

The Foundations of Entrepreneurial Strategy¹

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ABSTRACT

Motivated by a significant disconnect between research, teaching and practice regarding the role of strategy in entrepreneurial ventures, this paper develops an integrated framework that defines and delineates the scope of entrepreneurial strategy, clarifies the choices and complementarities that shape entrepreneurial strategy, and proposes a choice-oriented process for implementing entrepreneurial strategy. We take an axiomatic approach, highlighting four interrelated premises: (i) Freedom: there is more than one alternative path by which value can be created and captured from a given idea; (ii) Constraint: resource and strategic constraints prevent the entrepreneur from pursuing more than one of these alternatives at once; (iii) Uncertainty: even after undertaking cost-benefit analysis to deselect some alternatives, there is unresolved uncertainty preventing a ranking of at least two alternatives, and (iv) Learning by Commitment: partial movement down a path to learn more about an option changes both the value of and the information available about alternative paths. Together, these conditions give rise to our central organizing insight, the *paradox of entrepreneurship*: choosing between equally viable alternative strategic commitments requires knowledge that can only be gained through experimentation and learning of the type that inevitably results in (at least some level) of commitment that forecloses particular strategic options. Entrepreneurial strategy is a choice-oriented approach to overcoming the paradox of entrepreneurship. Specifically, entrepreneurial strategy is the set (or sequence) of choices founders (and their teams) make in order to test a value creation and value capture hypothesis when entrepreneurial experimentation requires partial commitment. This approach yields three principles of entrepreneurial strategy. First, Choice Matters: when learning requires partial commitment, start-ups will not simply be able to optimize by identifying a best approach, but will instead be required to select an alternative that results in leaving equally viable yet conflicting alternatives behind. Second, These Choice Matter: there are specific choices start-ups face – Customers, Technology, Identity, and Competition – where the interplay between experimentation and commitment are salient; a choice-oriented approach yields a reconceptualization of traditional frameworks endemic to teaching and research in these domains. Finally, These Choices Matter Together: structured complementarities and interdependencies among these choices results in the identification of four alternative strategic directions for a given idea. Together, these principles motivate a new class of choice-oriented decision-making tools for entrepreneurs. We highlight one new tool – Test Two, Choose One – that offers a novel approach for how to undertake entrepreneurial decision-making under uncertainty.

1. Introduction

The central strategic challenge facing an entrepreneur is how to choose. Almost by definition, entrepreneurs have limited resources but are unconstrained by their prior actions (Stevenson, et al., 1989). But, it is neither resource constraints nor the presence of a wide variety of alternatives per se that distinguishes entrepreneurial choice. Instead, it is the distinctive role that uncertainty plays when resources are limited but a multitude of options are available. While traditional decision theory assumes (often implicitly) that the analysis of uncertain alternatives can be decomposed from the choice process itself, an entrepreneur facing uncertainty can, in many cases, only reduce uncertainty through experimentation with one of the alternatives under consideration. However, experimentation not only provides information to the entrepreneur but also serves as the first concrete actions of the entrepreneurial firm. The fact that experimentation also involves concrete action has the consequence that the learning process cannot be (completely) decomposed from the choices that begin to commit an entrepreneur to a particular path. Rather than a question of optimization in which information gathering about alternatives is independent of the choice that is taken, key entrepreneurial choices involve selecting a path upon which to learn that also involves partial commitment.

To fix ideas, consider the emergence of bitcoin and blockchain technology. While the idea of “math-based currency” has been around since at least the 1990s, it was not until the 2008 proposal of the “blockchain” by Satoshi Nakamoto (a pseudonym whose actual identity has yet to be revealed) that cryptocurrencies could be created in a practical way (Nakamoto, 2008). At the core of Nakamoto’s idea was the creation of a public ledger, the blockchain, which could simultaneously serve to allow for arbitrary exchanges between participants alongside a decentralized incentive system for maintaining the integrity of all accounts. Though the concept of blockchain is quite general, Nakamoto also introduced the first specific instantiation of blockchain, Bitcoin, which has since become the single most common (but also most controversial) form of digital currency. Since 2008, a significant number of start-ups have been founded to take advantage of this new idea. Some companies such as Coinbase, a Y-Combinator start-up founded by Brian Armstrong and Fred Ehrsam in 2012, have focused on making bitcoin accessible to the masses (i.e., Coinbase hopes to be “PayPal for bitcoin.”) (Dixon, 2013; McMillan, 2014). At the same time as the founding of Coinbase, however, Ryan Fugger and later Chris Larsen founded OpenCoin (now Ripple) that decided to leverage the underlying concept of blockchain technology but instead implement their own cryptocurrency Ripple (XRP) as a competitor to bitcoin itself (Andrews, 2013; Craig, 2015).

This situation – where multiple start-ups seek to take advantage of the same idea at the same time yet stake their future on sharply divergent visions on how to leverage that idea – is inherent to entrepreneurship. In many cases, founders consider and discard strategies that are pursued by others. Moreover, founding teams often experiment with one approach over another under the premise that such learning will help them make a decision between one route or another, only to find that their initial choices actually constrain their future path of action: early market experiences begin to establish their reputation, early hiring choices shape firm culture, and experimentation by potential competitors lead them to be

disadvantaged if they then pursue an alternative route. The fact that different founding teams can come to starkly different conclusions about how to take advantage of a specific opportunity presents a fundamental puzzle: shouldn't we expect that for a given idea, there would be one clear, optimal path forward? Or perhaps there is so much uncertainty at the time of founding that early choices are essentially 'gut hunches,' differing on the basis of entrepreneurs possessing heterogeneous information?

To see why this matters, consider the conflicting advice received by founders. On the one hand, many entrepreneurs and mentors advocate that the essence of entrepreneurship is action. As argued by serial entrepreneur Richard Branson, "If you're looking to become an entrepreneur then don't waste your time going to university or business school. Just get on and do it."² Of course, what "it" is to "do" is still unsaid, but the message is clear: the essence of entrepreneurship is experimentation and hard work rather than analysis and planning. At the same time, other practitioners and advocates argue in exactly the opposite direction and emphasize the need for more systematic planning. In many classroom settings, there has been a move to adapt traditional approaches from strategy and economics to give would-be entrepreneurs tools to evaluate opportunities at the outset in a systematic way and undertake analysis to develop a practical and promising business plan.

But how would either of these approaches help an entrepreneur make a choice among multiple equally viable alternative paths for a given idea? An action-oriented approach only makes sense when there is one clear optimization path, while a planning approach only makes sense when a cost-benefit analysis can be conducted in advance of making a decision. Both of these approaches fail when an entrepreneur must select among alternative paths, learning about each path requires at least some degree of commitment, and there is no way of ranking the paths according to a clear cost-benefit analysis in the absence of such learning.

This is the *paradox of entrepreneurship*: choosing between alternative strategic commitments requires knowledge that can only be gained through experimentation and learning, yet the process of learning and experimentation inevitably results in (at least some level) of commitment that forecloses particular strategic options. In short, the very activities essential to choosing a start-up's value proposition are, fundamentally, in tension with the ability to establish and sustain competitive advantage. Entrepreneurs cannot simply experiment with an endless number of different business models, nor can they know in advance exactly what will work.

Resolving the paradox of entrepreneurship is the job of entrepreneurial strategy. By entrepreneurial strategy, we mean the set (or sequence) of choices a founder (and her team) make to test a value creation and value capture hypothesis when entrepreneurial experimentation requires partial commitment. Entrepreneurial strategy allows a founding team to make active choices about what capabilities to build, how to position their start-up within a value chain and in the marketplace, and come to terms with how their values as

² This quotation has been attributed to Richard Branson on the web but is not a direct quotation. Rakesh Agrawal (2013) offers a direct quotation of a related quote: "Screw it, just do it... You don't necessarily have to go to college. If you've got a great idea, start maybe four years before."

founders will shape the company they build. Yet entrepreneurial strategy is neither a fixed strategic document nor is it a business plan. Instead, entrepreneurial strategy involves identifying and then choosing among a set of distinct choices that define a company as it translates an idea into a meaningful value proposition. More than simply asserting that strategy is about what *not* to do (without specifying how one would know that one is foregoing a specific opportunity), entrepreneurial strategy involves active choice that results in leaving *equally* viable alternative paths behind.³

Our aim is two-fold: to reshape the unclear and often contradictory debate about the role of strategy and planning in entrepreneurial ventures, and offer a new approach that places the choices that entrepreneurs make about creating and capturing value from their ideas at the center of venture design and implementation. Our central contention is that entrepreneurial strategy – the process of active choice between equally viable alternatives – offers a powerful approach for confronting the inherent tension between learning and commitment. Rather than obscure the issue, we place this fundamental tension at the heart of the strategy process: what should an entrepreneur do when the information that is required to make core strategic decisions – such as an understanding of alternative cost structures, or the impact of different pricing models on demand – can only be obtained through experimentation and learning that leads a venture down a particular path?

Simply put, entrepreneurial strategy is the act of growing a decision tree: starting with the seed of an idea, founders nurture and then prune choices in order to transform that idea into an organization that creates and captures value. By being upfront that entrepreneurial choice is more than simply cost-benefit analysis (i.e., there are many plausible alternative routes but not all can be realized at the same time in the same venture), we develop a concrete approach that links learning, choice and commitment.

To do so, we lay out four core axioms that define the scope of entrepreneurial strategy:

- **Axiom 1 (Freedom):** There is more than one alternative path by which value can be created and captured for a given idea.
- **Axiom 2 (Constraints):** Resource and strategic constraints prevent the pursuit of more than one alternative at once.
- **Axiom 3 (Uncertainty):** Fundamental uncertainty prevents a ranking of at least some alternative paths.
- **Axiom 4 (Learning by Commitment):** Useful learning requires (partial) commitment to one path that changes both the value of and the information available about alternative paths.

³ To be explicit, entrepreneurial strategy is grounded in the conviction that strategy matters for start-up performance. Though further causal work is certainly warranted, prior empirical evidence suggests that choosing strategies aligned with founder expertise (Eesley et al., 2014) and choosing and persisting with a specific organizational blueprint (Baron and Hannan, 2002) are correlated with higher firm survival and performance. Furthermore, Kaplan et al. (2009) find evidence that the quality of the initial business plan is relatively more important than the strength of the management team in start-up firm growth. Relatedly, there is evidence that entrepreneurs are more inclined to choose and implement strategies coherent with their commercialization environments (Gans, Hsu and Stern, 2002; Hsu, 2006).

These four axioms apply to a wide range of choices that entrepreneurs face, though we should emphasize that they do not apply universally. For example, if there is a single clear path for commercialization from the outset, Axiom 1 does not hold, and an entrepreneur can simply focus on investment and the implementation of their plan. Similarly, most entrepreneurs are compelled to focus on their strategic choices due to constraints however there may be conditions for entrepreneurship (e.g. well-resourced spin-off venture) in which multiple paths can be undertaken at once and Axiom 2 is violated. At the same time, there are many cases where, though multiple paths exist, there is clear evidence as to which path is preferable, violating Axiom 3, and thus, traditional strategic analysis tools are appropriate. And finally, there may be cases where experiments along one path do not impact whether one can simply restart the process down an alternative path in the future (i.e. the only commitment is opportunity cost), thus violating Axiom 4. With that caveat stated, we contend that most of the foundational choices that entrepreneurs encounter do indeed satisfy these axioms. In fact, it is precisely when these conditions hold that entrepreneurs face the paradox of entrepreneurship, thus creating a need for an entrepreneurial strategy.

The four axioms have powerful implications for how to think about the choices entrepreneurs face, and the means by which entrepreneurial teams can use strategy as a tool in venture design and scaling. Specifically, the axioms yield three seemingly straightforward yet interconnected principles that lie at the heart of choosing an entrepreneurial strategy:

- **Principle 1: Choice Matters.** When experimentation and learning require at least some level of commitment, the choice of what to explore not only provides information but also forecloses alternative strategic paths.
- **Principle 2: These Choices Matter.** Not simply an abstract concept, founders systematically face a series of core choices that require them to balance the interplay between learning and commitment. We focus primarily on four clusters of choices that are central to the founding and scaling of a growth venture:
 - Choosing a Customer
 - Choosing a Technology
 - Choosing an Identity
 - Choosing the Competition
- **Principle 3: These Choices Matter Together.** Complementarities among the different choices underlying an entrepreneurial strategy imply that accounting for interdependencies among different choices may be more important than effective considerations regarding any individual choice. Our approach synthesizes the key complementarities that arise as the result of choosing with whom and how to compete, resulting in four alternative strategies that founders can explore for a given idea:

- Intellectual Property Strategy
- Disruption Strategy
- Value Chain Strategy
- Architectural Strategy

Each of these strategies involves a distinctive set of choices regarding Customer, Technology, Identity, and Competition, and highlights specific interdependencies that can be leveraged by founders in translating their idea into a viable company.

These principles lead to the question of how entrepreneurs will choose and implement entrepreneurial strategy in practice when they encounter alternative paths of commercialization and venture design for their idea. Our argument is that it is precisely because an entrepreneur has many choices at the time of founding and few resources to develop and position the venture, that it is crucial to use a methodical approach to entrepreneurial strategy. We argue this necessitates the development of formal choice-oriented decision tools for the process of entrepreneurial decision-making under the paradox of entrepreneurship. We highlight one tool – Test Two, Choose One – as a concrete stopping rule for entrepreneurial search. Under Test Two, Choose One, an entrepreneur continues with commitment-free learning (i.e., prioritizing exploration over commitment) until they have identified *at least two* equally viable alternative strategies. Their ultimate choice, then, directly reflects the fact that uncertainty cannot be resolved by cost-benefit analysis (they are choosing between equally viable alternatives) and so instead is resolved by internal considerations such as founder purpose. One consequence of Test Two, Choose One is that, in order to choose a strategy, entrepreneurs must become aware of an equally viable strategy that has been left behind. Chavda, Gans and Stern (2016) formally develops tools for entrepreneurial decision-making under uncertainty and derives additional implications of our axiomatic approach. An implication of our approach is the recognition that a key “unknown” to an entrepreneur is an understanding of the likely potential value that might be created and captured from their particular idea (and how alternative approaches might impact the realization of that value). Our approach therefore identifies a novel rationale for the value of mentors and informal advisors to a start-up company: not simply to provide “advice” but to reduce the level of uncertainty associated with this unknown by providing information on the relationships between different choice categories.

While we do not attempt a thorough literature review here, we acknowledge that our approach both involves a synthesis of a wide body of prior research as well as an explicit agenda to re-orient that research to focus entrepreneurial strategy on the interplay between learning and commitment. Specifically, by making explicit the linkage between fundamental uncertainty, and the trade-off between learning and commitment, we are able to shed new light on several interrelated literatures (which themselves are often siloed).

A few specific literatures are particularly worthwhile to highlight in this regard. First, there is an extensive literature in entrepreneurial finance, which, over time, has come to place an increasing emphasis on the centrality of experimentation and learning in entrepreneurship

(Gompers, 1995; Gompers and Lerner, 2001; Bergemann and Hege, 2005; Kerr, Nanda and Rhodes-Kropf, 2014). While there are very significant insights gained from this literature as to the interplay between learning and staged investing, this work by and large has abstracted away from the possibility that a single entrepreneurial idea may be commercialized along multiple (alternative and mutually inconsistent) paths. Second, our work also builds on but also sharpens insights from the strategy field that emphasize the challenges of selecting and implementing a strategy in the face of an uncertain environment (Rivkin and Siggelkow, 2006; Gavetti and Rivkin, 2007) and the interplay between exploration and strategic search in start-up firms (Murray and Tripsas, 2004). This also draws upon insights in Lafley, Martin, Rivkin and Siggelkow (2012) in terms of bridging practice and academic insights into strategic management. A third body of research concerns the development and consideration of alternative business models (Amit and Zott, 2001, 2010; see Wirtz, et al, 2016, and references cited therein). Research on business models has correctly emphasized the multiplicity of options available for creating and capturing value from a given idea, but has by and large implicitly assumed that the process of considering the value of alternative business models can be decomposed from strategic commitments to one business model over the other.

Over the past several years, there has been an explosion of work by both academics and practitioners aimed at articulating the role of alternative business models for start-ups. For example, a rich practitioner literature focuses on the process for the sequential development and evaluation of alternative business models (Aulet, 2013, Osterwalder and Pigneur, 2013, Osterwalder, et al., 2014). There is also a related body of influential work associated with the “Lean Start-Up Movement” which has expressed frustration with the lack of practical guidance from traditional frameworks, and has placed learning and experimentation at the heart of the entrepreneurial process (Ries, 2011; Blank and Dorf, 2012). While this body of work offers insight into how structured experimentation (hypothesis-driven entrepreneurship) allows for rapid learning cycles, the lean start-up movement specifically eschews the idea that those activities that are required for learning (such as working with early customers, and demonstrating early prototypes) necessarily engender partial strategic commitments.

An additional body of work focused on entrepreneurial effectuation and behavioral approaches to entrepreneurship (Sarasvathy, 2001, 2009) has emphasized the central role of iterative learning in overcoming the uncertainty of the entrepreneurial process and shaping the environment. As well, there is an emerging body of work that directly tries to evaluate the role of traditional strategy in entrepreneurial firms (see Ganco, et al. 2015 and Kuratko, 2008 for reviews of the literature, and Collis, 2016, for a recent example of attempts to link the fields of strategy and entrepreneurship).⁴ This body of work offers a wide range of perspectives about the potential for insight to be gained from translating the traditional tools of strategy for entrepreneurship. By and large however, this work has abstracted away from the fundamental interplay between freedom, constraints, uncertainty,

⁴ Relatedly, though not specific to start-ups, is the simple rules approach to strategy (Eisenhardt and Sull, 2001, 2012), which emphasizes flexibility and disciplined learning to facilitate choice among alternatives in the face of uncertainty. This work does not deal explicitly with the potential for such learning to limit an entrepreneur’s flexibility in changing course afterwards.

and learning by commitment that forms the core of our approach.

Finally, our approach offers a reconceptualization of key frameworks and tools that are central to research, pedagogy, and practice, including the Market S-Curve (i.e., diffusion studies in the tradition of Griliches (1957), Rogers (1962), and Moore (1990)), the Technology S-Curve (i.e., technological trajectories in the tradition of Dosi (1982), Foster (1988), Henderson and Clark (1990), and Christensen (1997)), and the Teecean synthesis emphasizing the interplay between appropriability and complementary assets (Teece, 1986; Gans and Stern, 2003). By reorienting these theoretical frameworks around the centrality of endogenous strategic choice under uncertainty, we provide a concrete linkage between these tools and entrepreneurial action.

Our plan is as follows. In the next section, we develop our axiomatic approach to entrepreneurial strategy, deriving the paradox of entrepreneurship. Section 3-5 draws out the three principles of entrepreneurial strategy resulting from this paradox, and Section 6 motivates a new class of choice-oriented decision-making tools for the practice of entrepreneurial strategy by growth-oriented start-up firms. A final section considers implications for research, teaching pedagogy, practice and policy.

2. Confronting the Paradox of Entrepreneurship

Entrepreneurs neither lack for ideas or potential ways to commercialize a given idea. Anyone who has ever sat through an ideation session or even sat next to an entrepreneur on an airplane can attest to the high level of fecundity of most entrepreneurs, and it should come as no surprise that many innovation-oriented entrepreneurs engage in multiple ventures over the course of their career. While an important aspect of the process of founding a firm is to conceive of and refine upon an embryonic idea, a separate and equally crucial challenge is to identify and implement a specific approach for value creation and value capture.

To begin with, this is a formidable requirement: it is not enough to simply identify a novel yet plausible way to apply a new technology to a new market; instead, entrepreneurs must be able to identify a segment of customers willing to pay for the idea, and in most cases, be willing to change their extant behaviour in order to take advantage of it (e.g., by purchasing a new good, or even undertaking investments or commitments to take advantage of the new good on an ongoing basis). The Segway, for example, featured ground-breaking technology and earned enthusiasm from top investors, but it floundered as a result of its inability to identify a sufficiently large segment of customers to begin to realize the economies of scale and the development of a specialized transportation infrastructure necessary for successful value creation and capture (Golson, 2015).

In most cases however, founders do not struggle with an inability to articulate a single value creation and capture hypotheses for an idea and are in fact able to develop multiple strategic alternatives to do so. As an example, consider Dropbox founder Drew Houston who came up with the idea to synchronize files across computers using cloud computing (after repeatedly forgetting his USB as a MIT student). Shortly after coming up with the

idea, Drew Houston submitted an application to Y-Combinator in 2007, documenting the potential ways he thought would allow him to create and capture value from his idea (reprinted in Shontell, 2013). His application described multiple strategic alternatives ranging from developing an in-house enterprise version for individual companies, to partnering with team project management software companies as the file syncing application, to selling directly to consumers as an alternative file storage technology.

Although Dropbox now has a multi-billion-dollar valuation, the ability for founders to envision multiple ways to turn an idea into a business is certainly not unique to Houston. In fact, this concept is central to entrepreneurship and underlies the first axiom of entrepreneurial strategy:

Axiom 1 (Freedom): For a given idea, there is more than one alternative path by which value can potentially be created and captured.

To be clear, this axiom implies there is delineation between the initial entrepreneurial idea and the subsequent possible strategies for commercialization of that idea. Thus, there can be instances where this axiom fails to hold, or does not apply to specific decisions. For example, in the case of drug development, there are some drugs for which there is a single clear patient population that is appropriate from the outset, and so the key question is whether it is worthwhile to invest to serve this patient population rather than having to choose among alternative patient populations. In this case, creating and capturing value from the idea does not require a meaningful *choice* but instead simply requires a willingness to undertake a risky investment.

However, for most entrepreneurs with ideas that are promising enough to contemplate founding a new venture, there are at least some key decision points where Axiom 1 holds. These are often critical moments in the founding and scaling of a venture, and are the moments where entrepreneurial strategy will be most important. While Axiom 1 can apply to a multitude of ideas, we contend that it is in start-up firms that Axiom 1 is most salient. Relative to firms at other stages in their lifecycle, with no pre-existing reputation or historical record to infer “best practices” from, start-ups will have the broadest set of alternatives for creating and capturing value from an idea and the greatest freedom of choice.

This freedom of choice, however, faces a mitigating pressure from the constraints that entrepreneurs face. This leads to the common challenge founders encounter when choosing between multiple promising commercialization approaches that cannot be all implemented at the same time. Consider for example, the core dilemma faced by the founding team of the then-fledgling Starbucks Coffee Company when their new hire Howard Schultz suggested an alternative strategy for their idea of introducing high quality coffee to the United States. The founders⁵ had up until then, commercialized their idea by selling coffee beans and coffee roasting equipment. Schultz, returning from a trip to Milan, proposed an alternative: translating the Italian coffee bar concept to the United States. Starbucks could

⁵ The Starbucks Coffee Company was originally founded by Jerry Baldwin, Zev Siegl and Gordon Bowker in Seattle, Washington. The three founders were inspired by coffee entrepreneur Alfred Peet.

continue its focus on coffee bean sales by prioritizing a certain set of decisions (e.g., developing capabilities in coffee bean selection) or it could focus on retail coffee bars, which prioritized a much different set of decisions (e.g. building expertise in real estate and retail operations). Moreover, these two alternatives seemed strategically inconsistent: on the one hand, the original coffee beans and equipment sales strategy pitched consumers an elevated home coffee experience by purchasing high-quality beans and brewing equipment themselves; on the other hand, the retail café strategy would require convincing consumers to adopt a different behaviour of drinking coffee outside of their home in a community setting instead. Given this challenge of discordant strategic alternatives, its scarce resources and founder time, Starbucks could not have achieved both of these visions simultaneously⁶ (Schultz and Jones Yang, 1999; Larimore, 2013).

This tension between multiple, competing visions for a venture are common – even perhaps fundamental – to the process of entrepreneurship, and are at the foundation of our second axiom of entrepreneurial strategy:

Axiom 2 (Constraints): Resource and strategic constraints prevent the pursuit of more than one alternative at once.

This axiom perhaps most clearly demarcates start-ups from larger, mature firms. For these latter, Axiom 2 may not hold as these firms face relatively less constraints such that it may be possible to explore multiple commercialization paths for a given idea (e.g., conducting parallel tracks in internal competition with each other). Start-ups, however, are not afforded this flexibility, and instead must reconcile the ironic tension between a great freedom of choice among alternatives and the resource and strategic constraints that limit their ability to pursue more than one alternative. In other words, for start-ups firms, creating and capturing value from an idea requires making a meaningful *choice* among alternatives whereas for larger firms, it simply requires a willingness to undertake risky investments.

An intuitive, straightforward resolution to the situation invoked by Axioms 1 and 2 is to identify the “best” alternative by eliminating suboptimal alternatives through cost-benefit analysis of the alternatives. If the economic and strategic value of the alternative paths can be easily ranked (i.e. evaluating paths on an ex-ante observable quantitative or qualitative metric), then the proper approach to overcoming a choice under Axioms 1 and 2 is *optimization*. Founders can gather information without making specific commitments to either path, and then can evaluate the alternatives to find out which one is most optimal (e.g. through maximization of expected utility). This approach, which we describe as commitment-free learning, is indeed at the heart of the standard analytical toolkit common to MBAs and other professionals, and exemplifies the role of analysis in traditional strategic planning.

Optimization, however, is often insufficient for entrepreneurs facing multiple alternative paths to apply, as it cannot allow for a ranking of all alternatives in an unambiguous

⁶ Ultimately the original founders and Schultz could not agree on a path forward, and Schultz had to strike out on his own to meaningfully bring his entrepreneurial insight into reality launching Il Giornale cafes (later renamed Starbucks).

manner. At its essence, optimization assumes a rational searcher comparing different alternatives based on some objective function and narrowing the search space smaller and smaller around the optimum. In applying this to entrepreneurship however, we contend that although commitment-free learning can help the entrepreneur reduce their search space, there will be a point where the lack of information i.e. uncertainty will leave the entrepreneur close to their “optimum” but unable to rank between the remaining alternatives. This is effectively assuming that there are different combinations of choices within this search space that are rather different from one another with non-monotonic performance profiles consistent with the NK modelling literature (Kauffman, 1993; Levinthal, 1997; Rivkin, 2000). It is important to emphasize however, that while the landscape could require combinatorial optimization, complexity is not a necessary condition for uncertainty to hold. Instead, assuming that there is more than one choice and the existence of complementarities (Milgrom and Roberts, 1995) is sufficient.

To be concrete, consider the grocery supermarket, an invention of the 20th century that had achieved global ubiquity by the 1990s. With the rise of the Internet, several different entrepreneurial teams – perhaps most famously, Webvan founded by Louis Borders and George Shaheen, and Peapod founded by brothers Andrew and Thomas Parkinson – came up with arguably the same underlying “idea”: an online grocery store in which customers would shop online for groceries that would then be delivered directly to their homes. From the outset there were some strategic choices that entrepreneurs easily eliminated: all start-ups in the space launched in agglomerated cities where costs of delivery were more economical, built user-friendly websites and pitched their services as convenient time-saving services for the busy professional. Within that strategy space however, the proper commercialization approach was unclear. It was possible to consider on the one hand an online grocery store that would be an automated, vertically-integrated substitute for traditional grocers competing directly with neighborhood supermarkets, and on the other hand an online platform that collaborated with local grocery stores by serving as their online sales channel thus becoming a value-added service. At the time, there was simply not enough practical information about the underlying size of the online sales channel, the preferences of individuals for brands and items that were only available at the local grocer, and the cost structure for each model to have an unambiguous ranking between these alternatives. Ultimately, the market had to support two competing “experiments” with Webvan⁷ pursuing the former path (Aspray, et al., 2013) and Peapod pursuing the latter (Ahold, 2014) as each firm sought to realize value under their approach.⁸

This example illustrates that even though commitment-free learning can eliminate some inferior alternatives, there is a fundamental Knightian uncertainty at the heart of entrepreneurship makes it difficult to fully rank all alternative strategic paths at the time

⁷ Most importantly, while it is easy to scoff today at the optimism that Webvan maintained through their highly touted IPO (only twenty months before they became the poster child for the excesses of the dot-com bubble in their bankruptcy), it is instructive to consider that the founders and investors in Webvan believed that the approach had enough potential to undertake that strategic bet.

⁸ It was only with the experience of rapid scaling by each player did it become clear that Webvan’s competitive approach actually involved much higher total costs (due to lack of economies of scale at the local level) while Peapod’s more tailored approach was survivable as a profitable but niche business that allowed them to form a long-term partnership with the Stop-n-Shop grocery chain (Glasner, 2001).

that choices have to be made (Knight, 1921). This simple insight motivates our third axiom of entrepreneurial strategy:

Axiom 3 (Uncertainty): Fundamental uncertainty prevents a full ranking of at least some alternative paths.

As with Axioms 1 and 2, there are certain situations where Axiom 3 need not hold, or is only of modest importance. In particular, some entrepreneurial choice involves a meaningful choice among alternatives but it is possible to conduct a critical experiment or test that allows for a clear ranking of alternatives before a meaningful commitment must be made. For example, by emphasizing how to leverage reduced costs of experimentation over time, many of the key insights of the Lean Start-Up are premised on being able to undertake commitment-free experiments and cost-benefit analysis until a clear ranking can be established. As a consequence, many start-ups extensively use A/B testing to evaluate the relative efficacy of alternative marketing messages or the utilization of alternative marketing platforms (e.g., comparing a Facebook versus Twitter campaign), allowing for a relatively clear understanding of the costs and benefits of alternative approaches prior to the time when a commitment would have to be made.

With that said, Axiom 3 holds for many of the most critical choices facing a fledgling venture. To see why this is, it is useful to think carefully about the nature of entrepreneurial learning (a topic considered in detail in Chavda, Gans and Stern (2016)). Consider a simple situation where an entrepreneur faces has an idea that can be implemented in multiple alternative ways (A, B, C, ...) but has very little ex-ante information about the relative value of alternative approaches (i.e., faces Knightian uncertainty). And, suppose that entrepreneur is able to undertake a noisy but informative test that compares two alternatives – A versus B, and then can choose one of these alternatives (i.e., Choose A or B) or undertake further search (i.e., consider alternatives C, D, E, etc.). Now consider the situation where the “A/B experiment” indicates that A is much better than B (e.g., $V(A) = 10 \cdot V(B)$) versus the situation where the experiment indicates that A is only slightly better than B (e.g., $V(A) = 1.1 \cdot V(B)$). In which case should the entrepreneur choose A versus consider C (at a cost)? While it might seem intuitive that one would “Choose A” when A is clearly better than B (as opposed to when A and B are similar), that decision-making rule ignores the fact that the experiment has also informed the entrepreneur that this is a *highly variable* environment, and that there may indeed be alternatives that are high relative to both of the first two choices under consideration. Indeed, it is the very fact that A is much higher than B that provides the rationale for additional search.

This simple insight motivates a more general approach to entrepreneurial search in which an entrepreneur should be encouraged to engage in commitment-free experimentation and learning in order to understand the value of alternatives, and will therefore only consider making a commitment to one path over another when multiple equally viable paths have been identified. In other words, until an entrepreneur has searched among alternatives so that they find themselves faced by Knightian uncertainty, they have not yet reached an optimal stopping point for search itself. If commitment-free learning indicates that one alternative is clearly better than any alternative currently under consideration, this suggests

the entrepreneur has not yet approached an optimum or reached the “entrepreneurial frontier” for their idea. By successively eliminating inferior options until a point in which multiple alternatives are viable (suggesting diminished returns to further experimentation), the very process of entrepreneurial search under uncertainty will ultimately place an entrepreneur in a position in which they face Axiom 3.

In other words, a subtle but important implication of Axiom 3 is that, at some point, the entrepreneur needs to make at least a partial commitment to one path in order to learn more about the market and the potential value of their venture. Consider for example the case of Ministry of Supply, a start-up founded at MIT based on the application of NASA materials science to integrate technology into professional clothing. While there were multiple potential viable paths (from developing fabrics to license to existing manufacturers, producing white-labelled clothing for sale to incumbent retailers, or developing their own brand and clothing design), it was difficult to assess the validity of their core value creation hypothesis - that young professionals would be willing to pay for dress shirts made of athletic fabrics (Khaire and Catzen, 2013; Stern and Wu, 2016). To test this core hypothesis, the founders launched a Kickstarter crowdfunding campaign explicitly to “learn” about the market, and this experiment brought the unexpectedly good news that there did seem to be demand (it was the largest Kickstarter fashion campaign up until that time) (Ministry of Supply, 2013; Farrell, 2012). However, that same experience also resulted in an almost inadvertent series of commitments – from the structure and relationships among members of the founding team to the particular niche that they would build upon going forward – that shape Ministry of Supply to the present day. Indeed, some commitments (such as the particular design of the shirt used for the Kickstarter campaign) turned out to be costly to reverse in terms of both direct costs at the outset and reputation over time. Indeed, to this day, some of the most “accessible” information about Ministry of Supply (e.g., the top results from a Google search) is still related to the initial “experimental” Kickstarter campaign. For any entrepreneurial experiment where the entrepreneur must interact meaningfully with a potential customer, supplier, employee, or partner, and must make representations about what product or service they are likely to sell or focus on, the entrepreneur faces the potential of losing control over the information that has been disclosed and how their initial experiments shape the reputation and perception of their idea and their fledgling venture.

While this uncomfortable tension is often obscured in both the practitioner and academic literature, we argue that the fact that learning engenders commitment is central to the challenge of founding and scaling a new venture, and is at the very heart of entrepreneurial strategy.

Consider the dilemma confronted by Robert Kearns, the inventor of the intermittent windshield wiper. At the time of his innovation, Kearns wanted to establish himself as a producer of intermittent windshield wipers and sought out a partnership with the Ford Motor Company. Eager to get his invention into production and ultimately move towards the marketplace, Kearns provided Ford with access to an installed working prototype in advance of a firm contract to serve as a Ford supplier. This action-oriented approach was premised on allowing safety tests of the windshield wiper to be conducted and figuring out

how Ford and Kearns might work together. However, Ford took advantage of the fact that Kearns had given them access to the underlying technology, cutting Kearns out of the deal in favor of in-house production (introducing a key innovation that quickly diffused throughout the automobile industry). By the time that Kearns understood that he had been expropriated, his opportunity to become the leading supplier of his technology had passed: it was only in a patent trial more than 20 years later that Kearns was able to earn some of the financial returns from his idea with his visions for building a company long since dashed (Andrews, 1990; Seabrook, 1993; Gans and Stern, 2003). Though an extreme case, the challenge faced by Kearns is central to core entrepreneurial choices: learning can only be achieved through specific commitments that are potentially irreversible. This motivates the fourth Axiom of Entrepreneurial Strategy:

Axiom 4 (Learning by Commitment): Learning that requires (partial) commitment to one path changes both the value of and the information available about alternative paths.

Axiom 4 is not a universal condition and is not applicable to all entrepreneurial choices. While moving down one path involves opportunity costs and also induces a bias towards a particular path that has already been invested in, it is also possible that opportunities not taken may be open for reconsideration at a future point in time.⁹ For example, application areas distant from the initial locus of experimentation may be relatively unaffected by early experiments such that even with failure along the initially chosen path, the conditions for commercialization in the alternative might remain attractive. To be clear, there is a subtle but important distinction between the opportunity costs of entrepreneurial experimentation and learning with partial commitment. While the former involves the costs of pursuing an experiment down one path rather than the next best alternative (e.g. lost time, capital or reputation benefit) the latter references the perturbations to the choice set that learning creates beyond just the foregone initial next best but also to all future choices available to the entrepreneur.¹⁰

⁹ For example, in condensed, finite-term entrepreneurship programs such as business school classes in which students pursue the development of a venture over the course of a semester (e.g. New Enterprises at MIT⁹) or accelerator programs (e.g. the Creative Destruction Lab at University of Toronto,⁹ or the Global Founders Skill Accelerator at MIT), there is a constructed time constraint that can often lead entrepreneurs to make choices without the opportunity for a full consideration and ranking of all alternatives. While these untested choices are reflected in the earliest experiences of the start-ups with their customers, suppliers and even potential employees, there is often an opportunity to undertake further analysis and pursue alternatives after the course or program ends. In many cases, there is often a re-thinking of any choices or commitments that were made during the original semester (including the main customers that might be served, the underlying nature of the idea itself, and even the structure and make-up of the founding team) and often an entire re-launch of the start-up itself. However, as start-ups move from the classroom learning environment to becoming an independent company, the potential for irreversibility is increased.

¹⁰ A useful clarification is that opportunity cost can best be thought of as relating to scientific experimentation in which running a particular trial on a set of variables may cost time, capital and effort but does not impede the scientist from seeking further resources to run another trial with a different approach. Learning with partial commitment however, refers to strategic experimentation in which running an experiment - even a rapid, low-cost test - can not only incur costs but can also foreclose the possibility of testing other alternative approaches.

With those exceptions in mind, the very nature of entrepreneurial experimentation often necessitates that the “experiment” not only allows the entrepreneur to learn as in a traditional scientific experiment but also shapes the market, the information available to potential competitors and suppliers, and even the expectations of customers in unrelated market segments. For example, ambitious New York start-up Quirky launched in 2009 with the vision of being a crowd-sourced consumer product company. Quirky launched as an end-to-end design and manufacturing company, sourcing ideas from its online community and developing the best ones for sale in retail department stores (Silvester, 2015). The idea was well received by Technorati (fielding over 2000 new ideas a week) and venture capitalists (raising over \$175 million) but struggled to maintain positive cash flow under such a model that required bearing the cost of manufacturing new goods and holding inventory. Although they management team and some of its investors attempted to “pivot” the company into an alternative direction (e.g. selling crowd-sourced product design services, partnering with established product manufacturers such as General Electric), at least in part because of its failure to develop successful consumer products, Quirky lost the opportunity to establish a strong position in these alternative markets that could have been promising entry points (Higginbotham, 2015; Anderson, 2015). This illustrates that it is in the nature of entrepreneurial experimentation that the activities that are undertaken to learn also have the consequence of changing the conditions for value creation and capture itself.

In combination, Axioms 1, 2, 3 and 4 reveal the fundamental tension at the heart of the entrepreneurial discovery process. For a given idea, entrepreneurs have freedom of choice among multiple potential paths to creating and capturing value. But they face resource and strategic constraints that prevent them pursuing multiple paths at once. At the same time, even after “commitment-free” learning, there can still be a level of uncertainty that prevents a meaningful ranking of at least some alternatives. And, finally, learning about these remaining alternatives necessitates at least partial commitment to one alternative. Commitment, however, engenders the consequence of changing the value and information of alternative paths not yet taken.

Together, these axioms yield our primary organizing insight:

The Paradox of entrepreneurship: choosing between alternative strategic commitments requires knowledge that can only be gained through experimentation and learning of kind that inevitably results in (at least some level) of commitment that forecloses particular strategic options.

In short, the very activities essential to choosing a start-up’s value proposition (learning and experimentation) are fundamentally in tension with the ability to establish and sustain competitive advantage (strategic commitment).¹¹ Entrepreneurs cannot simply experiment with different business models, nor can they know in advance exactly what will work. Instead, they must make consequential choices in advance of enough information for those

¹¹ Entrepreneurs must encounter this tension between learning and commitment for entrepreneurial strategy to apply: even in industries where portfolio strategies are common (e.g. many pharmaceutical companies develop multiple drugs in parallel to hedge risk exposure), at the earliest stages of starting up, entrepreneurs must still choose which drug to invest more resources in developing and investing in protecting.

choices to be ordered.

3. Principles of Entrepreneurship

The Paradox of Entrepreneurship frames a central puzzle for entrepreneurs that is at the foundation of the development and implementation of an entrepreneurial strategy: how can entrepreneurs structure their choices when they are faced with multiple equally viable paths for their given idea and learning about any path requires partial commitment?

To illustrate more clearly, it is useful to consider the key implications of the Paradox of Entrepreneurship in terms of what it means in terms of the core choices facing start-up firms. Consider an entrepreneur with an idea (depicted as a grey “light bulb”) and there is one clear path (suppose it is called the “Blue” path) associated with that idea. In that case, the entrepreneur would consider the value of the idea once implemented against the costs (including opportunity costs) of implementation, and so would be able to choose whether or not to *invest* along the Blue trajectory. This is of course a well-known problem with a wide range of tools available to help investors in this decision process. If the investment is risky, it might be possible to undertake a limited investment that simultaneously begins to realize the project but does so in a way that generates meaningful information about the overall value of the project. One could imagine this process as generating a “blue light bulb” at an intermediate distance from the original idea (as in Figure 1). This *real options* approach to investing is at the heart of the staged nature of venture capital (as well as a wide range of other financing approaches such as in drug development), and offers the ability to significantly enhance the overall efficiency of investment by uncovering information at an early stage of investment by taking action quickly and efficiently.

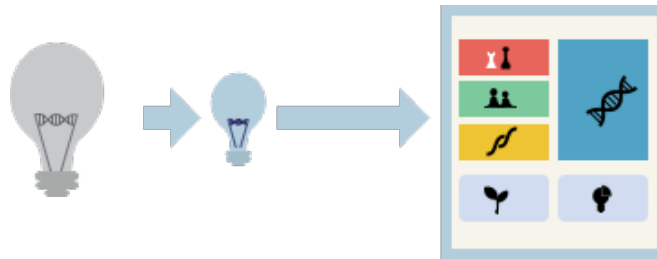


Figure 1 A real options approach to investing. Starting with an initial idea (the grey light bulb), the entrepreneur can invest in learning (the blue light bulb), receiving information that would then allow for a subsequent investment decision to implement the entire Blue plan.

However, now consider what happens when the entrepreneur faces two alternative paths (suppose they are called “Blue” and “Red” as in Figure 2). Each path is equally viable *ex ante*, and each path can be tested through a partial commitment that allows for learning and experimentation. Once the founding team undertakes learning down one path (say Blue), the team does learn more about that path, but in the case where the news about that path is negative, the team is now much *further away* in strategy space from the alternative (Red).

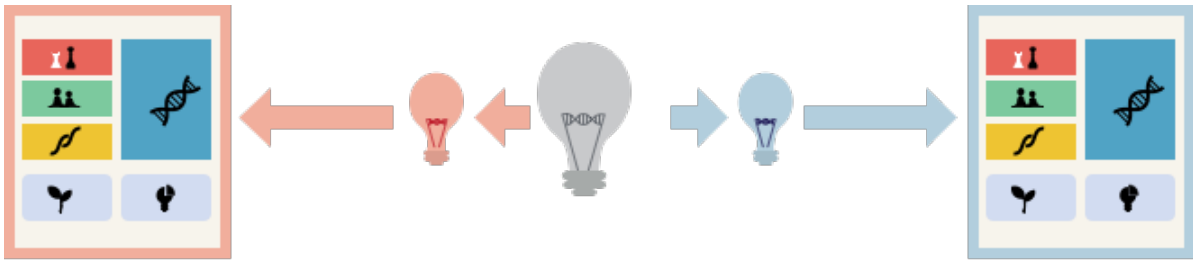


Figure 2 Choice Matters. Experimenting with Blue (or Red) leaves the entrepreneur further away from other potentially viable paths. Learning about “blue” could make “red” unviable. Thus, explicit choice is required to plan a sequence of outcome-contingent actions.

This simplified illustration depicts how learning about one path (Blue) can make another path (Red) unviable. Even if it were possible to “re-set” back to the initial starting point (the original grey light bulb), one can easily imagine that the time expended and the reputation developed along the Blue path makes pursuing Red more difficult (e.g., perhaps a competitor has entered this space, there is limited financial runway available, there is inertia on the part of the founding team). In other words, this simple example exemplifies the first broad principle of entrepreneurial strategy:

Principle 1: Choice matters.

Choice matters because there is path dependence in entrepreneurial choice: once an entrepreneur has decided to pursue a strategy (even through initial, small experiments), they are reducing their strategy choice set and entering onto a specific, sometimes irreversible trajectory.

To be clear, choice is defined in entrepreneurial strategy as an action under the control of the entrepreneurs that (a) instigates experimentation and (b) tests an element of a specific value creation and capture hypotheses. It is important to recognize that entrepreneurs will often face unresolved uncertainty between multiple alternatives along many dimensions and thus will face numerous choice points. Further, even if such constraints were relaxed, the need to clearly link outcomes to a change in a specific variable make running multiple experiments inefficient if not counterproductive. Founders must, therefore, prioritize the choice points that are the most crucial determinants of their firm.¹² We argue that these crucial choices are choice of customer, technology, identity and competition in the second broad principle of entrepreneurial strategy:

Principle 2: These Choices Matter.

These four choice points matter by construction: a value creation hypothesis requires articulating a customer segment for which the idea creates value and a technology that facilitates value delivery; similarly, a value capture hypothesis requires articulating with

¹² The importance of choice in the face of multiple alternatives with unresolved uncertainty could lend itself for further study of multi-armed bandit problems with endogenous commitment or with competition. See Chavda, Gans and Stern (2016) for a related study.

whom and how to compete, and the identity and position the venture will occupy. In addition to their foundational nature, these choices often have multiple potential options and typically involve specific communication to external parties (e.g. pitching a specific customer, purchasing certain technological assets, interviewing early employees, proposing supplier partnerships). In other words, these choices are where the interplay between experimentation and commitment are most salient: making a choice to experiment along one path will involve leaving alternatives behind.

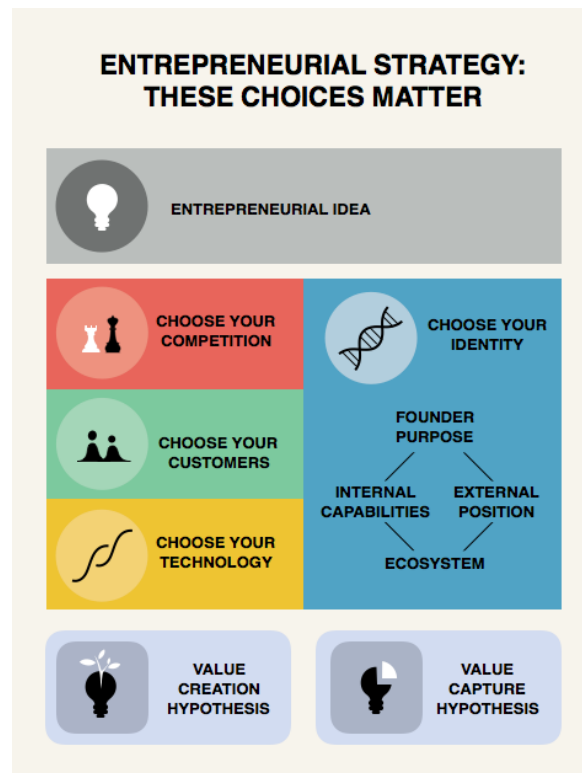


Figure 3 These Choices Matter. Failing to make an explicit choice on one of these dimensions of Customer, Technology, Competition and Identity necessarily means that an entrepreneurial strategy has not been formulated. Together, these choices form the value creation and value capture hypothesis that underlie the entrepreneurial strategy of the firm.

In the following section, we will consider the choices that entrepreneurs face, consider how the extant literature suggest making these choices (i.e. through traditional strategic analysis), and re-interpret these classical frameworks with an emphasis on making these choices in the presence of multiple equally viable options. This choice-oriented approach provides new insights into a range of traditional frameworks, and also allows for a more direct translation of those frameworks into practical entrepreneurial decisionmaking bridging the gap between theory and practice.

4. These Choices Matter: Customer, Technology, Identity and Competition

Choosing a Customer. For any start-up whose underlying idea has the potential to create meaningful consumer value, the question is most often not whether any potential customers exist, but which customer to choose. Because of their limited financial and human resources the earliest stages of a venture, entrepreneurs cannot serve all potential customers with equal attention and care. But even if this resource constraint is relaxed, entrepreneurs face a strategic trade-off in choosing among potential customers: serving one group of customers may allow for learning and experimentation in a way that allows them to create more value for and capture more value from subsequent customer groupings. Initial customer choice thus directs a start-up onto a trajectory within a particular vertical, for a specific segment that reinforces the value they provide to customers in and closely related to that segment; this ends up having the consequence of leaving the start-up farther away from offering value to customers who might have looked promising before any commitments were made.¹³ In addition to defining which customers to target, customer choice always involves pricing, sales and product design. Taken together, customer choice has a deep impact on the start-up, from the types of learning and experimentation that can be conducted to the types of employees the will be hired, to the type of organization needed to service early customers.

A common approach to customer choice often taught in business schools is the value creation and capture framework: calculate the potential for value capture for different types of customers by determining the value created net of costs incurred for serving each type of customer; then ranking and selecting the segment that maximizes value capture. Though a powerful insight, it is often impossible for entrepreneurs to employ as they face unresolved uncertainty over how much particular customers will value the idea and how much it will cost to reliably deliver that value as they scale. Entrepreneurs also face additional unknowns about how their choice of serving one customer segment at an early stage shapes their ability to serve additional segments and the broader market over time. Effective customer choice for entrepreneurs, therefore, requires an understanding of how customer choice interacts with overall customer sequencing and the evolution of entrepreneurial strategy and organization.

Fortunately for entrepreneurs, the study of how consumers adopt new ideas and technologies is among the most studied and rigorous areas in the social sciences. Specifically well-studied is innovation diffusion – the process by which new ideas and technologies spread among customers and markets – with decades of research concluding that across different verticals, diffusion is slow, and, for those ideas that ultimately make it, it follows an S-shaped pattern, moving across different adopter categories from early

¹³ To clarify the choice of customer in entrepreneurial strategy refers to the choice of end consumer. Thus, if an entrepreneur chooses to serve a particular segment of end consumers (e.g. seniors living in urban centers) then they choose to compete against incumbent services by serving those consumers directly or they can choose to collaborate with incumbents by offering services that enhance the value proposition those firms offer to the end consumers.

adopters to eventually the mainstream mass market (Griliches, 1957; Rogers, 2010; Watts, 2002).

Entrepreneurs, of course, do not have the luxury of the 20-20 hindsight of academic studies. Leveraging understanding of diffusion and the market adoption S-curve (also called the customer adoption lifecycle) at the earliest stages of a company requires making a forward-looking assessment of not only the attractiveness of different potential customer applications and segments, but the interrelatedness of those segments so that an entrepreneur can evaluate how to sequence customer segments effectively.

Geoffrey Moore was the first to make the connection between diffusion and consumer choice in an actionable way for entrepreneurs, by pointing out that while the market S-curve emphasizes the importance of multiple customer groupings and their adoption behavior over time, the practical challenge facing entrepreneurs is figuring out how to gain traction with an early customer segment while also preserving the ability to transition marketing and strategy over time to serve more mainstream markets (Moore, 1991). While some may interpret Moore's main insight as the latter point of evolving strategy across different customer segments, Moore's work also implies that entrepreneurs should choose an initial segment of customers that are influential on other segments. Effective customer choice therefore involves not only prioritization but also identifying and managing customers that are able to straddle the "chasm" as willing early adopters that are credible references as the start-up transitions across multiple customer segments.

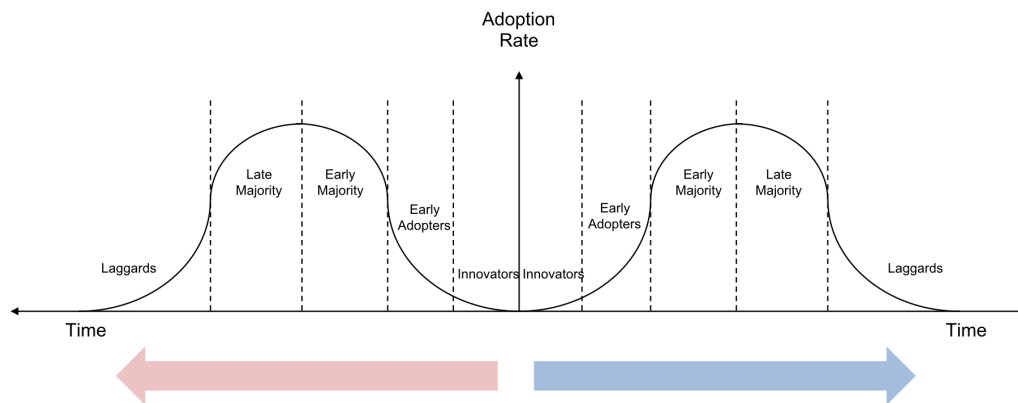


Figure 4 Choosing a customer implies that rather than a search for an exogenous "optimal" beachhead market, the market S-curve the start-up faces depends on the founders' choice of initial customer.

The market S-curve and Moore's chasm approach have both been taught in business classrooms for decades, however they are contradictory: whereas the former implies that there is an ideal segment of early adopters that exists in the environment (i.e. entrepreneurs should seek out and target that segment), the latter implies that the customer lifecycle can be managed. To be clear, the insight that the market diffusion S-curve can suffer from selection and hindsight bias in organization and management scholarship, and thus has limited applicability when applied prospectively is captured by the work of Kovacs (Kovacs, 2008). Our contention is that this has not yet been reflected in the entrepreneurship curriculum of most business schools.

Entrepreneurial strategy aims to re-conceptualize these seminal frameworks with the emphasis on the entrepreneur and the nature of choice under such uncertainty. Entrepreneurial strategy takes the position that customer choice is not a search process for the optimal early adopter or beachhead segment, but rather that the choice of initial segment will determine which market S-curve the start-up will participate on. In other words, for a given idea, each of the many customer segments that could gain value from it. Entrepreneurial strategy takes the position that each of those segments could be an appropriate “beachhead,” setting the start-up on a specific S-curve distinct from that of alternative customer segments. Although this conception renders the “optimal” starting point nonexistent, there are several factors entrepreneurs should consider in making a choice: customer sequencing and strategic coherence. Specifically, entrepreneurs should consider the impact the initial customer choice will have on subsequent possibilities. While it is possible that more than one customer groupings offer comparable opportunities for follow-on scaling, one group may focus the company early on in ways that might limit the potential for long-term growth (Catalini, 2016). They should also evaluate how each customer segment would fit and reinforce other strategic choices. For example, if the entrepreneur is planning to establish technology as a broad standard (perhaps at the expense of incorporating every bleeding edge innovation), then prioritizing mainstream customer segments at an earlier stage may accord better. In contrast, if an entrepreneur is planning to build a company known for being at the forefront of technological innovation then prioritizing customer segments that are tolerant of failure may be a better choice. In each case, the entrepreneurs would be choosing the appropriate beachhead market for their entrepreneurial strategy and orienting the market S-curve based on that choice, rather than searching for the optimal beachhead.

Choosing a Technology. Given that technology is rife with uncertainty and failure, making an active choice is important – perhaps even more so than in any other choice - for helping founders allocate their scarce resources in a coherent way. However, the concept of technology choice has disparate notions among entrepreneurs ranging from functional decisions such as which programming language to build in, to more fundamental issues such as which methodological approach to artificial intelligence to commit to. Yet despite this heterogeneity, a common theme seems to be that every entrepreneur can articulate why they are working on the next “disruptive” technology. This entrepreneurial fascination with disruptive technology does not however, exist in a vacuum, but rather is reflective of both academic research and management thought leadership in recent decades.

A key insight in management was the technology lifecycle, discovered by William Abernathy and James Utterback, who recognized that technology was dynamic and co-evolved with the market: in its infancy, new technology would undergo significant experimentation until over time, as its customer value creation became more defined, it would converge into a standard, dominant design (Utterback and Abernathy, 1975; Utterback and Suarez, 1993). This insight spawned several key follow-on ideas including Giovanni Dosi’s technological paradigms (Dosi, 1982), Michael Tushman and Philip Anderson’s technological discontinuities (Tushman and Anderson, 1986) and Richard Foster’s popular conceptual model of the technology S-curve (Foster, 1988). Foster re-stated the technology lifecycle to follow an S-shaped curve: early on in a new technology,

the return in performance (e.g. survival rate, megabytes of storage, processing speed) for investment is low and one can invest lots of resources for very incremental gains in improvement (stage of exploration). Over time, the technology's performance returns to investment will improve at an accelerated rate (stage of exploitation). This continues until growth begins to slow down in the face of diminishing returns to investment and fundamental limits to the technology. Foster also emphasized the transition between two technology S-curves as a source of difference between established firms and entrepreneurs: incumbents had to weigh the trade-off between continuing along the existing curve or exploring a new one, whereas new entrants could potentially win by choosing and dedicating themselves to a new technology S-curve. This insight became the foundation for the dominant approach for technological entrepreneurship: disruption.

This body of work on established firm failure in the face of S-curve transitions is grounded in the seminal work of Rebecca Henderson and Kim Clark who identified the root cause of failure as the organization of the firm itself (Henderson and Clark, 1990). More specifically, they argued that successful firms were often optimized for being the leader along the existing S-curve and were organized around leading the continual development of incremental innovations. Thus, when faced with a radically new S-curve that requires an entirely different approach, they are encumbered by their existing organizational incentives and structure. This insight that organizations matter also set the stage for Clayton Christensen's focus on the role of market dynamics in firm failure during S-curve transitions. Christensen argued that because successful firms are optimized to serve their existing customers, they are unable to experiment with nascent technologies that performed poorly on traditional performance metrics. These "disruptive" technologies are, therefore, unguarded entry points for entrepreneurs that are unconstrained by existing customer preferences (Christensen, 1997; Christensen and Bower, 1996).

Though Christensen, Henderson and Clark all analyzed technology from the perspective of established firms (see Gans, 2016, for an overview), their works have become some of the most influential for start-ups, in particular the popular concept of finding a "disruptive" technological opportunity. Whereas this research has not only been impactful but has also formed the foundation for much ancillary work, it is important to remember that fundamentally, these frameworks and theories have been deduced from backward-looking studies of very specific industries. If interpreted literally from the perspective of an entrepreneur, these frameworks can imply that technology exists in an environment exogenous to the start-up and the only optimal technology choice is for founders to be in the right place at the right time to find a new technology on the cusp of rendering incumbents obsolete.

In our experience advising start-ups, however, we have found that in practice, this kind of serendipity is a very rare occurrence. Our objective is to introduce a choice-oriented lens to understanding entrepreneurial technology choice. Rather than requiring entrepreneurs to happen upon an unexploited technology that they can ride the S-curve with, we argue that all technologies can hold the potential to create significant value. The actual outcome value of that technology hinges on how the founders choose to adopt a technology and potentially innovate upon it. To break this down, we argue that, not only should technology adoption

not be left to happenstance, founders must start by actively choosing which technology (or set of technologies) to adopt. To make this decision they need to weigh the trade-offs between the level of a technology and its rate of improvement among their technology options. For some start-ups, making a technology adoption choice will be sufficient in terms of choosing a technology, while for others, technology adoption may be just a starting point. These latter founders have to make an additional decision of choosing how to innovate upon their selected technology (or technologies).

Founders should weigh the trade-offs between investing in exploration through research and experimentation, with the gains from exploitation through commercialization. This draws upon the work of James March in exploring the trade-off in allocating resources to exploration versus exploitation in organizational learning (March, 1991). Drawing on the S-curve framework, one can think of a graphical illustration with the level of technology as the Y-axis on the technology S-curve, measuring a relevant performance metric (e.g. speed, survival rate, storage capacity, etc.). On the X-axis one can think of as time. The slope, is therefore rate of technology or the pace at which this technology can be expected to improve on a particular performance metric over a given period of time. This rate follows a S-shaped curve, reflecting a period of technology exploration followed by a period of technology exploitation. The key is that the time spent in each period and the overall dynamic is at least partly driven by the choices of the entrepreneur. An entrepreneur with a given idea has at the outset the choice between engaging in a relatively short period of exploration so they can move to market exploitation more quickly; or a longer period of exploration, perhaps investing resources in research and development for the potential of developing and riding a more impactful technology curve.

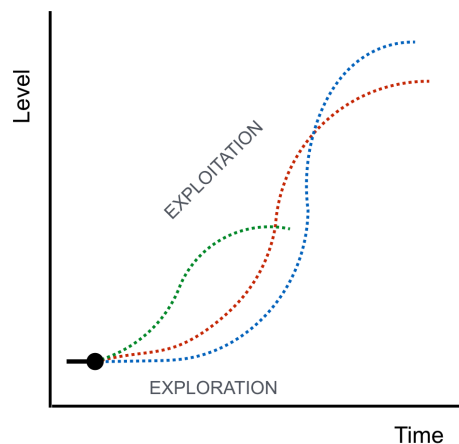


Figure 5: Choosing a technology implies that rather than taking the technology S-curve as determined, entrepreneurs can shape the technology S-curve they leverage by choosing how much time and resources to invest in exploration before switching to exploitation.

Overall, for a given idea, the founding team's choice of exploration versus exploitation induces alternative S-curves, and the job of the team is to choose among these alternative technology paths. A trade-off between exploration and exploitation exists because in evaluating technologies, founders are forced to weigh the pros and cons of a particular technology of a known quality and an unknown potential. We emphasize this trade-off

because despite the temptation of pursuing an emerging technology, adopting a high potential but low-quality, nascent technology can be extremely challenging and frustrating, adding extra uncertainty to the already volatile experience of entrepreneurship. Carefully considering these tensions of technology adoption and, if applicable, technology innovation can help founders define a clearer choice of technology. This is valuable as it allows them to evaluate how their technology choice coheres with their choice of customer, competition and identity, as well as think through their overall entrepreneurial strategy. For example, if a founder is planning to cooperate with established firms through licensing or building a key part of their value chain, it is important to consider whether they can integrate into existing systems without creating prohibitive frictions for incumbents. On the flipside, if a founder is planning to compete with established firms, they must be able to reason why they will be able to establish a competitive advantage with this choice of technology before well-resourced incumbents erode it. As another example of the nuanced interplay between choices, even though the S-curve for a particular technology may be improving in performance as the cumulative level of effort increases, that may not translate directly into value creation for an intended customer segment.

Choosing an Identity. For any entrepreneur facing multiple, equally viable alternative trajectories for their idea, a core element in that choice is the type of start-up identity each path warrants. To be clear, the general conception of firm identity is that, akin to a personality trait in an individual, it is a set of characteristics that separate a firm from other firms. Entrepreneurs face a unique challenge in choosing an identity because of their infancy: without an extant track record they have no core competencies, firm culture, or reference firms in analogous industries to anchor (or constrain) their vision for the future of the firm. Yet, the choice of identity cannot be deferred until such firm history been built up: entrepreneurs must be able to organize the actions of its employees internally (e.g. prioritizing actions based on a specific firm purpose in a consistent manner, developing certain internal capabilities through hiring and other investments), as well as manage and shape its perception by external stakeholders (e.g. its external positioning, the broader ecosystem of firms the firm belongs within). Moreover, recent research in organization theory has discovered that once these identities – internal and external – begin to form, it becomes extremely challenging to alter or migrate to an alternative identity: in the former, internal identity can create inertial frictions within a firm's employees and management that make it resistant to changes that challenge the existing identity (Tripsas, 2009); in the latter, recent studies have found evidence that deviating from an external identity can erode trust, reputation and perceived authenticity with customers and stakeholders (Frake, 2015; Phillips, Turco and Zuckerman, 2013). Taken together, it is clear that leaving identity to haphazardly form is dangerous because it can set the start-up down a costly if not irreversible path.

A significant body of work in entrepreneurial identity has focused on the characteristics and composition of founders and the top management team that correlate with success metrics such as future financing, speedy execution and firm survival (Eisenhardt et al. 2000; Eisenhardt, 2014; Burton et al., 2002). While this research has provided important insights on founding conditions and the path-dependent influence of the team on firm outcomes, it has implicitly assumed that individuals' identities can be measured by

observables (i.e. by that logic, two people with similar educational backgrounds, career histories and demographics will have comparable identities), thus spawning ex-post studies of ideal founder characteristics and founding team composition. In doing so, this literature has abstracted away from a key insight: a founder (and founding team) comes with a diverse body of prior knowledge and established networks, and different elements of this knowledge and network base can be leveraged for an entrepreneurial opportunity (Shane and Venkatraman, 2000; Shane, 2003; Burton, et al., 2002). Therefore, the same founding team is capable of taking on more than one identity by choosing to emphasize some elements of their prior knowledge over others.

Rather than profiling an optimal team composition for success or ideal qualities correlated with entrepreneurship, entrepreneurial strategy takes the position that founders have a choice of which elements of their prior knowledge to emphasize, and therefore have a choice of which identity they want to build. Relatedly, some recent work (Wasserman, 2006; 2012) has argued that founders can choose between orienting towards wealth maximization (a “Rich” identity) or choosing to maintain ownership control (a “King” identity). Although this work advances the notion of choice between alternative visions, we argue that entrepreneurs in fact have more than just a binary choice of identity. Instead, the choice of identity requires choosing among multiple alternative identities for a start-up. By that logic, there is no “optimal” founder and founding identity, but rather many different alternative identities that a founder can choose between by leveraging different attributes of their prior knowledge. Consider for example, Mick Mountz, who worked at Apple and Motorola before joining the founding team of would-be disruptor, Webvan. When he launched his own start-up around the idea of building mobile robots for order fulfillment, he could have leveraged his Webvan experience to build a “creative disruptor.” Instead, Mountz chose to build his start-up, Kiva Systems, as a collaborator to warehouse-dependent retail companies such as Staples, Walgreens and Office Depot, among others. Perhaps drawing upon his time at Motorola or Apple before Webvan, Mountz described their identity: “we start with our customers’ business problem from their perspective and work alongside them to find the right Kiva solution.”¹⁴ Mountz is just one example that a founding team or even a single founder, can take on multiple different identities.

The concept that a founder can build a firm into multiple, different identities implies that there is significant latitude for choice in determining a firm’s identity. To be clear, rather than assume that a firm has a given identity or “DNA” because of its observables (i.e. founders’ prior knowledge) we propose thinking about identity as a choice between different DNAs of the firm.

¹⁴ Mountz, M., 2012. KIVA the Disrupter. *Harvard Business Review*, 90, pp.74-80.

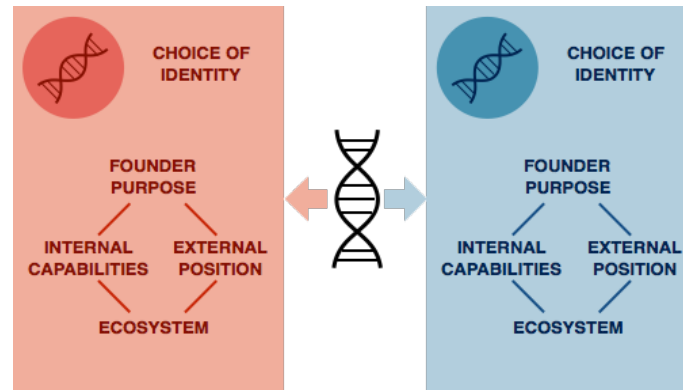


Figure 6 Choosing an Identity. Entrepreneurs need to consciously choose the type of identity they want to build rather than allowing them to haphazardly develop.

Furthermore, we argue that these different DNA or identities are each combinations of distinct elements of identity: the purpose the founding team commits to, the capabilities prioritized for development, the reputation and positioning of the firm, and the broader ecosystem the start-up belongs to. Synthetized from competitive strategy (Porter, 1980; 1985), carefully considering the complementarities and tensions between these four facets of identity – founder purpose, internal capabilities, external positioning and ecosystem – can help founders make a clear choice of identity from their set of potential alternatives.

Founder Purpose: In the early phases of a start-up, the founding team plays a vital role in defining the mission and scope of the firm. In other words, the start-up itself is the sum of the individuals involved. There is a large body of work on psychological theories of entrepreneurship that identify personality attributes correlated with entry into entrepreneurship such as the need for achievement, internal locus of control and preference for risk (McClelland, 1961; Begley and Boyd, 1987; see Shane, 2000 for a review). There is also a recent formal literature on strategic leadership that identifies the impact of founder vision on actions taken by others (van den Steen, 2016). Applying this work directly to entrepreneurial practice however, would seem to imply that these innate attributes define the founder (founding team) purpose. While it is often true that founders are inextricably tied up in their firms, and certainly possible that they may define success as achieving a certain amount of control or earning a particular laudatory achievement; we contend that founders actually have latitude in choice when it comes to determining their purpose, mission and definition of success for their start-up. Consider, for example, Anita Roddick who founded The Body Shop chain of cosmetic stores in the late 1970s with “no training or experience” with a goal to “simply create a livelihood for [her]self.” Early into her business Roddick recognized an opportunity to orient The Body Shop around a key social cause she supported: advocating for ethical, sustainable cosmetics. Drawing upon her time in Tahiti and South Africa, Roddick knew first-hand the effectiveness of using natural materials in beauty products (Lyall, 2007). This choice of purpose shaped the subsequent product offerings, capabilities and positioning of the firm, leading The Body Shop to become a leader of a new category of ethical cosmetics. The Body Shop exemplifies the concept that rather than being predetermined, the purpose of a firm is shaped by founder choice – in this case, Roddick may have had the impetus to form her firm to control her

own livelihood but made a choice to define her firm purpose to create shared value (Porter and Kramer, 2011).

Internal Capabilities: Similarly, founders have the opportunity to shape their start-up's internal capabilities through their choice of early hires, their organizational design (e.g. incentives, team responsibilities) and their early capital investments that collectively shape their organizational culture. Organizational culture has been a core field of study in organization sociology since at least the 1980s and although there is no dominant overarching framework, a seminal work is Edgar Schein's "iceberg" model. Schein divides organizational culture in three levels: artifacts and behaviors which are tangible characteristics observable by external parties (e.g. dress code, organizational structure), espoused beliefs (e.g. employee attitudes, shared goals) and the tacit underlying assumptions that affect firm behavior (Schein, 1985; 1990). Although this model has been an influential exposition of culture, it is challenging to apply for entrepreneurs who do not have an existing culture that can be analyzed. We argue the bridge between this model and practice is to realize that founders can choose from multiple cultures: founders can choose what internal capabilities to prioritize for investment, whom to hire for, how to design their firm and ultimately what kind of company they build.

External positioning: Another facet of identity founders must choose is that of their positioning and reputation as a firm. This is an area well-treated by competitive strategy (Porter, 1985) as a choice of the entrepreneur that can determine the trajectory of the firm. Consider for example, Elon Musk and his positioning of Tesla Motors. He could have chosen to position Tesla as an innovative entrant in the market for electric vehicles, which would have allowed him to capture the market leadership position rather quickly. Instead, he chose to position Tesla in the high-end luxury market of the broader automobile market, that not only had more incumbent competition but also required the Tesla automobile to be on the frontier on many dimensions (e.g. size, comfort, connected apps, material quality). This choice of positioning not only helped coordinate Tesla's internal investments in research and development, but also helped external stakeholders such as potential customers and investors to envision the industry-reimagination that Tesla was aiming for.

Ecosystem: Relatedly, founders also have a unique degree of choice in the geographic ecosystem they want to participate in. There is a well-established literature on the economic agglomeration of entrepreneurial activity (e.g. in centers such as Silicon Valley and Boston) driven by factors such as lower fixed entry costs and a higher concentration of entrepreneurial peers and auxiliary services (Saxenian, 1996; Delgado, Porter and Stern, 2010; Feldman, 2001; Glaeser, Kerr and Ponzetto, 2010). These studies however, examine growth entrepreneurship at an aggregate level and should not be interpreted directly as identifying "optimal" ecosystems for an individual start-up. Instead, applying entrepreneurial strategy suggests there are actually multiple potential ecosystems that an entrepreneur could choose to participate in, each that could lead the start-up to a different firm identity. As an illustrative case consider Brint Markle, the founder of Avatech, an avalanche-detection technology company. Originally launched in Cambridge, MA the founders were in school, at graduation Brint and his team had to make a decision about where to grow their business. On the one hand, the Boston area ecosystem provided them

with access to a rich engineering talent pool and exposure to some of the most cutting-edge research in electronic sensors. On the other, cities in Colorado and Utah provided the team with access to avalanche safety and rescue experts as well as the foremost ski and snowboarding athletes in the country.¹⁵ Ultimately, the Avatech team envisioned building a company that would advance snow safety for the backcountry community and chose to locate the company in Park City, Utah. Overall, this simple example reiterates our argument that applying this choice-based approach to entrepreneurial identity can help translate and align the literature with practice. Choosing to situate in a particular location opens an entrepreneur not only to local peer effects and knowledge spillovers, but also begins imprinting the internal and external identity of the firm.¹⁶ Founders therefore should view the ecosystem they participate in as a choice, and consider how different geographic and network locations fit with other elements of their firm identity.

Overall, founders need to carefully choose their entrepreneurial identity as their initial choices they make about their identity will exert a strong influence on their top management team and overall future identity of the start-up (Beckman and Burton, 2008). Rather than leaving something so ingrained to happenstance, entrepreneurs should actively choose the identity that best accords with their vision of the firm they want to build.

Choosing the Competition. Competition is an area well-treated by mainstream strategy research (Besanko et al., 2009; Tirole, 1988), perhaps most famously by Michael Porter with the development of his Five Forces framework (Porter, 1985, 1996). Under this approach, a firm should analyze the dynamic forces that shape its competitive environment: its existing customers, its suppliers, the current rivals, the threat of future rivals and the existence of potential substitutes. In the aggregate, firms that understand these forces will be better poised to develop and maintain a sustained competitive advantage while minimizing rivalry. Similar to larger firms, entrepreneurs must also pay consideration to the choice of competition but because they are often premised on ideas that may shape and change the industry and competitive environment they enter, such ex-ante analysis may be difficult to conduct.

We argue that framing competition as a choice for entrepreneurs allows them to think about how to compete on their own terms. While no entrepreneur has the luxury of choosing not to compete, competition should not be treated as an environmental fact. Instead, competition is a two-dimensional choice of with whom and how to compete that drastically shapes the direction of a venture by determining the competitive environment with which it will be entering and how the firm will interact and shape the landscape. To be more specific, for a given idea, entrepreneurs need to choose whether they want to pursue a route to commercialization in cooperation with established players, or construct an independent value chain that competes with established players. In addition, regardless of whether they choose to compete or collaborate, they must also consider how their venture is likely to

¹⁵ To be clear, both of these ecosystem options were better aligned with their vision for Avatech when compared with the Sunnyvale, California ecosystem in Silicon Valley which is concentrated with high-potential start-ups (Guzman and Stern, 2015).

¹⁶ For example, a choice of a particular ecosystem could influence a start-up to be more oriented towards execution and competition whereas another would be more inclined towards control.

evolve if they choose to compete on the basis of agile and speedy execution versus competing on the basis of strong bargaining power and enforcement of control.

Perhaps it is the choice of competition in which the paradox of entrepreneurship becomes most easy to see: experimentation with one path such as collaborating or execution, can cut off future options to experiment with competing or control, and vice versa. In addition, it is also often an ideal anchor for our choice-oriented framework as most ventures are founded on an idea based around a customer insight, a technology breakthrough or an idea for building a different kind of company.



Figure 7 Most entrepreneurial ideas are grounded in a customer insight, technological breakthrough or idea for building a new kind of company. Thus this makes competition a choice point that both illustrates the paradox of entrepreneurship most saliently, but also serves as an ideal choice point for organizing the discussion around the other choices. To illustrate, consider that Facebook was founded on the idea that college students (at Ivy League schools) could be well-served by an online social network (Giuliano, 2004); Google was founded on the idea of a more effective algorithm for search us (Batelle, 2005), and Amazon was based around building a company optimizing on cost (Entrepreneur, 2008).

Since ideas are usually grounded in these three areas, it is useful to consider competition as a more open-ended dimension of choice for most start-ups (i.e., companies are usually founded with the premise of creating value from an idea, and the competition choice delimits how value will be captured). By considering alternative ways to address with whom and how to compete, founders can clarify distinct alternative visions for their idea, and how their orientation and investments will impact the evolution of their venture. We therefore consider each of these distinct dimensions – with whom to compete and how to compete – in turn.

Competition versus Collaboration. The firm dimension of competition choice concerns the choice of with whom to compete against. Though the potential for competition is always present, a fundamental strategic choice to be adjudicated by any founding team is whether or not their ideal route to commercialization is in cooperation with established players, or whether their ideal route to the market involves constructing an independent value chain, which in most cases will then compete with established players.

Following a rich literature in innovation strategy (Teece, 1986; Arora, Fosfuri and Gambardella, 2004), it is well known that entrepreneurial firms face a choice between competing in the product market directly with incumbent firms or operating in the ideas market by collaborating with those firms through licensing, alliances and/or acquisitions.

While this key choice for entrepreneurs is shaped by outside factors such as the strength of intellectual property and the importance of complementary assets (Gans and Stern, 2003;

Gans, Hsu and Stern, 2002), there is often unresolved uncertainty and irreversibility as a result of disclosure problems that make this a meaningful choice for entrepreneurs that can impact on their future commercialization path (Gans and Stern, 2000). On the one hand, the control over costly-to-build complementary assets is a key wedge between the capabilities of start-ups and more established firms in an industry, and the inability to acquire these resources cost-effectively has an important impact on the ability of the start-up to both create and capture value. When specialized complementary assets are required, the sunk costs of product market entry are likely to be substantial. Simply put, a more “cooperative” approach with established players could reduce the costs of market entry borne by the start-up, may enhance the speed and scope of diffusion of the idea, and lessens the threat of competition from the large incumbents in a particular market. At the same time, constructing an independent value chain offers the start-up a higher degree of operational freedom, and also enhances the ability to capture value once that value chain is in place. By constructing one’s own value chain, a start-up avoids granting control rights over the ways in which their idea is commercialized to incumbent players (whom might have incentives to thwart or slow down the entry of a start-up’s innovation if it threatens current offerings). Additionally there may be situations where the existing value chain structure may be designed ineffectively for the segment of consumers a start-up intends to serve. In those cases, despite the costs of constructing an independent value chain, it could be even more costly to commercialize through traditional channels.

This choice is a crucial but difficult one at the time of founding: the hassles (and potential for expropriation) of working with established firms is difficult to forecast in advance and it is equally difficult to forecast accurately the costs and resources that will be required to establish a value chain from scratch on an independent basis. As well, the degree of cooperation from the established firm and their ability (and interest) in competing in the product market with new start-up entrants on a head-to-head basis will be difficult to predict beforehand.

However, there are important consequences of this choice that are both predictable and allows an entrepreneur to proactive in managing the challenges that are likely to arise. For example, if a founding team undertakes a more cooperative approach, it will be important to rapidly focus on aspects of their idea that reinforce the value they provide to the customers of the established firms and they will need to orient their technology choices in a way that allows for integration with the systems and offerings of the established player (e.g., emphasizing compatibility and their role as a value-added service). The company itself will also be shaped by such a choice: whereas a company that seeks to compete with established firms must build out the full value chain, a more cooperative approach is likely to be premised on a team that can work in an effective way with larger organizations and invests in developing comparative advantage in those capabilities and problem areas that are the focus of the firm’s effort.

Ultimately, the choice between competition and cooperation is fundamental and drastically shapes the direction of the venture: though entrepreneurs are not able to choose not to compete, the decision to collaborate with established firms means they faced a more limited

and significantly different competitive landscape than if they were to choose to compete with those very firms.

Execution versus Control. The second dimension of competition choice concerns the choice of how to compete. Here we distinguish between two directions of investment an entrepreneurial firm can make. One direction is to invest in control which is normally associated with the set of tasks and time to secure formal intellectual property protection or activities designed to keep an idea secret and only disclosed to a minimum number of people. We call this control precisely because it involves the entrepreneur facing the paradox of entrepreneurship by taking a measured approach to keeping future options open that may be subverted should the idea be able to be exploited by others. Founding teams pursuing this route invest their scarce resources in securing a certain amount of “control” over their idea. For a technology-driven start-up, investments in formal intellectual property protection, though expensive, can allow a start-up to exclude others from direct competition or enter negotiations with a supply chain partner with a significantly enhanced degree of bargaining power. Almost by construction, prioritizing control over the “idea” raises the transaction costs and challenges of bringing the technology to market or working with customers or partners, but it does enhance the ability of the start-up to capture the share of value that is being created. Formal intellectual property protection such as patents is not the only way that the founders can maintain control over their idea. Trade secrecy, proprietary methods or algorithms, and even employment practices such as non-competes can all contribute to allowing the founders to enhance their ability to control who has access to the technology or not, even as they share the basic “idea,” early prototypes, or even commercial products with others.

The other direction, by contrast, is to invest in execution. In contrast to control, this can involve a rapid move to commercialization and development involving more partners. And while control is about building up entry barriers that can protect the firm against competition in the future, when a venture focuses on execution, it expects such competition as it leaves entry barriers relatively low. Instead, it uses its rapid move to market to build up capabilities to beat out competitive threats when they arise. Start-ups pursuing this route prioritize the ability to experiment and iterate on their ideas directly in the marketplace. In other words, the founding team invests in executing rapidly and working with customers, suppliers, and investors who can contribute to the venture’s success – with issues of intellectual property or ultimate control over the “idea” put off for future discussion. The venture is simultaneously free to become its own best advocate and the founders are able to engage various stakeholders in the type of fluid and open communication that can help identify key customer priorities or help overcome supply chain bottlenecks.

Similar to the choice between competition and collaboration, the choice between execution versus control is crucial. Of course, not all ideas can be patented (or receive effective intellectual property protection), and innovations vary with how “leaky” they are likely to be in terms of the ability of competitors to imitate or potential partners to be able to exploit the idea without approval. For any given idea, however, founders need to consider how their venture is likely to evolve if they focus on execution – competing on the basis of speed and agility, versus control – competing on the basis of strong bargaining power and

a reputation for enforcing control over their idea. From a customer choice perspective, founders focusing on execution are more likely to start by choosing a narrower customer segment, prioritizing learning from early adopters versus a control-oriented start-up which, though slower, may be able to position themselves to broader markets when they do enter. At the same time, execution-oriented start-ups are more likely to iterate on their technology (ride the “S curve”) rather than focus on transferable and generalizable technologies that are subject to standardization. Finally, the choice between execution and control is likely to have significant impact on the company that is built. For example, where execution-oriented start-ups are more likely to encourage iterative experimentation and learning, control-oriented start-ups will still undertake experimentation but in a more deliberate and decisive fashion.

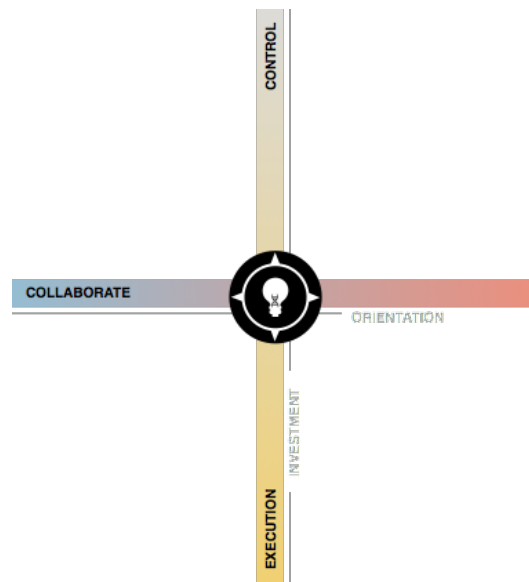


Figure 8 The two dimensions of competition, collaboration vs. competition and execution vs. control, help form a “compass” to organize our thinking of the interdependencies between the four choices.

Taken together, these two dimensions of choosing a competition – competition versus collaboration, and execution versus control --- forms a “compass” with the entrepreneur and idea at the center. This compass serves as an anchor to consider how these key choices of customer, technology, identity and competition interrelate to each other. Understanding these interdependencies is the basis of the third principle of Entrepreneurial Strategy:

Principle 3: These choices matter together

Given Principle 2, there are at least four core choices – customer, technology, identity and competition – that entrepreneurs must consider in choosing their entrepreneurial strategy, each of which have multiple alternatives to choose from. Given Axiom 4, this implies that any learning with partial commitment conducted for any of these four choices will alter not only the remaining alternatives in that choice, but also across the other choices (i.e. experimenting with a particular customer may not only foreclose other customer options, but could also render certain identity, technology, and competition choice alternatives

infeasible). Thus, it is crucial that rather than considering each of these choices separately, entrepreneurs must be able to recognize the interdependencies between the choices, develop multiple concrete alternative sets of these choices, leverage opportunities for potential complementarities and logically argue why their selected set of choices will cohere such that they are able to create and capture value. In other words, Principle 2 and Axiom 4 imply that accounting for the interdependencies and complementarities among different choices may be more important than effective choices regarding any individual choice.

To understand these interdependencies in a systematic way, we develop a novel conceptualization using the compass derived from the choice of competition as an anchor. This framework yields four alternative entrepreneurial strategy trajectories available for a given idea that can be contemplated by a given founding team: an Intellectual Property Strategy, a Disruptive Strategy, a Value Chain Strategy and an Architectural Strategy. Each of these strategies involves a distinctive set of choices regarding Customer, Technology, Identity, and Competition, and yields sharp predictions concerning specific interdependencies that can be leveraged by founders in translating their idea into a viable company.

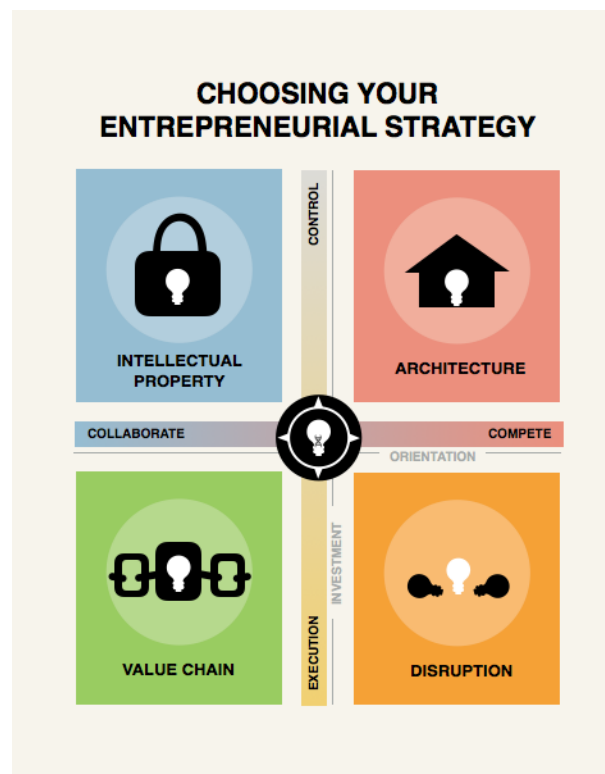


Figure 9 Entrepreneurial Strategy Compass framework. Organized around the choice of competition, this framework yields four distinct strategy trajectories available for a given idea: Intellectual Property, Disruption, Value Chain and Architectural.

5. These Choices Matter Together

Organizing entrepreneurial strategy around the choice of competition yields four quadrants of distinct strategies that a given idea can take on. We explore these four quadrants in turn.

Intellectual Property Strategy. Entrepreneurs pursuing an intellectual property strategy around their ideas choose to invest in *control* over their underlying innovation while aiming to construct a value chain through *collaboration* with incumbent firms in an industry in order to create value for the final end consumers.

As an anchoring example, consider Dolby Laboratories founded by Ray Dolby around his patented noise-reduction technologies. Dolby grew to become a global standard in audio for music and films, gaining and retaining market leadership for over 50 years.¹⁷ Interestingly, Dolby Laboratories itself achieved its multi-billion dollar valuation with limited direct interaction with film directors, music producers or audiophiles. Instead, Dolby followed an approach of licensing its proprietary technology to audio product developers and manufacturers including Sony, Bose, Apple and Yamaha among many others. By serving end customers from an arms-length away, companies that follow an intellectual property strategy like Dolby can manage to secure extraordinary returns by retaining control over its underlying idea while working with incumbents in the industry to create value for customers of existing firms by developing transferable innovations.

At its core, start-ups following an IP strategy are premised on a value creation hypothesis that their novel innovation can be transferred to the customers of the existing firms in an established market. IP strategy is unique in that, in order to implement it, an entrepreneur needs to know who their customer is on two layers: 1) Who are the final, end customers that will gain value from their idea? 2) Who are the established, downstream firms serving those end customers that are willing to pay in order to provide that defined value? Thus, given that the IP strategy is predicated on finding a paying customer that has the ability and incentive (downstream customers willing to pay) to integrate the technological innovation developed by the start-up, the choice of technology must accord with a seamless integration. An ideal technology would therefore be a modular innovation that could be slotted right into an established firm's operations with little to no integration costs or at the very least, have an initial track record of performance (Gallini and Scotchmer, 2002).

For an IP start-up the choice of how to use competition depends on the nature of its intellectual property assets and the dynamics of its potential licensees' industry (Teece, 1986; Arora, Fosfuri and Gambardella, 2004). At a basic level, if a start-up has secured a patent or trademark, it controls a tangible product or asset that can be described, licensed and transferred to others. Founders should license this asset exclusively if there are only a few dominant firms in the industry, as these firms will have a high ability and willingness to pay in order to exclude access to competitors, and subsequently grow its own market

¹⁷ Iconic films such as Kubrick's *A Clockwork Orange* and Lucas' *Star Wars* have credited Dolby technologies for elevating the level of emotional intensity films could convey. (As referenced to in <http://www.nytimes.com/2013/09/13/business/ray-dolby-who-put-moviegoers-in-the-middle-is-dead-at-80.html>).

share. In contrast, founders should license more widely if there are a number of firms in the industry as the ability to pay for exclusivity may be lower than the sum of all the firms' willingness to pay for access.

If a start-up does not have formal intellectual property protection, is based in a location with relatively weak institutions for enforcement, or operates in an industry with a poor track record of upholding IP, the founder needs to employ a strategy of working with established firms that hold longer-term perspectives coupled with developing the capabilities for continual idea generation. If an established firm becomes known for not paying for ideas presented to them, they are unlikely to have those ideas presented and, instead, will face more competition from rivals who have a better reputation for fair-trading in markets for ideas.

The role of the founding team from an identity perspective is centered on creating new technology (invention and innovation management), developing internal innovative capacity (and the ability to scan the external horizon for emerging trends and discoveries in their broad area), developing capabilities and resources to facilitate technology transfer, and, perhaps, serving a supporting role in the standard-setting process. At its essence, a successful start-up pursuing this strategy will become an ideas factory – a place where new ideas are conceived and developed to become complementary innovations for established firms.

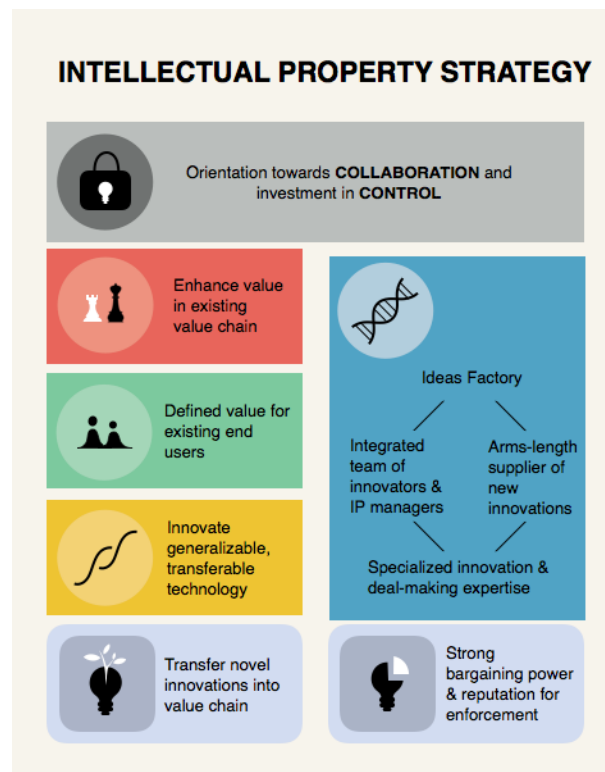


Figure 10 An Intellectual Property Strategy entrepreneur chooses to orient towards collaboration and invest in control.

Disruption Strategy. In stark contrast to an intellectual property strategy, entrepreneurs pursuing a disruption strategy around their ideas choose to prioritize *execution* and flexibility rather than control, and plan to engage in *competition* with industry incumbents by employing judo strategy and rendering them obsolete.

A classic example of disruption strategy is Netflix, founded by Marc Randolph and Reed Hastings in the late 1990s. Born out of frustrations with traditional video rental overdue fines, the founders envisioned a better solution for video rental that would leverage the then-emergent technology of DVDs. After immediately testing the concept by literally mailing a DVD through the United States postal service, Hastings and his team built out a novel video rental service that allowed avid movie watchers (i.e. those willing to pre-order their movies) to rent online, then receive and return movies on DVDs through the mail. Although they added additional innovations such as a recommendation engine online streaming later on, even in their initial strategy, Netflix was predicated on developing a new method of video rental that would render the traditional brick-and-mortar Blockbuster approach costly and obsolete. Companies like Netflix that pursue a disruption strategy are built on an orientation towards competition while investing in execution with the objective of establishing an independent value chain.

Start-ups pursuing this type of disruptive strategy are essentially seeking to create value by exploiting a novel technological trajectory (a new technology S-Curve) to develop a novel value chain differentiated and isolated from established players. In a disruption strategy, the customer choice should be a segment that is poorly served by existing firms, and ideally, a segment that would benefit from the value that an emerging technology could help deliver. These underserved customers exist typically because established firms have not found it worthwhile to develop solutions for their needs either because they are too small, or their preferences are at odds with the incumbents' current customers. Overall, in choosing the customer, disruption strategy founders should find those customer segments that are (a) under-served by existing firms and (b) can be served better by the new technological opportunity accompanying the new idea. The choice of technology should be focused on an emerging technology S-curve as those types of nascent technologies tend to be unexploited by established firms in the industry. Hence, there are opportunities to provide new services as well as opportunities for investment that improves the performance of those new technologies. Ideally, the evolution of the technology and the evolution of the firm's understanding of customer needs should go hand-in-hand, and so integration within these functions is important.

A disruption start-up is, by definition, one that has chosen a competition orientation against established firms in the industry by choosing to compete through execution. Disruption strategy founders, therefore, by choosing not to invest in control over their idea, will inevitably face the threat of imitative competition from incumbents and new entrants alike. They must try to delay this response as long as possible, which means not "mooning" the established firms by publicly declaring disruption. Thus, the choice of competition for disruption start-ups is about positioning the start-up in a way that takes advantage of the embeddedness of current established firms to prolong the period before they respond.

The identity of disruption entrepreneurs tends to accord with Schumpeter's notion of "creative destruction" in that the process of innovation requires "incessantly destroying the old [and] creating [the] new" (Schumpeter et al., 1942). At its heart, disruption strategy founders are building on their ideas with a theory that they can take advantage of the hidden weaknesses in current established firms and gain a stronghold before they react. This implies that time is of the essence for disruption start-up founders, and they must move quickly following practices from the lean start-up movement (developing products that can be quickly put into the market for customer feedback and improved upon with limited resources being deployed).

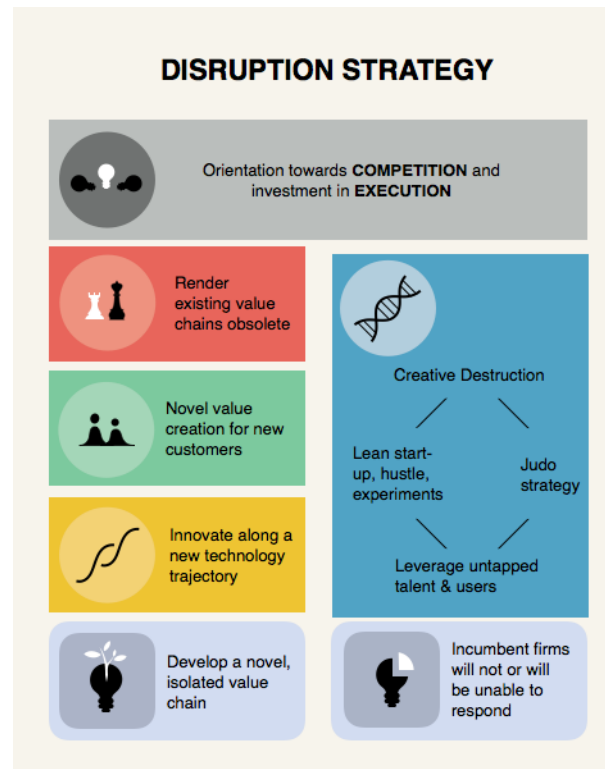


Figure 11 A Disruption Strategy entrepreneur chooses to orient towards competition and invest in execution.

Value Chain Strategy. Similar to a disruptive strategy, entrepreneurs pursuing a value chain strategy around their ideas choose to invest in *execution* rather than control. The fundamental difference however, is that value chain strategy entrepreneurs create value through *cooperation* with industry incumbents.

The concept of value chain strategy is well exemplified by Infosys, founded in the 1980s by seven engineers with only \$250 USD. The founding team saw an opportunity to leverage the growing developments in information technology and software to help US companies tap into the skilled global workforce, in particular in countries like India. As co-founder and later Infosys CEO Kris Gopalakrishnan explains, Infosys has focused on serving a unique role "help[ing] client[s] be more competitive in a globalized world," amassing clients like Accenture, Ernst & Young and Deloitte among others. Infosys and other companies pursuing a value chain strategy choose to orient towards collaboration and

invest in execution with the objective of playing an integral role in an established value chain.

At its heart, a value chain strategy involves the integration of an idea into an established value chain in order to both enhance the market power (of that value chain relative to others) and allow the start-up to establish and sustain bargaining power (within that chain). Perhaps more so than any other of the four strategy profiles, a key element of a value chain strategy is careful positioning of the venture to create value in a unique and distinctive way, for a particular “layer” of the value chain (Williamson, 1993). Rather than serving “fringe” customers as in a disruptive strategy, value chain entrepreneurs should seek to articulate a value proposition that will be meaningful for customers already being served (or soon will be served) by an existing firm. Relative to an intellectual property strategy, a value chain entrepreneur can take advantage of a significant period of experimentation and learning working with their partner and final customers to identify exactly how (and for exactly whom) one should target their offering.

The role of technology in a value chain strategy is somewhat more complex. On the one hand, value chain entrepreneurs want to not simply take advantage of innovation but identify a promising technology trajectory that incumbent firms have yet to exploit. This argues in favor of focusing on a novel technology (a new S-Curve) that has the ability, over time, to outpace current technologies in terms of performance and creating value for customers. At the same time, a successful partnership with established firms requires that the value chain entrepreneur integrate the technology and innovation into the processes and design of the existing value chain. This creates a tension between the unfettered exploitation of the new technology and the need to integrate that technology into established systems.

Successful value chain entrepreneurs must actively manage and resolve this tension. Success will depend less on the intrinsic value of the technology (as might be the case when one is pursuing a disruptive strategy) than on whether the technology can be meaningfully and practically integrated into the value proposition of a partner. Consequently, rather than simply investing in the power of the new technology, the value chain entrepreneur must also prioritize creating a bridge between the new and old technology. This integration can be achieved in a number of ways, including the development of modular interfaces, the creation of a collaborative product development team across the two organizations, and perhaps limiting the number of “bells and whistles” in order to focus on compatibility and the primary use cases faced by the customers of the partner.

By definition, value chain entrepreneurs have a competitive oriented towards collaborating with existing firms to enhance the value received by end users. Successfully capturing some of that value however, depends not only on a value chain start-up’s own positioning, but also on the choices and actions of the firms its partners with. If other firms in the value chain cede the responsibility for a given set of activities to the start-up, it will be possible for the start-up to accumulate bargaining power based on its capabilities over time; conversely, if partners actively seek to undermine the start-up’s potential to scale, the start-up may be limited in scope (even though the technology and ideas developed may

nonetheless flourish). Consequently, within a value chain strategy, the key choice in terms of competition is really centered on the choice of with whom to partner.

One of the most challenging aspects of choosing a value chain strategy is defining and maintaining a distinctive entrepreneurial identity. While control-oriented strategies allow entrepreneurs to organize their identity around a specific technology, and disruptive entrepreneurs can leverage an unfettered entrepreneurial spirit, value chain entrepreneurs must establish a distinctive identity even though they do not control its idea nor are they able to pit themselves against the “world.” Instead, the identity of a value chain start-up is centered on developing and growing its “core competency.” In other words, value chain start-ups form an identity around fulfilling an irreplaceable function in the value chain through their integrated team and the unique and specialized capabilities it develops.



Figure 12 A Value Chain Strategy entrepreneur chooses to invest in collaboration and invest in execution.

Architectural Strategy. The final strategy in the entrepreneurial strategy framework is the architectural strategy, which similar to the intellectual property strategy requires entrepreneurs to invest in *control* over their underlying innovation. A key distinction however is that architectural strategy entrepreneurs plan for competition against existing incumbents by developing a new value chain in the industry.

A clarifying example of architectural strategy is Bloomberg L.P., founded by Michael Bloomberg on the idea of bringing computers into the trading room to “make a difference

in the world of money and investing”¹⁸ by providing large quantities of real-time financial data to analysts. From the outset, Bloomberg believed the terminals Bloomberg L.P. was developing offered differentiated value from what the financial media industry offered, and followed an aggressive strategy of pitching and signing Merrill Lynch, one of the largest players on Wall Street, as its first customer. In addition to product innovation, Bloomberg engineered a unique business model in which Bloomberg L.P. retained actual ownership of the terminals, selling subscriptions on a per-user basis. Over time, Bloomberg L.P. was able to leverage its desktop presence to build out into secure messaging services, which had strong network effects, as well as broader financial news aggregation, which made imitation all the more costly. Throughout the next three decades, despite another information technology revolution in the interim, Bloomberg L.P. secured and retained a market leadership position with over 300,000 subscribers for its terminals,¹⁹ translating to billions in revenues annually. Bloomberg L.P. and other companies that follow an architectural strategy are in domain in which entrepreneurial strategy and traditional strategy overlap: architectural strategy requires entrepreneurs to invest in control over their core idea, while taking an orientation towards competition with established firms in the industry.

Unlike the other strategies, architectural strategy is about architecting an entirely new value chain in the marketplace, rather than boosting the performance of an existing value chain or trying to render them obsolete. Architectural entrepreneurs must, therefore, focus on establishing a sustainable competitive advantage to that allows them compete against existing value chains (Porter, 1985). Choosing this path therefore requires entrepreneurs to figure out how to build a new, integrated value chain that delivers value to customers while also building an “economic moat” such that they maintain control over their idea as they compete directly against incumbents.

Architectural entrepreneurs can establish competitive advantage through the traditional strategic approaches of either lowering the cost of delivering a certain type of value or offering a unique or increased amount of value through a differentiated product or service. In such cases, they can employ the tools of traditional strategy to maintain control through developing supply-side or demand-side economies of scale, increase customer switching costs, securing proprietary access to key assets or investing in formal intellectual property control rights. Increasingly, however, many architectural founders have also sought to establish competitive advantage through an alternative strategic approach of building a platform that brings together multiple actors in a novel way such that they increase the value end consumers receive, while also lowering transaction costs (Cusumano and Gawer, 2002; Gawer and Cusumano, 2002).²⁰ For these types of architectural founders, maintaining control requires “coring” the market by offering a novel and essential value to the market, as well as “tipping” the market by shaping market dynamics such that they become the standard platform of choice.

¹⁸ Bloomberg, Michael with Matthew Winkler. *Bloomberg by Bloomberg*, (1997, John Wiley & Sons, Inc.), Foreword, p. V.

¹⁹ <http://qz.com/84961/this-is-how-much-a-bloomberg-terminal-costs/>

²⁰ Platforms can exist in the other types of entrepreneurial strategies however creating and controlling a market intermediary is well aligned with the logic of an architectural strategy.

Start-ups pursuing an architectural strategy aim to choose customers with high influencer value such that they can serve as reference points for subsequent customer segments. To be clear, this means architectural entrepreneurs will be competing for either the existing customers or the target customers attractive to incumbent firms. Given that architectural founders are competing for the customers of incumbents, they do not have the luxury of evading detection. Thus, they must forecast and prepare for the competitive response by determining what the key linchpin of their idea they must secure.

As an architectural strategy is predicated on building out and sustaining control over a new value chain, the choice of technology must support and reinforce investment in that value chain. In particular, the entrepreneur should focus on a new technology S-curve that allows the start-up to control the technology as it progresses rapidly in performance such that it can maintain leadership over potential rivals.

More than in any other strategy, architectural founders must be committed to their vision and plan. Often because they are operating ahead of the current market curve there may be no existing models to reference or learn from. Thus, architectural entrepreneurs must be able to have the strength of conviction in their idea and strategy to make the commitments necessary to build out their value chain and invest in protecting that value chain from incumbent competition. Perhaps best characterized by Peter Thiel: “zero to one moments in business happens only once” (Thiel and Masters, 2014). Architectural entrepreneurs must have conviction in their ability to create an entirely new value chain and going from “zero to one” while making commitments that allow them to maintain sustainable control over their underlying idea.

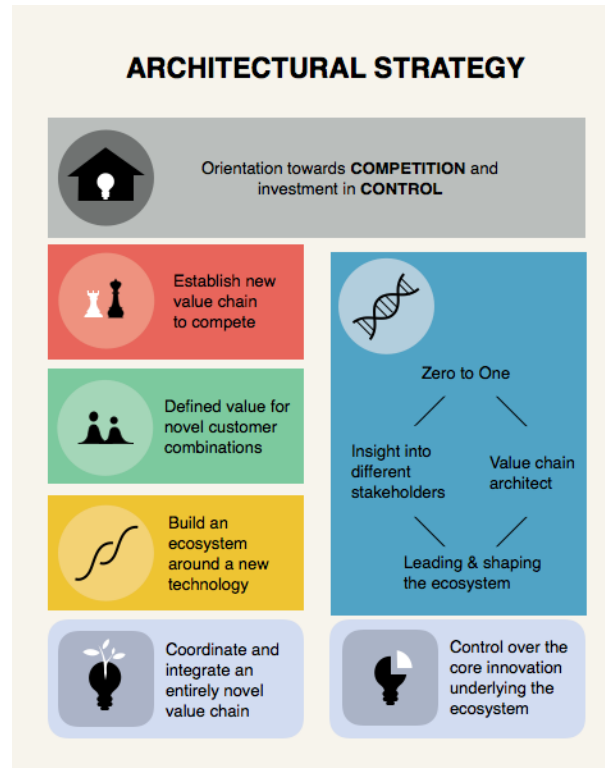


Figure 13 An Architectural Strategy entrepreneur chooses to orient towards competition but invest in control.

6. Choosing an Entrepreneurial Strategy

Principles 1, 2, and 3 come together to form the basis of entrepreneurial strategy, which we define as the set (or sequence) of choices a founder (and her team) make to test a value creation and value capture hypothesis when entrepreneurial experimentation requires partial commitment. In other words, entrepreneurial strategy is the plan that a founder undertakes when confronting choices that satisfy the four axioms. To understand what we mean by entrepreneurial strategy, it is useful to contrast this definition with two leading alternatives for considering how to manage an early-stage venture: competitive strategy and the lean start-up approach.

In the first instance, contrast our definition with the most common definition for as a competitive strategy: the plan of action chosen by the general management of a firm that allow that firm to create value and capture value over an extended period of time. Three crucial distinctions stand out. First, entrepreneurial strategy highlights the explicit role of choice and the fact that there may be multiple equally viable alternative paths for a venture that cannot be pursued all at the same time. Entrepreneurial strategy does not presume that there is one “best” plan for a given idea or environment (or more specifically that this would be knowable to the decision-makers at the time the choice has to be made); instead, entrepreneurial strategy emphasizes the urgency for structured choice when multiple options are available yet there is lack of clarity about how to prioritize among them. Second, entrepreneurial strategy is explicitly about planning to test a value creation and

capture hypothesis rather than necessarily commit to that plan over an extended period of time. The emphasis in entrepreneurial strategy is about the need to make partial commitments that allow the founders to learn about whether a particular path is likely to create and capture value in a meaningful way rather than necessarily the precise plan associated with undertaking that strategy over time. Indeed, it is possible that testing a value creation and capture hypothesis involves a very different set of actions than would be required to implement that hypothesis: for example, where the “test” might involve working with one customer segment that can provide rapid feedback and tolerance for technical experimentation, that “test” would be in service of ultimately establishing a larger market with less tolerant or interactive customers. Finally, by its very nature, entrepreneurial strategy is transitory in nature. Entrepreneurial strategy is the choice of a founding team early in the evolution of a new establishment, putting that venture on a path that (in the best case) results in the establishment of a sustainable competitive strategy over time.

At the same time, entrepreneurial strategy is distinct from more action-oriented approaches to entrepreneurship, which emphasizes the centrality of testing underlying business models. To be specific, these methods differ from entrepreneurial strategy in two essential (and related) respects. First, by and large, action-oriented approaches (and the lean start-up approach in particular) abstract away from the necessity of partial commitment. A focus on hypothesis-based alternatives implies that, after a test is conducted, it is possible to then subsequently make a choice independent of the impact that the experiment itself has had on the evolution of the venture. However, for some of the most central choices facing start-ups — such as their choice of customer, core technologies, organizational identity, and competition - the nature of entrepreneurial experimentation is distinct from that of a traditional scientific experiment. Entrepreneurial experiments do result in learning but also often require that viable “ex-ante” alternatives are forever left behind. The second key distinction from the lean start-up approach is the implicit assumption that the core choices facing a start-up can be resolved through an experiment that will generate meaningful data in advance of having to make commitments or scale. While there are many domains and applications for which this is of course true (e.g., variations of a product, pricing models, etc.), there are key areas where, even after all “commitment-free” learning has been undertaken, multiple equally viable paths still exist. By abstracting away from this possibility rather than placing it at center stage, the lean start-up approach cannot provide direct guidance to start-ups seeking to make core choices in the face of meaningful uncertainty.

Entrepreneurial strategy in contrast, emphasizes applying the choice-oriented framework in a way that directly confronts the paradox of entrepreneurship. To be concrete, we are proposing a new decision-making tool for entrepreneurs to consider and choose their entrepreneurial strategy formalized in Chavda, Gans and Stern (2016).

Test Two, Choose One. One of the greatest hurdles facing an entrepreneur with a promising idea is the paradox of entrepreneurship. Faced with Knightian uncertainty, entrepreneurs cannot determine the relative value of alternative directions without learning and experimentation. Such learning, however, induces at least some level of commitment that

can alter the alternatives available.

At a fundamental level, we have argued that choosing an entrepreneurial strategy means choosing among business models in the context of this paradox. While current debates in the start-up community and entrepreneurship literature abstract away from this interplay between uncertainty, action and commitment, entrepreneurial strategy offers a new alternative: when there is uncertainty about the expected value and variance of alternatives, founding teams should (1) iteratively eliminate alternatives using commitment-free analyses until they reach the paradox of entrepreneurship where they are faced with at least two equally viable and attractive alternatives that cannot be ranked without making some level of commitment to one and (2) after reaching the paradox, the entrepreneur should then carefully develop two fleshed-out models of their business before choosing one of the alternatives to commit to.

For clarity, consider an entrepreneur that is evaluating two potential directions (A and B) for their idea. If after commitment-free learning and analyses A and B appear to have indistinguishable expected value, then the entrepreneur has reached the paradox of entrepreneurship. If, however, after such commitment-free learning, A is significantly more attractive than B (or vice versa) then they can eliminate B and should continue to search for other alternatives until they find one with the same expected value as A. This runs counter to standard intuition that would deem A the “winner.” Rather than immediately choosing A, the fact that there is an easy, commitment-free ranking of A as superior to B indicates that the entrepreneur has not yet pushed against the frontier of what is possible with their idea and that bearing the costs of searching for an alternative that is of equal or potentially even higher attractiveness than A is of value. In other words, if commitment-free analyses generate the finding that one alternative is superior to another, entrepreneurs should continue search until they reach a point at which they are faced with ex-ante equal alternatives such that making a choice to partially commit to one alternative requires leaving an attractive alternative behind.

Once an entrepreneur has reached the paradox then they can begin to consider each of the alternatives more carefully. The differences between these models should not be trivial (e.g., a slight change in the ideal customer, or a modest perturbation to the supply chain). Instead, for an ambitious entrepreneur it is worthwhile to first develop a clear and compelling vision for their business bringing together all of the core choices facing a start-up: choosing a customer, choosing a technology, choosing an entrepreneurial identity and choosing the competition. Then, the entrepreneur should work through the logic of an alternative strategic trajectory reconsidering each of the four choices. Because these two alternatives will be equally viable and attractive ex-ante, making a proactive choice about which one to pursue and more importantly, which viable version of the start-up to leave behind forces the venture to come to terms with their core values and identity, and clarifies the intentions and commitments of the founding team.

Entrepreneurial strategy is not a passive process: by explicitly encouraging entrepreneurs to iterate until they have at least two promising alternatives of which one will be left behind, it involves consciously choosing a customer, a technology, an identity as a company, and

the nature of with whom and how you will compete. Entrepreneurial strategy allows a founding team to make active choices about what capabilities to build, how to position themselves within a value chain and in the marketplace, and helps founders come to terms with how their values as founders shape the company they build. Entrepreneurial strategy involves developing and then choosing among a set of distinct choices that define a company as it translates an idea into a meaningful value proposition. We should emphasize that entrepreneurial strategy is intended to be a flexible framework that holds across many circumstances. Thus, the scope of entrepreneurial strategy will vary by context, for example in situations where there is a short window of opportunity, entrepreneurs may be constrained to emphasize only select elements of the framework. This still retains the essence of entrepreneurial strategy: more than asserting that strategy is about what not to do, entrepreneurial strategy involves active choice that result in leaving viable alternative paths venture behind.

It is important to recognize entrepreneurial strategy does come at a cost: experiments are costly, strategy formulation and implementation take time, and the types of strategic commitments that are inherent to establishing competitive advantage often involve significant capital expenditures. However, the alternative is even more costly: sequencing activities so that expensive choices are made upfront locks ventures into commitments and activities that are difficult to unwind. Sometimes these decisions seem innocuous, such as when companies seek to gain traction by giving away early versions of a product, only to find that they have lost pricing power forever. In other cases, start-ups find themselves subject to circumstance rather than choice, such as when they commit themselves to providing the needs of an early customer, precluding their ability to focus first on their “ideal” customer. The power of an entrepreneurial strategy comes from the ability to first iterate through alternatives that can be easily ranked (thus weeding out poor alternatives that can be deselected through optimization) and then confronting a choice among equally viable alternatives that allows the founding team to select on the basis of the kind of company they want to build rather than simply what would be required in order to fund the venture itself.

7. Conclusion

A fundamental feature of the new venture process is the process of entrepreneurial experimentation and learning – but the value of such experiments are higher when guided by an entrepreneurial strategy process that allows for meaningful commitments to be made. This paper develops an integrated framework that defines and delineates the scope of entrepreneurial strategy, clarifies the choices and complementarities that shape entrepreneurial strategy, and proposes a choice-oriented decision-making tool for implementing entrepreneurial strategy. Our argument has been that by placing the entrepreneur and their idea at the center of entrepreneurial strategy, we are able to make conceptual progress on traditional strategy and entrepreneurship research, reframing them with a focus on resolving the tension between learning and commitment through proactive choice.

A clear implication of this framework for entrepreneurs is to reject passivity and

haphazardness in the process of building a venture around their idea. Moreover, it emphasizes that conducting commitment-free learning and analyses (e.g. cost-benefit calculations) is an important step for eliminating clearly suboptimal paths, but is insufficient for entrepreneurs aiming to create an ambitious growth business. In fact, entrepreneurs must recognize that until they face the conundrum of having to leave behind an equally attractive potential business path, they have not yet reached the entrepreneurial edge of their idea. Applying the “Test Two, Choose One” tool ensures that entrepreneurs push against the paradox of entrepreneurship and ultimately deal with the unresolved uncertainty they face by systematically considering two business models, carefully thinking through the ambiguities under each alternative and making a choice. As an aside, although it is possible that this tool and other elements of the entrepreneurial strategy framework may be applied a broader domain of firms, the framework was developed with a focus on start-up firms in which the impact of learning and experimentation is large relative to firm size. Thus, it may be relevant for mature firms seeking to develop start-up spin-offs, in-house incubators, or for guiding corporate venture capital investments. For managerial-level decision-making under uncertainty however, we defer to the rich, established body of literature on traditional strategy.

By isolating the idea from strategic commitments in the development of a start-up firm, this approach offers new insights into traditional frameworks, particularly for pedagogy. Rather than teaching from the literature through the lens of environmental determinism, entrepreneurial strategy challenges the notion of an “optimal” starting customer, technology, competitive market or founding team identity by emphasizing the choice that entrepreneurs have between multiple, complementary combinations of the four choices. This choice-oriented approach to teaching instead uses these traditional frameworks as ways to structure thinking about how entrepreneurial choice will shape the trajectories the start-up will be on.

This choice-oriented approach also offers a new methodological agenda for research in three key ways. Firstly, the emphasis on choice necessitates the further development of novel decision-making tools that help entrepreneurs navigate the process of choosing under uncertainty. Though this paper broadly outlines one particular tool, “Test Two, Choose One” there is much need for further work. Secondly, this paper motivates the exploration of new empirical measurement and inference methods. The emphasis that entrepreneurial strategy places on the multiplicity of options available for a single idea requires an empirical approach to delineate initial ideas from strategy.²¹ This necessitates further exploration into empirical measurement of ideas (i.e. the features that determine if a set of ideas are in the same or distinct idea spaces). This also implies that in contrast to extant literature that primarily distinguishes innovation-driven businesses from lifestyle-oriented small to medium enterprises, entrepreneurial strategy research necessitates another layer of measurement that can distinguish between different types of innovation-driven strategies. Thirdly, entrepreneurial strategy highlights the need for further research into the

²¹ As an example of efforts on this front, Ching, Gans and Stern (2015) has explored this by building a dataset of start-ups based on academic papers (paper-start-up pairs) and measuring the commercialization strategies these firms undertake, identifying a potential way to disentangle the core idea of a venture from its strategic choices.

process of entrepreneurial choice. This may involve inquiries into the type and quality of mentorship that entrepreneurs receive (e.g. from investors, advisors) and how that interplays with the strategic choices and trajectories of start-up ventures. In addition, although we have framed the discussion of entrepreneurial strategy around initial strategy formation, we have anecdotal evidence that it can apply to start-ups at later stages in their development. This suggests it could be fruitful to investigate how this framework applies to entrepreneurial choice when a start-up has already committed to one or more strategic choices (whether intended or unwittingly).

Relatedly, although the scope of this paper focuses on the (potentially irreversible) choices entrepreneurs make at the outset of their firm, there is certainly the possibility for further research effort into dynamic entrepreneurial strategy. Understanding how entrepreneurs may make changes to their initial strategic choices over time requires taking into account the effects such initial choices may have for the firm and market (Gans, 2012). For instance, Gans, Hsu and Marx (2015) identify strategic “switchbacks” that can occur when the initial choice of a start-up to compete against incumbent firms can influence their subsequent bargaining power (e.g. by establishing the value of their innovation) that puts the firm in a better position to co-operate with incumbents later. It is also important to note that entrepreneurial strategy does not address the interplay between entrepreneurial finance and strategy, largely because the intricacies of financial contracts and a full exploration of the different financing vehicles available was beyond the scope of this paper. Nonetheless, we believe this is an area ripe for future research to investigate the strategic implications of “choosing your financing” including not only the financing mechanism (e.g. venture capital with priced equity or convertible debt, debt or equity crowd-funding, simple agreements for future equity, bootstrapping, etc.) but also the timing and sequence of financing.²²

Entrepreneurial strategy also has some potential implications for policy. Often, there are programs or approaches to publicly funded initiatives that emphasize a specific model for the commercialization process (e.g. NSF Innovation-Corps for example advocates the lean start-up methodology,²³ university technology licensing offices advocates licensing intellectual property²⁴). Although the ultimate validity of this claim should be based on empirical evidence, the entrepreneurial strategy framework suggests a better approach would be to take a more diverse lens on entrepreneurship, and design programs to allow for heterogeneity in preferences and choices among entrepreneurs. By emphasizing the entrepreneur’s central role and responsibility to choose their strategy, these programs would serve as a value-add conditional on the entrepreneur’s choice of commercialization path rather than a directive.

²² Hellman, T. and Puri, M. (2000) (and a large body of follow-on papers) explore the interdependencies between product market dimensions and choice of financing strategy. Subsequent work could explore the choice of financing strategy and the choices of customer, technology, identity and competition.

²³ http://www.nsf.gov/news/special_reports/i-corps/curriculum.jsp

²⁴ <https://tlo.mit.edu/>

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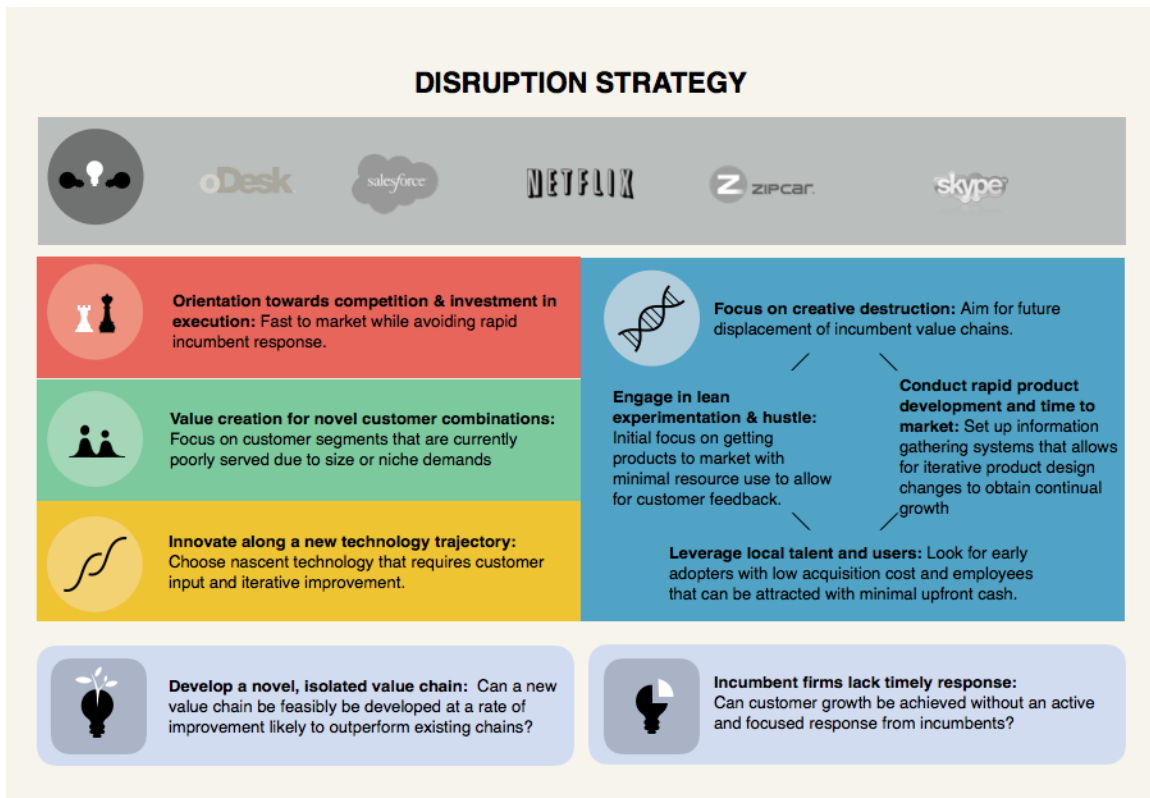
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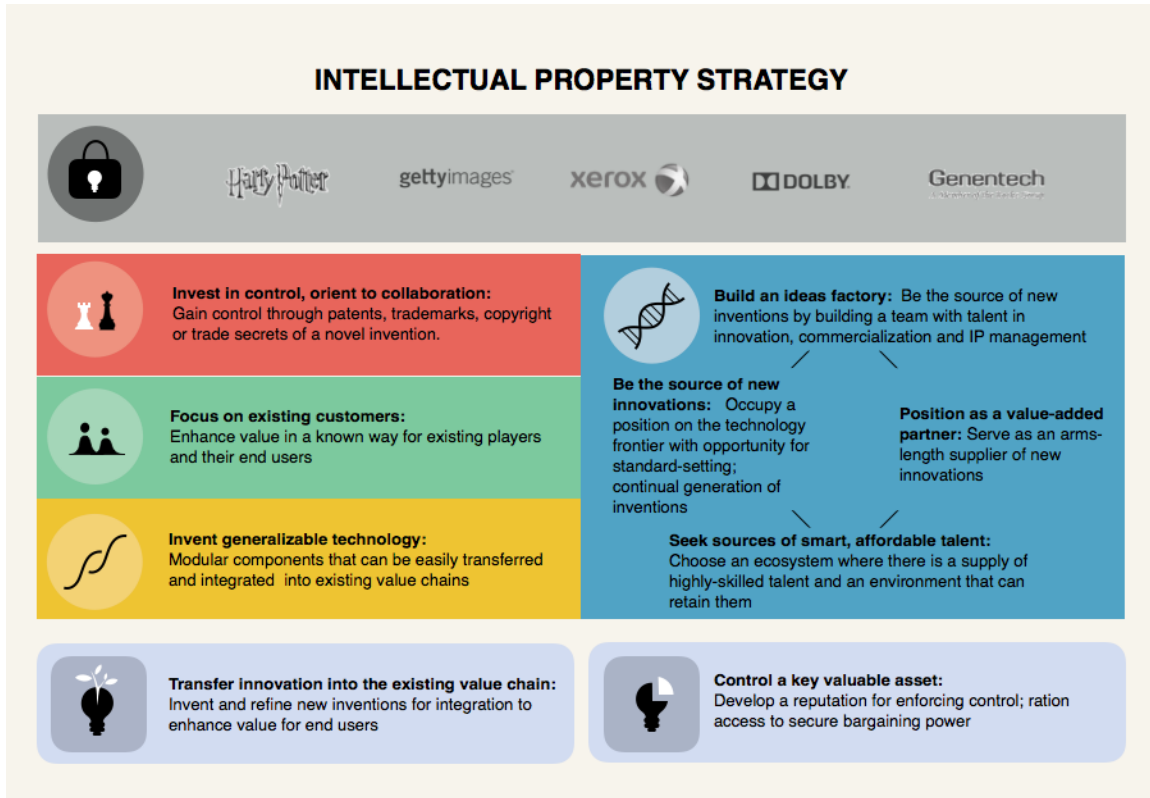
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Appendix

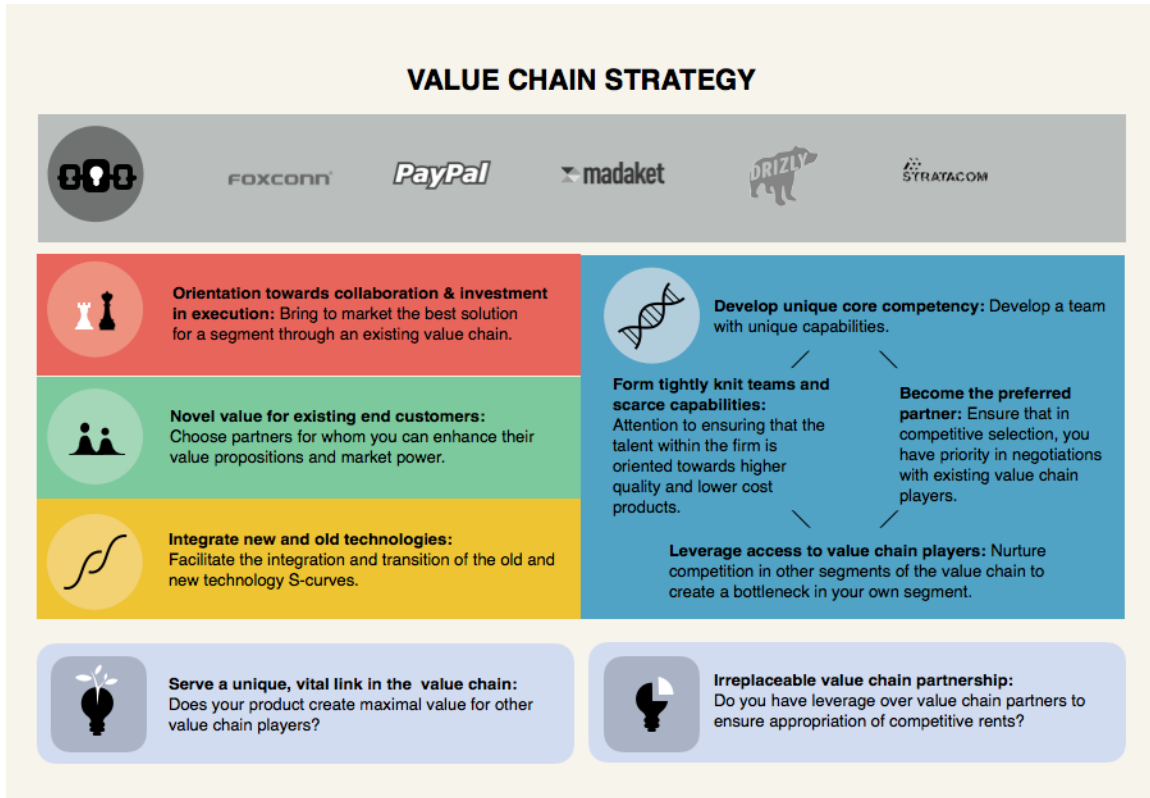
Appendix 1. Disruption Strategy.



Appendix 2. Intellectual Property Strategy.



Appendix 3. Value Chain Strategy.



Appendix 4. Architecture Strategy.

