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The Three Stages of Disruptive Innovation: Idea Generation, Incubation, and Scaling

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SUMMARY
Facing imminent disruption, many large, established firms have embraced innovation as a way to develop new growth businesses. To succeed in the face of disruptive change requires established firms to master three distinct disciplines: ideation, to generate potential new business ideas; incubation, to validate these ideas in the market; and scaling, to reallocate the assets and capabilities needed to grow the new business. This article illustrates how two successful firms (Amazon and IBM) have developed approaches that address all three disciplines.

KEYWORDS: change management, corporate entrepreneurship, entrepreneurship, innovation, innovation management, organizational design, ideation, scaling

If there is one topic that has obsessed senior executives in the past decade, it is that of "innovation." A McKinsey study found that 70% of the senior executives surveyed listed innovation as a major concern.[1] And no wonder they are worried. Industries such as retail, financial services, transportation, media, hospitality, education, and health care are under threat of disruption. The press reports the decline and demise of iconic companies such as Kodak, Sears, Borders, Radio Shack, and Toys R Us and the rise of disruptors such as Google, Uber, Lyft, Amazon, Airbnb, SoFi, Warby Parker, and Bloom Energy.

In the face of these seismic shifts, companies around the world have embraced a variety of efforts to drive innovation, including everything from setting up outposts in Silicon Valley, to launching corporate venture capital funds, to embracing design thinking and the lean startup methodology, to open

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source innovation. For example, a recent survey of more than 100 companies found that 92% claimed to have some involvement with startups as a way to access new technology.[2] IBM is reported to have more than 1,600 formally trained designers operating in 44 studios.[3] Companies such as Ford, Hasbro, Tesco, Verizon, and Qualcomm have tried to use hackathons to unleash creativity. Others, such as IBM, General Motors, Marriott, SAP, Toshiba, and General Electric, have invested heavily in design thinking to help generate new ideas. Still others such as Nordstrom, Bosch, General Electric, Procter & Gamble (P&G), and Coca-Cola have implemented lean startup programs. Companies such as Lego, Samsung, Lilly, and Cisco have tried using open source innovation to spur new ideas.

Given the energy, time, and money spent on these innovation efforts, why have the results not been more impressive? Why have more companies not cracked the code of disruptive innovation? One important reason is that firms have not appreciated the need to manage discontinuous and incremental innovation differently. Incremental innovation enables companies to do the important work of developing new products, extending the life of existing ones, refining existing processes to become more efficient, and finding new customer segments to drive revenue growth.[4] These efforts are incremental innovations that exploit existing assets and capabilities. In contrast, discontinuous innovation helps firms to develop new capabilities and assets, often selling to new customer sets.

To manage disruption requires leaders to balance the tension between exploiting a core business that generates reliable, short-term results, and exploring into new areas where results are uncertain, even if the long-term payoff may prove to be attractive.[5] Too often, organizations, faced with potential disruption from competitors, commit resources to generating new ideas for exploration but struggle to convert these ideas into meaningful businesses. In almost every case of disruption (such as Blockbuster, Sears, Nokia, and Kodak), the firm falls victim to a business that they had tried unsuccessfully to build themselves. In these situations, there is often a plethora of ideas for how the firm might build the products, technologies, and business models that they see emerging in the new ecosystem. However, growing a new venture involves taking assets and capabilities from existing profitable businesses and devoting them to more uncertain and often lower margin new businesses that may even cannibalize existing ones. Unless there is a clear strategy justifying the entrance into the new business, and unless senior management is prepared to protect these embryonic efforts, the tendency is for the mature business to either starve the new business or to impose on it the performance standards of the mature business, an easy way to kill the new venture.

Driving disruptive innovation in large companies requires firms to be ambidextrous—to compete in mature markets where efficiency, control, and incremental improvement are essential (exploitation), and to simultaneously compete

in new technologies and markets where flexibility, autonomy, and experimentation are needed (exploration).[6] This requires mastery of three distinct innovation disciplines: *idea generation* or *ideation* or the discovery and development of ideas for potential new businesses; *incubation*, where the new ideas are validated in the market; and *scaling*, where existing assets and capabilities are reallocated to help the new venture grow. Managers have too often concentrated on the first two of these disciplines and have neglected the third.

Corporate understanding of how to generate new ideas (*ideation*) has advanced greatly in the past 20 years, and many such firms are rightly regarded as exemplars. A smaller number are also proficient at rigorously testing new business concepts, using methods drawn mostly from the startup arena (*incubation*). However, relatively few have successfully scaled new ventures to enable them to lead or stay ahead of disruption (*scaling*). It is this last discipline that is critical to the success of new, highly innovative corporate ventures. But it has received much less attention.

Below, we review and discuss the tools and methodologies required by each of the three disciplines required by ambidexterity and illustrate how *idea generation* or *ideation* (e.g., design thinking, corporate venture capital, open innovation, and hackathons) is different from *incubation* (e.g., business design experiments, lean startup, business canvas), and how these are different still from growth or *scaling*. While each of these is necessary, unless all three disciplines are mastered, none will be sufficient by itself. Some firms have developed processes that successfully leverage all three disciplines, while other firms that have concentrated on only one or two of them have struggled or failed. Interestingly, an examination of the successes and failures suggests that the crucial underlying issue is not technology or organization design but leadership.[7]

Ideation: Generating Ideas for New Businesses

Generating new ideas is the first stage of successful ambidexterity. In most firms, research and development (R&D) has responsibility for new or improved offerings. This is traditional R&D and product development, with efforts focused on developing new features and functionality, sometimes pushing the boundaries of science and engineering to do so.[8] In most cases, however, the pressure to sustain revenue and profit performance in the face of competition drives these efforts toward incrementally improving the current business rather than developing new ones.[9] These incremental improvements are exploitative in that they improve existing approaches and build on existing capabilities.

In the past 20 years, firms have embraced a variety of approaches designed to address this weakness and generate ideas either "outside-in," making the boundaries of the enterprise more permeable, or by engaging employees and sharing ideas with customers and competitors ("inside-out").[10] The following four such approaches have been widely adopted.

Open Innovation

Firms have learned to use the "wisdom of crowds" to generate product ideas, solve technical problems, and even develop advertising campaigns. Hank Chesbrough has observed that firms are taking advantage of the reality that not all the smartest people work for a company, and that a company does not have to conduct the research to profit from it.[11] This simple idea has spawned a variety of ways in which firms can tap into the creativity of those outside the firm, or the firm can contribute ideas to others beyond the firm.[12] These include opening the company's platform and sharing intellectual property so others can develop products with it (e.g., Apple, Google, Amazon, and Intuit), inviting customers to suggest ideas for new products and services (e.g., Lego, P&G),[13] offering contests for participants who can provide solutions for company problems (e.g., NASA, InnoCentive, and Kaggle), or fostering networks or communities of interest (e.g., IBM, Wikipedia, and Facebook).

Corporate Venture Capital

Another common approach is for companies to develop relationships with startup ecosystems through corporate venture capital units with the objective of gaining insight into the innovation efforts of startups. Unlike traditional venture capital where the objective is to fund new businesses and generate a financial return, the objective of corporate venture capital is typically to identify and exploit synergies between the startup and the larger firm and provide opportunities for growth.[14] Firms may invest in startups to provide a window on new technologies, to explore new business models, or to enter new markets. The startup company may get financial capital, access to channels and customers, and the expertise of the larger firm (e.g., technology, manufacturing, and distribution). Often, these investments are made with an eye to a future acquisition. These efforts may include the use of technology scouts (who are based permanently in places like Silicon Valley or Berlin), accelerator units or "garages" that maintain active relationships that may lead to more formal arrangements (e.g., Analog Devices' Analog Garage in Boston or Axel-Springer, General Motors, and USAA's units in Silicon Valley), and startup hubs that provide resources to early stage firms in return for the option to later invest (such as Audi's Innovation Hubs in Silicon Valley, Munich, and Haifa). Like open innovation, these investments provide a way for established firms to access ideas outside the boundaries of the firm.

Design Thinking

Design thinking is a methodology for stimulating creativity—a way of generating insights into the real problems faced by customers and rapidly generating prototypes or potential solutions.[15] Originally developed by David Kelley and the design firm IDEO, design thinking seeks to release the human capacity for creativity that can be stifled in mature organizations. To rediscover this, he developed an iterative process called design thinking that first encourages generating new ideas and insights (creativity) through empathic

listening and then narrowing the focus through rapid prototyping and testing (implementation).[16] The process relies on the following principles (or practices):

- *Empathize*—Begin by deeply understanding your customers' problems. This requires understanding your customers in their environment and gaining empathy.
- *Define*—Do not jump to solutions before you are clear about the real problem the customer has. This means being open to changing the initial definition of the problem based on your insight into the root cause of the problem.
- *Ideate*—Use brainstorming (wild ideas, no criticism or evaluation, build on the ideas of others, yes-and) to generate alternative ways to address the customer's pain point.
- *Prototype*—Develop low-resolution prototypes of your solution. Focus on prototypes that will test the key insights you have about the customers. Do not let the perfect be the enemy of the good.
- *Test*—Share the prototype with the user and listen carefully for their reactions. Use these to develop deeper insights into their needs. Use these to iterate and redefine the problem, which may lead to further insights.

The process of design thinking is a methodology for stimulating creativity. It enhances ideation and provides some initial data about customer acceptance. But it does not provide significant evidence about the business value of the proposed solution (incubation) or whether the underlying idea justifies taking assets and capabilities away from the current business (scaling).

Employee Involvement

The role of employees in innovation has evolved substantially beyond suggestion boxes to encompass online suggestion systems, internal contests, and hackathons. For instance, to encourage employees to suggest ideas, Adobe provides employees with a starter kit for suggesting new ideas ("Kickbox"), including instructions on how to develop an idea, a bar of chocolate, and $1,000 in no-questions-asked seed funding.[17] Mastercard employs a similar program called "Ideabox."[18] Another popular variant of employee involvement is the hackathon—intense idea-generation sessions for cross-functional teams of employees. For example, Atlassian, a maker of software development tools, has a quarterly hackathon, called "ShipIt," involving more than 800 people and 50 teams. Hackathons have improved Atlassian's customer service, advertising campaigns, internal operations, and even initiated new product development.

What is common across these various approaches is how they help to surface new ideas, either from outside the company (open innovation, corporate venture capital) or from within (design thinking, employee involvement). Done

well, they can enhance creativity and, critically, in the case of design thinking, focus idea generation on high-value customer problems.

These idea-generation techniques are agnostic about the nature of the ideas that are generated—disruptive or incremental—but generally promote incremental innovations. Unfortunately, there is no necessary relationship between excellence in these practices and being better positioned to take advantage of market disruptions. In fact, there is evidence that the better firms are at promoting incremental improvements, the worse they are at discontinuous innovation.[19] They have mostly been applied to develop products or processes that fit within existing business models. Only rarely are they applied to solve the problem of how to build a new scalable business. Firms then need to do more than open innovation or design thinking if they are to generate ideas of the sort required for disruptive innovation. There are two practices that can help ideation produce ideas suitable for validation and scaling:

- *Scale of Ambition*—Setting a scale of ambition that is equal to the opportunity or threat of disruption helps to move ideation away from the incremental or tactical. This means defining an aspiration for a new business or business model, not just a new product or service—for example, a technology firm declaring that they want to create new revenue streams from services, not just sell existing components. For example, at Amazon, ideas for new businesses are considered if they meet three criteria: they offer a differentiated customer experience, they can grow into a large business, and they can provide great returns on invested capital.[20] At Corning, new business ideas are pursued if they can generate $500 million in revenue over a five-year horizon.[21] At IBM, new business opportunities must be aligned with the larger corporate strategy and promise $1 billion in new revenue over five years. At Cypress Semiconductor, new ideas must promise $40 million in revenues within three years.[22] Specifying an ambitious target moves people away from thinking in terms of smaller, incremental advances.
- *Hunting Zones*—Aside from setting ambitious goals, it is important to put boundaries around ideation by defining the markets, business models, types of problems, or customers to focus on. This ensures effort is focused on areas most likely to deliver on the ambition. Otherwise, the democratic style of ideation techniques, like hackathons, can result in a plethora of ideas that help exploit the existing business but may not address disruptive threats. For example, at Corning, new businesses should leverage their deep expertise in optical physics and sophisticated manufacturing as a barrier to imitation. At IBM, new ideas are considered if they leverage across the company (hardware, software, and consulting) and offer a new source of customer value. At Amazon, the guiding principle for new ideas is to "think big." The lesson here is to provide concrete guidance to focus the search for new businesses. These guardrails help ensure that ideas are considered and should include an assessment of the attractiveness of the opportunity (market size, ease of penetration, substitute threat, etc.).

If ideation techniques are focused at the right scale of ambition and within well-defined hunting zones, and if the subsequent validation of these ideas is based on research, then the probability of them meeting the challenge of disruptive innovation increases. Without them, there is a strong prospect of developing an "experiment zoo," where people and resources are fragmented across multiple potential areas of opportunity. For example, a large Japanese electronics firm embraced ideation and generated more than 400 new ideas, but, when pressed, acknowledged that only two of those had actually generated revenue, and these were incremental additions to existing businesses. Ideation is a necessary but not sufficient first step in ambidexterity.

Even with a well-run ideation approach, many, if not most, ideas generated are not very good. That is the nature of ideation: to generate a diversity of options. So, how does a leader separate the good ones that are worth investing in from the bad? The answer is through *incubation*—a process to determine whether the idea meets the market test.

Incubation: Validating the New Idea

Given the above activities, companies usually do not lack new ideas. But how does a leader separate the good ones that are worth investing in from the bad? The answer is through *incubation* or *validation*—a process to determine whether the idea meets a market test. This is the second discipline required for ambidexterity. Three useful methodologies address this challenge: the lean startup,[23] the business model canvas,[24] and the Stanford Launch Pad.[25] Each of these offers a way for leaders to test their ideas in the marketplace.

Lean Startup

The lean startup, originally proposed by Steve Blank and further developed by his student Eric Ries, begins with an entrepreneur's hypothesis about a new product or service. The idea is to work backward from the business results you are trying to achieve rather than forward from some solution or technology you want to sell. The intent is to eliminate wasteful or unnecessary practices, focus on quickly designing and running an experiment to test the original hypothesis, and iterating based on the results of the experiment. The approach emphasizes a build-measure-learn logic with the development of a minimally viable product (MVP), putting the product in front of potential customers, rapid iteration and pivoting based on this learning, and the use of metrics that can lead to informed decisions rather than vanity metrics that make the manager look good. Although the methodology was originally designed to help entrepreneurs, it has been enthusiastically embraced by large firms from around the world. General Electric, for example, has trained more than 60,000 of its employees in the lean startup method.[26] P&G and Intuit have used the approach to develop new products. The National Security Agency is using it to improve nuclear security codes. Consulting firms with names like Leanstack, Kromatic, Udemy, and Bionic have sprung up to help firms implement the methodology.

Business Model Canvas

One practical way to think about implementing the lean startup model is through the business model canvas developed by Alexander Osterwalder.[27] This approach provides a set of nine building blocks that can be used in establishing a new venture. It helps users to systematically think through their business model and identify those elements needed to test the original hypothesis. The canvas can be adjusted as a company grows. This approach is not, in itself, new. IBM's Emerging Business Opportunity (EBO) program deployed a similar methodology in the early 2000s. Each EBO articulated a Business Design for the market opportunity that it aimed to develop. Its funding as a unit was then linked to accomplishing milestones of validating or refuting this business design.[28] Variants of the lean startup and business canvas methodologies are often used by startup accelerators like Y Combinator and Plug n Play.[29] These approaches typically provide some minimal funding and emphasize intensive interaction with customers, rapid prototyping, and fast iteration.

The Launch Pad

This is a Stanford Design School class for entrepreneurs that has generated more than 100 new companies over the past several years, 60% of which are still operating.[30] The class begins with an idea for a product or service and addresses three questions: Who is the hyper-specific target user? What is their specific pain point? and What single function have you performed to reduce this pain? Over the course of ten weeks, participants are required to talk to a minimum of 100 potential customers. Combining elements of design thinking, the lean startup, and the business canvas, the emphasis is on listening to the customer, rapid prototyping, and fast iteration.

Taken together, these approaches have had a measurable impact on helping both entrepreneurs and established firms incubate new ideas. While most often these are focused on incremental innovation developing new products and services, they can also be used to generate new businesses. However, these approaches are largely silent with respect to scaling; that is, if the entrepreneurial idea begins to grow, neither the lean startup nor the business canvas offers guidance for how to design the organization to ensure that the growth trajectory is sustained. Reflecting this, Steve Blank said that "After three or four years of watching innovation in large companies trying to use the lean startup methodology, I'm embarrassed to say that most of it has ended up in innovation theater" with nice coffee mugs and posters but few results.[31] He notes that while the lean startup methodology works, the larger problem is that big companies do not know how to scale the new venture.

There are three practices established firms can adopt to make their incubation activities more likely to generate a scalable business. Each of these addresses the barriers to scaling new businesses that Blank, Ries, and others have experienced as they try to port practices developed for the "startup" into the mature corporation.

- *Hypothesis Testing*—Central to incubation is the idea of an iterative loop between an assumption about the market opportunity, actual experience with customers that confirms or refutes that assumption, and adaptations to the model based on learning. This approach places a high value on learning through many small failures, not the route to success for most corporate executives. The idea is not to build an entire solution to test but to formulate a series of small tests of limited hypotheses. Jeff Bezos at Amazon captures this tension, observing that "Most large organizations embrace the idea of innovation but are not willing to suffer the string of failed experiments necessary to get there."[32] For this reason, there is both a lack of familiarity and comfort for many large firm executives with the basic skills of formulating and testing a hypothesis with data. Yet, without this discipline, the risk is that a business moves to scaling based on unproven assumptions or a flawed experiment.
- *Feedforward Measurement*—Another key area in which incubation challenges the typical practices of a core operating business is the measurement system. Most organizations review data on past performance, compare it with expectations, and act to correct errors. This is a feedback loop—What was our goal? How did we do? What explains the variance, how can we close the gap? What is required for an experiment is a feedforward system that tracks performance toward a strategic goal. What data do we have to tell us how an experiment is performing relative to its hypotheses? For example, one semiconductor firm adopted a system by which its new business investments had to define "early success factors." These were achievements that they would have on the path toward the goal for the experiment. These included milestones, such as the number of customer adoptions of a reference design. Similarly, when incubating new ideas at Amazon, the emphasis is not on measuring outputs (e.g., revenue or new customers), but focusing on assessing the inputs that drive the outputs (e.g., speed of delivery or rate of adoption).
- *Executive Oversight*—Senior managers need to be formally involved in the decision making on experiments in the incubation process. The biggest threat to moving from incubation to scaling a new venture is a profitable business unit that opposes diverting current investments with certain short-term rewards to the less predictable opportunity of creating a new disruptive venture. These managers are not acting with malice. It is often a rational choice to argue for certain gains over future possibilities. So, when the moment comes to commit, there needs to be clarity and a shared understanding about the ambition for the new venture. That means senior executives must commit time and attention to reviewing the experiment as it unfolds. Getting that level of engagement can be difficult, but it is hard to move forward without it.[33]

It is only after an experiment validates all or most of the hypotheses underpinning its business plan that the question becomes "How do we scale the new business?"

Scaling: Growing the New Venture

The issue of scaling or growing a successful new venture, while always difficult, is less problematic in entrepreneurial firms where growth is largely a function of attracting new capital and recruiting new people. Scaling is also less of an issue for incremental innovations such as the introduction of a new product or service where the new idea can be integrated into existing structures and processes.[34] But for a large firm, scaling a new disruptive business or business model that moves from a successful experiment to a fully operational business is a moment of both commercial and organizational vulnerability. You have reached the point where investment steps up a level. A well-designed and executed incubation can improve the odds of success, but it cannot eliminate risk. There is still a step into the unknown: Will customers behave and spend money as indicated by the experiment?

There is also a temptation to push the accelerator too hard, too quickly. "Never invest ahead of learning" is a golden rule for scaling. For example, in the 1990s, Andy Grove, then the legendary CEO of Intel, became convinced that an Intel technology for videoconferencing (ProShare) would be a huge market. He championed this program. Yet, after five years of effort and $750 million in investment, the project failed. Grove said, "We assumed that just because it could be done technically there would be high demand . . . it's just that we were wrong."[35]

Organizational vulnerability requires coordinating growth, but it is also about managing internal political dynamics, an especially important task with disruptive innovations. An *explore* unit that begins to scale successfully becomes vulnerable in three ways. First, if it is operated separately, it may be regarded by managers in the core with skepticism, both because it is receiving resources that they would like and may be seen as the "hot" new thing, relegating them to the "old" business. Second, many disruptive new businesses may initially offer lower margins and cannibalize the exploit business, not typically appreciated by leaders of the exploit business. For example, a former Barnes and Noble executive was asked why they were not more aggressive in countering Amazon and entering the online business? He responded that they "didn't want to put their most resourceful employees behind an effort that would siphon sales away from more productive stores."[36] Third, if the new business begins to succeed in the market, there may be a tendency to evaluate it with the rigors of the "exploit" management system where it may be seen as underperforming financially.

To be successful at scaling, a new venture needs to add customers, capacity, and capability fast enough to maximize the market opportunity. What is particularly interesting is that in contrast to entrepreneurial firms, large established firms typically have greater access to these assets and capabilities and, done correctly, should be able to scale faster than new companies. Just as with any business, it must do this in balance, so that it does what it needs to do to achieve revenue growth without excessive costs. The firms that are best at scaling appear to use all the following options to meet the needs of the new venture; they are not dogmatic about following a single approach.[37]

- *Acquire*—Mergers and acquisitions (M&A) is an obvious means to accelerate scaling for a new venture. If there are firms that can be acquired that have the necessary access to customers, capacity, and capability, then it can be an excellent fit. For example, 15 years ago, LexisNexis Risk was a sub-unit of the leading legal information provider, LexisNexis (LN). The new business started when LN managers observed that insurance companies were buying data to enable them to assess risk. LN acquired a small firm with technology assets that would allow them to add significant new value to their original data. Having validated that model over several years, they made an audacious bet on scaling by acquiring a large insurance data company, ChoicePoint, for more than $1B. These two acquisitions took a small unit and scaled it to a multibillion-dollar business that is not only equal in size to its parent, but which has a genuine claim to be a pioneer in big data analytics. The original unit brought the vision, a customer base, and the brand. The acquisitions brought technology and, critically, data.
- *Build*—Another route is to commit to a significant investment and build capacity internally. In 2013, British Telecom's CEO Gavin Patterson spent $2B for the television rights to broadcast U.K. Premiership Football (Soccer) on his TV station, BT Vision. This was a bold act that succeeded, and BT is now competing successfully with Sky TV. However, these bold leaps can also be dangerous. For example, Mozilla's $400M gamble on the "Firefox phone" was an attempt to compete with its much larger Internet browser competitors, Google and Microsoft. It failed and was shut down after three years. They invested ahead of learning.
- *Partner*—A further option is to find partners with the resources that a venture needs to scale. For example, while many Western technology firms have used acquisitions as a way of building a presence in China, the electronics design firm, Cadence Design Systems, has been successful in partnering. They have focused on building a local ecosystem to supplement their own investments in the emerging market. General Motors has partnered with the ride sharing company Lyft to access data and insights into ride sharing. The development of platform business models provides another area of opportunity for firms to gain access to resources. For example, Apple's "app store" model is increasingly being adopted by technology hardware firms eager to tap into a wider base of software developers for different end-applications.
- *Leverage*—The greatest advantage an incumbent has over a startup is that they start with potentially valuable assets and capabilities that the startup lacks. The mature business has customers, capacity, and capabilities, some of which can be repurposed to meet the needs of the new venture. For example, the IBM EBOs (discussed in detail in the next section) were separate units focused on new growth areas that leveraged assets and capabilities from the core business. These new business ventures could access software, hardware, technology, marketing, and manufacturing capacity at levels far greater than would have been available to a stand-alone startup. Leveraging assets from

the mature business can be contentious and activate some of the jealousies already mentioned. IBM managed this through an "extended team" construct that gave co-ownership for success of the new venture to select individuals in the mature business and aligned their personal incentives accordingly.

The *acquire* and *build* options are often seen as the most attractive. Acquisitions enable a firm to move at pace to assemble the elements of a business and, as with the example above, capture the opportunity quickly. However, the success rate of these sorts of acquisitions is surprisingly low. Acquisitions that aim to "reinvent" a business model substantially underperform relative to those that add to existing capabilities.[38] Many such acquisitions are also "startups" that may have immature technology and unproven business models. This reality, coupled with the difficulty of integrating startups into the corporate culture, tends to drive the low success rate.

The challenge with adopting a build approach is that the likelihood of corporate scrutiny and intervention increases. The result is often to reduce the scope of the innovation so that it can be delivered with lower risk in a shorter time. This pressure is particularly strong if there are new technology assets involved that are outside the core competence of the firm. It is challenging to stay on a long, uncertain path, sustaining investment, with limited market data on the payoff.

Partner and *leverage* offer a more complex approach. Both involve reconciling competing interests and, often, navigating inter- or intra-company politics. The payoffs, though, can be much greater. In the IBM example, the EBO units had the ability to leverage product, sales channels, and back-office assets from the core business. The net effect was that IBM achieved a higher return on investment from these organic ventures than from its acquisition portfolio during the same period, 2000 to 2005.[39] Amazon is one of the masters of the "platform business model," which enables it to partner with other firms to scale its ventures. For example, the first Amazon Kindle was a relatively low-tech e-book offering. What made it powerful was that it had the widest selection of published books and magazines of any e-reader. Amazon positioned itself in the center of a transaction between publishers, who lacked the technical savvy to build their own device, and consumers, who liked the low-cost, easy-to-use solution. There is no single right answer for scaling a new venture. Those that are successful often combined two or more of these strategies. For example, IBM used acquisitions to help accelerate their EBO program; LN built its new technology platform based on acquired assets; General Motors has used acquisitions (Cruise Automation) and partnering (Lyft) to build their autonomous driving effort.

Leverage is a successful, if underused, model for scaling new ventures.[40] What is essential is the role of leadership in providing a supportive and enabling context. Three elements appear critical: active sponsorship from senior leadership, separate explore and exploit units, and ambidextrous leadership that can balance the competing demands of explore and exploit.

- *Active Sponsorship from Senior Leaders*—This is critical to both getting new ventures the assets and capabilities they need and to enabling them to override corporate norms and policies.[41] Unless the new venture has active senior-level sponsorship, the internal dynamics of the core business are likely to slow down or smother the new business. Some of this occurs because existing core units will demand compliance with their processes (e.g., finance, HR). Some of it may come from a sense by the exploit managers that the new venture is not important (a science project) or, worse, it is directly competing with the core unit (e.g., for customers, manufacturing, or talent). In most instances, these managers are making a rational choice to do what, from their vantage point, will optimize business performance. For explore units to succeed, senior leaders need to be prepared to assert the logic of long-term priorities to ensure that the requisite assets and capabilities are available to the new venture. That can be uncomfortable for some leaders who may be conflict averse. If these leaders have been involved as sponsors through the ideation and incubation processes, then there is a higher probability that they will understand why these battles are worth fighting.
- *Separate Explore and Exploit Units*—No new venture can survive without the autonomy to act with a faster clock speed than is typical for the incumbent organization. Unless it has this autonomy, new ventures will be forced into making compromises between what is needed to scale the business and what is right for the core. This means having separate architectures (people, structure, metrics, and culture) for the explore and exploit businesses. Microsoft applied this logic as it developed its response to Google in corporate email and productivity. It appointed separate leaders for Microsoft Office on the desktop and Microsoft Office 365 in the cloud. Each offering had distinct priorities. One was focused on customer experience and the sophistication of the software, the other on moving rapidly to convert corporate customers to cloud-based email servers. They were effectively cannibalizing Microsoft's existing enterprise account business, moving ahead of Google to disrupt its own market. Having successfully grown the 365 business, it has come back together in a single unit.
- *Ambidextrous Leadership*—Scaling a new venture requires two very different leadership competencies: the ability to lead the explore unit *and* the ability to balance both the explore and the exploit businesses.[42] In the first instance, the explore leader needs to be entrepreneurial, able to create a compelling vision, deal with organizational politics, recognize how and when to pivot, and leverage the organization's resources. In the second instance, the leader needs to be able to deal with the tensions inherent in running both an exploit and an explore unit, with different time frames, skills, structures, metrics, and culture. This inevitably leads to conflicts over resource allocation and priorities.[43]

To solve the explore problem, one common strategy is to hire an executive from outside the firm to bring expertise, knowledge, and capabilities the firm

lacks. Counterintuitively, putting an outsider in this role is sometimes correlated with underperformance at scaling the new unit. One outside leader hired to run an internal venture described how the core business made no effort to actively oppose her efforts, but they denied her any support and assistance. Her team was underequipped to achieve its goals and could not get access to the resources of the core business. She described how her team became isolated in its approach—"we became the rebel alliance"—and totally failed to build the relationships they needed to be successful. In contrast, internal appointments have the credibility and social networks that enable them to call in favors and leverage assets and capabilities that outsiders cannot.

Beyond appointing an appropriate leader for the explore venture, there also needs to be a leader capable of managing the tension between explore and exploit. Every successful story of scaling a new venture inside an existing corporation we are aware of involves a leader that can manage this balance. They are able to drive operational performance in the mature business, at the same time as the explore unit invests in building the customers, capacity, and capabilities for the long term. For example, Microsoft could not achieve this without a leader that had the drive to focus on the goal, manage the organizational politics, recognize how and when to pivot, and leverage the organization's resources to achieve his goals. General Motors has created a separate ambidextrous unit for building autonomous vehicles and ride sharing, with a very senior executive providing oversight and support.[44]

The Three Stages of Disruptive Innovation in Action

Excelling at one or two of the three stages of disruptive innovation is unlikely to lead to success. If a firm generates new ideas but cannot adequately determine which are likely to succeed as a new business, they will waste resources on unsuccessful ventures. For example, several years ago, Cisco implemented a new venture initiative called "the Councils and Boards process," an elaborate system of cross-functional committees designed to develop new billion-dollar businesses within Cisco. To generate new ideas, they developed an open innovation process (the I-Prize) and an internal idea-generation process to solicit employee ideas (the I-Zone). In 2007, this process generated more than 1,200 ideas from 2,500 participants. They then used a new venture framework to screen these ideas for feasibility (vision, strategy, and a ten-step execution process). Unfortunately, they had no disciplined process to scale these new ventures, and, in 2011, their then CEO, John Chambers, closed the program saying, "We have disappointed our investors and confused our employees."[45] They successfully addressed the ideation and incubation challenges but failed at scaling.[46] If a company is good at both ideation and incubation, they may initially identify promising new ventures only to fail as they try to scale them. Similarly, a company that has no skills at ideation but is good at incubation and scaling is likely to grow businesses that are not truly innovative. Success requires all three disciplines. Below, we illustrate how two firms, Amazon and IBM, were able to master all three.

Amazon

Amazon was founded in 1994 as an online bookstore. Twenty-five years later, it is a $177 billion company with more than 600,000 employees competing in businesses as disparate as selling books, clothes, diapers, and groceries (Amazon.com) to producing television shows (Amazon Studios) to the largest provider of cloud computing (Amazon Web Services) to providing fulfillment services to other companies (Fulfillment by Amazon) to being a leader in artificial intelligence (Amazon Echo). More recently, they have entered the brick and mortar retail business (Amazon Go) and begun competing with FedEx and DHL in delivering packages (Prime Air, Amazon Flex). In 2017, they were named by *Fast Company Magazine* as the world's most innovative company.[47] How were they able to do this? The answer is in how they have mastered ideation, incubation, and scaling to both exploit their existing assets and capabilities and to leverage these into new businesses.

The essence of their innovation process begins with Bezos's belief in three big ideas that pervade Amazon's organization and culture. First is the idea that customers are at the center of everything they do. This means that the people closest to the problems are the best equipped to solve them. The second principle is that innovation should focus on long-term thinking, not short-term profits. New initiatives are thought of as "programs," not "projects," with a recognition that it may take years to have a significant impact. The final principle is to encourage a passion for invention.[48] This means being patient and persistent—and recognizing that failure and invention are inseparable twins.

To operationalize these principles, Amazon has made innovation a pervasive part of their culture. Their leadership principles include not only customer obsession, but also invent and simplify, think big, and a bias for action. To make innovation a part of daily life, Bezos encourages small teams to continually come up with new ideas. He says, "If you can increase the number of experiments you try from a hundred to a thousand, you can dramatically increase the number of innovations you produce."[49] To accomplish this, the emphasis is to maximize the number of experiments but to keep the cost of each as low as possible. He argues that the real barrier to innovation is not a lack of imagination but the bureaucracy of large organizations. This also means accepting failure—and Amazon has plenty of failures, including high-profile examples such as the Fire smartphone, Amazon auctions, and Z-shops.

How do they do this? Their solution is based on a systematic process of ideation, incubation, and scaling that generates hundreds of new ideas every year, most of which either fail or add only incremental value and a few that result in new multibillion-dollar businesses.

Idea Generation. The core process begins with a person or team proposing a new idea that will enhance the internal or external customer experience. To formally propose the idea, the originator begins by composing a six-page narrative called the PR/FAQ (never a PowerPoint presentation). The PR/FAQ follows a strict

format. It is based on the idea of "working backwards" from a customer problem and begins with a one-page press release (PR) announcing the release of the final product. This includes the name of the product in language that the customer will understand, who the customer is, what benefits they will receive, a description of what problem the product or service solves, and an explanation for how the product will elegantly solve the problem. The PR announcement may also indicate how easy it is to use the product and even hypothetical customer quotes. The PR is followed by five pages of Frequently Asked Questions (FAQs) that explain why customers will want the product, how they will use it, how much it will cost, and what benefits they will reap. It would also indicate the potential market size and any risks associated with the product. The FAQ is often supplemented by an appendix and a mock-up of a prototype.

Once the narrative is prepared, it is presented to a group consisting of colleagues, the immediate boss, someone from higher management, and a "bar raiser" who is from another function who can act as a sanity check. Again, there is a strict process to be followed. The narrative is not circulated in advance but passed out in the meeting, and the first 30 minutes are in silence as participants read the memo. This format ensures that all those in the meeting begin with a common understanding of the proposal. In evaluating the proposal, the discussion focuses not just on the technical merits of the idea, but also whether it has the potential to be a big idea that the customers would really love. After a discussion, the most senior person in the room will make a decision to allocate minimal resources to continue the project. These may include release time for the proposer, a small budget, or some engineering support. Estimates are that about 50% of proposals move to the next stage. If successful, the revised PR/FAQ will then be presented at the next higher level of management.

Several aspects of this process are noteworthy with respect to ideation. First, like design thinking, it is a bottom-up process that begins with an obsessive focus on improving the customer experience. Second, the structure of the meeting also acts to focus the discussion on an evaluation of the specifics of the proposal with everyone having the same information. Finally, the Amazon culture is one that encourages people at all levels to identify and propose incremental innovations to enhance unit productivity and drive efficiency or new business ideas that leverage existing assets and capabilities. Estimates are that the business leaders at Amazon will see about 100 PR/FAQs a year, suggesting that the process is successfully generating a constant stream of new ideas.

Incubation. Once approved and with some limited resources, the next step is to build a MVP and to quickly get this in front of customers. Like the lean startup methodology, the priority is not on internal testing, but getting the product launched and learning quickly which features are valuable and which are not. This is usually done using a small market niche. Customers are probed as to whether they would actually buy the product. Do the early adopters love it? Can it lead to a big business? Like the business canvas model, variants of the product are often explored using A/B tests. The concern in this phase is not profitability

or the competition, but whether the product or service is strategically important and will really deliver a better customer experience. Sometimes, teams employ the business canvas to ensure completeness.

To enhance speed and accountability during incubation, Amazon relies on what are called "single-threaded teams" or "2-pizza teams." These are small teams (that can be fed with two pizzas) of six to ten people. Each team consists of a small number of people with the skills needed to develop the idea (e.g., a handful of engineers, a product manager, and a designer). The team is free to act autonomously with little or no need to coordinate across functions. There is often a single agreed-upon metric used to provide focus and accountability. Unlike many organizations where internal projects are required to use a standardized technology or set of tools (like Google), teams at Amazon are able to use whatever tools and technologies they think are best for the task at hand. This single or small set of feedforward metrics and the freedom to use whatever approaches are most useful becomes the equivalent of a P&L so that the team itself becomes like a small profit-and-loss center, and the team leader is like a mini-general manager. Often, the person who proposed the idea becomes the team leader, so that these projects act to attract and retain entrepreneurial talent.

The use of small, highly focused, and accountable teams, the emphasis on an MVP, fast iteration, and a customer-centric focus replicate the lean startup methodology but do this in a large organization with access to more talent and resources than a startup. The use of small teams also enhances the speed with which experiments can be run. Experiments are designed to fail early. To facilitate this, a distinction is made between one-way and two-way doors. With two-way doors, the consequences of a failure are minimized because you simply return to where you started. Because the teams are self-contained, lengthy and costly coordination across functions is minimized. There is an acknowledgment that this approach may result in some duplication and inefficiency, but the benefits of rapid iteration and learning outweigh these costs.

If the product or process proves viable, the team may modify their PR/FAQ and submit the next request to more senior management. This request includes an account of the resources needed to begin to scale the program. If approved, the team will be given the additional resources to begin to roll out the product or service on a larger scale.

Scaling. The use of small decoupled teams also makes scaling easier. As they begin to grow, teams (especially in product and engineering) continue to own the product or service on an end-to-end basis. They interact with other parts of the organization in a manner similar to APIs (application programming interfaces). This permits teams to leverage assets and capabilities of the larger organization (e.g., access to capabilities, capacity, and customers). They request specific inputs and outputs but continue to have their own budget, so maintaining control of the project. This reduces dependence on others and the negative effect of gatekeepers. With senior management oversight, additional resources are

provided to ensure that the project is receiving what is needed to scale the effort. A key element of this is the widely shared belief that to be truly innovative, you need to be prepared to be misunderstood for a long period of time and willing to persist in the face of skepticism.

Supporting this process is a tenet referred to as "the institutional yes." In most organizations, approval for additional resources is made through a committee or review process in which a single veto can either kill or slow down an initiative. Managers at Amazon recognize this, and rather than ask "why are we doing this?" ask "why not?" They believe that most big errors are not of commission but omission. For example, Amazon Go, the new retail store with no checkout, was begun by envisioning how great it would be for customers to simply walk in, grab their item, and walk out without having to wait in line to pay. Presented with this idea, most organizations would say "Why do we need this?" and note that it required skills that currently do not exist (sophisticated cameras and artificial intelligence). Amazon said "Why not?" Once there is evidence of early success, the program does not compete for resources with others but is funded on its merits. The emphasis is to double down quickly on winners and not get caught up in trying to coordinate across projects.

It is worth noting that it is the combination of ideation (the PR/FAQ process), incubation (single-threaded teams with MVPs), and scaling (institutional "yes" and the escalation of resources with senior manager oversight) that accounts for Amazon's remarkable success at innovation. Many of these projects begin as incremental improvements but morph over time into new businesses. It is this process that underlies Amazon's ability to move into new businesses in cloud services, third-party fulfillment, logistics, retail sales, and consumer technology.

IBM Emerging Business Opportunities

O'Reilly, Harreld, and Tushman describe how, during the period 2000-2005, the IBM company implemented a process to discover and develop new businesses from within the larger organization. Their EBO process developed a set of businesses that generated more than $5 billion in growth over that period.[50] This process began with a clear strategic intent that included a desire to explore new business models and capabilities, generate $1 billion in revenue over a five-year period, offer sustained profit growth, and establish IBM as a market leader in these new areas. It recognized the need for separate operating units and ambidextrous leadership and replicates the ideation, incubation, and scaling disciplines.

Ideation. The EBO process begins with the appointment of a very senior executive as the person responsible for overseeing the new ventures. Think of this person as the internal venture capitalist who will fund, oversee, sponsor, and, if necessary, terminate the new venture. The process began with a set of principles for deciding on what types of new growth businesses IBM wanted. They identified six characteristics:

- The EBO should be aligned with and support the larger IBM strategy.
- New ventures should provide for cross-IBM leverage (hardware, software, and consulting).
- It should offer a new source of customer value.
- It should promise revenues of $1 billion within a five-year time frame.
- It should allow IBM to be the market leader.
- It should provide sustained profit and not be commoditized.

With these constraints, twice a year, the company would survey employees, IBM fellows, technology leaders, and venture capitalists. Given their insights into IBM, they were asked for suggestions for opportunities or areas in which IBM might grow new businesses. Every year, they would receive on the order of 150 suggestions. Experts in the strategy group would then review these suggestions and narrow down the list to 20 to 30 areas that they believe might justify some investment. Strategy teams would then collect market insight data on these areas and further narrow the list to a small set of potential new businesses. Based on the input of senior management, they would then focus on selecting leaders for these initiatives and provide funding for them.

Incubation. Once an idea for a new business is selected and a leader appointed, a business plan is developed that includes an initial allocation of resources (money, people, and technology) and a set of milestones and metrics that will determine progress and subsequent funding. A training program for the leaders helps them understand how to establish and communicate a clear vision, select a team, understand the organizational politics, and sustain an initially unprofitable venture. The leader of the new business reports both to the senior management of a line of business and to the senior corporate executive responsible for new ventures. The EBO is then run as an internal startup with continued funding based on meeting set milestones just as a venture capitalist might fund a venture.

Scaling. What differentiates the EBO process from the lean startup methodology is the careful attention that is paid to growing the new venture. To ensure that resources are provided in line with growth, the new venture relies on the oversight and support of the senior corporate leader, disciplined mechanisms for cross-company alignment, and resources that are ring-fenced to make sure that funding is provided when and where it is needed. Growth is closely monitored and, if milestones are not met, the initiative is stopped. If milestones are met, resources continue to flow to the new venture, any resistance from other parts of the organization is moderated, and a clear process is in place to gradually migrate the new venture back into the mature business. It is only when the EBO has a strong leadership team in place, a proven customer value proposition, and clear market success that the new business is migrated back into the larger organization.

TABLE 1. The Three Disciplines of Ambidexterity.

	Exploitation	Exploration
Ideation	***Open Innovation*** (getting ideas from others outside the firm) ***Corporate Venture Capital*** (getting ideas from the startup world) ***Design Thinking*** (getting ideas from customers/users) ***Employee Involvement*** (getting ideas from employees)	Same but with: ***Broader scale of ambition*** ***Defined hunting zones***
Incubation	***Lean Startup*** (build-measure-learn to work backwards from a business goal) ***Business Canvas*** (design and test a new venture hypothesis) ***Launch Pad*** (identify target customer pain points, interviews, iterate to achieve product-market fit)	Same but with: ***Hypothesis Testing*** (development of capabilities through experimentation) ***Feedforward Measurement*** (metrics of progress toward goals) ***Governance*** (leadership to ensure assets and capabilities are available as needed)
Scaling	***Spreading Constructive Ideas*** (going slower to get faster, reduce cognitive load, more vs. better, breach assumptions, promote accountability, clearing the path)—see Sutton and Rao, *Scaling Excellence* (2014)	Same but with attention to: ***Customers, capacity, capabilities*** obtained through a***cquisitions, building, partnering***, and ***leverage*** All with: ***Active senior sponsorship*** ***Separate explore and exploit units*** ***Ambidextrous leadership***

Like the Amazon example, the IBM EBO process illustrates how careful attention to all three innovation disciplines is needed to organically grow new businesses. Other firms such as Bosch (the German industrial company) and AGC (the Japanese materials firm) have developed similar programs that pay careful attention to ideation, incubation, and scaling. For these efforts to succeed, what is important is that the process encompasses all three disciplines.

Conclusion

As the threat of disruption has increased, academics and practitioners have increasingly focused on how organizations can innovate. From the practitioner side, great progress has been made in helping firms with ideation and incubation. Processes such as design thinking, open innovation, internal innovation programs, and the lean startup methodology have been successfully applied. However, these programs have most often been used to help firms increase incremental innovation and have proven to be less useful for helping them meet the challenges of disruptive change. Furthermore, because these approaches were designed originally for entrepreneurial firms and not incumbent corporations, they have largely failed to solve the scaling issue for large firms.

To deal with discontinuous innovation, firms must master three distinct stages or disciplines, *idea generation (ideation)*, *incubation (validation)*, and *growth (scaling)*. While these three stages can also apply to incremental innovation, being successful at discontinuous innovation requires leaders to be more sophisticated at managing these stages (see Table 1), especially in how they approach scaling. Furthermore, mastering only one or two of these stages is insufficient. Having new ideas that do not meet the market test, having market-tested ideas that cannot be scaled, or scaling ideas that are not market validated are all recipes for failure. Success needs all three.

For large firms, simply "acting like a startup" is not enough to guarantee success. The organizational and cultural inhibitors of success inside a corporation remain formidable. Our fundamental proposition is that for new ideas—even those with demonstrated market acceptance—to become new businesses, they require leaders to master all three disciplines. This can be achieved through a blend of acquisition, building, partnering, and leveraging assets and capabilities from the exploit business. To do this successfully requires leadership and organizational practices that manage the tensions of successful incumbent organizations, which the startup-inspired methodologies were not designed to address. Each of the three stages—*ideate, incubate*, and *scale*—is distinct and necessary, but only when all three are in place is it likely that new ideas will result in new business that enable incumbents to lead disruptive innovation in their markets.

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