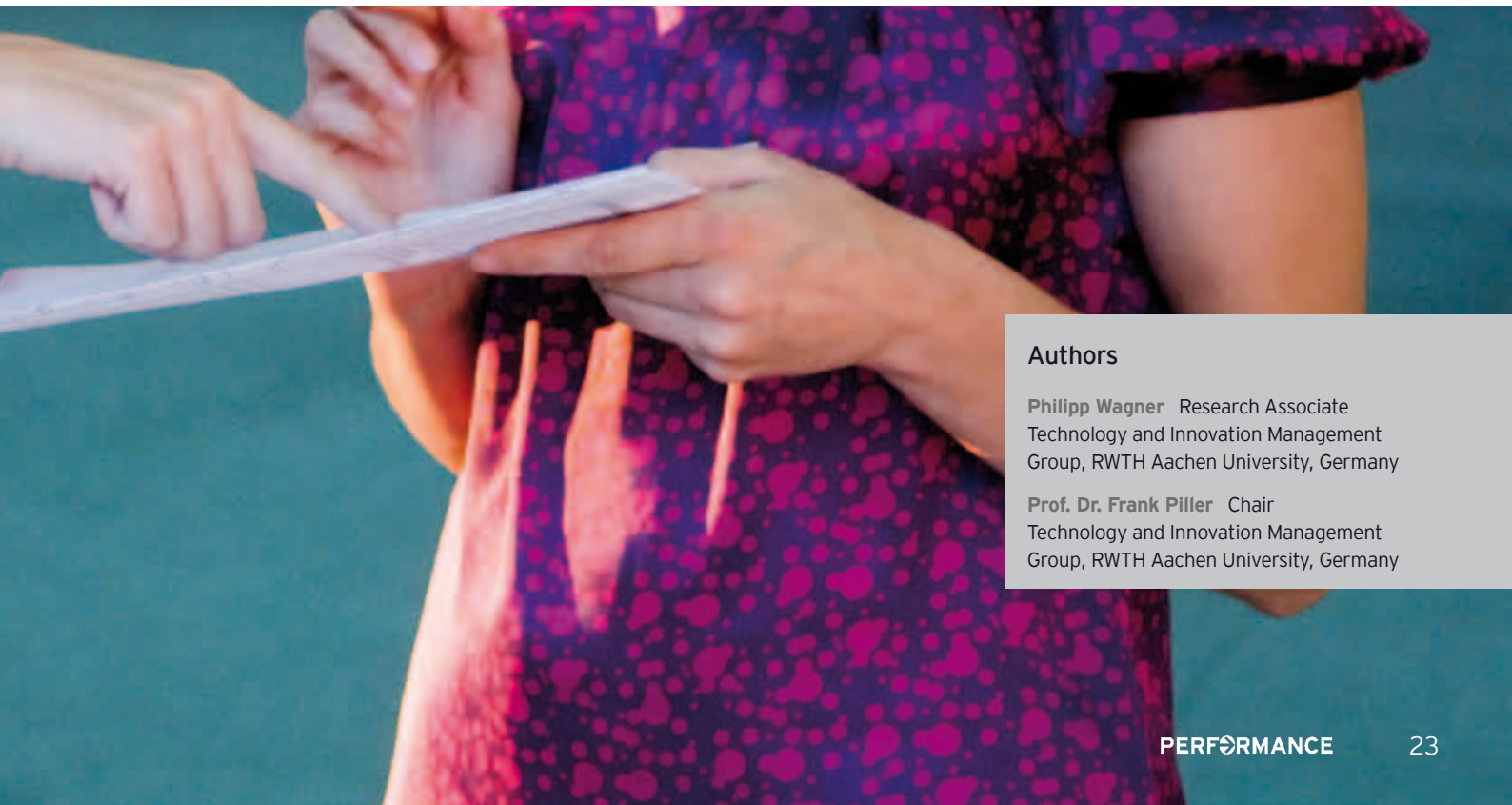
Article

Increasing innovative capacity: is your company ready to benefit from open innovation processes?

A company's ability to innovate is key to its success. The strategic and systematic opening up of internal innovation processes to include external knowledge – in other words, open innovation – can result in significant competitive advantages. In this article, we present an audit aimed at helping companies assess their readiness for open innovation and, where necessary, optimize structures and processes.



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Open innovation is the practice of problem solving by looking beyond companies' boundaries to the outside world and its experiences and discoveries as part of the innovation process, instead of relying exclusively on the internal skills of one's own researchers and developers.

Like any corporate process, innovation activities are subject to the imperatives of effectiveness and efficiency – in other words, doing the right thing in the right way. This entails offering the variety of products or services that best fulfills customers' and users' needs (fit to market) while making the best use of resources (time to market and cost to market). The efficiency and effectiveness of innovation are determined by the company's access to knowledge. This is because innovation processes are ultimately problem-solving processes, which are based on acquiring and processing information and knowledge. We can distinguish between two main types of knowledge:

Information on needs pertains to the needs and preferences of customers or users. Information on needs is important both in the innovation process (what benefits should an innovation deliver?) and for operative production and marketing management (how many units of each product version should be manufactured; where are the customers for these versions located?). Precise information on customer needs can increase the effectiveness of an innovation process, as this enables new products to be better tailored to customer requirements (fit to market), thereby paving the way for successful market launches.

Solution information is (technical) knowledge concerning how a problem or need can be solved or met by a specific product or service offering: what new technological interrelationship is required to meet the need? Which processes are necessary? How can a marketing campaign address latent customer needs? Appropriate knowledge of technological solutions increases the efficiency of the innovation process because it enables faster, more successful development processes (cost to market and time to market).

To sum up: information on needs helps answer the question of "what," while solution information answers the question of "how." Most methods of managing innovation in general, and open innovation in particular, basically aim to solve two key problems that emerge when acquiring information on needs and solutions:

- Transferring information on needs from the information carriers (i.e., customers and users) to companies is often difficult. This type of information is therefore described as **sticky**.

For example, some knowledge is available only implicitly and is very specific to individuals and contexts, making it difficult to be translated into concrete terms. Alternatively, stickiness can be due to the characteristics of the person searching for or providing the information e.g., a lack of ability to assimilate that information (lack of prior knowledge, training or complementary information) or a lack of ability to express that information on the side of the provider.

Where local information on needs is highly sticky, transferring this information entails many trial-and-error cycles between the company and the customer. If these are not successful, they result in flops. The high flop rates of many new products testify to the problem of sticky information.

The established approaches of market research offer an initial remedy. However, the problem remains that customers may not be able to formulate and articulate their needs accurately. And if traditional market research methods actually solved the problem, there would not be any flops – but the high failure rate (up to 70% in the consumer goods industry and approximately 50% for industrial goods and innovations in services) tells a different story.

- The second fundamental problem concerns the generation of solution knowledge. **Local search bias** describes the phenomenon of attempting to solve specific tasks using only experience and information that is already familiar (due to a similar or familiar technological background or a similar discipline) and which, therefore, appears easier to acquire and assimilate. This often goes hand in hand with the belief that only these known sources can contribute meaningfully to finding a solution.

The result is a limited solution space that does not venture from existing knowledge. This can certainly have advantages when it comes to optimizing existing processes (continuous improvement). However, where (more radical) innovation processes are involved, it can lead to the exclusion of precisely those sources beyond the realm of the familiar and traditional that might have yielded approaches for critical innovations. This can mean that truly radical innovations often fail to materialize. Likewise, the solution considered may be merely convenient and not the most efficient of all potential solutions.

1. Concept and methods of open innovation

The methods of open innovation take these two problems as their starting point. The term "open innovation" means involving external players in the innovation process in order to acquire information on needs or solutions. A central role is played by individuals and organizations that do not belong to the company's familiar network (unobvious others) but are integrated via informal, short-term network relationships. This is also the key difference between open innovation and traditional contract research or existing research and development (R&D) alliances.

Open innovation is characterized by a multilayered, open search and solution process between multiple players across enterprise boundaries. This opening up of the innovation process creates a great deal of new innovation potential. We understand open innovation as the **systematic** and **methods-based** exploitation of this potential. By collaborating with external players, organizations have improved access to detail about information on needs and an expansion in the sources of solution information. In this way, the knowledge and creativity of external players that was previously unavailable is integrated into the process. This represents a departure from the traditional idea of the innovation process as being located largely within the company, which can be described as a **closed innovation model**.

Our understanding of open innovation is that it calls for the integration of highly diverse knowledge sources drawn from the company's entire periphery, not just suppliers and customers but also technology experts from other industries, non-customers, interested users, students, etc.

Open innovation therefore signifies the practice of problem solving by looking beyond one's own company to the outside world. Above all, however, open innovation changes the way in which cooperation with external partners is approached and implemented. This shift in the coordination and acquisition of external knowledge is the central element in our understanding of open innovation, as well as being the key difference from other forms of cooperative knowledge development and the key reason for the benefits of the open innovation approach. External information is no longer generated in traditional R&D cooperation projects or by contracting engineering service providers, but rather by means of broadcast search and public calls for contributions within a large, undefined network of players who should collaborate on solving a problem.

> Absorptive capacity can be defined as the sum of organizational routines and strategic processes by means of which companies can acquire, assimilate, transform and exploit knowledge

Methods of open innovation

Open innovation methods can focus on integrating customers and users in order to generate information on needs. It can also focus on external technology providers in order to acquire solution knowledge. Both types of information and both classes of external interaction partner can be integrated at different stages of the innovation process (see Figure 1). As we see it, the central open innovation tools are primarily the **lead-user method**, **toolkits**, **innovation** or **idea competitions**, **broadcast search platforms** and open innovation **communities**. Customers are best integrated via lead-user method, toolkits and online communities as well as idea competitions; external experts are best integrated using the broadcast search methodology. These methods have already been described at length elsewhere (please refer to the references section at the end of the journal for recommended literature). As we see it, the chief problem in practice is no longer getting to know the methods and leveraging them to acquire knowledge. Rather, the problem is using this external knowledge internally to the benefit of one's own company. The remainder of this article focuses on this challenge.

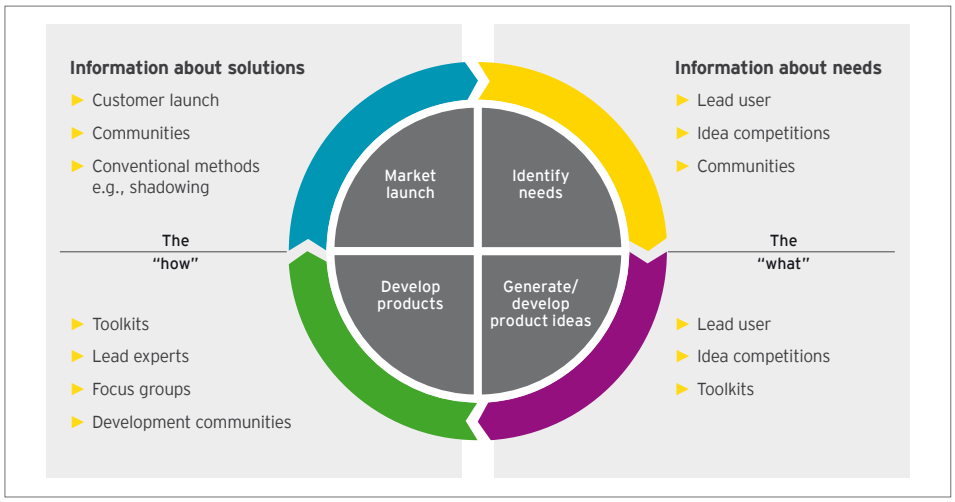
2. Audit for evaluating open innovation readiness

Open innovation should not be regarded as a cure-all and has certain limits. On the one hand, involving external players makes the management process more complex. On the other hand, boundaries within the organization also have to be overcome if new external knowledge is to be understood and exploited. These obstacles can be due to the design of organizational structures or the corporate culture.

Utilization and management of open innovation

While the methods of open innovation increase innovation potential, internal decisions and processes are required to leverage this potential and translate it into profit. In particular, aspects of assimilating, integrating and exploiting external knowledge become more significant. If a company does not have this absorptive capacity, all open innovation activities are ultimately no more than a cost driver. We therefore strongly recommend that companies have their ability to assimilate and process knowledge analyzed before investing in open innovation. This can be done using a straightforward auditing tool designed to help organizations prepare for opening up their innovation process and determine their readiness for open innovation.

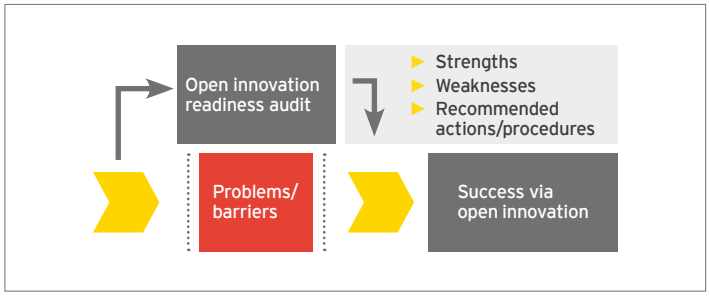
Figure 1. Open innovation methods across the phases of the innovation process



Basic principle of open innovation readiness

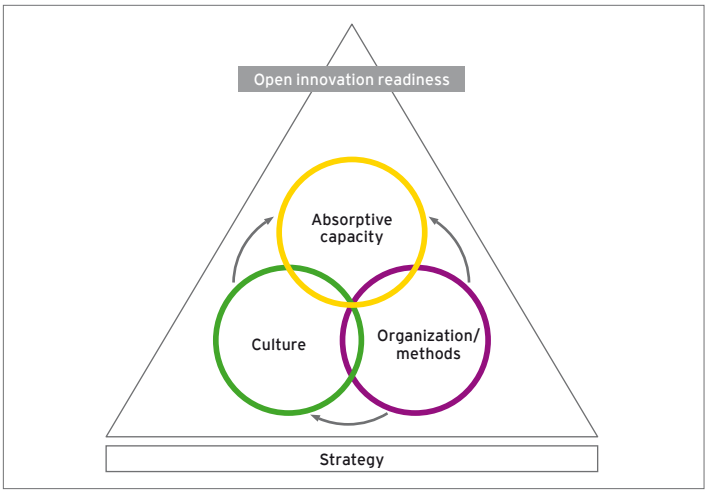
Figure 2 illustrates the underlying principle of the audit. The first step involves recording the actual situation with respect to open innovation readiness. The findings are then compared with a target situation that reflects optimum conditions. This comparison is used to generate a profile of the company's strengths and weaknesses with regard to open innovation. It also provides the basis for recommendations to eliminate obstacles and issues in advance or to counter these. The audit was developed by the Technology and Innovation Management Group at RWTH Aachen University on the basis of comprehensive analysis of companies' search for external knowledge and the assimilation and absorption of external knowledge.

Figure 2. Aim and purpose of the open innovation readiness audit



The central dimension of the open innovation audit is the concept of **absorptive capacity**. This describes companies' ability to assimilate, evaluate and above all disseminate external knowledge internally thereby ensuring that knowledge flows into development and innovation activities. Further dimensions of the audit include **culture**, **organization and methods** as well as **strategy**. Most importantly they can be interlinked to increase the company's absorptive capacity. Figure 3 shows the matrix of interconnections between the core dimensions of the audit, which will be described in greater detail later.

Figure 3. The core dimensions of open innovation readiness



Core dimensions of the audit

Even before open innovation became a popular concept, researchers had investigated companies' ability to recognize the value of new external information and to assimilate and commercialize it. This ability is known as **absorptive capacity** and is the central dimension of the audit.

Absorptive capacity is a product of organizational learning processes. It mainly depends on knowledge generated in the past relating to a knowledge domain. In terms of prior knowledge, absorptive capacity is therefore a function of R&D investment. Absorptive capacity also can be seen as a company's knowledge stock. Thus, the breadth and variety of employees and their respective knowledge also plays an important role.

But absorptive capacity is not only simply the sum of the individual employees' knowledge and capacities, but is also determined by organizational structures for internal communication and knowledge transfer. Absorptive capacity can therefore be defined as the sum of organizational routines and strategic processes by means of which companies can acquire, assimilate, transform and exploit knowledge.

Culture is a significant element when it comes to exerting a sustainable positive influence on the transition to open innovation. Our experience shows that many companies have to undergo a major change in this particular area. Companies that have been successful in implementing open innovation have reported that creating an open innovation culture is a powerful motivating factor, and that internal cultural barriers and a lack of motivation are the greatest obstacles. For the purposes of the audit, the term "culture" refers to a system of behavioral norms and values as well as firmly held beliefs of a social unit. With regard to the core dimension of culture, it is necessary to assess norms, values and ways of thinking and acting that are integrated into the corporate culture, anchored in employees' beliefs and relate to the assimilation of external knowledge.

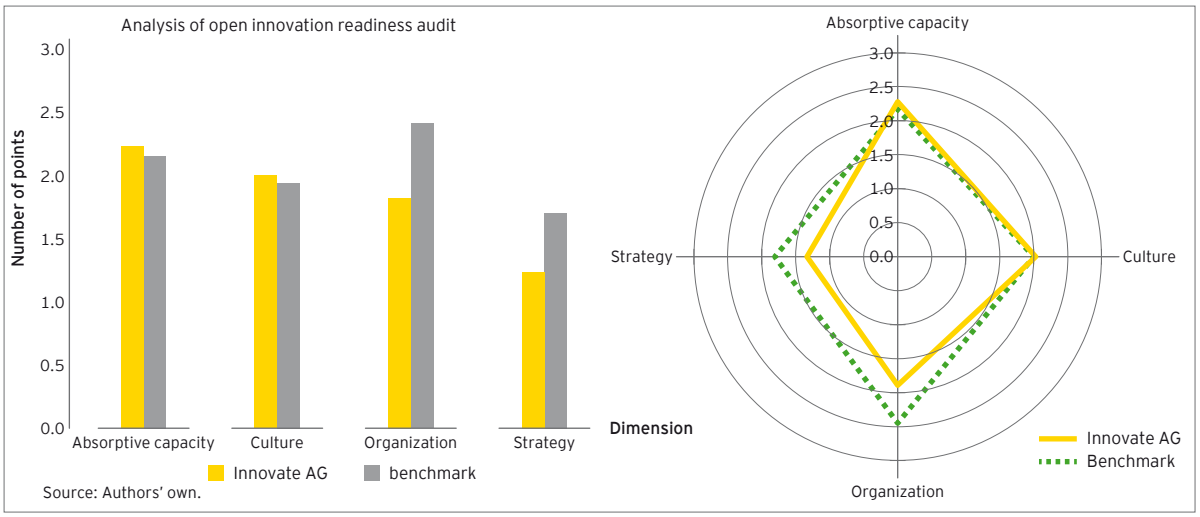
The **organizational structure** of a company and the **selection of appropriate methods** play an important role in open innovation readiness. Corresponding mechanisms and methods can be used to support absorptive capacity, e.g., the transfer and exploitation of knowledge. Organizational measures can also prove helpful in developing an open innovation culture. Due to the difficulty of documenting and influencing a corporate culture, organizational mechanisms and methods offer a convenient means of optimization. The importance of adapting organizational structures has been demonstrated in practice. Companies stated that they found structural changes within the organization to be particularly facilitating factors for open innovation.

The interaction between the innovation strategy and the strategic goals of the search for external knowledge is one of the significant aspects of the **strategy** dimension. The coordination, or fit, between the innovation strategy and the goals of the search for external knowledge enables corresponding activities to be aligned consistently and facilitates the design of processes and structures. The support provided by the strategy, therefore, also contributes to the increasing potential for assimilating external knowledge.

One starting point here could be the distinction between exploration and exploitation in the corporate strategy. While exploration refers to the search for and acquisition of knowledge beyond existing knowledge domains within the company, exploitation refers to the search for and application of knowledge within existing knowledge domains. This distinction matters for the use and design of search and integration processes.

Introducing open innovation should not be seen as a process for outsourcing internal R&D, and this certainly should not be the result. Rather, external research should be regarded as complementing internal R&D activities. In practice, companies that implement open innovation tend to maintain or even increase their R&D budgets.

Figure 4. Individual dimensions of the audit



Source: Authors' own.

In addition to this specific formulation of the innovation strategy, success with open innovation requires companies to have an explicit innovation and R&D strategy that includes elements of searching for knowledge and information in external business environment. Open innovation processes underscore the significance of the environment outside the company. In light of this fact, the company's strategy also needs to contain this as a strategic goal. Further, knowledge should be understood as a strategic variable and managed accordingly. For instance, by comparing the knowledge needed with the knowledge available internally, companies can uncover a strategic gap that makes it necessary to adjust capacities, i.e., to acquire knowledge for the company.

Using the audit

In order to enable companies to perform a self-assessment using a quick test, we converted into questions the dimensions presented in the previous section. Comparing strengths and weaknesses helps uncover starting points for opening up the internal innovation system in a better way to input from the periphery.

Users are given a questionnaire comprising 44 questions divided into sections covering the dimensions outlined previously. Users have a choice of five responses ranging from "strongly agree" to "strongly disagree." It is generally advisable to have a survey of this kind organized by a central unit within the company and to involve a variety of employees. Potential users include individual teams, departments or business units, as well as the company as a whole. It also makes sense to focus on individuals and departments responsible for innovation activities. The user's task is to assess the various aspects covered by the questionnaire with respect to their particular area.

The result is a strengths and weaknesses profile in the form of a graph. This can be generated for all the dimensions at once or for each individual dimension. This profile is the result of a comparison of the number of points from the user's own assessment and the maximum number of points possible. The latter is determined from the number of questions in the questionnaire as a whole and the maximum number of points for each individual question (see Figure 4).

Moreover, all the individual results should be centrally aggregated in order to generate a profile for the entire organizational unit. The following analyses are available:

- **Aggregated total value for all dimensions** as an indicator of general open innovation readiness
- **Breakdown of figures for the individual dimensions** enabling identification of primary fields for initiating improvement efforts
- **Breakdown of figures within the respective dimensions** enabling identification of specific starting points within the individual dimensions

Companies that have been successful in implementing open innovation have reported that creating an open innovation culture is a powerful motivating factor, and that internal cultural barriers and a lack of motivation are the greatest obstacles

3. Conclusion

Open innovation promises more effective and efficient generation of ideas and solutions. A distinction can be made between methods for acquiring information on needs and the generation of solution information. While the former primarily inhabit the domain of users, the latter are traditionally the domain of the company and the experts working within it. In recent years, there has been a shift in attitudes regarding the nature and intensity of involving various players. Customers, users and other external experts are no longer seen as mere providers of basic information for evolving existing products, but as partners for generating knowledge relevant to innovation. Companies' own R&D departments are no longer considered the only source of solutions. Rather, the aim is to leverage the vast potential of solution knowledge available in the external business environment.

However, in order to exploit the potential of open innovation, the corresponding methods must be tightly integrated into the innovation management toolbox. Moreover, open innovation calls for a shift in strategic orientation, the organization and companies' culture. These requirements are not dissimilar to those of traditional innovation management. Open innovation also needs to be planned, managed, monitored and formalized. In this article, we have presented a tool that enables companies to assess their readiness for open innovation as a basis for defining targeted internal measures aimed at promoting the benefits of open innovation.