

OPEN INNOVATION AT SAMSUNG

By Raghav Narsalay, Dr. Sabine Brunswicker, Mehdi Bagherzadeh
and Jung-Wook Kim

A technology conglomerate launched an open innovation contest that saw more than 500 external developers submitting Internet of Things (IoT) app prototypes—for a platform still being beta tested.

DEFINING THE OPEN INNOVATION CHALLENGE

South Korean conglomerate Samsung had identified the Internet of Things (IoT) as a strategic innovation area. In particular, it wanted to focus its innovation efforts on IoT platform technologies—such as its ARTIK platform project. Samsung envisioned the platform enabling users to create IoT applications in fields ranging from consumer wearables to home automation to smart lighting. ARTIK would comprise embedded hardware modules with on-board memory, advanced processing power, cloud connectivity, security features and a software stack. What is more, it would offer a family of core modules that differed in size and performance. But to be as valuable as possible for future users, the platform would also need complementary IoT hardware and software applications, which Samsung decided would be created by external developers. Although multiple technological considerations were involved in developing the ARTIK platform, the third-party aspect of the work was no mystery to Samsung.

For example, Samsung had predefined rules, created using simple application programming interfaces (APIs), for the development of peripheral software and hardware solutions in terms of interacting and exchanging knowledge with open innovation partners. Moreover, the company had created highly modular and easy-to-use software development kits that set up clear interfaces and standards distinguishing external developers' tasks from those related to creation of the core platform technology. As a result of this clear delineation, the open innovation challenge had a relatively low level of complexity.

Even so, finding novel and useful complementary IoT applications for markets such as consumer wearables or high-end industry uses lay outside Samsung's core competencies. Simply put, Samsung did not yet know how to identify the best software or hardware designs for such applications.

CHOOSING AN OPEN INNOVATION APPROACH

Because the ARTIK problem had a manageable degree of complexity but a high degree of knowledge hiddenness, Samsung decided to use an open innovation platform centering on a contest aimed at gathering ideas for ARTIK's complementary IoT applications (see the sidebar "Four modes of open innovation").

Through the contest, Samsung would invite developers to connect with its prototype IoT platform to create software applications for it, as well as test and run the applications on the platform. Samsung initiated the contest when the ARTIK platform was still in a beta version, accompanied by a toolkit not yet available on the market. As one vice president explained: "We wanted to reach out to the software ecosystem early on, and we used a contest to encourage future ecosystem partners to work with our platform. It is a way to get things moving a lot faster and to find potential solutions."

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To generate the most useful ideas from the contest, Samsung would have to work out how to manage knowledge sharing before the platform's concept had been proved. It would also need to motivate its innovation partners to keep developing applications even though the platform was not yet available on the market. And it would have to clarify the platform's software requirements as well as rules for the innovation contest.

PHASING IN THE OUTSIDERS

ARTIK's core modules were in the beta stage and the technology was still evolving. For instance, the platform's interfaces were not yet well established. So Samsung worked with a small number of companies to finalize these modules, including some that made open source hardware solutions, before ARTIK reached the proof-of-concept stage. Examples of these early collaborators included Smart Things Cloud for ARTIK's home applications. During this early phase of the work, Samsung and its collaborators openly shared information and ideas for new concepts for the development of the software and hardware required for the core modules.

To manage knowledge exchange in this stage, Samsung used tools such as JIRA, which helps software teams track issues while working on projects. The company also used an internal wiki to support the agile-development process. In addition, video conferencing and other tools enabled Samsung's early collaborators to share ideas and information and complete tasks more easily and effectively.

After ARTIK had reached the proof-of-concept stage, its technology platform had stabilized, and the interfaces were well defined. Samsung then involved a broader set of ecosystem partners—by launching an innovation contest for the external developers who would generate complementary IoT applications for ARTIK.

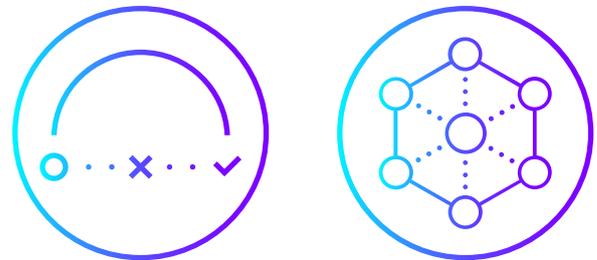
SUSTAINING COLLABORATORS' COMMITMENT

Keeping its innovation partners motivated to develop applications for a platform still not available on the market was not easy. Samsung could not rely on traditional market mechanisms and incentives, because ARTIK did not have any paying users yet. To sustain developers' creativity and their commitment to the project, Samsung needed to be creative itself using incentives; it came up with a two-part scheme.

Before launching the innovation contest, Samsung motivated its partners by sharing with them extensive information about the ARTIK technology. The opportunity to take part in this early development stage further inspired the partners to do their best work. After launching the contest, Samsung switched tactics. It offered cash prizes to encourage contestants' competitive spirit. External developers coming up with a winning solution could receive as much as US\$100,000 in prize money.

DEFINING SOFTWARE AND CONTEST REQUIREMENTS

Samsung knew that APIs and software development kits would be essential to establish the boundaries of potential software solutions. And it used these tools to align the contest-generated solutions with the ARTIK platform's core. In launching the contest, Samsung also recognized that it must create clear specifications, rules and requirements (including submission deadlines) to guide the external developers' problem-solving efforts. To this end, Samsung developed a video explaining the innovation challenge that it wanted the contestants to help solve.



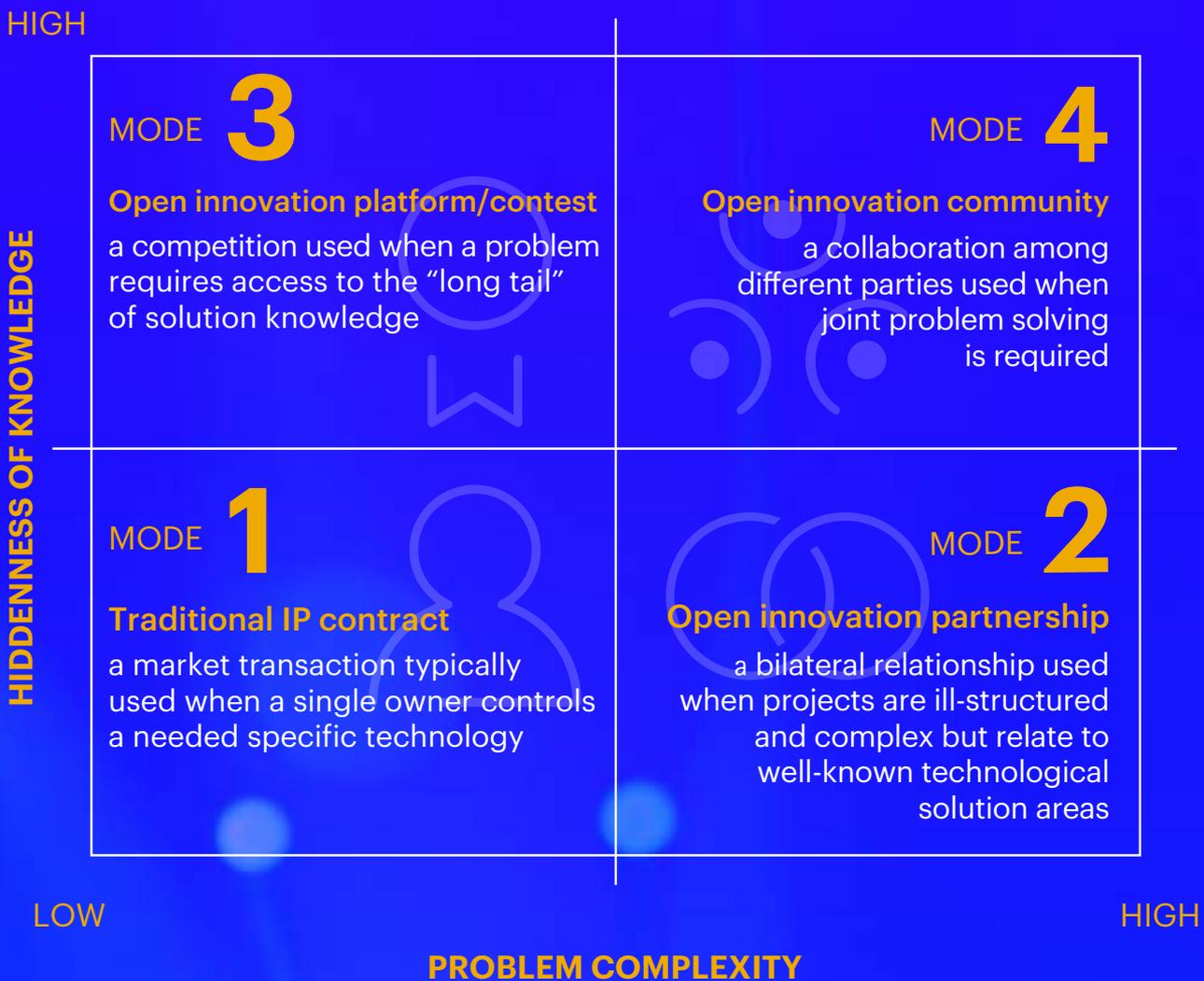
SCORING SUCCESSES

Nearly 500 developers took part in Samsung's innovation contest, and the company collated around 150 submissions. Assuming that about 20 percent of the resulting prototypes would be turned into scalable businesses, Samsung could reasonably count on approximately 30 contributors for its future IoT platform. An in-house development effort focused on a similar project would have required more time and investment than the open innovation approach Samsung selected.

The IoT platform innovations forming around Samsung's ARTIK chip technology also helped Samsung gain strategic positioning in an emerging technology area. News reporting indicates a positive market response to the launch of the winning prototype. And, the ecosystem of third-party developers that Samsung created through its innovation contest included entrepreneurial companies focused on promising applications that could be built on the ARTIK platform. One company, for instance, specialized in wearable footwear technologies; another, in smart-farming solutions. Finally, the project met important internal targets, such as promoting the uptake of the platform among developers, and helped Samsung gauge the size of the potential market for ARTIK.

FOUR MODES OF OPEN INNOVATION

In our research, we studied the research and development (R&D) operations of several large corporations with headquarters in the United States and Europe.¹ 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:²



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 <https://ssrn.com/abstract=2821203>

¹ 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 et al (2015). Mix and match: Open Innovation Project Attributes and Optimal Governance Modes. World Open Innovation Conference 2015. Santa Clara, UC Berkeley

² 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

Authors

Raghav Narsalay

raghav.narsalay@accenture.com

Dr. Sabine Brunswicker

sbrunswi@purdue.edu

Mehdi Bagherzadeh

bmedhi@purdue.edu

Jung-Wook Kim

jung.wook.kim@accenture.com

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