as the company often faces new competitors that historically have been present only in that local market. For example, there are no non-Chinese OEMs among the top 10 heavy duty truck manufacturers in the Chinese market, which represented 70 % of the world market in 2010. Competing with the local companies poses new challenges compared to competing with the well-known OEMs in Europe and North America. Local Chinese companies often develop products with shorter lifecycles, at a higher development rate, and at a substantially lower cost than European companies are used to. For example, the retail price of a typical low-cost heavy duty truck in China ranges between US\$26,000 and US\$33,000, compared to at least double that price in Eu-

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rope. Such price differences pose a challenge both for the product portfolio and product development process.

Not only competitors but also local market requirements are different in emerging markets. For example, Chinese premium car customers put a high value on features such as high-tech amenities, video screens and chrome that exude an aura of grandeur, whereas customers in Europe have high requirements on safety, comfort and environmental friendliness. Further, Chinese premium vehicle buyers often use private chauffeurs and are thus backseat passengers rather than drivers, which puts different requirements on vehicle design.

As a consequence, local market presence and knowledge are essential to develop a successful product portfolio strategy. A company from a mature market cannot enter an emerging market simply by introducing a copy of its home market products. It has to tailor its products to local market needs and local competitors. By identifying local market needs, such as product sophistication level and cost, different product families and variants can be developed to target the local segments.

One company that has succeeded in gaining global competitiveness through a strong local presence is General Electric. It has optimized its product portfolio not only from a local but also a global perspective based on “frugal innovation” (see insert).

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General Electric – Gaining global competitiveness through a strong local presence

General Electric (GE) increased its share of revenues from developing markets from 11 % in 2001 to 24 % in 2009. During the same period it invested over US\$330 million in expanding or creating research centers (in New York, China, India, Germany and Brazil). Investments are continuing with, among other initiatives, six new innovation centers planned in China.

GE’s strategy results in four priorities to build leadership in growth markets, based on reinforcing local empowerment with credibility and influence:

- Recentralize decision-making; bigger leaders with authority and accountability.
- Invest in local markets, with local players.
- Develop market-driven products.
- Build key customer capability.

As part of its strategy, GE’s Growth and Operations division headquarters is located in Hong Kong close to the emerging markets. GE is also working with “company to country” agreements to strengthen the collaboration with local governments in countries such as Saudi Arabia, Brazil, Indonesia and China to create technology and services solutions adapted to local needs.

One striking example of its focus on emerging markets comes from GE Healthcare, where a US\$700 million investment and a 97 % increase in the number of engineers in local R&D has delivered 32 new products and 55 % revenue growth from US\$2.2 billion in 2005 to US\$3.4 billion in 2010 in emerging markets (India, China and Brazil).

From this strong local presence GE has both increased sales in local markets and brought several locally developed products to the global market space, often referred to as “reverse innovation” or “frugal innovation”.

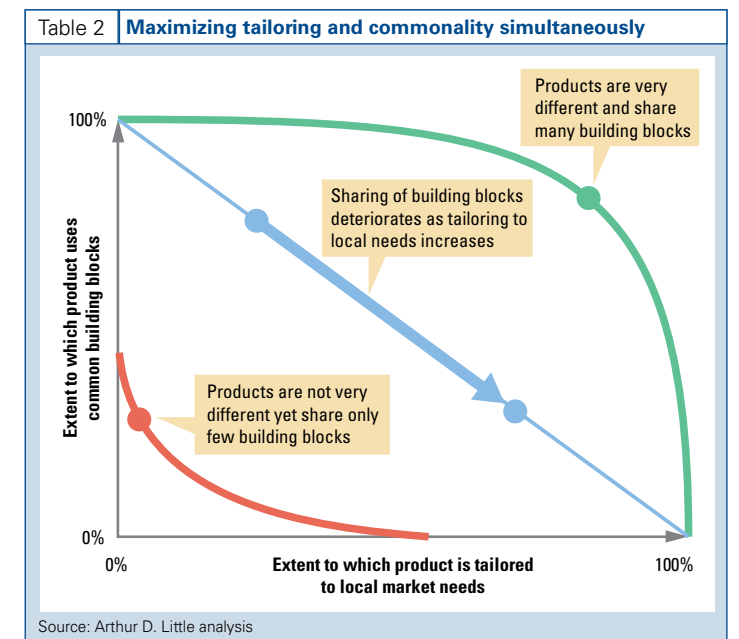
Source: General Electric corporate and investor presentations

Establish global product platforms to realize synergies

As the number of local markets served by the company increases, the complexity of the product portfolio at the global level will rise. Therefore, once the local product portfolio strategies have been established and consolidated globally, the company needs to take a step back and consider the synergy potential across the local portfolios in order to reduce development and product costs.

The key to realizing synergies and reducing costs in the global product portfolio is to establish product platforms. Put simply, a platform is a basic building block that is common to diverse end-products. Modularization – that is, conceiving a new product as a combination of building blocks, some of which are common with other products and some of which are specific to the product – is an important part of this equation. By analyzing the various modules of different products, the company can identify similarities and improve building block commonality, as illustrated in Table 2. It is a careful optimization exercise that considers two aspects. First, to what extent should the product be tailored to appeal to local market needs? Second, to what

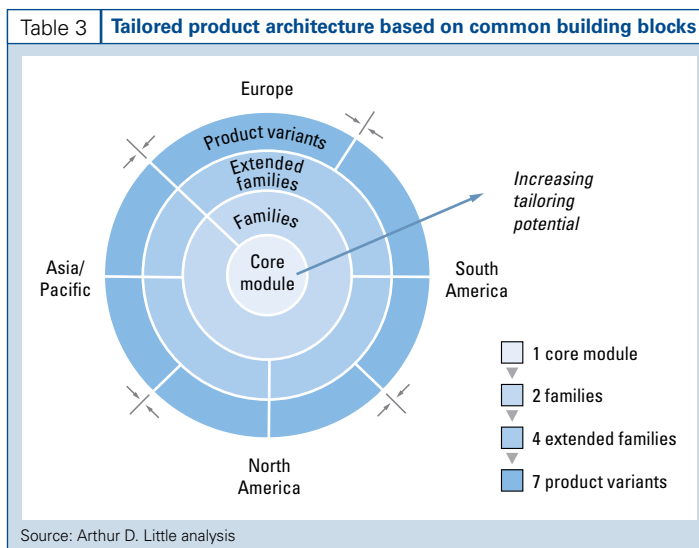
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extent can the product make use of common building blocks? Normally, as one increases the extent of tailoring to local market needs, the commonality decreases (see blue arrow). The trick is to understand how building blocks used for different products really differ, and how they could potentially be merged and turned into common building blocks, while giving in as little as possible on the tailored nature of the product (see green curve).

For example, Mercedes-Benz and Audi have established R&D centers in China in order to focus on vehicle adaptation and differentiation to meet local market needs successfully. This does not necessarily mean that entirely new products are developed for the local market but rather that the development will focus on key differentiating modules that together will create a new product variant to meet local needs. Audi's R&D center in China consists of three departments that focus on important Chinese market needs such as interior trim, exterior trim and decoration. Audi can use globally shared core platforms/modules to minimize costs while adding locally developed modules to create differentiated product families and variants (see Table 3).

A case in point is the Audi Q3 Crossover. Although built on the same core platform as the multi-purpose vehicles VW Touran and SEAT Altea, the Audi Q3 Crossover is a differentiated product family focusing on the needs of a premium



Electrolux – Optimizing the global product portfolio while ensuring tailoring to local market needs

Electrolux is a truly global company, with only 5 % of its 52,000 employees in its country of origin, Sweden, and sales in over 150 markets. With strong growth in emerging markets it envisions that emerging markets will represent 40 % of income in 2015.

Electrolux is pursuing both premium and mass market, resulting in a large product portfolio. It has the objective of leveraging global scale and operational synergies within the company. One step towards this global optimization is based on savings on global operations. Electrolux estimates that it will gain 50 % of the total identified operational savings of US\$430 million through modularization. To achieve this, Electrolux has established a process where each product is divided into modules and analyzed to identify potential cost savings. The process includes annual spend, reduced complexity (e.g. number of parts) and the impact on differentiation.

As the process takes into account the potential impact on the differentiation of its products, Electrolux ensures that important differentiating elements deliver what is required to meet local customer needs while core modules are optimized to reduce cost.

Source: Electrolux corporate and investor presentations

customer group. A specific product variant of the Audi Q3 Crossover has then been developed in order to meet the local needs of the Chinese market, for example by adding more room for the rear seat passengers (who are the main buyers in China) and an infotainment system (to address the demand for high-tech amenities).

Electrolux is another example of a company that has managed to meet the requirements for local tailoring and at the same time improve product commonality through modular thinking. Savings of US\$75 million were realized during 2009-2011, and additional global savings of US\$215 million are estimated by 2015 (see insert above).

Set up transversal governance instruments

As we have seen, establishing local product portfolio strategies ensures that products are tailored to the needs of the market served by the local R&D center. Likewise, establishing global product platforms ensures that synergies are realized across the local product portfolios. But neither of these two things happens automatically. Transversal governance instruments are needed to ensure alignment, collaboration and fluidity across the boundaries of local R&D centers worldwide. They ensure that the efforts made to reduce development and product costs are sustainable – in spite of organizational fragmentation – while at the same time empowering the organization to capture cost and speed advantages.

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Three types of governance instruments are on hand: decision rules, processes and tools. Clear decision rules are needed on how different product modules can be created, changed and phased out. Changing a module that is shared between products and regions, e.g. a so-called “core module”, is a decision that must be handled centrally to ensure compatibility with downstream modules. On the other hand, there is little need for central decision-making for downstream product variants, as fast development rates can be the key to success at the local market level.

The second instrument for governing the local-global balance is the design of the product development process. On the one hand, to enable efficient global collaboration it is critical to share a global product development process. On the other hand, companies should allow local process adaptations in order to meet the rapid development cycles and local requirements of emerging markets. A company that has succeeded in this balancing act is ABB, which has built a centralized organization combined with an “in country for country” strategy in order to move at local speeds and develop products for local markets (see insert).

Common tools and IT systems are the third governance instrument. They enable and induce efficient global collaboration by sharing data and building virtual teams. Engineers must be able to share the same CAx tools (Computer Aided Design, Computer Aided Engineering, etc.) and use a

common Product Database Management (PDM) tool in order to build sustainable part commonality and agile product development. Engineers working in different markets must be able to easily leverage the product variants, systems, models or components that other markets have developed.

A leading company in the automotive industry was able to realize significant part commonality and product development synergies by building efficient global collaborative systems and processes. The company had recently acquired an Asian company, which resulted in increased complexity of the product portfolio and a high number of duplicate parts. To reduce the high number of parts and ensure that engineers in the different markets could collaborate efficiently, all product platforms were integrated into one global PDM system. One governance model was used to steer the creation, change and phase-out of parts. A global part cost model was defined to quantify the value of part reduction as seen from a complete life-cycle perspective. The R&D centers in Asia and Europe were given the task of identifying and eliminating duplicate parts jointly. In total, a positive annual cash flow effect worth 7 % of the target company’s annual R&D expense could be realized through improved product platform commonality and increased product development efficiency.

ABB – Global balance through centralized organization combined with “in country for country” strategy

ABB is a multinational company with US\$31.6 billion revenues in 2010. Through a focused strategy it has realized strong growth in emerging markets, which accounted for 50 % of revenues in 2010, up from 42 % in 2006. ABB’s R&D resources in emerging markets have increased fourfold since 2005, adding more than 1,500 people to the organization. The number of R&D employees is expected to increase by an additional 50 % by 2015.

ABB has changed its global organization over recent years. In its own words, ABB has evolved “from holding company to locally relevant globally optimized organization”. On the one hand this means a highly centralized organization with a high focus on leveraging scale, process optimization and sharing across the organization. On the other hand, ABB’s emerging market strategy is based on “in country for country,” where local markets are responsible for sales, product and project management, local R&D and to some extent manufacturing, while other parts, such as manufacturing, sourcing and global R&D, can be managed globally to reduce costs. The objective of “in country for country” is to improve product competitiveness based on:

- Local product requirements
- Local competitiveness: cost and performance
- Innovation
- Speed to market

“Moving closer to customers and markets allows ABB to move at local speeds and develop products for local markets”

Source: ABB corporate and investor presentations

Insights for the Executive

Succeeding in global product development is in many ways a question of making the right trade-offs between tailoring products to meet local market needs and global standardization of products to reduce development and product costs. In order to ensure success, executives need to:

- Establish, for each local market, a product portfolio strategy that is tailored to the specific requirements and objectives set for that market. While aligning with the company’s global vision and strategy, the product portfolio strategy should answer the key questions of where, how, when and against whom to compete in the local market. A clear product portfolio strategy is a powerful instrument for steering the R&D center serving that market.
- Establish global product platforms that enable the realization of synergies, i.e. lower development and product costs, across the local product portfolios. Platform thinking entails a global analysis of the company’s products and their building blocks (modules). The building blocks used in a local product are either kept market-specific (if they are essential contributors to the market-tailored products) or they are merged with similar blocks used for other markets (if making them common leads to important cost reductions).
- Set up transversal governance instruments – decision rules, processes and tools – that ensure alignment, collaboration and fluidity across the boundaries of local R&D centers worldwide. Decision rules define clearly how core building blocks must be created, updated and phased out globally, and which choices local R&D centers are allowed to make to ensure an efficient response to local market needs and opportunities. Common processes and collaborative systems ensure that engineers share the same data and use the same development tools.

Simultaneously mastering the two requirements – expanding local R&D and orchestrating global R&D – is a delicate balancing act. As the center of economic gravity in

many respects continues to shift from mature markets to geographically dispersed emerging markets, keeping the balance will call for ever greater alertness and agility.

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