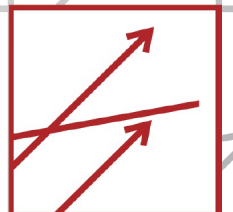




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Selecting Investments

**Disruption, Modularity,
and Jobs To Be Done**



Executive Summary

Many regard Dr. Clayton Christensen as one of the most impactful business thinkers of our time. His work, most notably *The Innovator's Dilemma*, introduced the concept of Disruption Theory to the world, and over the following decades, Clayton refined and expanded this body of research into a larger set of frameworks and tools. This body of work is central to our approach at Rose Park Advisors, as Clayton and his son, Matthew, founded the firm in 2007 with the goal of leveraging that research to drive exceptional investment outcomes.

This white paper offers a sampling of the frameworks and the insights they provide in investment selection.



Disruptive Innovation

The process by which an entrant comes to market with either a low-end foothold (offering something simpler and more affordable than incumbents) or a new-market foothold (finding opportunity with *nonconsumers*, or those who have never accessed incumbent offerings). Over time, as the disruptive entrant moves up market with a distinct business model, incumbent firms who have only been focused on serving their best customers struggle to respond.



Modularity and Interdependence

Industries dynamically and predictably shift from a state of interdependence, when firms vertically integrate to promise functionality and reliability, to modularity, wherein firms use plug-and-play components and resources to provide convenience and customization. The long-term success of any investment opportunity depends on whether a company matches its architecture (whether interdependent or modular) to where the market is headed.



Jobs To Be Done

Customers don't buy 'products'; they buy 'progress' needed in their distinct context and circumstances. This progress is necessary to get a specific Job done and is comprised of functional, social, and emotional components. Successful companies not only have a deep understanding of the Jobs of their customers, but their entire organization is structured to consistently help customers get their Jobs done.



Disruption At a Glance

The dilemma of disruption has proven vexing for large, incumbent firms because the nature of its origin is counterintuitive; successful firms fail when good managers do exactly what good managers are *supposed* to do. Like clockwork, a firm will introduce new products and services to delight its best customers in pursuit of increased profits and healthier profit margins. We refer to these efforts as **sustaining innovations**. Whether a sustaining innovation provides small, incremental product improvement or offers dramatic breakthroughs in performance, incumbent firms will predictably and tenaciously embark on a strategy of sustaining innovation to strengthen their business.

Disruptive innovations, in contrast, don't attempt to bring better products to established customers in existing markets.^{1,2} Rather, disruptive innovations introduce products that are not as good on established dimensions of performance while providing other benefits—typically simplicity, convenience, and affordability—that cater to an entirely different population of customers. From the perspective of incumbents, disruptive entrants cater to low-margin, low-value customers that are undesirable relative to their most prized customer segments. Unfortunately for incumbents, as disruptors improve their product offerings over time, products that were once only 'good enough' for a small segment of the market compete directly with mainstream offerings. As customers start to

Waves of Disruption: Each new generation of computing companies started out with simpler, less powerful, and more affordable versions of the generation before. Over time, as the underlying technologies improved, entrants disrupted large incumbents who were trying to maintain existing business models.

leave the incumbent and flock to more affordable and accessible offerings provided by disruptive entrants, disruptors overtake the incumbent. This phenomenon is a process, not a one-time event, and occurs in various sectors of the economy at any given moment.

A clear example of disruption played out several times in the history of the computing industry. In the 1970s–1980s, the computer market was led by very large and successful firms, including Wang, Prime, Digital Equipment Corporation, and Data General. The primary products these companies sold were called 'minicomputers,' desk-sized machines with the highest-end computing, software, and storage performance of the time. These minicomputers were purchased by large corporations and research institutions for upwards of \$100,000 to handle very large and complicated workloads.

Around this time, personal computers (PCs) were introduced, but unlike minicomputers, PCs were severely limited by way of processor performance and storage capacity. PCs sold for less than \$5,000 and at much lower profit margins than minicomputers. Manufacturers often sold initial units to hobbyists and families, a new and unproven market segment that minicomputer companies had no interest in serving. Over time, PCs became capable of handling more complicated workloads and minicomputer customers started to adopt PCs. As this process unfolded, Wang, Prime, Digital Equipment, and other incumbent computer firms were acquired or fell by the wayside. They were disrupted by PC manufacturers.

Many hear this story and erroneously assume that disruption is primarily a technological phenomenon, believing that scrappy startups operating at the cutting edge of technology are simply too difficult for incumbent managers to respond to. This is simply not the

Mainframes 1960s	Minicomputers 1970s	Personal Computers 1980s	Mobile Devices 2000s
IBM Burroughs Control Data Corporation UNIVAC Honeywell	Digital Equipment Corporation Data General IBM Wang Laboratories	Apple IBM Compaq Commodore Tandy	Apple Motorola Nokia RIM BlackBerry Samsung

case. First, disruptive innovation is often accomplished not with cutting-edge but rather well-understood, off-the-shelf technological components. Second, any effective manager at a large, established firm is constantly evaluating new technology on the horizon and often has the talent and/or resources to acquire, implement, and test it. This was certainly true of the minicomputer companies in the 1980s who easily saw the growing personal computer market and had the engineering talent to build and assemble PCs themselves.

To illustrate more concretely, consider the obstacles minicomputer incumbents faced as they watched the rise of the PC market. Their product development and engineering teams were organized to improve dimensions of performance that satisfied large, enterprise clients, not home users who had very different performance criteria. Enterprise sales teams had built a playbook to close large institutional accounts, a skillset that would prove useless when attracting individual consumers. Marketing and business development teams had established go-to-market channels to sell into enterprise clientele, not channels that would increase adoption in the personal computer space. Finally, incumbent firms' investors would have been asked to support plans to divert resources away from mature, cash-generating product lines to build out a low-margin business in an unproven market. An innovator's dilemma indeed!

Thus, disruption is primarily a business model phenomenon, not purely a technological one. The reason an incumbent firm struggles when faced with disruption is because its business model—the resources, processes, and priorities put in place to optimally serve its existing customers—is incompatible with the business model a disruptor has developed, making any form of response *extremely* costly.

Disruptors, by emerging at the bottom of a market with simple and affordable products, create a distinct set of capabilities relative to incumbents: different customers, different suppliers, new distribution channels, alternate go-to-market strategies, etc. These capabilities allow a disruptor to profitably move up market, and by the time the incumbent appreciates the threat, it's simply too late.

It is not a firm's technology alone but rather **how that technology can enable a disruptive business model** that affords the opportunity for transformative growth.

INVESTING INSIGHTS

- **It is not a firm's technology alone but rather how that technology enables a disruptive business model that affords the opportunity for transformative growth.** Investors need to carefully evaluate the business model of a company lest they find out that cutting-edge technology or the 'next big thing' is far smaller than advertised.
- **Disruptive entrants almost always make money in ways that incumbents cannot replicate, else the incumbent would have already exploited the market opportunity.** As investors seek to understand a company's long-term competitive advantage, careful attention needs to be made to the company's business model. The more distinct it is relative to incumbents, the higher likelihood it avoids intense incumbent competition.
- **A disruptive startup must demonstrate an ability to continuously move 'up market.'** Though any founder can claim that what is small and simple today will be large and sophisticated tomorrow, understanding how product performance will improve over time is crucial to evaluating long-term company success.

Low-End and New Market Disruption

After decades of studying disruption, we observe two types of disruption that we refer to as **low-end** and **new market** disruption. Rarely are disruptive firms exclusively one type or the other, but rather exist on a spectrum depending primarily on the types of customers a disruptive firm initially caters to. In both cases, the fundamental mechanism is the same: incumbent firms on a treadmill of sustaining innovation become generally disinterested and fundamentally incapable of responding to disruptive firms who have begun taking market share from beneath.

Low-End Disruption

The rate at which sustaining innovations improve a product or service typically outpaces the rate at which most customers can absorb those improvements. As an example, despite additional blades, auto-dispensing moisturizers, vibrating handles, and other improvements Gillette has pioneered over the years, most men's and women's shaving requirements haven't changed much for decades. All participants in a market exist on a spectrum—some customers are never satisfied, no matter how much performance is provided, while others demand quite little—but as a general rule, people's lives don't change much day to day, and what they demand from products or services don't change dramatically, either. When incumbent firms introduce sustaining innovations that many customers don't *actually* need, those customers become **overserved**.

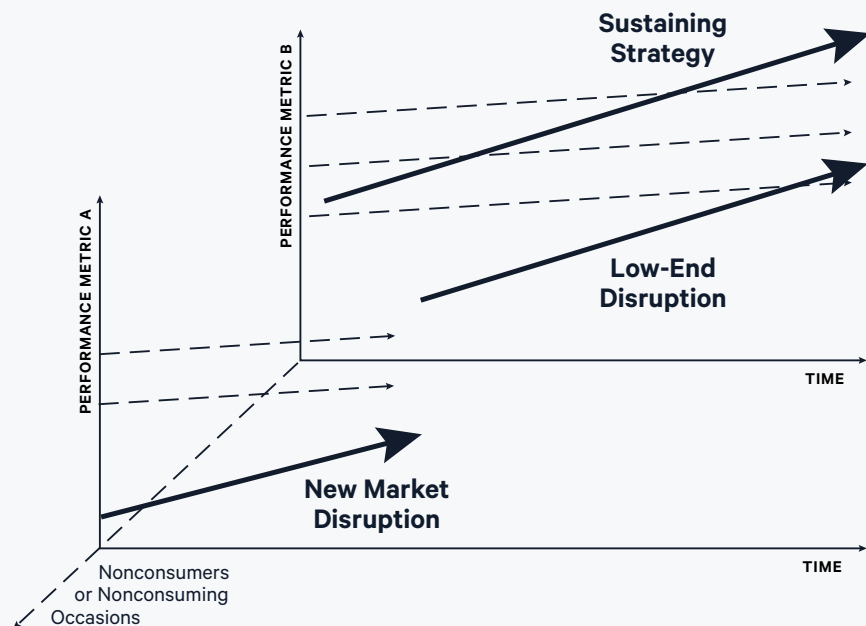
When overservice sets foot in a market, room is created for a low-end disruptor to emerge. A **low-end disruptor**, as the name implies, enters the *bottom* or *low-end* of an established market and begins capturing the least valuable customers from the perspective of incumbents. This causes incumbent firms to flee up market to capture better margins from better-paying customers. A low-end disruptor takes to the market something that is not performatively as good as incumbent offerings but is good enough for customers who value simplicity, affordability, or convenience. Importantly, disruptors do not enter the bottom of a market and stay there. Embedded within any truly disruptive firm is a business model and underlying technology that enables it to profitably move up market. The steel industry offers a helpful case study of this type of disruption.

For decades, the US steel industry was served by integrated steel mills. These massive facilities required hundreds of millions of dollars in up-front capital investment and were able to produce thick, strong, and smooth steel products for a variety of customers at high volumes. In the 1960s, a new approach to steel-making was introduced: minimills. Minimills would take as their input material

scrap metal, which meant that the surface quality and strength of steel produced varied dramatically based on the scrap that was used. Thus, the only market that minimills could enter at the outset was the concrete-reinforcing bar (rebar) market, where quality specifications were few and far between. The minimill production used a less expensive production process than that of integrated mills, which allowed minimills to sell rebar to customers at 20% lower prices than what integrated players could provide.

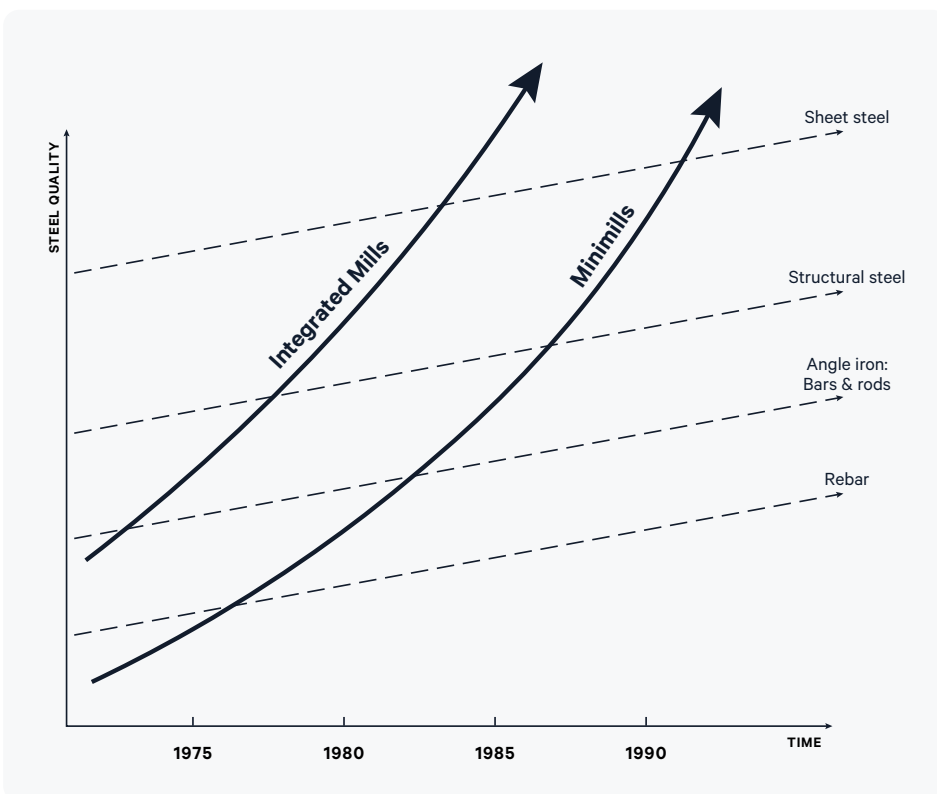
The entrance of minimills into the rebar market was not met with aggressive competitive responses by incumbents. Instead, integrated steel manufacturers focused their resources on markets that garnered more attractive margins and which minimill providers were unable to serve. By doubling down on bars and rods, structural steel, and sheet steel, integrated players were in part relieved to flee the low-margin rebar market.

Low-end disruptors, as in the case of minimills, introduce **asymmetries of motivation**. Disruptors are motivated to enter markets that incumbents find structurally unattractive, while incumbents are motivated to leave those segments in the face of low-cost com-



The Disruptive Innovation Model: Incumbents (represented by the top line) continue to move up market via sustaining innovation, often outpacing performance offered by technological advancements. This creates customers who are 'overserved' and thus are willing to adopt affordable 'good enough' solutions provided by disruptors (the bottom line).

petitors. However, once every incumbent flees the low end of the market, the relative price advantage enjoyed by the disruptors disappears, leaving them with only one option: improve their product offerings and move up market. Minimills did this by creating and leveraging technological developments in steel-making that allowed them to preserve their cost structure while simultaneously improving the quality of the steel. In the end, the very customers that integrated mills were trying to protect began to adopt lower-priced alternatives that were more than good enough in comparison. Integrated steel makers had been disrupted. As evidence of the opportunity present in low-end disruption, Nucor—an early minimill steel manufacturer—has seen a 12-fold increase in its share price over the past thirty years. U.S. Steel—a large integrated manufacturer—has seen 1.3x growth over that same period.



INVESTING INSIGHTS

- **A key look-for when evaluating a startup's approach is how it frames market competition.** If the conversation is all about incumbents, the startup is assuredly going to end up in a battle of sustaining innovation. Our research predicts that such a battle will often prove fatal.
- **A startup that is clear about performance tradeoffs is much more likely to maintain and build upon a disruptive strategy.** This was true of budget airlines like Southwest or Ryanair, who very blatantly avoided 'premium' features to attract the low end of the travel market. Investors must ask founders about the tradeoffs they are making to determine how clear their long-term disruptive vision really is.
- **A low-end entrant may have profit margins that look poor in comparison to established incumbents, but remember, this may be a critical long-term advantage.** As a low-end disruptor finds ways to make money at a margin profile that incumbents can't match, the threat of competition decreases.

New Market Disruption

While low-end disruptions capture share from incumbents within a known market, new market disruptions create new consumers by *competing against 'nonconsumption.'* They transform an existing product to be so much more affordable and accessible that an entirely *new* population of users can begin owning and using the product, effectively creating a new market. The personal computer example described previously was such a disruption—an entirely new market was built for individuals who previously were not computer owners at all. They were *nonconsumers* of computing, and disruptive firms like IBM and Apple found profitable ways to turn them into consumers. As with low-end disruption, the products offered by a new market disruptor are not better on the dimensions of performance that existing customers have previously valued, and thus cater to an entirely different set of users that incumbents are not motivated to capture.

The early transistor radios, offered by companies like Sony, were a new market disruption. Sony's first 'pocket' transistor radios had very low sound quality compared to the tabletop vacuum tube radios that dominated the industry. Companies like Zenith and RCA were motivated to sell home radios to families who would gather

around the living room to be entertained, thus there was a premium on volume and sound quality. Pocket transistor radios, in contrast, had two advantages over vacuum tube systems: they were much less expensive, and their small size allowed them to be portable. This combination made them appealing to a particular type of radio nonconsumer: teenagers. Teenagers wished to be able to listen to music with their friends and away from their parents, something a pocket radio perfectly solved for. Over time, as transistors became capable of handling more power, firms like Sony launched radio (and television) products that were so much more affordable than incumbent offerings that several incumbent radio manufacturers were disrupted.

One might read the above and assume that firms like RCA and Zenith simply didn't have the technical talent or know-how to move from vacuum tubes to transistors. But firms like RCA saw transistors on the horizon, and the technology was studied, evaluated, and piloted by their well-resourced R&D teams. At the time Sony came on the scene, transistors were not good enough to power tabletop systems. Meanwhile, managers at RCA and Zenith were focused on sustaining innovations and thus were eager to move into more profitable product categories that required even more power, a reality that made transistors far less compelling to pursue. Moreover, incumbent channel partners and profit margins were well-established by that point, making any attempt to build a business around transistor-powered electronics incredibly difficult. Incumbents sold their products into appliance and department stores that would collect revenue when customers came in to replace vacuum tubes that had burned out. This symbiotic value network was quite different from the one that Sony was building; Sony initially sold its products in emerging retail stores such as Kmart. By the time incumbent radio makers tried to replicate the retail sales model, the critical retail shelf space had already been taken.

A more contemporary example of a new market disruptive innovation is the rise of the smartphone, particularly in the developing world. Although high-end smartphones are comparable in expense to most desktop or laptop computers, low-end smartphones are less expensive and more portable. Despite their lower level of func-

tionality, this combination makes them appealing to users who cannot afford a traditional computer or broadband but can still benefit from communications and access to the internet. Smartphones thus saw significant uptake in the developing world, particularly in Africa, where there are forecast to be 613 million distinct mobile subscribers by 2025, accounting for 50% of the population of the continent.³ The story is even more striking in India. In 2010, 76% of all Indian internet traffic was PC only, and less than 1% of India's population had mobile internet access.⁴ By 2017—only 7 years later—90% of all Indian internet usage was on mobile.⁵ By 2022, India had more than 650 million internet users⁶ and more than 80% of all internet traffic is from mobile users.⁷

New markets are impossible to quantify, but an investor can get a sense of the size of an opportunity by considering nonconsumption. **How many potential customers might be created?**

INVESTING INSIGHTS

- **The potential market size for any disruptive product or service is often much larger than investors realize.** Traditional Total Addressable Market (TAM) analysis is a bottom-up look at existing transactions, but the risk for any investor is to neglect the magnitude of entirely new transactions that can be created.
- **New markets are impossible to quantify, but an investor can get a sense of the size of an opportunity by considering nonconsumption.** How many potential customers might be created if barriers or cost, access, or complexity are removed?
- **A tell-tale sign of new market disruption when evaluating investment opportunities is to consider the narratives of incumbents.** When incumbents deride new products or services as 'toys' or completely lacking in performance, it's a good bet that a founder has identified an opportunity to build an entirely new market.



Modularity and Interdependence

Modularity and interdependence stems from the observation that industry value chains “tend to evolve from states of interdependence, where leading firms need to be vertically integrated, to modularity, in which specialist firms that are responsible for critical pieces of the value chain and produce key product components can earn a disproportionate share of value in an industry.”⁸

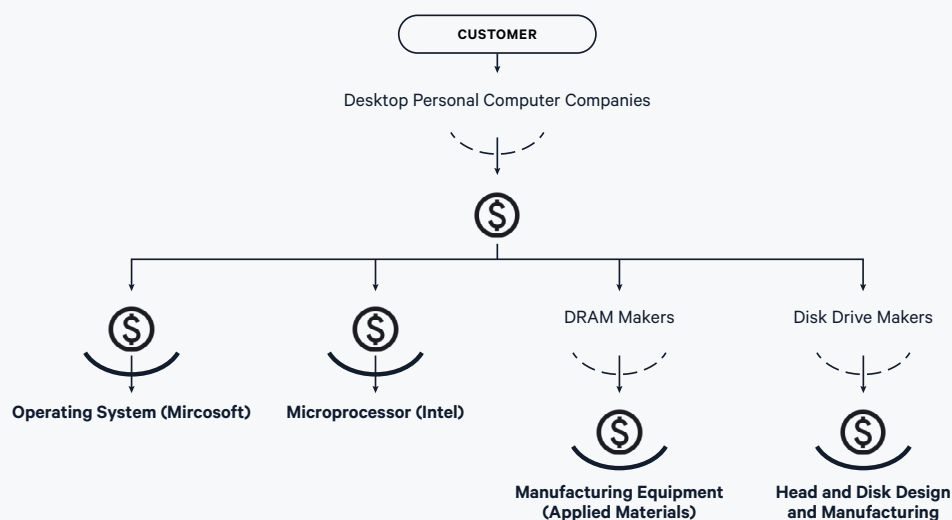
When an innovation first creates a new industry, the performance of its products and services typically undershoots the needs of all customers. Thus, to ensure it can provide necessary quality and reliability, a company will opt for an *interdependent* architecture, often vertically integrating into various aspects of the value chain. Henry Ford, for example, vertically integrated the company’s supply chain by acquiring railroads, coal mines, sawmills, and glassworks to provide a reliable automobile for purchase by the average American. Beyond keeping costs under control, this level of integration resulted in a highly interdependent architecture—to change one component would require changes to the others—and his assembly line produced identical vehicles with little room for customization.

Once basic customer needs for performance and reliability are met and exceeded, the types of improvements customers demand in a market start to shift. More than additional reliability, customers

want convenience, or the ability to customize their product, or they want their products made and delivered more quickly. To cater to these customer needs, managers will seek to standardize the interfaces between the components of their products. With standards in place, the product architecture can now become *modular*.

As industries shift from interdependent to modular architectures, the opportunity to generate attractive profits in that industry shifts along with it. Dr. Christensen called this the **Law of Conservation of Attractive Profits**, where “when modularity and commoditization cause attractive profits to disappear at one stage in the value chain, the opportunity to earn attractive profits with proprietary products will usually emerge at an adjacent stage.”⁹ The most profitable opportunities, in other words, flow from segment to segment of the value chain in response to whether that segment is driving the overall performance that customers are seeking.

A clear case study of this is the PC industry, where early entrants such as IBM were highly interdependent, controlling the design of processors, operating systems, and peripherals. As the industry modularized to adapt to customers wanting greater flexibility, PC companies began outsourcing core component design, including processors and operating systems. Unfortunately for computer assemblers, the processor and operating system came to define



The PC Value Chain Model:

In the desktop PC market, most of the profits flowed to operating system providers (Microsoft) and microprocessor makers (Intel). Other segments, such as DRAM and disk drives, became commoditized; however, outsized profits could be found among certain upstream suppliers who provided the performance-defining sub-components.

Desktop Personal Computer Companies from the Innovator’s Solution.

overall system performance. Thus, profits shifted from modular computer assemblers (such as IBM, Gateway, or Compaq) to the interdependent and proprietary component suppliers (mostly Intel and Microsoft). Within the product components, there exists an upstream supply chain with input providers for those components. For example, in the case of DRAM and hard drives, the suppliers of manufacturing equipment (DRAM) and drive heads (for disc drives) were able to capture outsized profits despite the downstream manufacturers facing intense margin pressure themselves.

INVESTING INSIGHTS

- **Markets are dynamic, not static.** An investor looking to capture long-term value thus needs to evaluate not only what state the industry is in (whether modular or interdependent), but also where it *will soon be*. These second- and third-order effects are where the largest prizes are won.

- **A startup that is taking a modular approach to the market is claiming that what is not good enough for customers is convenience, speed, or cost.** In contrast, an interdependent approach communicates that what customers lack is performance and reliability. Investors must test these claims by speaking to customers directly.
- **There are often multiple startups attacking the same market opportunity.** Beyond the strength of the team or other vital company characteristics, investors need to determine whether the company is interdependent or modular in the ways that the market demands. Even if two companies offer the same end-product, the underlying company architecture (whether modular or interdependent) may determine whether one is more successful in the long run.



Jobs To Be Done

The **Jobs To Be Done** framework offers a causal explanation for why consumers make purchasing decisions. A 'Job' represents the progress an individual is trying to make in a given circumstance, exemplified by the now-famous quote by management scholar Ted Levitt: "People don't want a quarter-inch drill, they want a quarter-inch *hole*" (emphasis added). Unlike the drill example, some Jobs To Be Done are more emotional and social than functional. For instance, the reason an employee in an urban area might take the train to work is not only because it is faster than driving (a functional benefit) but because the fixed train schedule allows them to plan a departure time that ensures they will be home in time for dinner with their family. In this way, the train offers functional, emotional, and social benefits to get the Job done of "Help me get to and from work reliably so that I can spend time with my children each day."

The language used to understand Jobs To Be Done (JTBD) is consistent with but materially different from standard marketing or sales terminology. Traditional marketing language might express that someone 'buys' a product or service to address their 'need' or 'pain point.' JTBD language would instead suggest that an individ-

ual *hires* a product to help them accomplish a Job To Be Done they are facing, much the same way an employer hires an employee to get a Job done.

This insight developed in large part after Dr. Clayton Christensen and a colleague worked to help a fast-food company increase sales of its milkshakes. The firm had been trying everything to boost sales, including making recommended changes to the product after conducting countless focus groups with milkshake customers. With nothing demonstrating a material impact on sales, Dr. Christensen's team sat inside a franchise for an entire day taking copious notes when someone ordered a milkshake. They found that customers predominately purchased milkshakes in one of two circumstances: between 6 and 8 in the morning when a customer was on the way to work, and between 2–4 pm when a parent would purchase a milkshake for their child after school.

In the first instance, the milkshake was hired to get an important Job To Be Done in people's lives: "Help me get through my boring commute to work and have a full stomach upon arrival." In this scenario, the Job To Be Done was purely functional. Tired and busy commuters who didn't have time for breakfast were seeking a meal

replacement that was energizing and filling—something a thick, sugar-filled milkshake did perfectly, especially when it fit nicely in a cup holder. These customers, upon being interviewed, described how they would try bagels, donuts, coffee, and fruit to accomplish that Job, but nothing worked quite as well as a viscous milkshake that lasted the entire commute.

In the second instance, the milkshake was hired to solve a social and emotional Job To Be Done for parents searching for a moment to connect with their children. As a parent and a child sat down and enjoyed a sweet and delicious milkshake together after school, the parent had ample time to let their child know they cared for them, and the child, smiling with a sweet milkshake in hand, would sit there and listen!

INVESTING INSIGHTS

- **Products and services compete not only with similar offerings, but anything that helps a customer get a Job done.** Reed Hastings, CEO of Netflix (and student of Jobs To Be

A ‘Job’ represents the progress an individual is trying to make in a given circumstance.

Done), famously stated: “We actually compete with sleep.”¹⁰ An investor’s due diligence process should include an evaluation of all potential alternatives to what a startup is offering.

- **As with new-market disruption, when the pure Job To Be Done is understood, market opportunities are often larger than originally anticipated.** TAM’s are typically defined by products or services, but in reality, they ought to be defined by Jobs To Be Done.
- **Whether a startup has a nuanced understanding of its customer’s Job To Be Done is not sufficient; it must execute against that Job to exploit the opportunity.** Specifically, to what degree is the startup’s sales, marketing, and product development motion all geared towards delivering on the Job To Be Done?

Conclusion

The frameworks introduced here are complementary and interrelated, offering far more impact when used collectively rather than in isolation. For example, an innovative entrepreneur may identify Jobs To Be Done in an existing market but neglect to consider non-consumers or the opportunity to create a new market. Similarly, an astute investor may identify a disruptive opportunity yet lack the perspective of modularity and interdependence to see where the value will accrue in the disruptive value network. By applying the frameworks holistically, we believe founders and investors improve their odds of success.

In his own research of the hard drive industry, Dr. Christensen found that disruptive companies were six times more likely to suc-

ceed than non-disruptive ones (36% vs 6%). This data shows that while these Frameworks have very strong predictive power, applying them does not guarantee success. Disruption is no more a ‘theory of everything’ than ‘game theory optimal’ is a perfect approach at a poker table—even the ‘right’ call can still lead to losses.

The underlying causal dynamics of disruptive innovation and related frameworks continue to persist across a wide range of markets, technology waves, and business models. Like gravity, the forces of disruption are constantly at work, and we predict they will persist for generations to come, just as they did in generations past. We remain confident that applying these frameworks in an investment capacity will prove valuable.

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