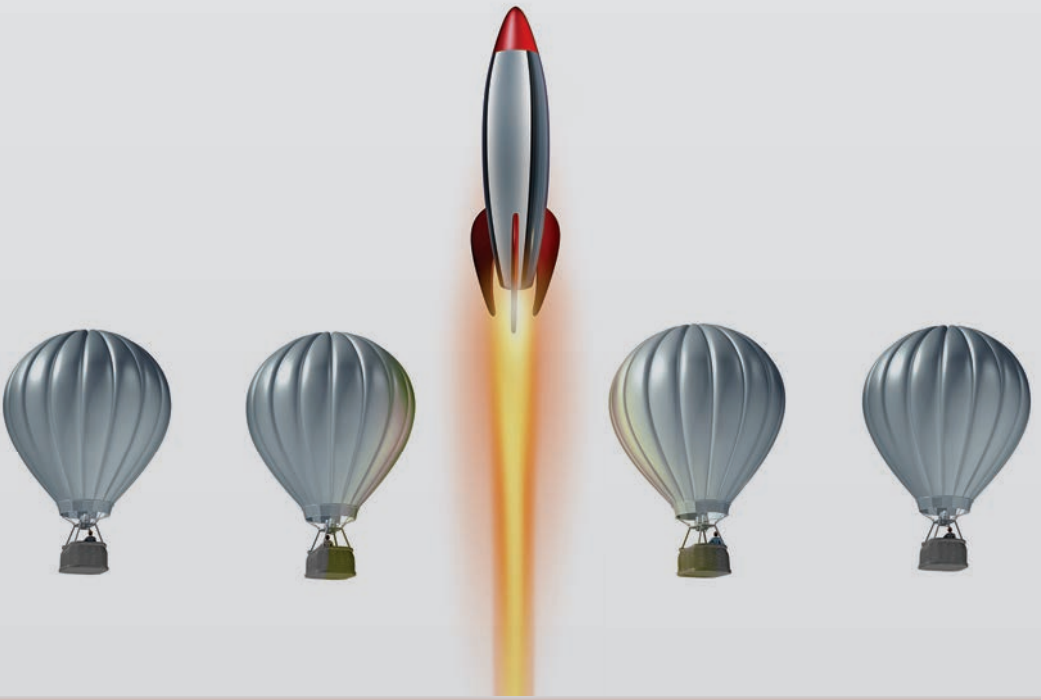


Disruptive Innovation and Digital Transformation



21st Century New Growth Engines

Marguerite L. Johnson

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*Disruptive Innovation and Digital Transformation: 21st Century
New Growth Engines*

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In honor of my deceased father, George E. Johnston, Sr.,
and my deceased father-in-law, Duffy Johnson, Jr.

What People Are Saying

Early Reviews

Ms. Johnson's new theory of disruptive innovation, called DICE (Disruptive Innovation Customers' Expectations), is a natural successor to the foundational work done by Clayton Christensen, Larry Downes, and others. In her clear and concise book, she synthesizes the teachings of prior works and shows how her DICE Theory extends those teachings by uncovering patterns in the life cycle of innovations. Johnson's DICE Theory will be key in helping the business managers and innovation leaders detect and predict disruptions, especially in the realm of digital transformations. —Spencer Pugh, Vice-President, Research and Development, Michelman (retired)

While some business publications are page heavy and content light, Johnson's text is the opposite. This is not a book for the casual or merely curious reader — it is targeted squarely at innovation professionals who want disruptive theory at the heart of their product strategies and who aren't afraid to roll up their sleeves. It is a thorough review of the published literature and the development of an interesting new framework for strategists to chart a path through the transformation. —Jim Fritz, Executive in Technology Strategy

This is a must-read for those seeking to be disruptors, not disruptees. It introduces the six-step 'pattern of disruptions'... a brilliant concept you'll apply to both traditional and digital innovation. An insightful roadmap for the next generation of innovators! —Dan Adams, Founder and President, The AIM Institute

As you pointed out in your book [Marguerite], many early literature and innovation models did not count the effect of this massive disrupting digital technologies. Your "new theory of disruptive innovation" is very timely and it should provide huge benefits to companies to reassess their current innovation framework to get the full market potential by leveraging the digital technologies. —SM Hasan, Ph.D, Senior Leader at GE research

Description

Disruptive Innovation and Digital Transformation: 21st Century New Growth Engines is for executive leadership, senior management, innovation catalysts, and digital marketing teams tasked with transforming businesses by accelerating growth through disruptive innovations and digital capabilities. It is a practical guide with concise insights for understanding the applications of disruptive innovation and how to iteratively apply them to projects and opportunities. It garners insights from the best minds across relevant disciplines—from its original theory and latest updates—to arrive at new insights on digital transformation.

The author evolves key approaches to disruptive innovation theory to reveal new digital applications and tells leaders what to look for—major categories of customers' expectations in an escalating pattern to understand in what context digital plus disruptive innovations must be aligned with consumer preferences, environments, and the jobs-to-be-done, which is modeled in a new theory, Disruptive Innovation Customers' Expectations (DICE).

DICE provides methods to use to lead digital disruption across products, services, and business models. DICE translates the vague parts of disruptive innovation by simplifying them down to what-to-do. DICE takes away the elusive nature of disruptive innovation by advising leaders: how to scan, to track, and to detect disruptions.

This book provides leaders with the right lenses to filter markets, giving order to complexity, and making disruptive innovation simpler.

Keywords

disruptive innovation; digital transformation; innovation management; platforms; business models; networked ecosystems; strategy; transformational leadership; business transformation; entrepreneurship; startups; open innovation; collaboration; marketing; Internet of Things (IoT); digital disruption; innovation ecosystems; and digital marketing

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- To my amazing husband (Michael) and our beautiful children (Kayla and Kyle): *I love you. You bring joy into my life. Thank you for listening to me and allowing me to drag you through the depths of disruptive innovation theories and digital transformation business cases. No words can convey the feelings in my heart.*

Marguerite Johnson
Bloomfield Hills, MI, USA

Preface

This book is written for business leaders by an innovation leader who understands the pressures of *delivering* on new growth. These pressures have intensified in the face of massive shifts in digital technologies, platforms, products, services, and business models. Like most of you, I did not have the time to “deep-dive” into the innovation literature to find all of the answers I needed. Nevertheless, digital transformation does not care. The changes it brings are disruptive. It has Newton’s first law of physics on its side. The law of gross tonnage: The heavier vessel always has the right-of-way.

For a business leader looking to apply knowledge from the literature on digital transformation and disruptive innovation, it takes a tremendous amount of time to dedicate to finding, sorting, sifting, reading, and analyzing. This is not helped by the “[m]any researchers, writers, and consultants who use ‘disruptive innovation’ to describe any situation in which an industry is shaken up and previously successful incumbents stumble. But that’s much too broad a usage” (Christensen et al. 2015). So, I did the work of synthesizing past research to demonstrate a pattern of six disrupters, I coined “Pattern of Disruptions”. These disrupters are a part of a larger theory and model, which I detail in Chapter One.

I reread many of the latest leading innovation books, articles, research studies, business cases, and industry reports on disruptive innovation, digital transformation, and digital disruption. I found the literature was insightful, but incomplete and vastly disjointed. You will find that I quote industry experts from these fields: disruptive innovation, digital transformation, business, strategy, and technology because I want readers to understand my perspectives do not exist in a vacuum. They are reinforced and shared across a community of leaders. There are entire books written on the chapters in this book. I did not attempt to capture all of the works that have been published on disruptive innovation and digital transformation. I extracted only the contextual meanings or significance from leading works. I took everything and viewed it through the lens of my

20-year career in business, innovation leadership, new product development, strategy, and product line (with P&L) management.

My passions for business, innovation, and strategy compelled me to write this book. I hope you find value in my methodologies, my new theory and model on disruptive innovation, and my synthesis of decades of research to equip business leaders with answers for the 21st-century. I hope they ignite the new growth engines of disruptive innovation and digital transformation in your organizations. Thomas M. Siebel, groundbreaking technology and business leader, has this advice in his book, *Digital Transformation: Survive and Thrive in an Era of Mass Extinction*: “In management, I find one of the most important skills is pattern recognition: the ability to sort through complexity to find basic truths you recognize from other situations” (2019). This book is the results of my work to identify patterns, sort through complexities, and reveal new insights into disruptive innovation and digital transformation. As the saying jokingly goes: *I took one for the team.*

PART I

It's the Background

INTRODUCTION

Digital Was Missed

Disruptive innovation and digital transformation are the two capabilities qualified to tackle the new growth challenges facing all companies in the 21st-century—regardless of size, industry, market, or sector. This statement best describes the current business environment. They collaboratively work together to power growth. The disruptive innovation approach informs what companies look for in order to accelerate growth. Digital transformation informs which mediums and how they are used to achieve growth. “If you don’t understand disruptive innovation, your digital transformation efforts could all be for nothing” (Jefferies 2019). This book defines “disruptive innovation” as the process of creating new products, services, business models, and/or platforms that redefines customers’ expectations, changes consumers’ behaviors, and creates a new standard for customer value. The process involves customer intimacy, the detailed insights that come from understanding how a customer’s needs translate into a customer’s expectations. The work in this book evolves decades of research on disruptive innovation to prepare business leaders for new growth in the 21st-century. Digital plays a significant role in all future innovations, but it propels disruptive innovations in new ways—not before discussed.

This digital collaborative approach to disruptive innovation is a very different approach than most companies deploy today. “Much of today’s innovation relies on the SIP [Structural Innovation Paradigm] that is focused on fulfilling customer needs with one goal in mind: delivering a product or service that is better, faster and cheaper than the customer can get from any competitor” (Simanis et al. 2009). Companies relying on the SIP approach to innovation have an intentional focus on maximizing their operating profits while simultaneously increasing the performances of their products. Their business operating models focus on increasing

efficiencies and improving performance. However, in the 21st-century profitability—from these levers—has reached its limits. Consequently, accelerating along these paths will not generate the new growth companies need in the future.

The new growth engines of disruptive innovation and digital transformation are focused on effectiveness in creating customer value—not strictly on productivity gains. Companies will need a different set of levers for future profitable growth. They will need to engage with customers to understand where to innovate. This shifts away from the SIP innovation approach. This will be hardest for large enterprise companies that are built around legacy assets and operations. This book demonstrates how to engage customers of all types (current, latent, and future): current customers defined as engaged in brand loyalty and/or consuming products and services; latent customers defined as new consumers from existing markets with unmet needs or unrealized expectations; and future customers defined as nonconsumers who previously relied on disparate solutions or alternative substitutions to meet their needs. This book helps companies uncover disruptive innovations that can only be understood by tapping into customers' expectations and unlocking capabilities through digital transformation.

Why Is Digital So Significant?

In addition to a different approach to innovation, companies will need to understand and to accept that customers have access to complete information. In the digital future, customers can draw from a broad network of information and sources (Rogers 2016). Customers can act on that information to access and to purchase from a company's competitors, alternatives, and substitutions. No longer will companies have an information advantage over customers. The speed of developments in technology and science, the pace of change in innovation, and customers access to an abundance of information means companies cannot debate whether to focus only on strategic customers, fitting their operating model, or to innovate in new markets. They must do both.

The world has been evolving toward a digital future of connected devices for nearly 30 years. "According to research from Gartner,

approximately 26 billion objects would be linked together in the [Internet of Things] IoT by 2020, 33 billion in laptops, PCs, and smartphones were added” (Collis 2018). Connectivity and data transfer for all of these devices were made possible nearly 47 years ago in 1973: “the U.S. Defense Advanced Research Projects Agency (DARPA) initiated a research program to investigate techniques and technologies for interlinking packet networks of various kinds” (Leiner et al. 2017). The standardizations (or communication protocols) that were developed allowed “networked computers to communicate transparently across multiple, linked packet networks” (Leiner et al. 2017). The result was the “Interneting project and the system of networks which emerged from the research was known as the ‘Internet’” (Leiner et al. 2017). A host of other protocols followed: “TCP/IP Protocol Suite, after the two initial protocols developed: Transmission Control Protocol (TCP) and Internet Protocol (IP)” (Leiner, et al 2017), the “Netscape browser” enabled by Hypertext Markup Language (HTML), and universal resource locators (URLs) (Anthony et al. 2017). The end result was the start of digital information spreading.

Around 1986, a number of “backbone facilities” were created to transfer large packets of data between networks. This was critical infrastructure added by the U.S. National Science Foundation (NSF) NSF-NET, the National Aeronautics and Space Administration (NASA) NSINET, and the U.S. Department of Energy (DOE) ESNET (Leiner et al. 2017). “In Europe, major international backbones such as NOR-DUnet [NORDUnet is a network of 5 Nordic National Research and Education Networks] and others provide connectivity to over one hundred thousand computers on a large number of networks” (Leiner et al. 2017). In the 1990s, commercial Internet backbones emerged to transport packets. These backbones enabled networks to connect and to link together into a vast network of networks. The combined system is the modern-day Internet. It consists of networked networks of giant carriers. These networks are owned and operated by different companies. “The individual core networks are privately owned by Tier 1 Internet Service Providers (ISP) ... AT&T, CenturyLink, Cogent Communications, Deutsche Telekom, Global Telecom and Technology (GTT), NTT Communications, Sprint, Tata Communications, Telecom Italia Sparkle, Telia Carrier, and Verizon” (Greene 2020). The digital protocols,

Internet backbone infrastructure, network architecture, and carriers are a networked ecosystem that has been fueling digital innovations over the past 30-plus years (Webb 2019).

Notwithstanding, the Internet alone is insufficient to drive new technologies. “[E]ven the most astounding new technologies can fail to gain traction in the marketplace” (Johnson 2018). Consequently, companies with a command of innovation practices, processes, talent, products, and services, as well as supporting value propositions and business models, can navigate new growth through disruptive innovation and digital transformation.

Why Should Businesses Be Concerned?

Without the insights in this book, a business leader, who understood disruptive innovation based on past readings of Christensen’s theory of disruption, could miss out on the impact of digital transformation on the future of innovation. Clayton Christensen’s *Theory of Disruptive Innovation* (hereinafter referred to as “the original theory”) began as a narrowly focused theory of B2B markets. Christensen’s original theory defined disruptive innovation as a “phenomenon by which an innovation transforms an existing market or sector by introducing simplicity, convenience, accessibility, and affordability where complication and high cost have become the status quo—eventually completely redefining the industry” (Christensen 2016). It focused on transforming existing markets or sectors through innovations when entrants offered products and/or services at the low-end of the market (frequently through lower pricing) to customers of incumbent companies and then advance upmarket. Christensen did not address the abilities of incumbents to create new markets with an offensive strategy of disruptive innovation. He would later acknowledge this in a book he wrote in 2016 (Christensen et al. 2016). He primarily considered market creation as an outcome of entrants innovating in markets that incumbents ignored. Albeit narrow, the original theory offered the business community a way to describe a scenario—B2B markets shifting and disappearing as the result of innovative new products and services.

The original theory has had “a profound effect on academic literature and management mindset” (Reinhardt et al. 2011). Disruptive innovation

has been extensively covered, which could make the phrase appear over-used. Despite the widespread use of the phrase, the books, and the many articles written about disruptive innovation, I struggled with the practical aspects of the theory to find new growth potential for the 21st-century. Consequently, I reread old books and read new books, articles, research studies, and industry reports that followed Christensen's work, searching for additional insights. I was able to detect several reasons to reopen the discussion on disruptive innovation—mainly around digital, which Christensen admitted to missing in his original theory—likely do to the timeframe when his original theory was published in 1997 (Christensen et al. 2015). Although the world's digital infrastructure was well underway by then, the impact of digital would not demonstrate its full dominance until 2007. Thomas Friedman wrote about this inflection year in a chapter of his book, *Thank you for Being Late, What the Hell Happened in 2007?* (Friedman 2016).

Since his first published works, Christensen answered to critiques of his original theory in a 2015 *Harvard Business Review* article, "What Is Disruptive Innovation?" It covered the ways in which he modified his original theory. For instance, he clarified: "Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by delivering more-suitable functionality—frequently at a lower price" (Christensen et al. 2015). He reinterprets the success of entrants, tying it to overlooked segments by incumbents. Later, in a 2020 interview with *MIT Sloan*, Christensen added technology as an enabler.

Disruptive innovation describes a process by which a product or service powered by a technology enabler initially takes root in simple applications at the low end of a market—typically by being less expensive and more accessible—and then relentlessly moves upmarket, eventually displacing established competitors (Christensen 2020).

Fundamentally, Christensen alerted the world to a new phenomenon. His peers and industry leaders acknowledged his works, and fellow authors contributed to enhance and to advance his original theory. There have been several key subsequent theories that expanded upon

Christensen's original theory. One of those books was written in 2015, *Big Bang Disruption: Business Survival in the Age of Constant Innovation*, by Larry Downes and Paul Nunes. It evolved the original theory of disruption to alert companies about disruptions “increasing in quality” that move upmarket. Christensen agreed with this revision to his original theory. “Disruptive innovations don’t catch on with mainstream customers until quality catches up to their standards” (Christensen et al. 2015). I shift the focus away from B2B markets and incumbents in Christensen’s theory, centering the focus onto customers’ expectations in my own theory, detailed later in Chapter One. I expand upon Downes’ theory to include digital capabilities that reinforce quality through reliability of assets and security in my theory, as well.

There is a chapter in another book that significantly contributed to the original theory. It is “Chapter Seven: Mastering Disruptive Business Models” of *The Digital Transformation Playbook: Rethink Your Business for the Digital Age* by David Rogers (2016). Rogers introduced a new theory of disruptive innovation to address: “disruption that is driven by consumer purchase behaviors, disruption that starts with the incumbent’s core customers (rather than starting with new markets), and disruption that is driven by values other than price or access” (2016). This is where Rogers agrees with Downes that disruptive innovation must create value beyond simplicity and accessibility, which were the basis of Christensen’s theory. His theory of business model disruption is two-sided (value proposition and value network), focusing on existing markets:

- “A difference in the value proposition that dramatically displaces the value provided by the incumbent (at least for some customers)” (Rogers 2016).
- “A difference in value network that creates a barrier to imitations by the incumbent” (Rogers 2016). These networks involve “people, partners, assets, and processes that enable the business to create, deliver, and earn value from the value proposition” (Rogers 2016).

Rogers’ insights on business model innovation started with identifying a flaw in the original theory of disruptive innovation—the definition of “customer.” In the original theory, only B2B customers were included.

Rogers suspected this is what led Christensen to miss disrupters that were consumer-driven. “Its origins in B2B industries may be the reason Christensen’s theory explains a great many cases of disruption but missed others” (Rogers 2016). Rogers refocused and directed his theory toward consumer purchase behaviors (value propositions). In doing this he was able to build onto the original theory of disruption for incumbents with business model innovation (value networks). “My intent is to use the business model specifically as a predictor of business disruption, and for this purpose, the schema can be simpler” (Rogers 2016). Rogers points out that “value networks” are areas where established companies are unwilling to change. “[T]he existing value network of the incumbent prevents it from imitating the appealing new offerings of its challenger” (Rogers 2016). The challengers’ “value networks” do not replicate the assets or operating models of incumbents, which make incumbents uninterested in switching to the challengers’ new operating models. This unwillingness to change value networks will adversely impact incumbents’ innovation value propositions, as well.

Rogers’ theory effectively identified two dimensions for disruptive innovation. I am grateful for Rogers’ work. I incorporated Rogers’ theory of a two-sided approach to disruptive innovation (without his narrower focus on “incumbent’s core customers”). However, I highlight the shift in the value formula between dimension-one (products and services) and dimension-two (business models including digital platforms) over time. Most markets originate from a product or a service, thus value generation starts in dimension-one. As a result of digital, as time goes on more value is generated in dimension-two. This shift in value creation is important. It is the digital tipping point. Companies with products and services that have not been digitally transformed risk losing their leverage in the value creation formula. Also, I offer ways to reinterpret his use of the phrase “consumer purchase behaviors” for products with my theory’s major categories of customers’ expectations. Finally, I added a third dimension that needs to be monitored, the innovation S curve. This dimension reflects the maximum combined value creation of dimensions one and two, the saturation level.

Alongside others, Christensen contributed to modifying and to clarifying his original theory. Christensen coauthored a book, a companion theory to his original theory of disruptive innovation, to factor in customer behaviors. The title of that book is *Competing Against Luck: The*

Story of Innovation and Customer Choice (Christensen et al. 2016). In the mid-1990s, he realized his original theory did not answer “what a company should do offensively to be successful: if you do this and not that, you will win” (Christensen et al. 2016). He called this companion theory “Theory of Jobs to Be Done” (Christensen et al. 2016). This theory’s contribution is near and dear to me because it was inspired by a conversation Christensen had with a Detroit consultant, Bob Moesta. (I was born and raised most of my childhood in the city of Detroit.) Later I reference this conversation and how it impacted Christensen’s theory of “jobs to be done.” I reinterpret and build upon Christensen’s jobs theory by filling in some of its gaps, such as refining customer needs in the context of customer expectations and interpreting saturation of addressable needs.

What New Information Will This Book Offer?

Although there are many books that expanded upon Christensen’s original theory, none of them synthesized it with other disruptive innovation theories to create one comprehensive theory. This book does that work, as well as expands upon the combined theories in these ways: it builds out the methodologies to track, to scan (monitor), and to detect disrupters; it defines disrupters in a pattern (escalating categories of customers’ expectations) as the directional forces that guide and create opportunities for new value creation; and it identifies disrupters made possible through digital and business models.

The synthesized theory is called *Disruptive Innovation Customers’ Expectations* (hereinafter referred to as *DICE*) Theory. It is a phenomenon of changing consumer purchase behaviors that starts with the initial introduction of a product or service, escalates through a pattern of major categories of customers’ expectations (accessible, dependable, reliable, usable, delightful, and meaningfulness) that is driven by customers’ adoption of new capabilities and new technologies, which ends in consumers’ behaviors being redefined into a new set of customers’ expectations. New value is created from products, services, business models, and/or merging existing customers with non-consumers around a new set of expectations resulting in new markets, new industries, or new sectors. Void of changing consumers’ behaviors and redefining customers’

expectations around a new set of customer value an innovation is not disruptive.

Throughout the book I build on elements and dimensions of the theory to demonstrate its application, using models and illustrations. In the following chapters I provide various examples to demonstrate when a disruptive innovation effectively disrupted a market, changing consumers' behaviors around a new set of customers' expectations for value creation. This is an important distinction to make in the practice of innovation. It is different than general innovations that increase sales, build brand loyalty, and compete well in the marketplace. General innovations have momentary impacts on customers' behaviors. They do not permanently change behaviors or redefine expectations for value creation. Acknowledging that general innovations can be popular without being disruptive can prevent companies from being blindsided. It also helps companies improve how they calculate risks to their investments and how much weight they put on innovations in their pipeline for strategic planning. Questioning, observing, networking, and experimenting can help leaders reveal the true nature of an innovation (Dyer et al. 2019).

Here is a brief history of the evolution of key published works on disruptive innovation that shaped my investigations:

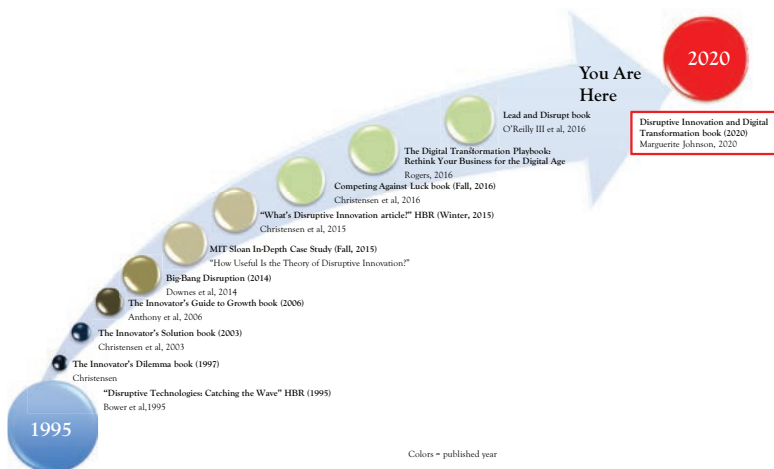


Figure I.1 Key published works on disruptive innovation (1995–2020)

Regrettably, Clayton Christensen passed away before I wrote this book. So, I will not have the benefit of hearing his thoughts on the ways I recommend evolving his original theory. I will pick up from where he and others left off because disruptions have increased enabled by digital and businesses continue to struggle to find new growth opportunities. My investigations and learning are captured in this book. It reassured me that the decades of coverage, since 1995 when Clayton Christensen first wrote about the theory in *Harvard Business Review*, is still relevant today.

How Is This Book Organized to Present a Comprehensive Approach to Disruptive Innovation?

1. Only the absolutely necessary information is included, supported by meaningful examples, case studies, tables, and illustrations; in order to fully comprehend the *DICE Theory* and the actionable guidance it suggests for business leaders, strategic planners, futurists, and customer experience digital marketers I suggest reading the entire book.
2. Chapters are portioned into parts to give the reader a sense of how the information “fits” into the overall book: It’s the Background; It’s the Framework; It’s Mastery; and It’s Control.
3. Each chapter is a self-contained comprehensive package of insights and information on the subject (only when necessary are cross-references used to direct the reader back to sections, figures/tables, or chapters to review for additional insights).

CHAPTER 1

The Origins of *Disruptive Innovation Customers' Expectations (DICE) Theory*

This book intends to demonstrate some aspects of disruptive innovation that have been overlooked in the past, possibly explained by the popularity of the original theory that ultimately left many questions unanswered and possibly explained by the timing of the original theory. It highlights some new observations about disruptive innovation, suggests ways that these new observations can be applied, and highlights new insights for businesses looking to undergo digital transformation. The *DICE Theory* targets new growth areas with precise navigation to future disruptions. Finally, it is a warning to innovation practitioners that there are massive disruptive innovations accelerated by digital technologies underway, and Christensen may have underestimated the impacts to any organization looking to survive digital disruption. The risks to incumbent companies are greater. They have less room for maneuverability than a new entrant.

This chapter is organized simply (who, what, when, why, and how) to provide readers with necessary building blocks to ground all other content in this book.

Who Is Impacted?

Creating new growth is the mandate for all leaders, and the job of creating new growth falls within the responsibilities of senior management. The original theory left companies with a few blind spots—not that they cannot be overcome, but if left unchecked they could mislead companies in the digital future. Disruptive innovation and digital transformation represents opportunities to grow in new areas for businesses with the right

capabilities. However, it can be hard to identify those capabilities, using the original theory. Christensen admits that it is limited; others contributed to improve the original theory, but there are still gaps. “But the strategic model of disruptive innovation we’ve all become comfortable with has a blind spot” (Downes et al. 2015).

I already covered the broader scope of needs to revisit in the original theory for disruptive innovation and digital. In this section I detail my observations of key phenomena to refine and to refocus them. As follows I highlight four (4) main areas for leaders, areas where I revisited and reassessed when applying the original theory to growth in the 21st-century. This sheds light particularly for those who were previously exposed to the original theory or any of its past iterations. These areas should be revisited:

1. Christensen acknowledged that his original theory of disruptive innovation...

doesn’t predict or explain how, specifically, a company should innovate to undermine the established leaders or where to create new markets. It doesn’t tell you how to avoid the frustration of hit-and-miss innovation—leaving your fate to luck. It doesn’t tell you how to create products and services that customers will want to buy—and predict which new products will succeed. (Christensen et al. 2016)

There was a study by *MIT Sloan’s* Andrew A. King and Baljir Baatar-togtokh. They conducted an in-depth case study analysis of 77 disruptive innovation cases discussed in *The Innovator’s Dilemma* and *The Innovator’s Solution* “to understand how to apply the theory of disruptive innovation” based on four key elements focused on incumbents: “incumbents in a market are improving along a trajectory of sustaining innovation,” “they overshoot customer needs,” “they possess the capability to respond to disruptive threats,” and “incumbents end up floundering as a result of the disruption” (King et al. 2015). The *MIT Sloan* team interviewed one or two experts from each case study. To control for bias, the *MIT* team allowed respondents to be anonymous. “Many of the theory’s exemplary cases did not fit

four of its key conditions and predictions well” (King et al. 2015). A small number of cases fit all four, for example, “the disruptions by Salesforce.com, Intuit’s QuickBooks, and Amazon.com” (King et al. 2015). Noteworthy, Christensen recognized the theory’s inability to perfectly explain all aspects of a dynamically changing environment and multifaceted decisions that led to disruptive innovations. “More nuanced case analysis, he argues, shows that the theory of disruptive innovation explains the failure of leading businesses, time after time and industry after industry” (King et al. 2015).

2. Christensen’s original theory provided B2B incumbents with a defensive competitive strategy for their existing markets. Christensen admits that his theory is a “theory of competitive response to an innovation” (Christensen 2016). Christensen argued disruption opens up markets held by incumbents when entrants offer low-end goods to consumers or entrants offer increased functionality, most frequently with lower prices. This is one of the ways Christensen elaborated on the original theory to include “two types of markets that incumbents overlook”: “low-end footholds” products that customers deem “good enough” and “new-market footholds, disrupters create a market where none existed” by “offering an affordable solution to individuals and small organizations—and a new market was created” (Christensen et al. 2015). Entrants progress upmarket expanding on their original footholds, thereby decreasing revenues of incumbents and denying them future growth opportunities. “When mainstream customers start adopting the entrants’ offerings in volume, disruption has occurred” (Christensen et al. 2015).
3. The innovations of entrants were disruptive to incumbents. Incumbents reacted defensively to entrants’ innovations. W. Chan Kim and Renée Mauborgne defined the types of innovations Christensen prescribed for incumbent’s defense in his original theory, as “value innovations,” competitive strategies in their book *Blue Ocean Strategy* (2005). These types of innovations create “a better product or a new brand but not disruption” (Rogers 2016). Christensen did not study entrants as part of his original theory. Later, Christensen coauthored a book, *The Innovator’s DNA*, which studied the behaviors of new entrant innovators: such as Amazon, eBay, and Tesla.

4. Lastly, the absence of a robust proactive innovation strategy for large incumbent companies in the original theory steered them toward a single type of disruptive innovation, business model innovation. Looking to one of the first market leaders to apply Christensen's original theory of disruptive innovation, we find Proctor & Gamble (P&G). In 2004, P&G's executive leadership tasked two 30-year veterans of P&G to design "a new-growth factory whose intellectual underpinnings would derive from the Harvard Business School professor Clayton Christensen's disruptive-innovation theory" (Brown et al. 2011). P&G codified its answer to disruptive innovation: "Disruptive—new brands or business models that win through simplicity or affordability" (Brown et al. 2011). This is competitive strategy, defensive maneuvering to protect incremental product innovations. A new business model singularly is not the answer to "disruptive-innovation theory" (Roger 2016). P&G was not alone in leveraging Christensen's theory of disruptive innovation as a tool to create new growth. "Many leaders of small, entrepreneurial companies praise it as their guiding star; so do many executives at large, well-established organizations, including Intel, Southern New Hampshire University, and Salesforce.com" (Christensen et al. 2015). P&G deserves immense industrywide respect for its courage to step up to the challenges it faced to grow. It is an established leader in innovation and a curator of remarkable brands. The goal of this book is not to shame or to discourage companies from facing down threats with whatever credible means they have in their defense arsenals. It is only to recognize that disruption is a dynamic challenge, and it needs the full "light of day" to understand it.

What Are the Observed Phenomena?

The phenomena that I observed clearly defines the original theory of disruptive innovation is a strategy for incumbents businesses to defend against competitors. It does not capture a wider lens of innovation outside of the perspectives of incumbents being disrupted by entrants in their existing markets. It does not address the need to find growth in new

markets, when customers evolve beyond the original theory's assumptions of "simplicity, convenience, accessibility, and affordability." This is an important reason to look more closely at the innovation approaches of the past and to evaluate their continued effectiveness to meet the challenges of the future.

In a book by Rita McGrath, *Seeing Around Corners* (based on a concept developed by Andy Grove), she calls attention to an observation made by Grove—a strategic inflection point "is a time in the life of a business when its fundamentals are about to change" (McGrath 2019). The awareness of strategic inflection points must be maintained. Companies should formalize a process to continually horizon-scan for strong (near) and weak (farther) signals. Any company that neglects this work runs the risks of being blindsided by disruptive forces (Webb 2020). In order to move forward with our reset on the original theory, we must clear up a few other areas that could obstruct our way forward.

The *DICE theory* addresses all of the incongruences in the original theory that I observed, as well as it shines a light on other key phenomena that are not mentioned in the original theory, but they must be addressed in order to grow in the digital future. The capabilities of finding, identifying, and targeting new areas for growth are desperately needed. Like much of this book, the answer to finding, identifying, and targeting new growth for the digital future was the result of my work to aggregate knowledge, filter it through my lens as a business leader and an innovation practitioner, and bring in my observations, investigations, and research from other published works.

Let us start at "finding": Gartner describes an emerging technologies phenomenon in its *Hype Cycle* phases: Innovation Trigger, Peak of Inflated Expectations, Trough of Disillusionment, Slope of Enlightenment, and Plateau of Productivity, a downward slope develops between "Peak of Inflated Expectations" and "Trough of Disillusionment." I was left with these observations: (1) a need to improve upon the original theory to understand the multiple points of disruptions that are capable of avoiding the downward spiral in the *Hype Cycle*—from "Peak" to "Trough"—and (2) a suspicion that focusing on the customer was the best place to correct this pitfall. I argue that the downward slope is where companies' innovations and customers' expectations for value creation never caught up to

one another to gain realignment. I also argue that companies fall into this “Trough” because they are not factoring in the results of customers considering other aspects after gaining access to an innovation. “One of the most consistent patterns in business is the failure of leading companies to stay at the top of their industries when technologies or markets change” (Bower et al. 1995).

Onto “identifying”: Abraham Maslow’s philosophy of human’s basic needs (physiological, safety, love and belonging, esteem, self-actualization) does not equip companies with sufficiently detailed information to innovate. Companies should avoid tracking basic needs outside of the contexts of customers’ expectations and consumer purchasing behaviors. It is important to note: building innovations off of a set of “universal” needs fails to acknowledge that everyone does not have the same expectations for how her/his needs are met nor when/if she/he will act on them with a purchase. There must be a method to consider customers’ needs as an evolving loop—from customer expectations—to new value creation—to changed consumer purchase behaviors. Christensen cautioned leaders to avoid labeling a product or service as disruptive innovation, but instead apply his theory in an evolutionary way to understand an environment (Christensen et al. 2015).

Finally, “targeting”, which iteratively systematizes the efforts for both “finding” and “identifying”: patterns are excellent sources of evidence. Pattern recognition is an established methodology used in technology, scientific research, investigations, and in daily life to trigger warnings about safety and to build familiarity. Like a tree trunk’s rings record history in a pattern, disruption shows up in products and services—in an orderly recognizable pattern that consistently illuminate customers’ expectations; they are markers of disruption. There are also choices that are framed around decision-making or maneuvers inside the pattern. The existence of this pattern could present a challenge for any company introducing a disruptive innovation without complete awareness. It could mean a company focused on the original theory’s “simplicity, convenience, accessibility, and affordability” assumptions of disruptive innovation would miss future disruptions. It also means leaders would not develop the ambidextrous decision-making abilities required to interpret dynamic landscapes and avoid being disrupted.

The Innovator's Guide to Growth, a book affiliated with a consultancy practice cofounded by Christensen, suggested the need for a pattern on the last page of the book:

Today's world presents vast opportunities for companies seeking to build competitive advantage through innovation. In any domain, people solve problems in a predictable way. When they first encounter a new type of challenge, they must solve it using an unstructured, trial-and-error approach. Over time, as understanding of the challenge grows, clear rules emerge to guide problem-solving efforts.

We believe that the concept innovation is in transition between a theory of random trial and error and perfectly predictable paint-by-number rules. We think of this transitional period as the “era of pattern recognition.” (Anthony et al. 2008)

The inspirations behind my *Pattern of Disruptions* for products, services, and business models resulted from a synthesis of a number of sources: key published works and observed phenomena of disruptive innovation that redefined customers' expectations and value creation from my years as an innovation practitioner and business leader. Then I tested the pattern with digital products, for example the mobile phone and the smart phone, as well as products transitioning to digital, for example the Swiffer® and Magna Seating's reconfigurable interiors. This and other examples are highlighted in this book. Each disrupter builds on the capabilities unlocked in the prior.

- Accessible—originated from Christensen's original theory of disruptive innovation in *The Innovator's Dilemma*.
- Dependable—originated from the global acceptance of quality standards and Downes' *Big Bang Disruption* theory of disruptive innovation.
- Reliable—originated from the advantages of digital to replicate, to store, to protect, and to secure assets.

- Usable—originated from Steve Jobs at Apple. He combined innovations into devices, such as the iPhone, evolving the devices’ intended digital purposes (calls, texts and emails), as well as developing features and platforms to enable the devices’ ease-of-use.
- Delightful—originated from Jeff Bezos at Amazon. He elevated the importance of delivering on customer experience.
- Meaningfulness—originated from megatrends focused on planet-scale concerns.

There are major categories of escalating customers’ expectations. They reveal a pattern that I call out in the *DICE Theory*. They are the *Pattern of Disruptions*, an innovation lifecycle of major categories of customers’ expectations. The pattern can be used to track changes in value creation, changes in purchasing behaviors, and changes with capabilities and technologies (Figure 1.2). The pattern is not a checklist. It is an innovation lifecycle.

- “Accessible”: breaking down barriers to ownership and consumption;
- “Dependable”: quality, measured by uptime;
- “Reliable”: infrastructure safety (assets) and digital networks (data);
- “Usable”: expanded utility for purposes not originally intended often enabled by digital connectivity;
- “Delightful”: intense focus on user experience through a digital platform (or multisided platform); and
- “Meaningfulness”: targets megatrends, for example: climate change and sustainability; urbanization; aging; disparities and inequalities.

Three disrupters (reliable, usable, and delightful) rely on the advancement and the proliferation of digital technologies throughout society. They require new infrastructure, new technologies, and new business rules (i.e. digital transformation). The last disrupter will require companies to develop new value networks, innovation and business ecosystems, and digitally network them.

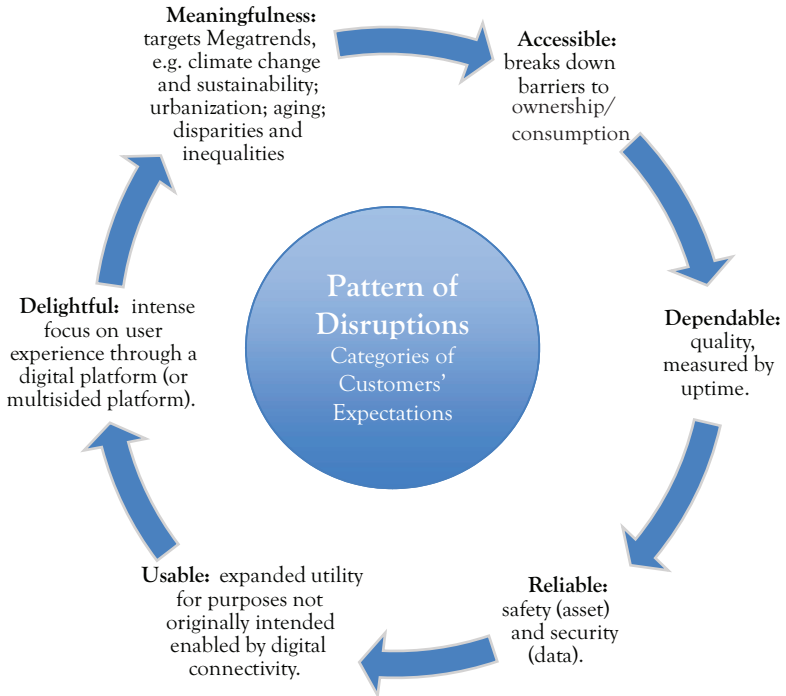


Figure 1.2 Major categories of customers' expectations: *Pattern of Disruptions*

I brought forward other theories to inform the *Pattern of Disruptions*:

- Digital is the tipping point. It has been changing the rules of business since the modern-day Internet was created. It will be the force that disrupts markets and erupts into mass diversifications in innovation, business models, competitor cooperation, cocreation, and a multitude of products and services, all of which are vague concepts at best from this vantage point. *DICE* is necessary for companies to comprehend the future of disruption. Digital transformation is a broad umbrella of initiatives that an organization takes in order to capture value and opportunities from integrating digital technologies into its products, processes, operations, and services (Furr et al. 2019).

- There were other disruptions besides the original theory's reliance on cheaper goods entering the low-end of the market and moving upmarket to higher performance products and services, thereby displacing incumbent companies' offerings. Two different authors proposed expansions or improvements to the original theory. Both of these authors' theories and observations are absorbed into *DICE*. One is conveyed exactly as the authors presented it, and the other is modified from its suggested version.
 - The exact meaning of "increasing in quality" to move upmarket is absorbed from the authors of *Big Bang Disruption* (Downes et al. 2015).

In recent years a new—disquieting—form of disruptive innovation has emerged. It doesn't follow Clayton Christensen's classic model, entering the market as a cheap substitute to a high-end product and then gradually increasing in quality and moving up the customer chain. Instead, the innovation beats incumbents on both price and quality right from the start and quickly sweeps through every customer segment. This kind of "big bang" disruption can devastate entire product lines virtually overnight. Look at the effect that free navigation apps, preloaded on smartphones, had on the market for devices made by TomTom, Garmin, and Magellan. Big-bang disruptions often come out of the blue from people who aren't your traditional competitors. (Downes et al. 2015)

- Downes modeled the observation and referred to disruptive innovations fitting this description as "big-bang disrupters" in the shape of a "Shark Fin." These disrupters did not fit into the original "dilemma" described by Christensen. These disrupters come out of "a function of near-perfect market information" (Downes et al. 2015). A poor reputation for quality in the digital age can ruin any brand and cost a company untold sums. This phenomenon is the result of disrupters enhancing quality and uptime demands on

products and services. (I illustrate the “Shark-Fin” shape and where it fits into *DICE* model in Chapter 2, Figure 2.1.)

- The other author whose theory is absorbed into *DICE* is Rogers’ theory of disruption, as a two-sided approach across consumer purchase behaviors and business models. *DICE* defines consumer purchase behaviors, as customers’ expectations, and not only on the basis of price or access, but as a pattern of major categories of customers’ expectations for value creation throughout the innovation lifecycle. Also, *DICE* focuses on value through interactions of products, services, and business models. These interactions occur through networks that exceed the value that any one contributor brings to the marketplace. Like Rogers’ theory, *DICE* unlocks value through interactions of “people, partners, assets and processes” (Rogers 2016). *DICE* has the added element of digital capabilities in business model platforms through digital transformation of products and services.

The origins for the decision patterns for the S curve innovation maneuvers later discussed used Rogers’ theory as a catalyst, as well as key published works and observed phenomena of disruptions through digital business model innovation. I use Netflix as an example to illustrate how maneuvers through digital business models can disrupt. Furthermore, I highlight an example of the two dimensions of *DICE Theory* and their interactions (the *Pattern of Disruptions* for products/ services and business models) using passenger vehicles and digital platform business models. Both examples are highlighted in this book.

Regarding the S curve of innovation, there are six maneuvers relevant for the dimensions in the *DICE Theory*:

- A company could expand within a disrupter, leaving very little market share available for competitors. [*Landside*: “the disrupter quickly takes over the entire market, pushing the incumbent into obscurity” (Rogers 2016)].

- A company can climb a curve to the top and then jump into the next curve.
- A company could recognize an upcoming shift in customers' expectations, climb with the market expansion before realizing its capabilities are unmatched for the climb. The company jumps to the next curve.
- A company could jump early in preparation for building its talent to climb the next curve, realizing the market is saturated. [*Splitting the market*: “with the disrupter’s and the incumbent’s business models each taking large shares” (Rogers 2016)].
- A company might jump and ‘pause’ before climbing—realizing it needs additional capabilities through partnerships.
- A company participates in a segment of the market. [*Niche* “where the disrupter is attractive to only a very specific portion of the market” (Rogers 2016)].

Later in the book I model the *DICE Theory* with its dimensions of value creation and the S curve of innovation. You will see how they feature in leaders' strategic choices and decision-making for disruptive innovation.

This book offers the breadcrumbs to follow through repeating patterns of disruptions and maneuverers that are revealed only in this book:

- It demonstrates that a pattern of disrupters exists to track major categories of customers' expectations for disruptive innovation. It highlights how over time these disrupters influence the success of products and the unfortunate demise of competitors that failed to recognize them.
- It absorbs past theories of disruptive innovation, as well as brings into focus three digital disrupters—never before addressed.
- It detects disruptions across all customer types for companies to position capabilities, resources, talent, and supply chain partners—to be the disrupter and not the disrupted. This predictive ability is what truly set it apart from other theories.

- It enables both incumbents and new entrants, as well as acts as an alarm to alert them to when they are being (or at risk of being) disrupted. For incumbents, it offers ambidextrous flexibility, leveraging innovation through core (incremental), adjacent (breakthrough), and transformational (disruptive) capabilities. For entrants, it informs them about needed innovation capabilities to maximize impact and lower uncertainties.
- It develops a new theory of disruptive innovation and models it to help companies manage multiple innovation S curve maneuvers.
- It is the only book—to my knowledge—that addresses the need to combine the capabilities of digital transformation with disruptive innovation to accelerate new growth across products, services, and business models for the 21st-century.

When Is “DICE Theory” Observable?

Here are the delimiters for the *Pattern of Disruptions*:

- The *Pattern of Disruptions* is immutable. After customers gain access to a disruptive innovation (product, service, or business model), they move on to create expectations for value creation and behaviors in the next disrupters. This triggers the next disrupters and redefines the focus of customers' future expectations.
- A product, service, or business model can be disrupted multiple times, including within the same disrupter. There can be multiple disruptions occurring until new customers' expectations are redefined to change purchasing behaviors—displacing the incumbent.
- Once a disruptive innovation redefines customers' expectations within a disrupter, the disruptive innovation starts the pattern over from the beginning, taking on its own path through the pattern, and leaving behind the product(s), service(s), or business model(s) it disrupted.

- A disruptive innovation that makes it to the last disrupter “meaningfulness” starts the pattern over from “accessible,” taking with it all of the insights it acquired through the previous iterations.
- Disrupters are impacted by developments in previous disrupters. For instance, a new technology can enable a disrupter to expand its range of capabilities, creating a “ripple effect,” for example, 5G in “reliable” will impact computing speeds that enable the next disrupters. (“Reliable” is undergoing such robust cycles of digital innovations that envisioning the impacts to the next disrupters appears to be cosmic predictions (way past conceivable). However, one of the purposes of *DICE* is directional guidance.)

Here is guidance for the S curve of innovation:

- Unlike the *Pattern of Disruptions*—defined by customers’ expectations, the S curve maneuvers of a company to disrupt is determined by the company’s talent, competition, and capability.
- Understanding these maneuvers within the S curve of innovation can extend the market for a product/service/business model innovation. They can guide companies to use technology to enable a product or service to meet customers’ expectations. They can shift value created from a single-use product or service to a networked use product or service (business model digital platform).

Why Companies Can No Longer Put Off Developing Digital Transformation Plus Disruptive Innovation Capabilities?

The first versions of the Internet evolved into networks of networks, adding architectural infrastructure (or “backbones”), commercial providers (Internet Service Providers), and billions of connected “things.” This combined with digital transformation is accelerating the speed of

disruptive innovation. This should be of greatest concern to the majority of global companies in developed countries, as they have the most to lose in economic value from digital disruptions. Their markets are larger and scaled over decades. Their brands make their products and services recognizable across the globe. The historical knowledge of these incumbents is well documented in business cases, books, and online resources. They are invested in their current operating models—perfected through skilled labor force, supply chain partners, and industry standards. It will be difficult for these companies to adapt to a different set of rules, new operating models, and capabilities to create value.

Developed countries will defend these companies with nationalists political viewpoints. They will attempt to protect physical products at their geographic borders. This will momentarily stall digital disruptions to physical products. For now, digital disruptions do not recognize borders, which are creating another political frontier for developed countries—the Internet. There are ongoing battles over which Internet is allowed to operate and to have access to customers within a country's borders. “Sometimes virtual borders need to be erected, so that data do not leave or enter a certain country” (*The Economist* 2020). This includes data privacy regulations. “Data were supposed to float freely around the world to where they are most efficiently crunched. But flows are increasingly blocked by governments which seek to protect their country's people, sovereignty and economy” (*The Economist* 2020). This is causing what the technology industry calls “Splinternet,” “a maze of national or regional and often conflicting rules” (*The Economist* 2020).

Nevertheless, once a “digital twin,” a digital copy of a physical asset, is created then there is the potential for that asset to exist in “mirrored-economies,” where a product is both physical and virtualized. The decoupling of products from their physical locations into digital twins eliminates a long-standing barrier to entry for entrants. Virtual products do not require the capital investments needed for physical products. This opens up opportunities for servicing both physical and virtual products. The COVID-19 global pandemic will stall digital disruptive innovations in physical products, but not for long. Time will pass, and while countries, cloud technology companies, and businesses fight over policies, legislation, and infrastructure,

companies should prepare their senior leadership and midlevel managers to monitor developments closely to upgrade their digital capabilities. This book steers clear of policymaking and legislation, as these environments are fluid and any assumptions are inherently wrong from the start.

However, there is a more imminent threat posed by digital, and that is: products/services that are not digitally transformed—integrated with technology. They risk losing value to platform business models that unlock network effects. This book is a good first step for managers to prepare. It will help them explain what they are seeing in the marketplace. It will accelerate their intentional efforts to target ideas, opportunities, projects, and proposals for disruption. It will inform the decisions they make about resources to build the best capabilities for the challenges ahead. It will give them evidence from past disruptions, as well as help them explain what it means to be disrupted.

How Can Practitioners Apply DICE?

To demonstrate some of the ways the *DICE Theory* reaches different outcomes than the original theory of disruptive innovation—specifically for products and services, let us examine the smartphone market. The smartphone is a point of contention with the original theory of disruptive innovation. In fact, Christensen dismissed the iPhone as a disruptive innovation (Rogers 2016). The mobile cellphone market was established. Christensen did not acknowledge that there could be a digital disruption occurring in an established market for an existing product. He later attributed the smartphone disruption to the laptop market and not the cellphone market (Roger 2016). Therefore, all smartphone innovations following the laptop were considered performance improvements (incremental innovations) for a sustaining business.

This is how disruption plays out in the smartphone market using *DICE*. Motorola was the first to mass-produce a handheld mobile cellphone on April 3, 1973. The first smartphone followed 19 years later, in 1992. “It was called the Simon Personal Communicator, and it was created by IBM more than 15 [fifteen] years before Apple released the iPhone” (Tweedie 2015). The first version of the iPhone was released on June 29, 2007. It was Steve Jobs who recognized the need to disrupt

the smartphone market at the “usable” disrupter; he carried it through to “delightful,” and on to building a company valued at more than 300 billion dollars. Since Job’s death Apple is worth more than three times that valuation. There is more to come from innovations in the “delightful” disrupter for smartphones—consider camera technologies for virtual reality and augmented reality—as well as in “meaningfulness” disrupter, with battery technologies and wireless charging technologies threatening to eliminate cables for charging (Table 1.1).

Table 1.1 Pattern of Disruptions and smartphone market

Major Categories of Customers' Expectations	Customer Needs	Disruptive Innovation Examples
Accessible	Expensive; limited to business professionals	Lower cost devices and plans
Dependable	Battery life, fires	External batteries, recalls, design phones to use less power
Reliable	Networks = certain geographies and cell towers	Expanded coverage areas and 3G, 4G, 5G
Usable	Unique accessories, data storage, music, apps	Interoperability devices/accessories, cloud storage, sharing platforms
Delightful	Fragmented community sharing, awkward pairing and configuring “connected” smart devices, for example, car, home, apps, etc.	User experience, multisided platform network effects, voice-interactive assistants
Meaningfulness	Materials impacting climate change, mining for cobalt, lithium, and recycling batteries	Virtualized product, dematerialized product design; European Union resolution to control e-waste, potentially requiring a common charger for smartphones—possibly wireless charging

Reflecting back on Gartner’s *Hype Cycle* for emerging technologies, the original theory of disruptive innovation does not explain the phenomenon of what happens next, why innovations descend into the “Trough of Disillusionment” after entering the market? Or how can a company

that invests in disruptive innovation at “accessible” hold on to and defend its investment? Is there an engine that could suspend the time the “Peak of Inflated Expectations” curve meets expectations? These questions are more relevant today, as we look to the Digital Transformation in the New Industrial Revolution (Industry 4.0) and the seismic shifts in technology. Digital will unlock disruptive innovations for many products/services/business models that are still awaiting the opportunity to enter the digital disrupters in the *Pattern of Disruptions*. In order to take advantage of digital disruptions, the processes within a company must be digitized to allow future leaders to access archives of innovations to determine future impacts, as well as to build data models for predictive analytics. This is an exciting time because it means innovations that never reached the digital disrupters in the *Pattern of Disruptions* are in play.

Digital is the innovation tipping point that shifts the competitive landscape, making it difficult to catch up. The digitally disruptive impacts occurring in the “reliable”, “usable,” “delightful,” and “meaningfulness” disrupters will be faster and far more difficult to challenge due to platforms and networked ecosystems. The potential for network effects in digital takes over. This increases the advantages to the frontrunners, leaving very little market share available to competitors. It will not be the first time that a revolution offers opportunities for disruptive innovations.

How Is the Pattern of Disruptions Different than Another Set of Patterns?

Deloitte University Press (2015) conducted a comprehensive business case analysis on disruption, “looking for the specific ways threats manifest in a world.” They uncovered nine *patterns of disruption*. Here are the delimiters *Deloitte* sets:

These patterns are more than “one-off” occurrences, but they also are not universal forces; they are disruptions that will likely occur in more than one market but not in all markets; each delivers new value through a new approach subject to a set of market conditions; each brings its own challenges for the incumbent. (*Deloitte University Press 2015*)

Without the benefits of discussions with *Deloitte* and only the white paper it published on its website, I attempted to align its patterns in Table 1.2.

Table 1.2 Comparing the Pattern of Disruptions to other patterns

Pattern of Disruptions: Major Categories of Customers' Expectations	[Nine] Patterns of Disruptions (Deloitte University Press)
"Accessible": breaking down barriers to ownership/consumption	<ul style="list-style-type: none"> • Align price with use: reducing upfront barriers to use • Unbundle products and services: giving you just what you want, nothing more
"Dependable": quality, measured by uptime	
"Reliable": infrastructure safety (assets) and digital networks (data)	<ul style="list-style-type: none"> • Unlock adjacent assets: cultivating opportunities on the edge
"Usable": expanded utility for purposes not originally intended, often enabled by digital connectivity	<ul style="list-style-type: none"> • Expand marketplace reach: connecting fragmented buyers and sellers—when-ever, wherever • Connect peers: fostering direct, peer-to-peer connections
"Delightful": intense focus on user experience through a digital platform (or multisided platform)	<ul style="list-style-type: none"> • Turn products into platforms: providing a foundation for others to build upon
"Meaningfulness": targets megatrends, for example, climate change and sustainability; urbanization; aging; disparities and inequalities	<ul style="list-style-type: none"> • Shorten the value chain: transforming fewer inputs into greater value outputs • Converge products: making 1+1 >2
	<ul style="list-style-type: none"> • Distribute product development: mobilizing many to create one

Observable distinctions between *Pattern of Disruptions* and Deloitte's patterns are as follows:

- *Pattern of Disruptions* offers a repeatable innovation lifecycle for products, services, and business models.
- It is robust and comprehensive—capturing the evolutionary lifecycle of innovations.
- It is not limited to certain industries, markets, or sectors.

Key Takeaways From Chapter 1

- Christensen's original theory was a first step in alerting incumbents to changing market conditions that threatened their leadership in existing B2B markets.

- Christensen missed a key warning to incumbents: the source of the threats to market leadership is changing consumer behaviors (based on major categories of customers' expectations for value creation, *Pattern of Disruptions*) that include digitally enabled products, services, and business models.
- Digital transformation is a set of capabilities that businesses must develop, which integrates digital to increase value to customers.
- *Pattern of Disruptions* is a guide for innovators and strategists to develop disruptive innovations.
- In addition to the value generation guidance in the pattern, business leaders can leverage maneuvers in the innovation S curve.
- The ability to disrupt across all dimensions in the *DICE Theory* requires ambidextrous leadership.
- *Part 1: It's the Background* is complete.

Disruptive Innovation and Digital Transformation

21st Century New Growth Engines

Marguerite L. Johnson

Disruptive Innovation and Digital Transformation: 21st Century New Growth Engines is for executive leadership, senior management, innovation catalysts, and digital marketing teams tasked with transforming businesses by accelerating growth through disruptive innovations and digital capabilities. It is a practical guide with concise insights for understanding the applications of disruptive innovation and how to iteratively apply them to projects and opportunities. It garners insights from the best minds across relevant disciplines—from its original theory and latest updates—to arrive at new insights on digital transformation.

The author evolves key approaches to disruptive innovation theory to reveal new digital applications and tells leaders what to look for—major categories of customers' expectations in an escalating pattern to understand in what context digital plus disruptive innovations must be aligned with consumer preferences, environments, and the jobs-to-be-done, which is modeled in a new theory, Disruptive Innovation Customers' Expectations (DICE).

DICE provides methods to use to lead digital disruption across products, services, and business models. DICE translates the vague parts of disruptive innovation by simplifying them down to what-to-do. DICE takes away the elusive nature of disruptive innovation by advising leaders: how to scan, to track, and to detect disruptions.

This book provides leaders with the right lenses to filter markets, giving order to complexity, and making disruptive innovation simpler.

Marguerite L. Johnson leads transformational innovation growth strategies. Her business leadership and market knowledge extends across many commercial and industrial markets: automotive electrification, vehicle electronic safety systems, engines, heavy off-road equipment, and plastics. Marguerite's expertise includes: disruptive innovation, digital transformation, ideation, customer insights, digital marketing, digital business models and platforms, open innovation, co-creation, and innovation ecosystems. She earned a Master's degree in acquisitions management from Central Michigan University and several professional certifications from Northwestern University, Kellogg, Harvard Business School, and MIT Sloan. Marguerite is a twice US patented inventor.

Service Systems and Innovations in Business and Society Collection

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