

WHAT DEEP-TECH STARTUPS WANT FROM CORPORATE PARTNERS

By Nicolas Harlé, Philippe Soussan, and Arnaud de la Tour

This article is the first in a two-part series on how big companies can collaborate with entrepreneurs and startups engaged in “deep technology”—developing technologies that advance scientific and technological frontiers in industries as diverse as agriculture, health care, energy, and transportation—technologies that in many cases address the biggest societal and environmental challenges and shape the way we solve the most pressing global issues. This article looks at young companies’ needs with respect to other players in the startup ecosystem, particularly large corporations. The second, “A Framework for Deep-Tech Collaboration,” BCG article, April 2017, considers ways that companies can go about setting up collaborations with deep-tech startups. Both articles are based on research conducted by BCG and Hello Tomorrow, a global initiative that connects deep-tech entrepreneurs with corporations and investors. The research involved more than 400 deep-tech startups. BCG and Hello Tomorrow also conducted in-depth interviews with other key ecosystem players, including investors, support organizations, and mentors. The full results are presented in the report From Tech to Deep Tech: Fostering

Collaboration Between Corporates and Startups.¹

AS CISCO’S JOHN CHAMBERS predicted years ago, every company has become a tech company. Affecting aspects of every industry—from the supply chains and processes to customer journeys—digital technologies have revamped virtually every corporate function and activity. But some companies do more than simply apply digital technologies to existing functions or innovative business models that reinvent customer experiences. These innovation leaders seek to develop unique, proprietary, and hard-to-reproduce technological or scientific advances that have the power to create their own markets or disrupt existing industries. Following the past decade of digital innovation, these deep technologies, which will be at the center of the next wave of industrial and information revolution, represent the “next big thing” that venture investors are looking for.

Because of their intense focus on science and technology, deep-tech startups face

their own particular set of challenges. An innovation ecosystem has taken root around them, and within this ecosystem, deep-tech companies see large corporations as the partners that can best help their businesses mature and grow.

At the same time, large corporations seeking new sources of innovation are increasingly turning to new-venture vehicles, including corporate venture capital, accelerators and incubators, and idea labs. (See *Corporate Venturing Shifts Gears: How the Largest Companies Apply a Broad Set of Tools to Speed Innovation*, BCG Focus, April 2016). All these vehicles have soared in number among the biggest companies in multiple industries, as these firms seek new partners and skills that can bring more agility to their R&D operations, disrupt existing business models, provide access to adjacent markets, and help them develop a more entrepreneurial internal mindset. Even though innovation built on deep tech is now a priority, many companies still struggle to work effectively with startups, and the road to productive collaboration is rocky.

BCG and Hello Tomorrow surveyed more than 400 deep-tech startups, inquiring about their needs and their preferred partners. The tech ventures represent ten industries—aerospace, air quality and environmental technology, beauty and well-being, data sciences, energy, food and agriculture, health care, Industry 4.0, transportation and mobility, and water and waste—in more than 50 countries. Our goal was to understand deep-tech startups’ needs and challenges and how they interact with other stakeholders in the ecosystem. In addition, we conducted in-depth interviews with other key ecosystem players, including investors, support organizations, and mentors.

Deep-Tech Startups Seek Corporate Partners

Our research revealed that startups have plenty of choices when it comes to partners but that they, like their preferred partners, struggle to make the relationships work. Corporate partnerships offer lots of advantages—more than most other potential

partnerships—but it is difficult to secure and make them successful. While 95% of startups wish to develop long-term corporate partnerships, only 57% of them have done so. There are many obstacles, including the following:

- Inadequate preparation on the part of the startup, including lack of a clear value proposition, application, and proof of concept
- Failure of both parties to clearly define the relationship right from the beginning, including agreeing on vision, business, knowledge, and HR objectives
- Misalignment of timing and processes, including complex and slow corporate decision making
- Lack of a clear status and role for the startup within the larger company
- No high-level sponsorship for the startup within the corporation
- Lack of buy-in from the business on the corporate side

Large companies that want to bring deep-tech startups into the fold need to consider carefully the particular needs of these young operations, particularly where the startups stand in their development and what type of bets the bigger companies are making. Both sides also need to work out the fit and structure of the collaboration and specify how the two entities will actually work together.

What Makes Deep Tech Different?

Digital innovation is often about speed to market and scaling up fast to seize first-mover advantage. Deep tech is different in several ways: it involves a strong research base, a challenging business model, and large investment needs. Given their ambition—and often their complexity—truly disruptive deep technologies can require considerable development time before being brought to market.

For deep-tech startups, a strong research capability is essential since their innovations rely mostly on fundamental and advanced R&D supported by highly developed skills, knowledge, and infrastructure. New materials that demonstrate promising properties in lab conditions need improvements to meet industrial standards. External factors—for example, clinical trials in the health care industry—mean the need for additional resources and can extend the development process for years.

The business models are challenging because deep-tech startups are creating products that are absolutely new. Entrepreneurs must think not only about the technological development of their product but also about how to jump-start nascent or nonexisting markets. This requires the ability to anticipate and understand customer needs that don't yet exist, as well as a detailed strategy that addresses the challenges of industrialization and scaling up production. On top of that, some groundbreaking products are based on advanced materials and newly developed resources, so deep-tech startups need sharply honed business skills to work through such challenges as procurement, manufacturing, and achieving scale. Furthermore, there is always the danger that incumbents, feeling the threat of disruption, will actively seek to slow down, or block, new technologies from entering the mainstream.

Because in many cases, expensive infrastructure is required to support development and deep tech generally takes time to mature and reach the market, substantial funding from understanding and patient investors is essential. (More than 20% of the companies in our survey expect to work three years or more before getting a product to market, and 50% of startups underestimate the time that they will need.) Early experimentation and prototyping generally require expensive equipment. Testing and scaling is much more costly when it involves purchasing hardware as well as software, which is available and relatively inexpensive from the cloud. Not only is deep-tech capital intensity higher than that of conventional product develop-

ment, the payback periods are also typically further in the future because of the longer time to market. Funding is, therefore, a big and time-consuming challenge.

It Takes an Ecosystem—and a Corporation Can Be a Pillar

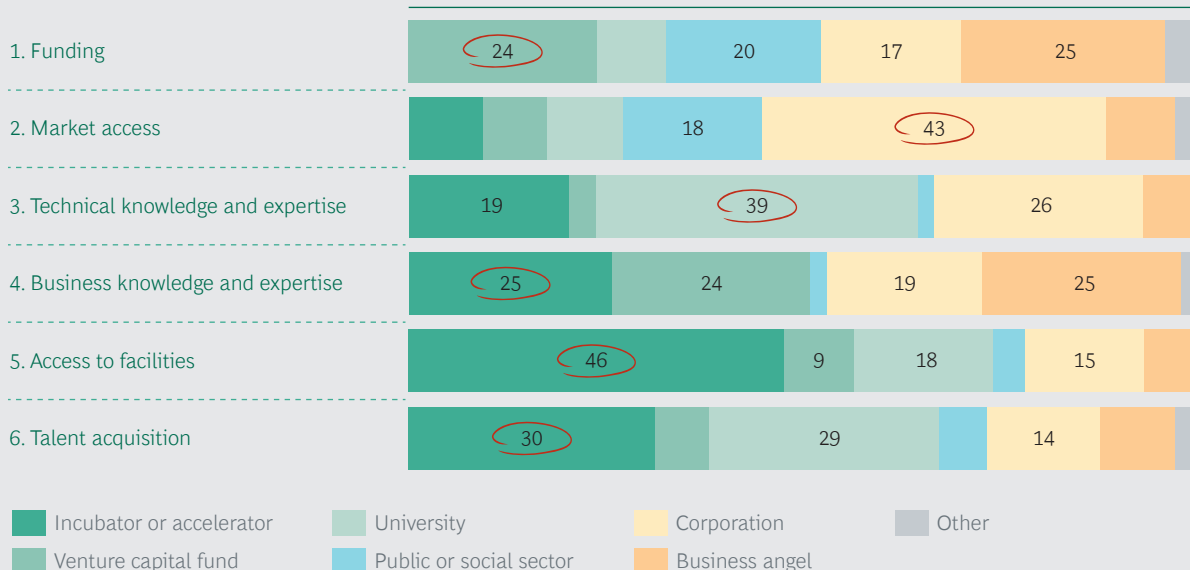
For all of these reasons, deep-tech entrepreneurs look to a broad ecosystem of organizations, institutions, and individuals for support. The most common top priority is funding: 80% of the startups we surveyed rank it among their top three needs. But it is far from their only need. Startups look to the supporting ecosystem for help with market access (61%), technical expertise (39%), and business expertise and knowledge (26%). Startups are attracted to particular funders by the specific attributes that they bring to the table. (See Exhibit 1.) Startups' needs evolve as they and their products move closer to market, and the attractiveness of various types of funding partners shifts as well.

Our survey found that overall, deep-tech startups target venture capital, business angels, corporations, and the public sector in roughly equal measure, with 15% to 25% of respondents indicating a preference for each. (University grants are generally seen as less desirable: they are preferred by only 10% of startups.) A comparison of historical funding sources and startups' preferred funding channels for the future reveals the evolution of the funding life cycle. It's not surprising that friends and family most often provide seed capital: 40% of our respondents benefited from such investments. And, on average, 30% of companies accessed the public sector, but we found wide discrepancies among countries and industries. For second-stage funding, deep-tech startups turn toward so-called professional sources—venture capital funds, business angels, and corporations—which, in addition to being able to provide larger sums of cash, can also provide business intelligence, professionalism, network access, and market credibility. Fear of misaligned vision and objectives is a concern, however. Some 35% of startups that had not yet received venture capital funding considered such

EXHIBIT 1 | Startups Seek Different Partners for Different Needs

NEEDS OF DEEP-TECH STARTUPS,
RANKED BY IMPORTANCE

PREFERRED PARTNER TO SUPPORT THE NEED (%)



Source: BCG–Hello Tomorrow deep-tech survey.

misalignment a critical roadblock. However, only 20% of those that actually had venture capital investors reported any friction.

In addition to funding, startups' preferences for each type of potential partner are shaped substantially by their assessments of their other needs. As a result, corporations are the preferred partners for companies looking to gain access to the market through, for example, access to market and customer data, an existing customer base, or a distribution network. Those that give top priority to technical knowledge and talent acquisition look to universities. Venture capital firms, corporations, and business angels are all seen as desirable for providing business expertise. And it's no surprise that incubators and accelerators rank high among startups seeking access to facilities such as offices, labs, and testing grounds.

When it comes to partner desirability, corporations have a decided advantage over other ecosystem participants. Corporations are the preferred partners for most potential needs: they are differentiated by their ability to provide market access, technical knowledge, and business expertise, and funding is the icing on the cake. (See Exhibit 2.)

The Evolving Needs of Startups

Large companies looking to partner with deep-tech startups need to segment these up-and-comers according to their maturity and market readiness. Sharpening their understanding of startups' needs and expectations provides a user's guide to what startups are seeking from other participants in the ecosystem. In Exhibit 3, the maturity axis is the level of development of the technology or product itself. The estimation of maturity ranges from early stage (idea, proof of concept) to intermediate stage (prototype, minimally viable product) to late stage (market-ready product). The market readiness axis indicates whether a product or technology will easily find commercial application and customers. It takes into account customer needs and receptiveness, the regulatory environment, and current innovations in the field.

Applying this segmentation analysis to our sample reveals four categories of startup, each with its own set of needs: potential quick wins, demand bets, development bets, and technology bets.

Potential Quick Wins. These are startups that have a commercially ready product

EXHIBIT 2 | Startups' Perception of Their Needs and Preferred Partners

	CORPORATIONS	VENTURE CAPITAL FUNDS	BUSINESS ANGELS	INCUBATORS OR ACCELERATORS	UNIVERSITIES	PUBLIC OR SOCIAL SECTOR	Share of startups with a critical need (%)
Funding	✓	✓	✓			✓	80
Market access	✓					✓	61
Technical expertise	✓			✓	✓		39
Business expertise	✓	✓	✓	✓			26
Access to facilities	✓			✓	✓		23
Talents				✓	✓		22

Corporations are among the partners preferred for supporting the full scope of needs. They are preferred primarily for market access and technical knowledge; although funding is not the leading startup expectation, companies include it in their offer



Startup considers stakeholder a preferred partner



Startup prefers the stakeholder's support to that of others



Startup would like the stakeholder's support

Source: BCG–Hello Tomorrow deep-tech survey.

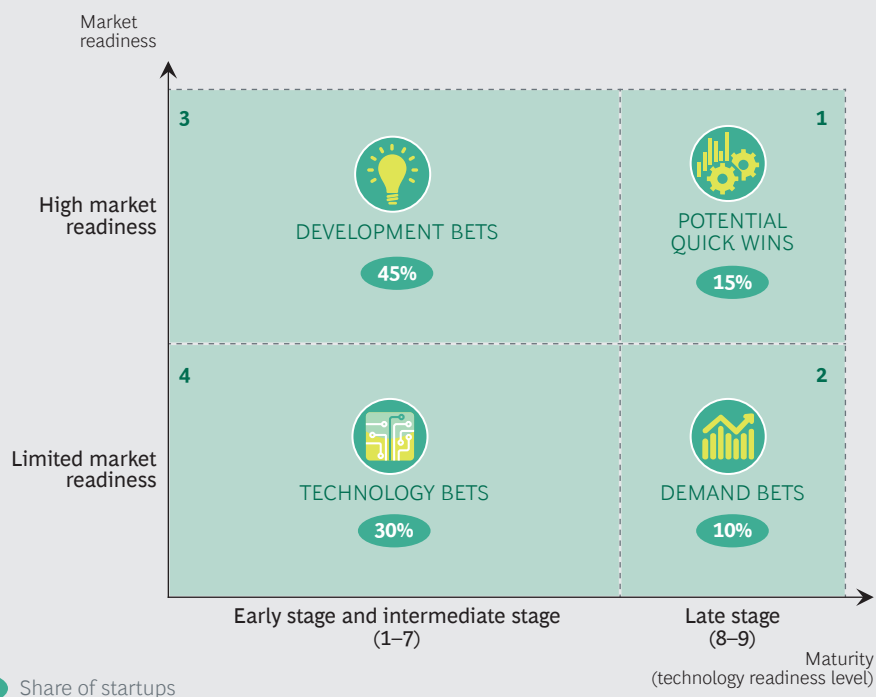
and a market that is prepared to adopt it. The immediate challenge is to achieve scale (initiate large production volumes, for example, or mount a major public-relations and marketing campaign), and for this, they need fresh funding, market access, and talent. Among startups in this group, 40% consider venture capital funds the preferred channel (compared with 25% overall) because venture capitalists tend to offer more generous levels of funding. To develop the customer base and the distribution network, many startups turn to corporations, although only 25% of them expect to get funding out of these collaborations. One-quarter of them do expect to get visibility, and 20% indicated that they expected to gain credibility, business knowledge, or technical knowledge.

Demand Bets. These are startups with a product that is sufficiently mature to be launched but that still has no broad commercial application. Their main challenge is to identify and create a market for their technologies. The two key roadblocks are the lack of a distribution net-

work (42% of startups in this group mentioned this as a challenge, compared with 16% overall) and market resistance to change (37% of them cited this as a challenge, compared with 20% overall). Other than funding, their most important resource needs are market access (a customer base and a distribution network) and business knowledge, for which the preferred partners are, respectively, corporations and venture capital funds.

Development Bets. These startups have identified a market opportunity and defined a value proposition, and they are developing a technology to respond to the opportunity. They have not yet created a market-ready product. They are focused on gaining access to technical expertise (a critical need for half of these startups, compared with 40% overall) and overcoming technological uncertainty (which 25% of them describe as critical). To obtain the expertise they need, they are willing to consider collaborations with companies and universities, but less than half have actually established corporate partnerships

EXHIBIT 3 | The Four Types of Deep-Tech Startups



Source: BCG–Hello Tomorrow deep-tech survey.

(compared with 57% overall). Of the collaborations that the development bet startups have established, 60% are research partnerships that share the costs and risks of R&D and accelerate the product development.

Technology Bets. These are startups that have identified a promising (though not fully developed) technology that lacks a market application. Their objective is to develop a viable product that fills a market need. The two chief roadblocks that these startups face are long development time (a major problem for 30%) and technological uncertainty (noted by 25%). Because the attendant uncertainty makes funding risky, their funding is generally from university and public sources. Obtaining access to corporate knowledge and support is relatively difficult for technology bets owing to the risk factors involved. Survey participants from this group express stronger needs for all resources, as they need to turn a technology into a solution to a problem, and they need to develop a marketable product in order to reach the potential-quick-win stage.

FOR LARGE COMPANIES with big innovation ambitions, picking the deep technologies to support depends on strategic priorities and a strong market assessment. Choosing the right partner, however, is much like a courtship, especially since the relationship is likely to be a lengthy one. In our experience, these arrangements tend to involve significant commitment from both sides—not just in terms of money but also management time, organizational expertise, and resources. Understanding what your prospective partner is looking for, as well as how those needs align with your own ambitions and capabilities, raises the chances for success.

NOTE

1. See *From Tech to Deep Tech: Fostering Collaboration Between Corporates and Startups*, <http://media-publications.bcg.com/from-tech-to-deep-tech.pdf>.

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A FRAMEWORK FOR DEEP-TECH COLLABORATION

By Nicolas Harlé, Philippe Soussan, and Arnaud de la Tour

This article is the second in a two-part series on how big companies can collaborate with entrepreneurs and startups engaged in “deep technology”—developing technologies that advance scientific and technological frontiers in industries as diverse as agriculture, health care, energy, and transportation. These are technologies that in many cases address the biggest societal and environmental challenges and shape the way we solve the most pressing global issues. The first, “What Deep-Tech Startups Want from Corporate Partners,” BCG article, April 2017, considers young companies’ needs with respect to other players in the startup ecosystem, particularly large corporations. This article looks at ways companies can go about setting up collaborations with deep-tech startups. Both articles are based on research conducted by BCG and Hello Tomorrow, a global initiative that connects deep-tech entrepreneurs with corporations and investors. The research involved more than 400 deep-tech startups. BCG and Hello Tomorrow also conducted in-depth interviews with other key ecosystem players, including investors, support organizations, and mentors. The full results are presented in the report From Tech to

Deep Tech: Fostering Collaboration Between Corporates and Startups.¹

COLLABORATIONS BETWEEN BIG COMPANIES and startups are the business world’s odd couples—two entities, which at an operational level have little in common, trying to work together. A recent study reported that “50% of startups said that their experience working with corporations was mediocre or worse.” At the same time, according to that study, 82% of corporations view interactions with startups as “somewhat important” to “very important.” Almost a quarter said that these interactions were “mission critical.”²

When the pairing involves deep technology—technologies that advance scientific and technological frontiers—the differences tend to be even more pronounced, thanks to the time required and complexity involved in creating a new technology (and, in many cases, a new product and market) from scratch. As we illustrated in our first article in this series, deep tech is different in several ways: it involves a

strong research base, a challenging business model, and large investment needs. Given their ambition, and often their complexity, truly disruptive deep technologies can require considerable development time before being brought to market.

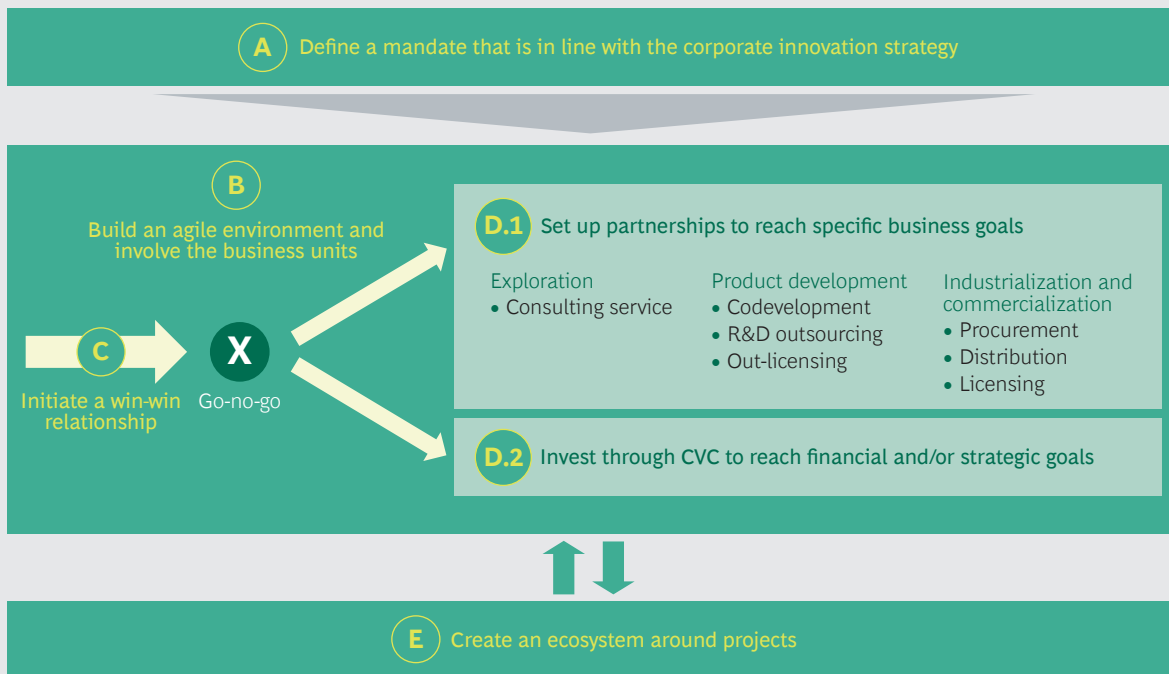
Big companies looking to collaborate need to raise their game. Plenty are trying. BCG research among the top 30 companies in each of seven industries—technology, communications, media and publishing, automotive, chemicals, consumer, and financial institutions—found significant increases in the use of three early-stage innovation development vehicles from 2010 through 2015. Among the 30 largest companies in each industry, the use of corporate venture capital (CVC) increased from 27% in 2010 to 40% in 2015. Among the top ten companies in each sector, it jumped from 41% to 57%. The use of accelerators and incubators (including partnerships) increased from 2% to 44% among the 30 largest companies in the seven industries and from 4% to 66% among the 10 largest. The use of innovation labs has climbed from 5% to 19% among the top 30 companies and from 16% to 41% among the top 10. (See

Corporate Venturing Shifts Gears: How the Largest Companies Apply a Broad Set of Tools to Speed Innovation, BCG Focus, April 2016.)

Putting the right venturing vehicles in place and priming them with promising candidates is the easy part, however. Preparing the larger organization for and ensuring that it productively invests time and resources in multiyear collaborations with dissimilar partners around speculative technologies (that some in the company doubt and others feel threatened by) are far bigger challenges.

On the basis of our research into the needs, challenges, and interactions of 400 startups representing ten industries— aerospace, air quality and environmental technology, beauty and wellbeing, data sciences, energy, food and agriculture, health care, industry 4.0, transportation and mobility, and water and waste—in more than 50 countries, BCG and Hello Tomorrow have developed a framework to help big companies navigate the trickeries, vagaries, and inevitable difficulties of deep-tech odd-couple collaborations. (See Exhibit 1.)

EXHIBIT 1 | A Framework for Corporate Collaborations with Deep-Tech Startups



Source: BCG–Hello Tomorrow deep-tech survey.

Define the Mandate

Successful companies develop innovation models and systems that are suited to their circumstances and reflect their corporate strategies. (See *The Most Innovative Companies 2016: Getting Past “Not Invented Here,”* BCG report, January 2017.) Successful companies also define a mandate for their innovation programs, ensuring that their organizations know what the goals, focus, and parameters of these efforts are. The mandate need not be long or complicated, but it should cover the following points:

- **The Company’s Innovation Objectives.** These may focus on strengthening the core business, expanding into adjacent areas, or exploring and preparing for future entry into currently unrelated business areas. The role of deep tech—compared with the application of digital technologies to existing products, services, processes, and functions—should be highlighted.
- **R&D Focus.** The topics on which the company wants to focus its R&D efforts should be defined.
- **Preferred Partner Profile.** An approximate profile of the kind of startups the company wants to partner with should include, for example, whether they are in early-stage, intermediate-stage, or late-stage development.
- **Resources.** A description of the required resources should specify, for example, the budget, people, and facilities that will be needed to meet the mandate.

Companies also need to define the desired balance between internal sourcing of innovation, using the company’s own capabilities, and external sourcing of innovation, including partnering with deep-tech startups.

Construct a Startup-Friendly Environment

Lots of large companies have established CVC arms, incubators and accelerators, and innovation labs to house their external inno-

vation programs. These models can work well, especially when the sponsoring companies are leveraging the scale effect of working with a significant number of startups with similar development cycles and needs. Because so many deep-tech startups have unique technologies and singular development cycles, however, they don’t necessarily fit comfortably into such systems. Moreover, relying on a standalone operation can mask the parent company’s organizational and cultural barriers that should be addressed if it is to collaborate productively with younger, faster, more nimble partners. Companies have to think through, for example, how they plan to interact with startups, where decision power resides, whether they can act and react as promptly as startups expect and require, and what types of KPIs will be applied to assess progress.

On the basis of our research and case experience, we have identified five areas in which most corporate sponsors should assess their readiness for deep-tech collaboration.

Assuring That Processes Are Fast and Light. Big companies should either tailor their internal processes for more agile interaction or create parallel processes with dedicated staff to work with the smaller and more nimble startups while the rest of the organization focuses on business as usual. It is most important to adapt the processes, such as procurement, legal, and finance, on which the startups will lean regularly for support.

Making Certain That Governance Procedures Ensure Clear Responsibilities and Accountabilities. To ensure alignment with corporate goals and full management buy-in, companies need to set up a governance framework for startups that is anchored at top management levels and provides appropriate oversight.

Providing Startups with Easy Access to Resources. Startups look to corporate partners for nonfinancial assistance in several areas, the most important—from a startup’s point of view—being technical and business expertise and market access.

From the sponsoring company's perspective, getting value from its deep-tech ventures depends in part on engaging the relevant people and parts of the business. The company needs to identify the capabilities that potentially provide value—for example, data and access to customers, networks, mentors, and technical experts—and allow startups to navigate as freely as possible among them. Creating a network of engaged experts and champions across the business to act as project managers for the collaboration can help. Immersion programs enable talent from the company to work for the startups for predetermined periods. In addition to providing startups with access to expertise, such programs help companies enrich the development of their up-and-coming executive talent and emphasize entrepreneurial values in their own corporate cultures.

Adapting Company KPIs to Track Long-Term Results with a Portfolio Approach.

The most consistently successful innovators have strong processes for reviewing development projects to ensure timely completion. But for collaborations with startups, they need to adapt these processes, especially those employed in areas not closely related to the core business. For nascent deep-tech ventures, for example, KPIs focused on short-term P&L impact can be counterproductive. KPIs should be adapted—by, for example, measuring knowledge acquisition in the early technology stages and financial impact in the later maturity stages—to reflect the maturity of the particular startup and the nature of the collaboration. KPIs should be clearly established from the beginning of the relationship and progress communicated regularly with the startup and within the company.

Making Sure That the Company Has the Right Culture and Mindset. Adapting the “hard” side of the organization—governance, processes, and KPIs—is not enough. Big-company and small-company values, cultures, and goals are different. The corporate individuals assigned to work with startups may need their own immersion in entrepreneurial cultures so that they can better understand what startups are trying

to do and the particular challenges that they face. In this way, the corporate representatives will be able to see the startups as valuable partners to be championed throughout the larger organization.

Look Before You Leap

Deep-tech ventures represent deep commitment on both sides. Both corporate partners and startups are well advised to spend time “dating,” getting to know each other and their aspirations and expectations before entering into a more formal, longer-term relationship. One of the main challenges reported by both startups and large companies is the lack of transparency and alignment on common goals from the beginning. This is a problem that leads to wasted time and, perhaps, painful renegotiation down the road.

We have seen both sides benefit from temporary associations with clear (ad hoc) milestones for assessing how and when decisions could be made to extend and deepen the relationship. Companies and startups use these times to explore mutual goals, collaboration platforms, and team chemistry. They can also iron out potentially thorny issues—such as intellectual property (IP) rights—and test the viability of the partnership, achieving some quick wins, working on mutually defined projects, and building momentum through a short but intense period. They can agree on a common roadmap with clear milestones, defining the most efficient path to the common goal, with each milestone constituting an opportunity to assess the relationship, confirm or change the next milestone and go to the next level, or stop the relationship.

Choose the Right Model

Companies can choose from several different models—CVC arms, incubators and accelerators, and business partnerships—to bring relationships to the next level when it suits their deep-tech venturing objectives. As we indicated in the first article in this series, in many cases, the best model is determined by the startup's maturity stage and its readiness to go to market. (See Exhibit 2.)

EXHIBIT 2 | The Best Collaboration Model Is Determined by the Startup's Maturity Stage

	EARLY STAGE		INTERMEDIATE STAGE		LATE STAGE	
PHASE (technology readiness level, scale: 1–9)	Exploration (1–2)	Experimental proof of concept (3–4)	Functional prototype (5)	Minimum viable product (6–7)	Industrialization (8)	Commercialization (9)
OBJECTIVE	Explore opportunities around a disruptive technology	Prove feasibility of the product or solution and acquire missing knowledge	Figure out how the product or feature will be achieved and get early-user feedback	Get proof of traction on a first, minimal version of the final product or service	Design a product for mass production and produce it	Identify distribution channels and persuade customers to buy it
PARTNERSHIP FORMAT	<ul style="list-style-type: none"> Consulting service (expertise) 				<ul style="list-style-type: none"> Codevelopment: R&D outsourcing, out-licensing 	
CHECKLIST	<ul style="list-style-type: none"> Well-defined research fields Signed nondisclosure agreement Defined IP ownership 	<ul style="list-style-type: none"> Technology validation Clear problem and solution Technical specifications Complementary teams 	<ul style="list-style-type: none"> Validated knowledge from experimental proof of concept Clear value proposition (market and application) IP landscape analysis 	<ul style="list-style-type: none"> Functional prototype Clear market and business model hypothesis Key risks addressed 	<ul style="list-style-type: none"> Proof of traction Industrial capacity readiness Key internal barriers (cultural, technical, process, and organizational) identified 	<ul style="list-style-type: none"> Proof of traction Validated business model Commercial readiness Ecosystem readiness
KSFs	<ul style="list-style-type: none"> Continuous assessment of opportunities, goals, and roadmap alignment Definition and implementation of the right KPIs at the right stages Progressive integration of new capabilities 					
	<ul style="list-style-type: none"> Understanding of potential markets Understanding of business and technical needs 	<ul style="list-style-type: none"> Involvement of technical staff 	<ul style="list-style-type: none"> Business adhesion Agility to refine prototype 	<ul style="list-style-type: none"> Business adhesion Agility to refine the minimum viable product 	<ul style="list-style-type: none"> Business adhesion Readiness of the corporate organization 	<ul style="list-style-type: none"> Business adhesion

Source: BCG–Hello Tomorrow deep-tech survey.

Note: KSF = key success factor.

Partnership Models. Companies can pursue multiple models of partnership, each with its own advantages. For example, for startups in the early stages of development, a consulting-service arrangement allows the company to help pay for R&D as it takes the opportunity to review and assess the technology before it pursues a deeper and more complex relationship. When the startup has a more mature technology or product, the companies can pursue a product codevelopment deal under which they join forces with a dedicated budget, firm goals, and a clear time frame for going to market. Alternatively, they can engage in an R&D outsourcing arrangement, in which, for example, the startup develops a product for the sponsoring company.

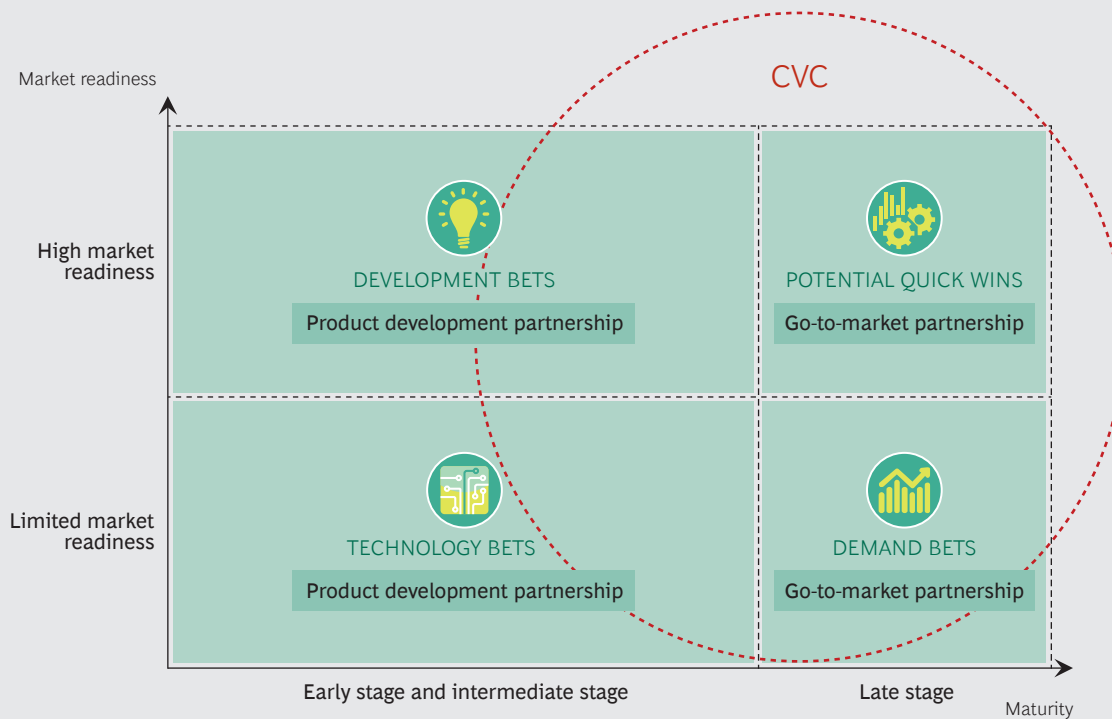
At the most mature stage, when the product is market ready, there are several likely variations of commercial partnerships to follow. Such arrangements enable the startup to scale up and build the credibility it

needs to persuade other companies to work with it. Distribution partnerships can help the startup accelerate revenue growth by tapping into the larger company's marketing capabilities and customer base. Under a licensing agreement, the larger company can license the startup's IP for its own use and sale to others.

The deals that each company and startup actually strike vary according to need and circumstance, but companies should start by defining a framework, including key success factors, for each startup maturity stage and a checklist to help validate its go-no-go decision at each stage gate. To avoid problems related to ambiguity, the companies must discuss exclusivity, a common roadblock, as early as possible in their relationship.

Exhibit 3 illustrates a framework, which organizations should fine-tune, depending on their objectives and capabilities, and use as a tool—rather than a standardized process—to facilitate decision making.

EXHIBIT 3 | Each Relationship Model Is Best Suited for a Particular Startup Type



Source: BCG–Hello Tomorrow deep-tech survey.

CVC Models. Companies generally use one of two CVC models: investments made through their own venture capital arms or investments made externally through an independent venture fund. In both cases, the financial returns are an important factor, but the strategic benefits of the two differ.

The internal CVC model can be a powerful vehicle for aligning the interests and strategies of the startup and the sponsoring company, and it provides for a much closer collaboration on technology development, business planning, and going to market. It may limit the startup's ability to work simultaneously with other companies that could benefit its technological development, however.

The external model does not require the sponsoring company to develop its own in-house capabilities and is most relevant when a company would like to explore opportunities in new areas. It provides access to the contacts of experienced venture capital funds and access to a range of investments that is broader than a company-owned CVC arm would likely see.

Whatever their CVC approach, companies need to have clear goals and know how they want deep tech to fit with their larger corporate strategy. They should ask themselves the following questions:

- **What are our CVC-related objectives?**
In general, strategically oriented and financially oriented CVC investments have different goals. In 2016, BCG examined 83 CVC units and found that 66% were strategy focused, although positive ROI was also a prerequisite, and 34% focused purely on the financial returns of the investments they made. (See *Corporate Venturing Shifts Gears: How the Largest Companies Apply a Broad Set of Tools to Speed Innovation.*)
- **Where—at the corporate center or in the business units—is the responsibility for defining the company's deep-tech priorities and areas of focus?** Definition at the corporate level will focus investments in innovations that could create new businesses or disrupt core businesses. Business unit responsibility is appropri-

ate when the objective is to reinforce current business lines or develop adjacencies.

- **Where should the CVC unit's organizational home be?** CVC units can be based in several functions of the organization, but strategy and R&D are the most common. The chosen department should possess relevant technology skills and market know-how in the business areas of focus and should be able to ensure close cooperation with the business units and key corporate functions.
- **How many deals do we want to source?** Companies can use CVC to gain exposure to a few high-potential or strategically important startups, or they can invest, and scout for opportunities, more broadly. The primary lessons companies should take from the venture capital industry are that attractive opportunities are few and the size of an investment is an important lever for managing investment risk and deepening knowledge of a technology ecosystem. BCG's analysis of CVCs showed that only 0.5% of all business plans received made it to the investment stage. That is, companies screened some 700 business plans to make three or four CVC investments.

Build Your Own Ecosystem

Whatever form they take, the relationships between established companies and startups should not be built on the typical one-to-one basis. Instead, they should take into account cooperation and collaboration with the broader deep-tech ecosystem.

As we said in our first article, deep-tech entrepreneurs look to a broad ecosystem of organizations, institutions, and individuals for support and assistance. Corporations are preferred partners for a number of reasons, but startups do still look to others—including other startups, companies that are not direct competitors, suppliers, customers, and scientists—for support and assistance.

Building or tapping into a connected ecosystem has advantages for sponsoring companies as well. These include balancing the risks in a portfolio that includes many startups, enabling startups to help and mentor each other, and gaining a broader understanding of the scope of technologies under development. In addition, participating in the wider ecosystem of activity can help position a sponsoring company as an active participant in an emerging technology and gives it access to other participants when it comes time to address consensus-building issues such as industry standards.

An Initial Checklist for Building a Collaboration Platform

Partnering with deep-tech startups means making a serious commitment: success is far from guaranteed and payback time frames can be long. Before they make the commitment, companies should be sure that they have addressed some basic concerns.

Capabilities. Does the company have the internal capabilities and market experience to support the collaboration platform, or should it seek external assistance? Developing a company's own deep-tech management structure requires know-how and reputation. It also requires market experience. Many companies that lack these capabilities prefer to partner with existing incubators or accelerators or to enter into simple mentorship arrangements. When defining their goals, companies must take into account their internal capabilities and cultural mindsets and define their ambitions accordingly.

Oversight. Which corporate function should oversee collaboration with startups? The answer depends in part on the technology readiness level (TRL) of the startup's solution and the solution's proximity to the sponsoring company's business. Collaborations with startups that have a low TRL and technologies that are far from the company's core business are probably best placed with a dedicated function (such as R&D or an innovation lab). By contrast, collaboration with startups with a high

TRL (almost market ready) and technologies close to the company's core business should be in the business units.

Space. Whether and where companies dedicate a physical workspace for startups depends on how closely they want to work together. (It should be noted, however, that this subject does not rate high among most deep-tech startups' needs from their corporate partners.) If the collaboration takes the form of a few meetings per month, there's probably little need for close physical proximity, but if company and startup personnel plan to work closely together (on product codevelopment, for example), a dedicated, nearby physical place can facilitate cooperation.

Location. When deciding where to locate the physical collaboration space, companies should consider places where the venture has ready access to other high-quality startups or having the venture physically near the sponsoring company's office. A number of companies have gone the former route and located their ventures in technologically relevant innovation hot spots—such as Silicon Valley, London, New York, Boston, and Tel Aviv—allowing for proximity to vivid startup ecosystems. Other companies prefer physical closeness to their own facilities and operations, concentrating their collaboration and acceleration activities near their corporate R&D

units or in certain target markets. In this way, they facilitate close relationships and easy interaction with their core businesses.

DEEP-TECH COLLABORATIONS RESIDE at the far end of the risk-reward continuum: they are, by definition, high-risk endeavors, and their payoff is uncertain. Still, the potential impact of a new technology can be enormous. Smart companies looking to partner with deep-tech startups can tilt the odds in their favor by planning carefully, communicating clearly, and recognizing that these collaborative ventures are indeed business odd couples: the willingness of both parties to give and take within an established framework for working together is an essential prerequisite for success.

NOTES

1. See *From Tech to Deep Tech: Fostering Collaboration Between Corporates and Startups*, <http://media-publications.bcg.com/from-tech-to-deep-tech.pdf>.
2. See Imaginatic and Mass Challenge, *The State of Startup/Corporate Collaboration 2016*, https://cdn2.hubspot.net/hubfs/1955252/SCC_2016/Startup_Corporate_Collab_2016_Report.pdf.

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