OPEN INNOVATION AT BOSCH

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German multinational engineering and electronics company Bosch was on a mission to invest in the development of environmentally friendly storage solutions that are an essential driver of innovations in areas of renewable energy and smart grid. To uncover the right technologies for this innovation effort, it launched an open innovation contest on a third party's platform.

DEFINING THE OPEN INNOVATION CHALLENGE

In recent years Bosch has undertaken measures to set a standard in the storage market. It not only established a unit specifically focused on energy storage,[1] but also focused its open innovation efforts on this area. To establish an innovation advantage in broader discussions on renewable energy, executives wanted to explore new technological solutions for energy storage. In particular, Bosch wanted to address its industrial customers in the machinery sector and the contribution to the emerging trend of e-mobility.

Above all, the company aimed to identify a solution that did not rely on electrochemical reactions, in the same way as batteries do for instance. Such an innovation would help the company fulfill a major objective: supporting ecological sustainability by maximizing the use of renewable energy (such as wind or solar) while also ensuring a reliable supply of electricity to customers at a manageable cost. The company decided to use open innovation to tackle this challenge.

CHOOSING AN OPEN INNOVATION APPROACH

Bosch's energy-storage problem was not overly complex, in that the company already understood how the various processes of renewable energy production, energy storage, and energy supply would have to work together. But the location of a potential solution for storing renewable energy without using electro-chemical processes was less obvious. The open innovation team knew that a number of new, non-electrochemical technologies were available to choose from, yet Bosch did not know which of them would make the best match for its particular storage problem. Indeed, the open innovation team assumed that cutting-edge approaches could be potentially found outside their own business network of suppliers and customers, or even within their own industry.

Bosch opted to work with a specialized open innovation intermediary to conduct an open innovation contest on behalf of Bosch. The contest involved a large group of diverse individuals and organizations to access problem solvers and identify potential "outlier" solutions (see "Four modes of open innovation").

Open innovation intermediaries vary in terms of their service offerings, which can range from:

• Running team-based research and development (R&D) contests (such as IdeaConnection) with a small but diverse crowd

• Large technical contests that include an "open call" among a network of thousands of scientists to identify novel technical solutions, often referred to as technical search or request for proposals (RFPs)

• Contests that are focused not only on the technological invention, but also the innovation and the advancement of a first conceptual idea into a more solid innovation concept.

Indeed, the intermediaries and their network of solution providers also differ in the types of problems they can help to solve. For example, while some intermediaries specialize in science and emerging technology search, others may focus on software programming or design. Bosch decided to partner with one of the leading open innovation intermediaries. The company specializes in helping to support technological solutions using contests and implementing RFPs. In particular, they focus on search across industry verticals to increase the potential for unconventional solutions.

FRAMING THE PROBLEM FOR THE CROWD

Bosch's project team members knew they had to share information about the technical problem at hand—including project specifications and requirements—to enable contest participants to generate potential solutions. But they also understood that revealing too much specific information could cause participants to make assumptions about how the solution would be used in a future application. As a result, they might fixate too early on a solution which restricted the ideas coming in from the crowd. Framing the problem in overly specific terms could also present a risk that knowledge about Bosch's goals and interests would leak out to competitors.

Abstracting the problem also enabled Bosch to avoid describing the problem in its own technical language.

Bosch set out to frame its innovation problem in abstract terms. To do so, it described the problem without making any reference to its industry or to energy storage. This increased the odds that problem solvers in the crowd who were not knowledgeable about the current energy storage solutions for Bosch's industrial clients would also participate.

"Abstracting" the problem also enabled Bosch to avoid describing the problem in its own technical language. This simplification made it easier for prospective participants to understand the call for proposals, further boosting the likelihood of attracting a healthy number of problem solvers to the contest. What is more, Bosch decided to broadcast the problem anonymously via NineSigma's platform, so participants would not be aware of the company's technological interests. This increased the chances of attracting problem solvers from distant technological fields, further enriching the diversity of the proposed solutions.
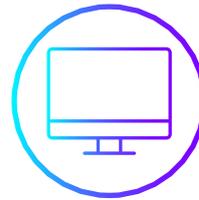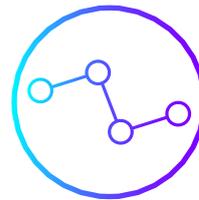
SHARING INFORMATION, PROTECTING INTELLECTUAL PROPERTY

Bosch relied on its clear policies for managing information sharing in open innovation projects. It defined three levels of sensitivity of information and prescribed rules governing sharing for each level. For example, information at the highest level of sensitivity cannot be shared with outsiders. Moreover, every project team member must obtain approval from the project manager before sharing sensitive information with outsiders. The rules further informed which information about the innovation problem at hand was communicated to the crowd. NineSigma operates with transparent IP policies that apply equally to all participants in the open innovation contests it runs.

To enter Bosch's contest, problem solvers had to state any legal IP rights associated with their proposed solution. They also had to give Bosch access to their solution (for instance, through IP licensing agreements) if they forged a bilateral partnership with the company after the contest. After short-listing proposed solutions that came in from the contest, Bosch moved to partner with three especially promising candidates. It used a simple non-disclosure agreement (NDA) to foster more detailed knowledge exchange with its new partners.
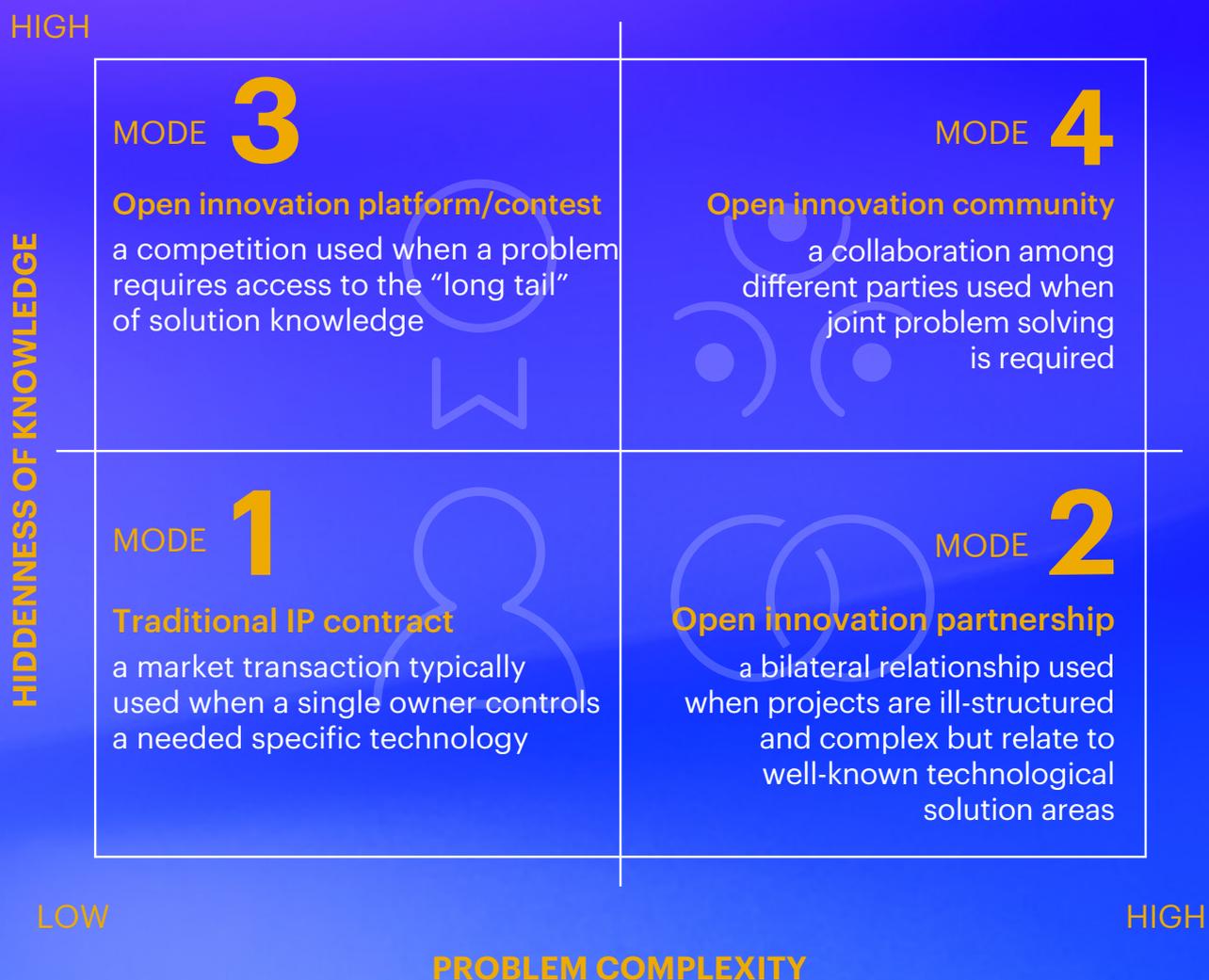
SCORING SUCCESSES

The project created an impact in at least two ways. On the one hand, it enabled Bosch to shape the discussion on energy storage among its innovation ecosystems of suppliers, customers and other business partners. Rather than being a follower in the discussion, Bosch is now an active "shaper" of the discussion. The use of an open innovation intermediary, accelerated Bosch's own technological learning and strengthened its technological knowledge. While the technology is still in a development phase and not yet on the market, it gives Bosch the opportunity to define the future footprint of energy storage. The project also increased the capacity for open innovation in Bosch. Since it first began practicing open innovation in 2000, Bosch has continued to invest in this approach. Today, 20 percent of its innovation budget is allocated to open innovation. Roughly 200 full-time employees are dedicated to implementing open innovation practices. And open innovation now constitutes a central element in the company's customer-centric innovation strategy.

FOUR MODES OF OPEN INNOVATION

In our research, we studied the Research & Development (R&D) operations of several large corporations with headquarters in the United States and Europe.[2] These companies each had more than 1,000 employees and total revenues of at least US$250 million. We found that, to work with external parties to augment their internal R&D, these corporations have used four basic modes of open innovation:[3]

HIGH

HIDDENNESS OF KNOWLEDGE

MODE **3**

Open innovation platform/contest
a competition used when a problem requires access to the "long tail" of solution knowledge

MODE **4**

Open innovation community
a collaboration among different parties used when joint problem solving is required

MODE **1**

Traditional IP contract
a market transaction typically used when a single owner controls a needed specific technology

MODE **2**

Open innovation partnership
a bilateral relationship used when projects are ill-structured and complex but relate to well-known technological solution areas

LOW   HIGH

PROBLEM COMPLEXITY

Source: Bagherzadeh, M. and S. Brunswicker (2015). Mix and match: Open Innovation Project Attributes and Optimal Governance Modes. World Open Innovation Conference 2015. Santa Clara, UC Berkeley; accessible via SSRN https://ssrn.com/abstract=2821203

1   http://boschenergystoragesolutions.com/en/nba/about_us/about_us_1

2   These four modes of open innovation were identified based on an analysis of more than 100 open innovation projects of large firms in the United States and Europe. This data collection was jointly executed by the Research Center for Open Digital Innovation and Haas School of Business, UC Berkeley. For more detail on this classification scheme see Bagherzadeh, M., S. Brunswicker etal (2015). Mix and match: Open Innovation Project Attributes and Optimal Governance Modes. World Open Innovation Conference 2015. Santa Clara, UC Berkeley

3   For more detail on the study results read the report: Brunswicker, Sabine; Bagherzadeh, Mehdi; Lamb, Allison; Narsalay, Raghav; Jing, Yu. (2016). Managing open innovation projects with impact. Whitepaper. Research Center for Open Digital Innovation, Purdue University. West Lafayette, Indiana. www.purdue.edu/opendigital

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