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Legal Education: A New Growth Vision: Part III—The Path Forward: Being Both Human and Digital

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Legal Education: A New Growth Vision
Part III—The Path Forward: Being Both Human and Digital

ABSTRACT

In the decades ahead, innovative and status quo-breaking law schools will leverage and combine multidisciplinary, multigenerational human expertise with digital platform and artificial intelligence (AI) technologies to create vibrant legal education ecosystems. These combinations will deliver market-valued knowledge and skill transfer and development services that are high-quality, cost-effective, omnichannel, pedagogically sound, data-validated, personalized, on-demand or just-in-time, and multi-format (e.g., hybrid, HyFlex, digital-first, digital-live, etc.).

Modern business models (e.g., platform and open) will provide these future-focused law schools with solid foundations for reimagining legal education. These agile, shape-shifting programs are also likely to discover diverse revenue opportunities by offering complementary services to adjacent markets. Growth opportunities for inventive law schools abound, so long as entrepreneurial program leaders embrace a human-AI integrated future. Simply put, digital and business model innovations represent the only firewalls to obsolescence.

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SERIES OVERVIEW

This final installment of the three-part *Legal Education: A New Growth Vision* series asserts that when a strategic inflection point threatens traditional law school business and service models, the strongest survivors will be led by forward-focused, innovative, and agile education entrepreneurs.

Like successful Silicon Valley startups, these survivor law schools will bring together dynamic teams—consisting of visionaries, thinker-planners, and drivers—to discover exciting pathways for innovation that yield sustained economic growth, program vitality, and institutional relevance. These education innovators embrace mindsets that (1) presume instability over stability, (2) value action over inaction, (3) imagine and nurture nascent innovations, (4) continuously reconfigure program operations and resources to identify and serve customer needs, and (5) nimbly respond to changing market conditions.

Part III also integrates the multidisciplinary ideas discussed throughout *Parts I* and *II* into a sample plan that moves law schools on a forward path consistent with Negroponte's vision of uniting humans with the digital realm—in other words, "being digital."

I. INTRODUCTION: PLATFORMS ARE EATING THE WORLD

In 2011, Netscape founder Marc Andreessen penned an op-ed titled "Why Software Is Eating the World," predicting that software will radically change business and society.[1] Eight years later, software remains important but the emerging apex technology predators that will redefine the business landscape include platforms and artificial intelligence (AI).[2] Because these technologies increasingly drive the digital

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1. Marc Andreessen, *Why Software Is Eating the World*, WALL ST. J. (Aug. 20, 2011), https://www.wsj.com/articles/SB10001424053111190348090 4576512250915629460 [https://perma.unl.edu/J4TQ-JBGE] ("More major businesses and industries are being run on software and delivered as online services . . . .").

2. GEOFFREY G. PARKER ET AL., PLATFORM REVOLUTION: HOW NETWORKED MARKETS ARE TRANSFORMING THE ECONOMY AND HOW TO MAKE THEM WORK FOR YOU 63 (2016); *see also* Tom Simonite, *Nvida CEO: Software Is Eating the World, but AI Is Going to Eat Software*, MIT TECH. REV. (May 12, 2017), https://www.technologyreview.com/s/607831/nvidia-ceo-software-is-eating-the-world-but-ai-is-going-to-eat-software [https://perma.unl.edu/R774-YWK9] (discussing how the end of "Moore's law," the coming plateau in transistor density, will affect future technology); Aaron De Smet & Chris Gagnon, *Organizing for the Age of Urgency*, MCKINSEY Q. (Jan. 2018), https://www.mckinsey.com/business-functions/organization/our-insights/organizing-for-the-age-of-urgency [https://perma.unl.edu/5MEX-MUW3] (outlining a "road map" for the organization of the future including elements such as urgency and agility).

economy, successful enterprises will constantly scout for and seize venture opportunities, adopt emerging platform technologies, regularly update business models, and continuously adapt their processes and program offerings to compete in a human-AI integrated marketplace. These nimble and wily enterprises approach each day as a test with zero-sum results: survival or extinction.

Amazon.com, Inc. typifies such an enterprise. Amazon's full embrace of the immense power of digital platforms, customer-focused business models, and human-AI integration illuminates the pathway forward for survival-oriented law schools.[3] Further, Amazon's unparalleled success highlights the role of "high-quality" and "high-velocity" decision-making focused on value, personalization, profitability, and market expansion.[4] Amazon CEO Jeff Bezos has attributed Amazon's steady success to a relentless "Day 1" mindset, which he first articulated in his March 21, 1997 Letter to Shareholders:

> But this is Day 1 for the Internet and, if we execute well, for Amazon.com. Today, online commerce saves customers money and precious time. Tomorrow, through personalization, online commerce will accelerate the very process of discovery. Amazon.com uses the Internet to create real value for its customers and, by doing so, hopes to create an enduring franchise, even in established and large markets . . . . The competitive landscape has continued to evolve at a fast pace . . . . Our goal is to move quickly to solidify and extend our current position while we begin to pursue the online commerce opportunities in other areas . . . . This strategy is not without risk: it requires serious investment and crisp execution against established franchise leaders.[5]

Businesses with an entrepreneurial culture, such as Amazon's Day 1 mindset, typically exhibit the following characteristics: (1) customer obsession, (2) a skeptical view of proxies [e.g., processes, research, and surveys], (3) the eager adoption of external trends, and (4) high-veloc-

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3. *See generally* Albert Bollard et al., *Accelerating the Shift to a Next-Generation Operating Model*, MCKINSEY & CO. (Dec. 2017), https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/accelerating-the-shift-to-a-next-generation-operating-model [https://perma.unl.edu/Z2HG-DEAR] ("The next-generation operating model is defined by a continual effort to improve end-to-end customer journeys and business processes by applying advance technologies and sophisticated operational methods in an integrated manner."). Developing next generation operating models involve: (1) using a "clean-sheet" to continually improve and reinvent the customer experience journey, (2) rapidly integrating new technologies into current operations via continuous learning and testing, and (3) increasing forward momentum by implementing agile methodologies and deploying teams to eliminate customer pain points and reinvent customer experience journeys. *Id.*

4. De Smet & Gagnon, *supra* note 2 (describing Jeff Bezos's decision-making philosophy).

5. Jeffrey P. Bezos, *1997 Letter to Shareholders*, AMAZON BLOG (Mar. 21, 1997), https://blog.aboutamazon.com/company-news/amazons-original-1997-letter-to-shareholders [https://perma.unl.edu/C6G3-BNF4].

ity decision making.[6] In contrast, businesses that "wait and see"[7] or take the "Day 2"[8] approach generally descend down a path of irrelevance due to failure to experiment, evolve, and embrace industry and technology changes. In an April 2017 shareholder Q&A session, Bezos again explained the differences between Day 1 (leaders/survivors) and Day 2 (followers/failures) enterprises and quipped "*that* is why it is *always* Day 1."[9]

Since ecosystems represent the future,[10] savvy law schools should similarly adopt a Day 1 mindset to imagine and implement new digital strategies and build human-AI integration and personalized instruction into the core of legal education.[11] *Part III* of this three-part

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6. Jeffrey P. Bezos, *2016 Letter to Shareholders*, AMAZON BLOG (Apr. 17, 2017), https://blog.aboutamazon.com/company-news/2016-letter-to-shareholders [https://perma.unl.edu/PQV4-FSN7]. In his April 2017 letter to Amazon shareholders, CEO Jeff Bezos explained that "most decisions should probably be made with somewhere around 70 percent of the information you wish you had. If you wait for 90 percent, in most cases you're probably being slow." De Smet & Gagnon, *supra* note 2. He adds that being wrong and then quickly course correcting provides opportunities to develop momentum, whereas being slow will be expensive and potentially catastrophic. *Id.*

7. De Smet & Gagnon, *supra* note 2 ("The average large firm reorganizes every two to three years, and the average reorganization takes more than 18 months to implement. Wait and see is not an option; it's a death sentence.").

8. Bezos, *supra* note 6 (describing Day 1 and Day 2 businesses). Bezos's Letter to Shareholders opened with the following:

    "Jeff, what does Day 2 look like?"
    That's a question I just got at our most recent all-hands meeting. I've been reminding people that it's Day 1 for a couple of decades. I work in an Amazon building named Day 1, and when I moved buildings, I took the name with me. I spend time thinking about this topic.
    "Day 2 is stasis. Followed by irrelevance. Followed by excruciating, painful decline. Followed by death. And *that* is why it is *always* Day 1."

    Id.; *see also* Amazon News*, Jeff Bezos on Why It's Always Day 1 at Amazon*, YOU-TUBE (Apr. 19, 2017), https://www.youtube.com/watch?v=ftwXS2H_iJo#action =share [https://perma.unl.edu/8KMG-28ND] (describing what Day 2 looks like); DW360, *Amazon CEO Jeff Bezos: It Is Always Day One*, YOUTUBE (Apr. 26, 2018), https://www.youtube.com/watch?v=KpbKeNghRYE [https://perma.unl.edu/U5WV-HSP2] (discussing the principles Jeff Bezos follows to ensure the success of Amazon).

9. Bezos, *supra* note 6.

10. *See Legal Education: A New Growth Vision Part II*, section IV.A (examining ecosystems). In brief, an ecosystem is a "network of cross-industry players who work together to define, build and execute market-creating customer and consumer solutions. An ecosystem is defined by the depth and breadth of potential collaboration among a set of players: each can deliver a piece of the consumer solution, or contribute a necessary capability." Michael Lyman et al., *Cornerstone of Future Growth*, ACCENTURE STRATEGY 16 (2018), https://www.accenture.com/t20180511 T201522Z__w__/us-en/_acnmedia/PDF-77/Accenture-Strategy-Ecosystems-Exec-Summary-May2018-POV.pdf#zoom=50 [https://perma.unl.edu/W2ZD-38ZM].

11. Amazon News, *supra* note 8; *see* Martin Hirt, *If You're Not Building an Ecosystem, Chances Are Your Competitors Are*, MCKINSEY & CO. (June 12, 2018), https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-in

series posits that Day 1 law schools will be those programs that embrace entrepreneurship to differentiate their education services in a presently oversaturated legal education market.[12] Acutely aware of the transitory nature of success and that "every business model fails eventually,"[13] these forward-looking law schools actively scout and

sights/the-strategy-and-corporate-finance-blog/if-youre-not-building-an-ecosystem-chances-are-your-competitors-are [https://perma.unl.edu/PHJ6-RH62] (noting ecosystem innovations at Intuit, Facebook, Alibaba, Google, Amazon, Apple, Tencent, etc.). Hirt writes, "Today, ecosystems make possible improbable combinations of attributes. Think of a competitor that offers the largest inventory, the fastest delivery time, the greatest customer experience, and low cost, all at once." *Id.*

12. See *Legal Education: A New Growth Vision Part II*, Part II for a discussion of the oversaturated legal education market. HENRY CHESBROUGH, OPEN SERVICES INNOVATION: RETHINKING YOUR BUSINESS TO GROW AND COMPETE IN A NEW ERA 3, 10–11 (2011) (discussing how organizations must cultivate growth opportunities by continuously reinventing their services in order to differentiate their offerings and gain competitive advantages); BHARAT ANAND, THE CONTENT TRAP: A STRATEGIST'S GUIDE TO DIGITAL CHANGE, xi, 299, 304 (2016) (explaining that education is an "information good" because it now involves the "moving [of] information, bits and bytes," like other entertainment or media products). Further, "[e]ducation is 'non-rivalrous'—any piece of knowledge can be consumed simultaneously by millions of users. Education is also 'non-excludable'—access is increasingly hard to restrict, given mechanisms for free, instantaneous worldwide [digital] distribution (and other times, piracy)." *Id.* at 304; *see also* Mark A. Cohen, *Recommendations for Corporate Legal Buyers and Providers in the Digital Age*, FORBES (Sept. 24, 2018), https://www.forbes.com/sites/markcohen1/2018/09/24/recommendations-for-corporate-legal-buyers-and-providers-in-the-digital-age/#66f6fe07369a [https://perma.unl.edu/TV66-E6EY] (asserting that legal service survivors in the digital age will "adopt a client-centric philosophy" and "differentiate" the products and services offered). Cohen explains that differentiation in the legal industry involves three components: legal experience and expertise, efficient human and technology delivery processes, and achievement of results, including customer trust and satisfaction. *Id.* Forward-focused, financially sustainable law schools will similarly embrace these three components when reinventing their legal education business model.

13. Greg Satell, *How Blockbuster, Kodak and Xerox Really Failed (It's Not What You Think)*, INC. (July 7, 2018), https://www.inc.com/greg-satell/pundits-love-to-tell-these-three-famous-innovation-stories-none-of-them-are-true.html [https://perma.unl.edu/K6SV-9GPP]; RITA GUNTHER MCGRATH, THE END OF COMPETITIVE ADVANTAGE: HOW TO KEEP YOUR STRATEGY MOVING AS FAST AS YOUR BUSINESS xi (2013) (offering strategy perspectives "based on the idea of transient competitive advantage: that to win in volatile and uncertain markets, executives need to learn how to exploit short-lived opportunities with speed and decisiveness"); *see also* MARK W. JOHNSON, REINVENT YOUR BUSINESS MODEL: HOW TO SEIZE THE WHITE SPACE FOR TRANSFORMATIVE GROWTH 187 (2018) (quoting Peter Drucker) ("Every organization . . . has a theory of business . . . . Some theories of the business are so powerful that they last a long time. But . . . they don't last forever, and indeed, today they rarely last for very long at all. Eventually every theory of the business becomes obsolete and then invalid."); Peter F. Drucker, *The Theory of Business*, HARV. BUS. REV. 100–01 (Sept.–Oct. 1994), https://hbr.org/1994/09/the-theory-of-the-business [https://perma.unl.edu/V27A-8HWR] (identifying four "specifications of a valid theory of the business": (1) "The assumptions about envi-

discover opportunities to deliver relevant, market-valued legal educa-
tion services by combining compelling technologies with updated busi-
ness models.[14] In building a state-of-the-art education ecosystem, law

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ronment, mission, and core competencies must fit reality"; (2) "The assumptions
in all three areas have to fit one another"; (3) "The theory of the business must be
known and understood throughout the organization"; and (4) "The theory of the
business has to be tested constantly"). Drucker reminds leaders that "[i]t usually
takes years of hard work, thinking, and experimenting to reach a clear, consis-
tent, and valid theory of business." *Id.* at 100. Drucker further recommends that
leaders establish routine preventive care check-ups and seek early diagnosis of
any problems with the theory of business so that curative action can be taken to
prevent stagnation. *Id.* at 101–04. For a current day example of business model
restructuring designed to adapt to the digital age, see *Tencent Restructures to
Focus on Cloud, Artificial Intelligence*, ASIA TIMES (Oct. 1, 2018), http://www.
atimes.com/article/tencent-restructures-to-focus-on-cloud-artificial-intelligence/
[https://perma.unl.edu/CQ8Z-4EGR] (describing the missions of Tencent's new
Cloud and Smart Industries Group [CSIG] and the Platform and Content Groups
[PCG]). CSIG will provide integrated cloud and internet solutions for "smart" ed-
ucation, healthcare, retail, and security industries, and the PCG will deeply inte-
grate "social platforms, content industries and technologies." *Id.*

14. Andrea Ovans, *What Is a Business Model?*, HARV. BUS. REV. 3 (Jan. 23, 2015),
https://hbr.org/2015/01/what-is-a-business-model [https://perma.unl.edu/R4FP-
ZR8Q] (quoting Joan Magretta): ("A good business model answers Peter
Drucker's age-old questions, 'Who is the customer? And what does the customer
value?' It also answers the fundamental questions every manager must ask: How
do we make money in this business? What is the underlying economic logic that
explains how we can deliver value to customers at an appropriate cost?"); *see also*
Mark A. Cohen, *New Business Models—Not Technology—Will Transform the Le-
gal Industry*, FORBES (Nov. 8, 2018), https://www.forbes.com/sites/markcohen1/
2018/11/08/new-business-models-not-technology-will-transform-the-legal-indus-
try/#fc8a0e518ccf [https://perma.unl.edu/7K4J-VQ93] (highlighting Mark W.
Johnson's new book *Reinvent Your Business Model*). Cohen then posits that "law
firms [and by extension law schools] must rethink their economic/business model,
value proposition, (lack of) alignment with clients, hiring practices, resources,
strategic partners, supply chain collaborators, and delivery capability." *Id.* Cohen
further states that technology alone cannot solve customer demands and ensure
enterprise profitability, rather financial survival in a shifting industry landscape
requires law leaders to design "business models that deliver impactful customer
solutions consistently, scalably, efficiently, cost-effectively, collaboratively, trans-
parently, and measurably." *Id.*; *see generally* JOHNSON, *supra* note 13, at 28 (ar-
ticulating a "four-box business model" framework consisting of: (1) customer
value proposition, (2) key resources, (3) key processes, and (4) profit formula");
Irving Wladawsky-Berger, *It's All About Business Model Innovation, Not New
Technology*, WALL ST. J. BLOG: CIO J. (Nov. 2, 2018, 3:00 PM), https://
blogs.wsj.com/cio/2018/11/02/its-all-about-business-model-innovation-not-new-
technology [https://perma.unl.edu/V5WB-J64T] (reviewing Mark Johnson's four-
part business model framework and explaining how savvy leaders scout for and
then reinvent their business models to serve "white spaces"—that is, new market
opportunities). For a pre-mortem of Valparaiso Law School's failed business
model, see Marilyn Odendahl, *Valparaiso Law School to Write Its Final Chapter
in 2020*, IND. LAW. (Nov. 28, 2018), https://www.theindianalawyer.com/articles/
print/48771-valparaiso-law-school-to-write-its-final-chapter-in-2020 [https://
perma.unl.edu/GE6J-RB36] (quoting Jon Costas, mayor of city of Valparaiso and
elder law attorney) (discussing the need for innovations in legal education and

school leaders will discover and disseminate fresh pedagogical approaches that are both human and digital.[15] To make this grand vision a reality, this Article recommends that legal education entrepreneurs follow the lead of Larry Page, who expects Google's visionaries to be "uncomfortably excited" and have "a healthy disregard for the impossible" when inventing education services for an unknown future.[16]

The objectives of *Legal Education: A New Growth Vision Part III* are twofold: first, to propose ideas for designing and delivering pedagogically sound, data-validated legal education services; and second, to mobilize organizational action that improves program solvency and long-term sustainability (regardless of a program status as public, nonprofit, or for-profit). Specifically, university leaders must chart innovation mission trajectories,[17] embrace technology, foster startup cultures of innovation and entrepreneurship,[18] continuously adapt,

recommending collaborations with the business sector). Mayor-attorney Costas then states, "People are so used to dramatic change in this world . . . . I think they realize it's just a part of life and to fight for an old paradigm may not be the best thing and may stop a new paradigm." *Id.*

15. *See* Hirt, *supra* note 11 ("Platforms are fast rewiring even physical markets, in the process redefining how traditional companies need to respond."). Hirt then points to how Apple and Tencent have gained "vast scale by placing customers at the center of their digital activity," thus creating and capturing value unimaginable a decade ago. *Id.*; *see generally* Marc de Jong et al., *The Eight Essentials of Innovation*, McKinsey Q. (Apr. 2015), https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-eight-essentials-of-innovation [https://perma.unl.edu/K39Q-6GNV] (identifying the eight innovation essentials as: (1) Aspire, (2) Choose, (3) Discover, (4) Evolve, (5) Accelerate, (6) Scale, (7) Extend, and (8) Mobilize).

16. John Doerr, Measure What Matters 147 (2018) (describing how Larry Page of Google wanted his teams to be "uncomfortably excited" and have "a healthy disregard for the impossible"). According to Alan Kay (computer scientist), "It's easier to invent the future than to predict it." Alan Kay, Goodreads, https://www.goodreads.com/quotes/7191798-it-s-easier-to-invent-the-future-than-to-predict-it [https://perma.unl.edu/Z566-9DFR].

17. As discussed *infra* in section II.A, an innovation mission trajectory (IMT) represents a fusion of modern innovation theories. An IMT encourages entrepreneurs to imagine the fantastic and improbable future and then design ways to implement those dreams. See Appendix III for an expanded definition.

18. Eric Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses 27 (2011) (defining a startup as "a human institution designed to create a new product or service under conditions of extreme uncertainty"). Ries also notes that "[e]ntrepreneurs who operate inside an established organization sometimes are called 'intrapreneurs' because of the special circumstances that attend building a startup within a larger company." *Id.* at 26–27; *see also* Calestous Juma, Innovation and Its Enemies: Why People Resist New Technologies 39 (2016) ("The ability to identify emerging technological opportunities and harness their benefits is an essential aspect of entrepreneurship, business development, and public policy."). Juma also notes the importance of "adopt[ing] business strategies and policies that take into account the importance of emerging technological opportunities." *Id.* at 40.

seize new market opportunities, and focus obsessively on delivering customer value.[19]

Part I of this Article outlines a path forward for legal education programs seeking to achieve financial and enterprise sustainability by uniting the best aspects of human teachers and digital interactions (i.e., being both "human" and "digital"). Part II offers some practical ideas and approaches for designing legal education of the future. Part III emphasizes the importance of a Day 1 mindset, introduces two innovation frameworks, and briefly describes the Objectives and Key Results (OKRs) transformation management system. Part III then organizes the multidisciplinary ideas discussed in this three-part Article series into sample schedules for planting, tending, and harvesting emerging education innovations. In the conclusion, Part IV again calls law school leaders to manifest a Day 1 mindset and immediately begin the process of organizational self-disruption and reinvention. By the year 2050, these Day 1 law school survivors will seamlessly fuse the best aspects of traditional human law school education with modern technologies. In particular, these law schools will deliver omni-channel, platform-based education experiences that coherently combine human, digital, and eventually AI-enhanced personalized instruction for complete knowledge and skills development solutions. Appendices I–III reprint the T-shaped skills for knowledge professionals, consolidate the multimedia sources referenced, and provide a glossary of key terms.

Finally, this Article snapshots the legal education landscape as of Fall 2018. Bear in mind that because technology innovations mushroom, exciting new opportunities may arise by the time the reader considers the ideas set forth herein.

II. PATH FORWARD: BEING BOTH HUMAN AND DIGITAL

As discussed throughout this three-part series, education can no longer reside exclusively within the walls of architecturally grand buildings surrounded by manicured lawns and weed-free gardens. Digitization challenges the supremacy of physical infrastructures and assets—a hard and extremely cold fact that should be firmly embedded in the minds of university leaders.[20] Information and communica-

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19. Anticipating an argument that education is inherently different from other consumer relationships and, therefore, the "student as customer" analysis is patently wrong, please note the specific type of education discussed in this Article: professional education (not undergraduate education). Students attend professional schools to obtain doctrinal knowledge and technical skills for a *professional career*.

20. Marshall W. Van Alstyne et al., *Pipelines, Platforms, and the New Rules of Strategy*, Harv. Bus. Rev. (Apr. 2016), https://hbr.org/2016/04/pipelines-platforms-and-the-new-rules-of-strategy [https://perma.unl.edu/2FVJ-AYH8].

tion technologies (ICTs) now join faculty and students together across time zones, uprooting traditional campus-centric models.[21] As the business world has transcended the physical realm, so too must education. Growth requires moving quickly, taking risks, learning from mistakes, and constantly improving.[22] It requires digging in, getting dirty, and sowing the seeds of change.

This does not mean, however, that successful legal education programs must abandon the foundations of their identity or forget their core mission. Nor does it mean that digitization has usurped the essential human role in developing future legal thinkers and doers. Rather, it means that legal education programs must return to the root of their purpose: to nurture fertile minds to think in new and different ways, to foster problem-solving skills and creativity, and to satisfy the expectations of all their customers (i.e., students, graduates, employers, and practitioners). They must employ technology to augment—not override—faculty expertise; collaborate with individuals from outside or within other facets of the education space; and develop self-sustaining and self-improving processes for ongoing growth.

Above all, survival-oriented, Day 1 education institutions committed to "digital reinvention"[23] will design, test, iterate, and refine new

21. Information and Communications Technology (ICT) refers to "the technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions." *Information and Communications Technology (ICT)*, TECHOPEDIA, https://www.techopedia.com/definition/24152/information-and-communications-technology-ict [https://perma.unl.edu/9Y7H-ZHAE]. The scope of ICT is broader than just "information technology" (IT) and describes "the convergence of several technologies and the use of common transmission lines carrying very diverse data and communication types and formats." *Id.*; *see generally* ERIC SCHMIDT & JONATHAN ROSENBERG, HOW GOOGLE WORKS 12–15 (2017) (explaining how computing power, connectivity, and information will radically reshape all "information-driven" industries, including higher education). Schmidt and Rosenberg argue that ICTs now threaten the traditional education model where universities serve as gatekeeper to scarce resources—specialized knowledge and information—by controlling distribution channels and access to physical learning spaces. *Id.* In the decades ahead, product excellence (human and digital) instead of geographical constraints will determine whether education programs thrive or wither. *Id.* Speed, adaptability, and cost will, therefore, separate winners from losers. *Id.*

22. *See generally* Arun Arora et al., *A CEO Guide for Avoiding the Ten Traps that Derail Digital Transformations*, MCKINSEY & CO. (Nov. 2017), https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/a-ceo-guide-for-avoiding-the-ten-traps-that-derail-digital-transformations [https://perma.unl.edu/TQ4R-BYWM] (identifying the following 10 traps: (1) excessive caution, (2) fear of the unknown, (3) lack of focus, (4) running out of money, (5) lack of talent, (6) lack of discipline, (7) failure to learn, (8) change fatigue, (9) going it alone, and (10) going too slowly).

23. IBM INST., *Plotting the Platform Payoff: The Chief Executive Officer Perspective*, IBM 2018 GLOBAL C-SUITE STUDIES 21 (May 2018), https://www.ibm.com/services/insights/c-suite-study/ceo [https://perma.unl.edu/WMJ9-NTU6] [hereinafter *Plot-*

methods of teaching and learning to achieve competitive advantages.[24] They also remember that competitive advantage is transient—like blooming flowers.[25] These organizations recognize the temporary nature of success because each customer interaction presents an opportunity to either succeed or fail.[26] As a result, these organizations constantly re-evaluate and reconfigure resources (people, capabilities, and assets) to replenish flows of new ideas, develop market advantages, and adapt to satisfy evolving customer needs.[27] They also regularly prune non-producing projects to focus their human and financial resources on seed initiatives with potential.[28] Most critically, education entrepreneurs understand that innovative organizations must continuously subject their product and services to ongoing cycles of re-evaluation, refreshment, re-engineering, reinvention, redeployment, removal, recycling, and rebooting. Innovation mis-

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ting the Platform Payoff] ("Digital Reinvention involves a fundamental ground-up reinvention of strategy, operations and technology."). Leaders seeking to advance their Digital Reinvention agendas should do the following: (1) "pursue a new focus," (2) "establish new ways of working," (3) "build new expertise," (4) "envision possibilities," (5) "create pilots," (6) "deepen capabilities," and (7) "orchestrate reinvention." *Id.* at 22–23.

24. ANDREW J. POLICANO, FROM IVORY TOWER TO GLASS HOUSE: STRATEGIES FOR ACADEMIC LEADERS DURING TURBULENT TIMES 17–19 (2016); *see generally* Debra Moss Vollweiler, *Don't Panic! The Hitchhiker's Guide to Learning Outcomes: Eight Ways to Make Them More Than (Mostly) Harmless* (July 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3220459 [https://perma.unl.edu/D5ZZ-W77V] ("Teaching has been defined as 'the act of giving lessons on a subject' while learning is 'knowledge gained through study,' which can be of information, skills, behaviors or values.").

25. MCGRATH, *supra* note 13, at 5.

26. JOSH LINKNER, THE ROAD TO REINVENTION: HOW TO DRIVE DISRUPTION AND ACCELERATE TRANSFORMATION 139 (2014). Also, according to Linkner, "Success can intoxicate even the most disciplined leaders and trick them into thinking their advantage is sustainable. Don't drink the moonshine. Your responsibility as a leader is to deeply instill within your organization the understanding that even its most profound successes are only temporary delights." *Id.* at 51.

27. MCGRATH, *supra* note 13, at 27–28 (describing the importance of continuous reconfiguration and shape shifting). McGrath also states, "Innovation is not optional in a world of fleeting advantages. Innovation is not a sideline. Innovation is not a senior executive hobby or a passing fad. Innovation is a competency that needs to be professionally built and managed." *Id.* at 134; *see also* ANAND, *supra* note 12, at 332 (warning that failure to meet customer needs opens wide pathways for competitors and disruptors). He adds that "[c]ustomer-centricity wasn't deadly; product-centricity was." *Id.*; CLAYTON M. CHRISTENSEN, THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL 119 (2016) ("Resource allocation and innovation are two sides of the same coin: Only those new product development projects that do get adequate funding, staffing, and management attention have a chance to succeed; those that are starved of resources will languish. Hence, the patterns of innovation in a company will mirror quite closely the patterns in which resources are allocated.").

28. MCGRATH, *supra* note 13, at 53–74 (discussing how to assess vitality of organizational activities and when to shift, disengage, or exit).

sion trajectories are essential to establishing and maintaining this process long-term. The purpose, goals, and process of innovation mission trajectories are discussed below.

A. Envisioning Innovation Mission Trajectories

Education leaders must recognize that focusing on operations only solves today's problems, while focusing on strategy can shape an enterprise's future.[29] Wise leaders who are good stewards[30] of the minds entrusted to them will invest in the future and work to strengthen the programs under their care for future generations.[31] Entrepreneurially-minded leaders must engage in the spadework necessary to create innovation mission trajectories for law schools that will guide the program to a specific set of dynamic outcomes.

As the reader may have observed, the phrase "innovation mission trajectory" winds throughout this three-part Article series like morning glory vines flush with blooms, rambling up a garden trellis to provide protection from the harsh climate of a changing world. "Innovation mission trajectory" represents a fusion of the various innovation and management theories described in *Legal Education: A New Growth Vision Parts I* and *II* without suggesting strict compliance in form or application.[32] Because innovation is a fluid process,

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29. IBM INST., *Redefining Competition: Insights from the Global C-suite Study – The CEO Perspective*, IBM 2016 CEO C-SUITE STUDIES 6 (Jan. 2016), https://www-01.ibm.com/common/ssi/cgi-bin/ssialias?htmlfid=GBE03719USEN& [https://perma.unl.edu/QHT9-VF58] [hereinafter *Redefining Competition*]; *see also* ANDREW MCAFEE & ERIK BRYNJOLFSSON, MACHINE PLATFORM CROWD: HARNESSING OUR DIGITAL FUTURE 244–45 (2017) (describing attributes of "geeky" leaders as having grand visions and strong opinions as well as "seeing the big patterns and kind of instinctively knowing what's the right way to do things"); *see generally* Chris Bradley et al., *Eight Shifts That Will Take Your Strategy into High Gear*, MCKINSEY & CO. (Apr. 2018), https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/eight-shifts-that-will-take-your-strategy-into-high-gear [https://perma.unl.edu/4C57-BYXJ] (recommending: (1) strategy as a journey with rolling plans that can be updated, (2) vigorous debate of alternatives with various resource allocations, (3) embrace a "one-in-ten wins" mindset to discover breakout "hits," (4) budget allocations to support big moves, (5) "resource liquidity" as the means to pursue emerging opportunities, (6) a portfolio view of opportunities and risks, (7) holistic examinations of system performance, and (8) the first forward step unlocks the transformation journey).

30. *See Matthew* 25:14–30, *The Parable of the Talents*, (The Catholic Study Bible/New American Bible) (1990).

31. ERIC REIS, THE STARTUP WAY: HOW MODERN COMPANIES USE ENTREPRENEURIAL MANAGEMENT TO TRANSFORM CULTURE & DRIVE LONG-TERM GROWTH 34–35 (2017) (discussing the concept of legacy). Reis also asserts that modern, thriving organizations will synthesize past excellence with future opportunities. *Id.* at 35.

32. See, e.g., Grove's spirit of adventure and his concept of "articulated end result"; Levitt's penetrating and illuminating questions about business definition and how to satisfy customers; McGrath's challenge-driven innovation and discovery-driven growth approaches and especially her insight that fragile, new innova-

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not a rigid result, visionary leaders will remain open to all possibilities and pathways that might move their institution forward and adjust their mission trajectories as necessary.[33] The purpose and goals of innovation mission trajectories are to: (1) point the eyes of education entrepreneurs (and intrapreneurs) skyward, (2) contemplate the seemingly impossible, and (3) combine and recombine human expertise and digital technologies to—after backbreaking toil and many failed attempts—achieve a once-radical vision.[34] In essence, the phrase innovation mission trajectory evokes the sentiment attributed to legendary circus showman, entrepreneur, and visionary P.T. Barnum: "If I shoot at the sun, I may hit a star."[35]

For leaders, the process for turning innovation mission trajectories into real, tangible results requires vision, strategy, determination, and inner agility.[36] Forward-focused strategies look past near-term

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tions require patience and tenderness; Hamel's heralding of the brilliance of freethinkers; Weitzman's recombinant seed ideas; Christensen's disruptive innovation; Chesbrough's open innovation; Kim and Mauborgne's value innovation; Anand's insights on the strategic value of holistic connections (relational, functional, and organizational); Porter's wise strategic insights and distinctions; Reis's startup vision and ideas on how to modernize and innovate; McAfee and Brynjolfsson's "geeky leadership" concept; design thinking, and the leadership examples of Louis Gerstner (IBM), Jeff Bezos (Amazon), Steve Jobs (Apple), and Larry Page, Sergey Brin, and Eric Schmidt (Google). Combining innovation mission trajectories with Objectives and Key Results (OKRs) can make the once impossible possible. See subsection IV.B.3 *infra* for a brief introduction of the OKR structured goal setting approach.

33. REIS, *supra* note 31, at 108 (discussing how the implementation of a grand vision requires nimble strategies, pivots, and adjustments or realignments to make the vision come to fruition). Reis encourages organizations to mix and match a variety of innovation management techniques and ideas that become a part of the "fabric" of an organization. *Id.* at 308.

34. *See, e.g.*, Kenneth Chang, *Falcon Heavy, in a Roar of Thunder, Carries SpaceX's Ambition into Orbit*, N.Y. TIMES (Feb. 6, 2018), https://www.nytimes.com/2018/02/06/science/falcon-heavy-spacex-launch.html [https://perma.unl.edu/5K6L-QT9P] ("The success gives SpaceX momentum to begin developing even larger rockets, which could help fulfill Mr. Musk's dream of sending people to Mars."); *see also* Jong et al., *supra* note 15 (describing how big aspirations and bold visions, such as President John F. Kennedy's 1962 man on the moon challenge, can serve as a "compelling catalyst, provided that it's realistic enough to stimulate action today").

35. The original source of this adage is unclear. It has been attributed to a 1633 verse in the poem *The Church-Porch* by Anglican priest George Herbert, Ralph Waldo Emerson (poet), P.T. Barnum (circus entrepreneur), John McEnroe (tennis player), Norman Vincent Peale (minister and motivational speaker), Les Brown (motivational speaker), and even pop star Britney Spears. *See If I Shoot at the Sun, I May Hit a Star*, QUOTE INVESTIGATOR (Nov. 20, 2012), https://quoteinvestigator.com/2012/11/20/shoot-at-sun/#more-4805 [https://perma.unl.edu/JWS2-SAD2].

36. Johanne Lavoie & Jens Riese, *Leaders: It's OK to Not Know Everything*, MCKINSEY & CO. (July 2, 2018), https://www.mckinsey.com/business-functions/organization/our-insights/the-organization-blog/leaders-its-ok-to-not-know-everything

discomfort and uncertainty to future benefits and opportunities.[37] First, leaders must separate strategic plans from strategic action and intent.[38] Strategic plans often "sound like a political speech" and thus garner little attention.[39] Strategic action, conversely, is embodied in "concrete steps" which have been taken or are underway that connect to long-term goals.[40] Strategic action occurs in the present and demands that everyone focus their attentions and energies on furthering innovation mission trajectories—analogous to former Intel Chair and CEO Andrew S. Grove's "clearly articulated end result."[41] Grove argues that the power of strategic actions stem from the fact that they can immediately be felt and thus build momentum.

Second, leaders must drive strategic intent by pushing organizations to innovate and meet "stretch targets."[42] Stretch targets are those that, to an outside observer, may look like "ambitions that [are] out of all proportion to their resources and capabilities."[43] Strategic intent forces members of organizations to refocus resources, be inventive, and develop and expand capabilities in accordance with innovation mission trajectories. While the traditional view of strategy seeks to achieve a "degree of fit between existing resources and current opportunities," strategic intent, on the other hand, "creates an extreme misfit between resources and ambitions."[44] Strategic intent rejects de-

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[https://perma.unl.edu/LHJ2-MUFC] (identifying the following building blocks of inner agility: (1) "pause to move faster," (2) "embrace your ignorance," (3) "radically reframe the questions," (4) "set direction, not destination," and (5) "test your solutions–and yourself").

37. ANAND, *supra* note 12, at xxvii. Navigating digital change involves understanding what is "happening today, while recognizing that tomorrow will be mercilessly different." *Id.* at x.

38. ANDREW S. GROVE, ONLY THE PARANOID SURVIVE: HOW TO EXPLOIT THE CRISIS POINTS THAT CHALLENGE EVERY COMPANY 146 (1999) [hereinafter GROVE, ONLY THE PARANOID SURVIVE].

39. *Id.* at 146–47.

40. *Id.*

41. *Id.* at 147; *see generally Legal Education: A New Growth Vision: Part I*, Part III (describing Intel's response to strategic inflection points).

42. Gary Hamel & C.K. Prahalad, *Strategic Intent*, HARV. BUS. REV. (July–Aug. 2005). For insights on some stretch target challenges, see Ryan Davies et al., *In Search of a Better Stretch Target*, MCKINSEY & CO. (Nov. 2017), https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/in-search-of-a-better-stretch-target [https://perma.unl.edu/Q95F-8WB5].

43. Hamel & Prahalad, *supra* note 42.

44. *Id.*; *see, e.g.*, Michael E. Porter, *What Is Strategy?*, HARV. BUS. REV. (Nov.–Dec. 1996), https://hbr.org/1996/11/what-is-strategy [https://perma.unl.edu/4VR8-V6AF] [hereinafter *What Is Strategy?*] ("Strategy is creating fit among a company's activities. The success of a strategy depends on doing many things well—not just a few—and integrating among them. If there is no fit among activities, there is no distinctive strategy and little sustainability."); *see also* Michael E. Porter, *Strategy and the Internet*, HARV. BUS. REV. (Mar. 2001) [hereinafter *Strategy and the Internet*] (explaining that strategy "involves the configuration of a tailored value chain—the series of activities required to produce and deliver a

mands to "Be realistic!"[45] The key question is not "How will next year be different from this year?" but "What must we do differently next year to get closer to our strategic intent?"[46] The powerful combination of innovation mission trajectories and strategy (plans, action, and intent) guide short-, mid- and long-term actions, while ensuring the organization remains adept enough to adjust to new circumstances and customer opportunities.[47]

IBM's turn-around in the 1990s illustrates the importance of a clear innovation mission trajectory and bold strategies, and informs the path ahead for established educational institutions.[48] Then-CEO Louis Gerstner responded to Strategic Inflection Points (SIPs) by integrating ICTs into every aspect of IBM's business model, transforming a large, vertically-organized corporation from a "product business" into "a knowledge business."[49] He correctly anticipated that ICTs would cause extreme disruption in the industry, as well as generate tremendous business opportunities.[50] In a decade, Gerstner "took a deeply ingrained culture, hardwired into the organization over eight decades, and transformed it to go in a completely different direction."[51]

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product or service—that enables a company to offer unique value. To be defensible, moreover, the value chain must be highly integrated"). Porter then articulates "Six Principles of Strategic Positioning": (1) "Right goal" such as "superior long-term return on investment"; (2) "A value proposition, or set of benefits, different from those that the competitors offer"; (3) "A distinctive value chain" uniquely tailored to a target market; (4) "Trade-offs" to ensure the delivery of distinctive products and services; (5) Organizational "fit" that fosters self-reinforcing systems of innovation and improvement; and (6) "continuity of direction," which means that it may forego certain opportunities to create and continuously improve unique skills and build strong customer relationships. *Id.*

45. Hamel & Prahalad, *supra* note 42.

46. *Id.*

47. *Id.*; *see also* JOHNSON, *supra* note 13, at 183–84 (quoting Harvard Business School historian Alfred Chandler) (arguing "structure follows strategy"). Johnson explains:

> For structure to follow strategy, the strategy development team must begin with the root of how value is created—the customer. It must identify the critical, unsatisfied jobs of current and potential customers before deciding how best to achieve the company's growth objectives. The team should then consider how to pursue those objectives with a set of real options one or more of which completely reimagines the business model, changing the game within its industry, transforming existing markets, or creating new ones.

Id.

48. *See Legal Education: A New Growth Vision: Part I*, Part III (describing Intel's turnaround led by Andrew S. Grove and Gordon Moore).

49. GREG SATELL, MAPPING INNOVATION: A PLAYBOOK FOR NAVIGATING A DISRUPTIVE AGE 134–35 (2017).

50. *Id.*

51. *Id.* at 139. While the Three Horizons framework will be discussed *infra* in subsection IV.A.2, it should be noted that IBM's survival turned on Gerstner's long-term

B. Aligning Action with Innovation Mission Trajectories

The challenge for legal education leaders is how to align visionary innovation mission trajectories with actions that are tangible, measurable, and verifiable.[52] To address this, program leaders should engage in a two-step process that (1) builds multidisciplinary digital innovation teams and (2) fosters an environment and culture where innovation thrives.[53] As section III.B will discuss further, the fresh education service innovations that these teams develop and launch will yield important data and metrics that can potentially provide meaningful insights for near-, mid-, and long-term strategic intent and concrete actions.[54]

vision and his leading the shift of IBM's Horizon 2 and 3 projects (developed by its "world class R&D labs") into new product lines. *Id.* at 135. IBM also fostered a culture that focused on meeting customer needs, which made customers loyal during its transformation. *Id.* at 135, 138.

52. *See, e.g.*, REIS, *supra* note 31, at 103–04 (discussing "actionable, accessible, and auditable" metrics); *see also* McGRATH, *supra* note 13, at 34–36 (stating that "stretch ambitions" such as seeking awards and recognition can prevent organizations from becoming "complacent and content to pursue yesterday's advantages"). Education entrepreneurs may consider seeking external validation of the success of program redesign by applying for the Malcom Baldridge Quality Award. *See Baldridge Performance Excellence Program*, NIST, https://www.nist .gov/baldrige [https://perma.unl.edu/GSF5-43EF].

53. Business model expert Mark Johnson emphasizes the importance of top leaders (1) forming and supporting innovation teams capable of pursuing new ideas and market opportunities (which he calls "white-spaces"), and (2) protecting the work of these innovation teams from the demands of sustaining core business operations that exert strong gravitational pulls toward conformity and tradition. JOHN-SON, *supra* note 13, at 182; *see also* Gary P. Pisano, *The Hard Truth About Innovative Cultures*, HARV. BUS. REV. (Jan.–Feb. 2019), https://hbr.org/2019/01/ the-hard-truth-about-innovative-cultures [https://perma.unl.edu/6ZUU-M8W7] (discussing the difficulties in creating and sustaining innovative cultures). Pisano explains that innovative cultures require the balancing of seemingly opposite behaviors such as: (1) "tolerance for failure but no tolerance for incompetence," (2) "willingness to experiment but highly disciplined," (3) "psychologically safe but brutally candid," (4) "collaboration but with individual accountability," and (5) "flat but strong leadership." *Id.* He adds that leaders of innovative cultures will need to be transparent about the challenges and difficulties ahead, commit to the long term since there are "no shortcuts in building an innovative culture," and remain vigilant to restore equilibrium should the balance of human behaviors be "thrown out of whack." *Id.*

54. IBM INST., *Leading Through Connections: Insights from the Global C-suite Study*, IBM 2012 CEO C-SUITE STUDIES 33 (2012), https://www-935.ibm.com/services/ multimedia/anz_ceo_study_2012.pdf [https://perma.unl.edu/5XCH-HV9V] [hereinafter *Leading Through Connections*] ("Compared to their underperforming peers, outperformers have more access to data, greater capacity to draw meaningful insights and, perhaps most important, a stronger ability to act on those insights. Essentially, they are insight-driven.").

1. *Step 1: Build Multidisciplinary Digital Innovation Teams*

The day-to-day work of implementing an organization's innovation mission trajectories is best handled by small, full-time, energetic, self-managed, customer-obsessed, multidisciplinary digital innovation teams made up of diverse talent.[55] The technology credo "given enough eyeballs, all bugs are shallow"[56] further supports the use of multidisciplinary teams because as innovation expert Greg Satell writes, "When you get stuck, you need to bring a more diverse set of skills, perspectives, and experiences to meet the challenge."[57] As an example, Satell recounts a water pollutant detector project that involved a multidisciplinary team of engineers, technology experts, and marine biologists.[58] The engineers and technologists naturally focused on designing sensitive sensors; whereas, the marine biologists recommended deploying clams since clam shells open when exposed to "pollutants at concentrations of just a few parts per million."[59] By working together, this multidisciplinary team delivered an efficient, timely, and cost-effective solution.

Inspirational lightning bolts that unearth solutions can appear anywhere, but they are especially likely to strike positively in university knowledge ecosystems. For instance, Steve Jobs credited his college

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55. REIS, *supra* note 31, at 63–69 (discussing innovation teams); *see* SATELL, *supra* note 49, at 138 (noting how IBM "continually meets with customers to understand their needs" to learn about unresolved problems that may lead to marketplace opportunities); *see also* IBM INST., *Incumbents Strike Back: Insights from the Global C-suite Study*, IBM 2018 GLOBAL C-SUITE STUDY 28 (Feb. 2018), https://public.dhe.ibm.com/common/ssi/ecm/98/en/98013098usen/incumbents-strike-back_98013098USEN.pdf [https://perma.unl.edu/2ZM6-5SZH] [hereinafter *Incumbents Strike Back*] (highlighting the benefits of "cultivating autonomy and continuous learning by implementing a more fluid work structure made up of cross-functional teams"); *see generally* ANDREW S. GROVE, HIGH OUTPUT MANAGEMENT xvi, 40–41 (1995) [hereinafter GROVE, HIGH OUTPUT MANAGEMENT] (stating that "business and education and even surgery represent work done by *teams*"). To emphasize the importance of teams to an organization's continued success, Grove articulates his formula that a manager's output equals "[t]he output of his organization" plus "[t]he output of the neighboring organizations under his influence." *Id.* Customer-obsessed means laser focus on (1) identifying and meeting current and yet to be defined customer needs, (2) working backwards from customer needs when designing and delivering products and services, and (3) delivering consistent and always improving value to customers. *See, e.g.*, *Leadership Principles*, AMAZON, https://www.amazon.jobs/en/principles [https://perma.unl.edu/6C3F-ZL EJ]; Bezos, *supra* note 6.

56. SCOTT MERRILL, *With Many Eyeballs, All Bugs Are Shallow*, TECHCRUNCH (Feb. 23, 2012), https://techcrunch.com/2012/02/23/with-many-eyeballs-all-bugs-are-shallow/ [https://perma.unl.edu/7QWR-WRSH] (explaining that Linus' Law was named by Eric Raymond in *The Cathedral and the Bazaar* in honor of Linux creator Linus Torvalds).

57. SATELL, *supra* note 49, at 51.

58. *Id.* at 49.

59. *Id.*

study of calligraphy as integral to his design philosophies.[60] Recognizing this bounty of multidisciplinary talent, savvy educational entrepreneurs will harness the rich array of faculty and student knowledge, insights, and experiences to identify, design, test, and iterate novel and pedagogically effective education experiences. Leaders may find the U.S. Military's Defense Advanced Research Projects Agency (DARPA)[61] Grand Challenge and XPRIZE Foundation models to be worthy of consideration, especially if winning students received tuition reductions or scholarships for their education innovations.[62] Further, education entrepreneurs will likely find crowdsourcing and open innovation to be important tools in the garden shed.[63]

Once established, these digital innovation teams can develop, design, test, and iterate new educational services and products, and build pedagogically-sound, effective teaching and learning templates.[64] Successful un-siloed or free-range teams consist of motivated

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60. *Id.*

61. The DARPA website events page explains:

> One way DARPA aims to spur technology breakthroughs is by hosting events that bring together partners from across the science & technology ecosystem. Through workshops, symposia, proposers [sic] days, prize challenges and other special events, DARPA aims to engage thought leaders in diverse technical disciplines. The goal of these interactions is to build interdisciplinary synergy for tackling vexing technical challenges and sparking technological leaps forward.

Events, DARPA, https://www.darpa.mil/events [https://perma.unl.edu/248J-585K].

62. SATELL, *supra* note 49, at 50–51 (explaining that the DARPA Grand Challenge gives million-dollar prizes to competitors who generate "breakthrough new technologies like self-driving cars and advanced robots"). The XPRIZE Foundation awards prizes for solving a number of "insanely tough problems" such as "building an economically viable spaceship, designing a car that can get 100 mpg," and "transforming CO_2 emissions into useful products." *Id.*; XPRIZE, https://www.xprize.org/ [https://perma.unl.edu/DHW5-GN7V]; *see also* Alex Davies, *Inside the Races that Jump-Started the Self-Driving Car*, WIRED (Nov. 10, 2017), https://www.wired.com/story/darpa-grand-urban-challenge-self-driving-car/ [https://perma.unl.edu/8JZK-VF5N] (describing how the Grand Challenge and Urban Challenge, competitions for autonomous vehicles hosted by DARPA, shaped the self-driving car industry); *How a Bunch of Geeks and Dreamers Jump-Started the Self-driving Car*, WIRED (Nov. 10, 2017), http://video.wired.com/watch/how-a-bunch-of-geeks-and-dreamers-jump-started-the-self-driving-car [https://perma.unl.edu/ZDV4-5FCY].

63. *Legal Education: A New Growth Vision Part II*, subsection IV.B.4 introduces the concept of open innovation. *See generally* SATELL, *supra* note 49, at 50–51 and Chapter 5: "Opening up innovation" (describing the use of open innovation by the corporate giants Eli Lilly and Procter & Gamble); *see also* HENRY CHESBROUGH, OPEN INNOVATION: THE NEW IMPERATIVE FOR CREATING AND PROFITING FROM TECHNOLOGY (2006) (defining open innovation as a "knowledge landscape" where "valuable ideas can come from inside or outside the company and can go to market from inside or outside the company").

64. *See* CLAYTON M. CHRISTENSEN & HENRY J. EYRING, THE INNOVATIVE UNIVERSITY: CHANGING THE DNA OF HIGHER EDUCATION FROM THE INSIDE OUT 284–87 (2011)

volunteer multidisciplinary members[65] who are enthusiastic, collaborative, flexible, and efficient when presented with unorthodox ideas and constant change.[66] Because universities have rich sources of human talent, they are uniquely able to bring together digital innovation teams with exactly these characteristics. Faculty contributes legal and business process knowledge; instructional designers provide knowledge and skills transfer and development expertise;[67] expert technology staff ensures digital delivery, functionality, and data capture; and students bring creativity, receptivity, and zeal for using new technologies in the learning process.

Here, the value of Agile and Lean methodologies (discussed in *Legal Education: A New Growth Vision Part II*, subsection IV.C.3) becomes clear. Organizations benefit from implementing Agile and Lean Startup methodologies because these methods empower digital innovation teams to ideate and innovate at the grassroots level, permitting organization leaders to focus their time on more top-level work, such as developing overarching innovation mission trajectories, prioritizing projects and goals, allocating resources, launching strategic initiatives, fostering cross-disciplinary collaborations, and removing inno-

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(describing BYU-Idaho's online course production system); *see also* Yao-Ting Sung et al., *The Effects of Integrating Mobile Devices and Learning on Students' Learning Performance: A Meta-analysis and Research Synthesis*, 94 COMPUTERS & EDUC. 252, 266 (2016), http://www.sciencedirect.com/science/article/pii/S0360131515300804 [https://perma.unl.edu/K4C6-PQES] (discussing benefits of modifying "already developed mobile-integrated education programs" instead of starting from a blank slate). *But see* Sarah Green Carmichael, *How Focusing on Content Leads the Media Astray*, HARV. BUS. REV. (Nov. 23, 2016) (discussing with Professor Anand the "best practices trap" which often overlooks the interrelationships and connections that may be foreclosed when seeking to identify a single best practice); *Strategy and the Internet*, *supra* note 44 (warning that a focus on "best practices" may lead to lost opportunities for product and service differentiation); *see* ANAND, *supra* note 12, at 211 (reflecting Porter's view that if there was a single, correct way of doing things, strategy would be unnecessary); *see also* JERRY Z. MULLER, THE TYRANNY OF METRICS 57 (2018) (questioning those experts who peddle the models and tools of "best practice").

65. Darrell K. Rigby et al., *Embracing Agile*, HARV. BUS. REV. (May 2016) (observing "it's better to enlist passionate volunteers than to coerce resisters").

66. *See Agile 101: 12 Principles Behind the Agile Manifesto*, AGILE ALLIANCE, https://www.agilealliance.org/agile101/12-principles-behind-the-agile-manifesto/ [https://perma.unl.edu/EMW4-AW5A]; *see also* Jordan Furlong, *The Agile Lawyer Will Rise as Permanent, Full-Time, Salaried Employment Vanishes*, LEGAL REBELS: THE NEW NORMAL (Jan. 30, 2014), http://www.abajournal.com/legalrebels/article/the_rise_of_the_agile_lawyer/ [https://perma.unl.edu/6RW6-BPJ4] (describing the new characteristics of legal employment: agile, technology-enabled, multidisciplinary and creative).

67. *See, e.g.*, Joshua Kim, *The Liminal Role of Instructional Designers*, INSIDE HIGHER ED. (Aug. 23, 2017), https://www.insidehighered.com/digital-learning/blogs/why-instructional-designers-should-be-counted-educators-rather-staff [https://perma.unl.edu/9GVR-C896].

vation impediments.[68] Critically, successful Agile and Lean Startup implementation requires institution-wide adoption of more collaborative, flexible processes; otherwise, the ossifying tendencies of old habits will undermine innovation. Likewise, "parasitic naysayers who would rather criticize than create" can impede or stall momentum.[69] Thus, program leaders must take particular care to ensure faculty and staff are aligned with the innovation mission trajectories and to choose wisely the members of digital innovation teams. After making the decision to build digital innovation teams, education entrepreneurs committed to bringing innovation mission trajectories to fruition must create, nurture, and guard the green shoots of innovation.[70]

2. Step 2: Foster Conditions Where Innovation Can Thrive

Digital innovation teams thrive when they have the freedom, flexibility, and resources to experiment, and operate in environments buffered from the gravitational pull of the status quo.

Innovations blossom when organizations flatten decision-making hierarchies and dismantle rigid silos of thought, discipline, and function.[71] Agile's approach to decision-making and conflict resolution revises traditional management structures to stimulate innovation. Under a traditional, authority-based, hierarchical (vertical) manage-

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68. Rigby et al., *supra* note 65.

69. LINKNER, *supra* note 26, at 42, 216 (describing his experiences with lawyers and tax specialists as being one where "these 'professionals' were remarkably adept at shooting down idea after idea"); *see also* Darrell K. Rigby et al., *Agile at Scale*, HARV. BUS. REV. (May–June 2018), https://hbr.org/2018/05/agile-at-scale [https://perma.unl.edu/KP99-WYPD] (noting how skeptics and protectors of the status quo "will produce all kinds of antibodies" to attack and impede innovation progress).

70. Serena Advani et al., *Solving the Customer-Experience Puzzle: A Guidebook for Government Leaders*, MCKINSEY & CO. (May 2018), https://www.mckinsey.com/industries/public-sector/our-insights/solving-the-customer-experience-puzzle-a-guidebook-for-government-leaders [https://perma.unl.edu/9RLS-PUMY].

> In the beginning of its own customer-experience transformation, one federal agency saw small, self-organized working groups pop up to work on problems that employees considered critical. At first, leaders were unsure if this would dilute the central effort or confound priorities, but they soon embraced the groups as the lifeblood of the transformation effort.

Id.

71. Rigby et al.*, supra* note 65; *see* Darrell K. Rigby, *The Amazon-Whole Foods Deal Means Every Other Retailer's Three-Year Plan Is Obsolete*, HARV. REV. 1, 5 (2017), https://hbr.org/2017/06/the-amazon-whole-foods-deal-means-every-other-retailers-three-year-plan-is-obsolete [https://perma.unl.edu/523T-6LNN]; *see also* Carolyn Dewar et al., *Agility: Mindset Makeovers Are Critical*, MCKINSEY & CO. (Apr. 30, 2018), https://www.mckinsey.com/business-functions/organization/our-insights/the-organization-blog/agility-mindset-makeovers-are-critical [https://perma.unl.edu/YKQ7-FSAP] (describing differences between traditional and agile mindsets); *see also Incumbents Strike Back*, *supra* note 55, at 28 ("Seven in ten Reinventors empower their teams to decide the best course of action.").

ment structure, disagreements and challenges would typically be re-
layed to upper management for resolution which slows decision-
making velocity.[72] Agile flattens management structures and ener-
gizes innovation by empowering teams to "resolve disagreements
through experimentation and feedback rather than endless debates or
appeals to authority."[73] Resolution via feedback and experimentation
gives accurate, real-time insights on how to solve issues and deliver
customer satisfaction. Most importantly, rapid deployment of proto-
types or minimum viable products (MVPs)[74] coupled with immediate
feedback from end-users propels an efficient, continuous improvement
process that can lead to novel discoveries.[75]

Vitally, Agile and Lean Startup reject intricate and formalized
strategic plans in favor of rapid and energetic cycles of design, testing,
iteration, and implementation.[76] To define and highlight progress

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72. Dewar et al., *supra* note 71; *see* Aaron DeSmet & Greg Jost, *Keys to Unlocking Great Decision-making*, McKINSEY & CO. (Apr. 19, 2018), https://www.mckinsey .com/business-functions/organization/our-insights/the-organization-blog/keys-to-unlocking-great-decision-making [https://perma.unl.edu/3MFS-BQJP] (recommending an "action-oriented decision architecture"); *see* Wouter Aghina et al., *The Five Trademarks of Agile Organizations*, McKINSEY & CO. (Jan. 2018), https://www.mckinsey.com/business-functions/organization/our-insights/the-five-trademarks-of-agile-organizations [https://perma.unl.edu/9UF6-R28V]; Aaron De Smet & Leigh Weiss, *Decision-making: How to Get the Big Bets Right*, McKINSEY & CO. (May 10, 2018), https://www.mckinsey.com/business-functions/organiza-tion/our-insights/the-organization-blog/decision-making-how-to-get-the-big-bets-right [https://perma.unl.edu/47R6-XLLU] (emphasizing the importance of deci-sion velocity and quality).

73. Rigby et al., *supra* note 65.

74. Prototypes, or the original model of a product, provide a starting point for future models (e.g., pencil sketches). *Prototype*, TECHOPEDIA, https://www.techopedia .com/definition/678/prototype [https://perma.unl.edu/7XNC-F59J]. A minimum viable product (MVP) is a pared-down version of the product. *Minimum Viable Product* (MVP), TECHOPEDIA, https://www.techopedia.com/definition/27809/mini mum-viable-product-mvp [https://perma.unl.edu/Y6NK-KQVK] (last visited Jan. 7, 2018). MVPs can help determine market viability by providing the "most mini-mal form of your complete solution." Jason Thomas, *Proof of Concept vs. Mini-mum Viable Product (and When to Use Each)*, LEAN LABS (Jan. 23, 2015), https:// www.lean-labs.com/blog/proof-of-concept-vs.-minimum-viable-product-and-when-to-use-each [https://perma.unl.edu/M5RW-L79W].

75. Rigby, *supra* note 71; *see also* McAFEE & BRYNJOLFSSON, *supra* note 29, at 250 (noting that when developing a successful new product or service, "[g]etting the right balance can be unpredictable, often requiring trial, error, and luck").

76. Steve Blank, *Why the Lean Start-Up Changes Everything*, HARV. BUS. REV. (May 2013) (discussing "the fallacy of the perfect business plan"); *see* Raphael Buck et al., *Sprinting Toward a New Business Model*, McKINSEY & CO. (Akzente 2017), https://www.mckinsey.com/~/media/McKinsey/Industries/Retail/Our%20Insights/ Sprinting%20toward%20a%20new%20business%20model/Sprinting-toward-a-new-business-model.ashx [https://perma.unl.edu/8HQA-7D8A] ("Successful com-panies target transformation using a structured process: setting objectives and specifying the strategy, designing the new business model, developing and imple-menting solutions, communicating, steering processes, and tracking progress.").

guideposts, leaders may find it beneficial to sketch short-, mid-, and long-term flexible targets that can deftly respond to unpredictable market conditions.[77] However, leaders must take care to not stifle and stall innovation by creating a risk-averse atmosphere or by being unwilling to cede control to the digital innovation teams. Instead, leaders should articulate an overall vision and direction, and then unleash the energy and talents of the multidisciplinary digital innovation teams. If chosen wisely, the teams will self-direct and constructively collaborate without requiring constant approval and direction.

Last, on a practical level, gradual introduction of Agile methodologies to implement innovation mission trajectories may yield the best results, especially if experienced Agile-trained IT software developers can guide the initial process and help break through organizational "pathologies" that inhibit "productive innovation."[78] Both Agile and Lean Startup recommend pilot projects as an effective approach for introducing innovative methods, overcoming any internal resistance, and developing momentum.[79] Small pilot projects provide teams with opportunities to learn and adjust during the innovation process.[80]

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77. REIS, *supra* note 18, at 72 (reminding readers that detailed plans only work well in stable operating environments, not when there are uncertain and rapidly changing conditions).

78. Rigby et al., *supra* note 65 (recommending that organizations "start small and let the word spread"); *see also* Christian Seelos & Johanna Mair, *When Innovation Goes Wrong*, STAN. SOC. INNOVATION REV. (Fall 2016), https://ssir.org/articles/entry/when_innovation_goes_wrong# [https://perma.unl.edu/NR25-TDDD] (arguing that when organizations focus on correcting innovation pathologies, they can build innovation capacity and competence). The authors identify six organizational pathologies: (1) "never getting started," (2) "pursuing too many bad ideas," (3) "stopping too early," (4) "stopping too late," (5) "scaling too little," and (6) "innovating again too soon." *Id.* They then list the following steps to "improve the practice of innovation": (1) "define a clear objective," (2) "ask meaningful questions," (3) "draw on relevant knowledge," (4) "formulate hypotheses," (5) "test potential solutions," and (6) "synthesize findings." *Id.*

79. Seelos & Mair, *supra* note 78; *see* MCGRATH, *supra* note 13, at 123 (discussing how working with a few teams on an ongoing basis builds and maintains project momentum); *see also* Advani et al., *Solving the Customer-Experience Puzzle: A Guidebook for Government Leaders*, MCKINSEY & CO. (May 2018), https://www.mckinsey.com/industries/public-sector/our-insights/solving-the-customer-experience-puzzle-a-guidebook-for-government-leaders [https://perma.unl.edu/S8YG-D798] ("Our guidance: approach digital improvements in bite-sized chunks."). For organizations moving toward AI, the article *Artificial Intelligence for the Real World* offers some insights on launching AI pilot projects. Thomas H. Davenport & Rajeev Ronanki, *Artificial Intelligence for the Real World*, HARV. BUS. REV. (Jan.–Feb. 2018), https://hbr.org/2018/01/artificial-intelligence-for-the-real-world [https://perma.unl.edu/3FY7-2XVQ].

80. Robert M. Pech, *Achieving the Innovative Edge in Technology, Engineering Design, and Entrepreneurship*, J. INNOVATION & ENTREPRENEURSHIP 1, 2 (2016) (recommending that the ideal way to develop innovation capabilities is to "start small and learn as you go"); *see also* RITA MCGRATH & IAN MACMILLAN, DISCOVERY-DRIVEN GROWTH: A BREAKTHROUGH PROCESS TO REDUCE RISK AND SEIZE OPPOR-

Such "low-risk trials" enable testing without disrupting the entire organization.[81] These pilot projects can demonstrate how teams within a larger organization can successfully use Agile and Lean Startup to conceive, create, iterate, and launch (or jettison) new services and products designed to deliver customer satisfaction and value.[82]

III. DESIGNING EDUCATION FOR THE FUTURE

The goal of any modern legal education program should be to provide physical and digital opportunities for value-creating interactions between students, faculty, and members of the professional community. By doing so, an education program can position itself as a trusted knowledge and skills development partner.[83] Ground-breaking programs that deliver omni-channel, platform-based (and eventually personalized, AI-integrated) educational experiences will likely enjoy significant market share advantages because they will have redefined teaching, learning, and knowledge and skills development. Ulti-

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TUNITY 206–07 (2009) (describing how pilot projects can generate momentum that can help overcome resistance to change); Pisano, *supra* note 53 (noting the difficulties with and resistance to organizational change). For some insights on the barriers to change in the legal industry, see William D. Henderson, *Innovation Diffusion in the Legal Industry*, 122 DICK. L. REV. 395, 419 (2018) (describing how massive public resistance [MPR] is a "common reaction" to innovation goals and change efforts). He observes that "[c]hange is hard, even for highly educated professionals." *Id.* at 419. He also warns that "organizations are much harder to influence than individuals." *Id.* at 427; *see also* Patti Sanchez, *The Secret to Leading Organizational Change Is Empathy*, HARV. BUS. REV. (Dec. 20, 2018), https://hbr.org/2018/12/the-secret-to-leading-organizational-change-is-empathy [https://perma.unl.edu/QU2E-U4Y4] (providing insights on how to shepherd effective organizational change).

81. Gary Hamel, *The Why, What, and How of Management Innovation*, HARV. BUS. REV. (Feb. 2006).

82. Matti Kaisti et al., *Agile Methods for Embedded Systems Development – A Literature Review and a Mapping Study*, EURASIP J. EMBEDDED SYSTEMS 1, 11 (2013); *see generally* Henderson, *supra* note 80, at 427 (noting that innovation pilot projects have a better chance of taking hold if they are culturally compatible, simple to use, and deliver observable benefits). Professor Henderson also recommends that when designing, testing, and launching innovations, developers should: (1) adopt "the perspective of the end user"; (2) provide a solution that is better than what is currently available; (3) deliver a familiar and compatible service or product that diminishes "perceived uncertainty"; (4) eliminate unnecessary complexity in the user experience and interface; (5) offer potential customers limited time trials to experiment with the product or service; and (6) deliver results that can be observed by others within the social system. *Id.* at 412–16.

83. Eric A. Chiappinelli, *Just Like Pulling Teeth: How Dental Education's Crisis Shows the Way Forward for Law Schools*, 48 SETON HALL L. REV. 52 (2017) ("A school can increase its viability by providing concrete service to the local community."); *see also* JOHNSON, *supra* note 13, at 107 ("Innovators would do well to heed this overarching lesson: don't attempt to scale a business model before testing your assumptions in the marketplace, especially one in which both the technology and its costs are changing fast.").

mately, market dominance and financial success await those professional education programs that can successfully combine omnichannel, platform education with robust clinical training and field placements.[84] These concepts are discussed more concretely in the following sections.

A. Platform-Based Education

As introduced in *Legal Education: A New Growth Vision Part I*, subsection II.A.2., digital platforms enable "value-creating interactions between external producers and consumers."[85] Value co-creation results when collaborators exchange ideas, solve problems, and support social and entrepreneurial endeavors.[86] Boosted by the network effects phenomenon[87] and Metcalfe's Law,[88] digital innovations often spring from these collaborative and energetic ecosystems involving large numbers of contributors and interactions.[89] Digital entrepreneurs and designers can quickly and inexpensively layer platforms'

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84. MICHELE R. PISTONE & MICHAEL B. HORN, CLAYTON CHRISTENSEN INST. FOR DISRUPTIVE INNOVATION, *Disrupting Law School: How Disruptive Innovation Will Revolutionize the Legal World* 14 (2016), https://www.christenseninstitute.org/wp-content/uploads/2016/03/Disrupting-law-school.pdf [https://perma.unl.edu/ZJP6-T8AE]; *see also* Sean Gallagher, *How Amazon's Purchase of Whole Foods Highlights the Hybrid, 'Omnichannel' Future of Higher Ed*, EDSURGE (June 22, 2017), https://www.edsurge.com/news/2017-06-22-how-amazon-s-purchase-of-whole-foods-highlights-the-hybrid-omnichannel-future-of-higher-ed [https://perma.unl.edu/25QX-UT3V] ("Like Amazon, the colleges and universities that are able to deliver across channels—leveraging the combination of physical presence and online algorithms—will be uniquely positioned to take advantage of the in-demand, destination nature of studying in certain cities; the local sourcing of faculty; and proximity to key employers, industries, and job opportunities.").

85. PARKER ET AL., *supra* note 2, at 5. In platform exchanges, "the producer and consumer exchange three things: information, goods or services, and some form of currency." *Id.* at 36. Currency includes intangibles such as "influence as a thought leader," fame, attention, and reputation. *Id.* at 37.

86. Wenjie Li et al., *Digital Entrepreneurship Ecosystem as a New Form of Organizing: The Case of Zhongguancun*, FRONTIERS BUS. RES. CHINA 13–14 (2017).

87. The network effect refers to the increase in value of a good or service the more that people use it. *The Network Effect*, INVESTOPEDIA, http://www.investopedia.com/terms/n/network-effect.asp [https://perma.unl.edu/SU2S-CSV8]. Investopedia gives the example of the internet being useless in its early days to the general public, but consistently gaining more value as more websites emerged and it connected more and more people. *Id.*; *see also* ANAND, *supra* note 12, at 18 (explaining that network effects "are about connections between users").

88. Metcalfe's Law measures the "value" of a network based on the square of the number of "nodes"—computers, servers, connected users, or otherwise—in the network. *Metcalfe's Law*, TECHOPEDIA, https://www.techopedia.com/definition/29066/metcalfes-law [https://perma.unl.edu/97MG-P2P2].

89. Li et al., *supra* note 86, at 3–4 (discussing digital innovation and digital entrepreneurship ecosystems); *see also* SATELL, *supra* note 49, at 193 ("Today, we live in a networked world, and competitive advantage is no longer the sum of all efficiencies, but the sum of all connections. Strategy, and by extension innovation, must

components in novel ways instead of beginning from a blank canvas.[90] The wild growth of Facebook, YouTube, and their counterparts illustrates how "frictionless entry" enables new members to quickly and easily join and participate in a digital community—thereby creating value.[91] Simply put, "*In the world of network effects, ecosystems of users are the new source of competitive advantage and market dominance.*"[92]

Because platforms are essentially "building blocks" which can be layered on top of other platforms, they are the perfect tools for recombinant (or combinatorial) innovation by education organizations.[93] Platforms also serve as the foundation of cognitive enterprises, an emerging business architecture trend that education entrepreneurs should monitor and be prepared to adapt to in the years ahead.[94] Forward-focused business strategists also recognize fertile market oppor-

focus on widening and deepening connections to talent, technology, and information.").

90. MCAFEE & BRYNJOLFSSON, *supra* note 29, at 138.

91. PARKER ET AL., *supra* note 2, at 25.

92. *Id.* at 33; *see also* ANAND, *supra* note 12, at 17–18 (quoting Intuit cofounder Scott Cook) ("I have come to the conclusion that network effects are the most profound idea I have encountered in my entire career.").

93. MCAFEE & BRYNJOLFSSON, *supra* note 29, at 138. For example: (1) a base platform is the original Internet information protocol, (2) the middle layer is the World Wide Web, and (3) the top is Facebook, which harnesses the power of free, perfect, and instant digital content distribution among its nearly two billion monthly users. *Id.* at 137–38; *see* Josh Constine, *Facebook Has 2 Billion Monthly Users . . . and Responsibility*, TECHCRUNCH (June 27, 2017), https://techcrunch.com/2017/06/27/facebook-2-billion-users/ [https://perma.unl.edu/BTL4-EENN]. See *Legal Education: A New Growth Vision Part II*, subsection IV.B.1 for a description of recombinant (or combinatorial) innovation.

94. IBM INST., *The Cognitive Enterprise: Part 1 – The Journey to AI and the Rise of Platform-centric Business Architectures,* IBM 2018 GLOBAL C-SUITE STUDY 1–2, 9 (Jan.   2018),   https://public.dhe.ibm.com/common/ssi/ecm/gb/en/gbe03910usen/gbe03910usen-05_GBE03910USEN.pdf   [https://perma.unl.edu/X2ZW-5QMC] [hereinafter *The Cognitive Enterprise*] (explaining that "cognitive enterprise" is an emerging business architecture that unites multiple platforms with revolutionary technologies with exponential growth such as AI, blockchain, Internet of Things, robotics, AR and VR, etc.). The report concludes:

> The major enterprises of the world sit on unique assets in their core processes, proprietary data, business networks and expertise. The emergence of the Cognitive Enterprise presents a unique opportunity to harness these capabilities to sustain these organizations into the next generation and reinvent them for a new age. This is not a passive ambition however, but one which requires boldness in the selection of platforms, full embrace of new technology potential, and profound reskilling of people and teams at all levels.

Id. at 13. *But see* KLAUS SCHWAB, THE FOURTH INDUSTRIAL REVOLUTION 13 (2016) (warning that concentration of platform value and power in the hands of only a few industry-players could pose substantial societal risks due to (1) the lack of choice and competition, and (2) the potential for industry and/or governmental restrictions that inhibit free and open collaborations).

tunities of well-designed platforms with elegant user interfaces that thoughtfully guide the user's digital experience.[95] Well-designed and executed platforms may, therefore, provide the means by which to differentiate an organization's position in an otherwise crowded market. Importantly, embracing digital knowledge platforms can bring together internal and external sources of knowledge and technical capabilities to create new knowledge and skill products, services, architectures, and systems.[96] Relatively low entry costs for digital platform creation and scaling enables almost-frictionless opportunities for community members to interact and exchange value.[97] Innovative education programs that make platforms the foundation of both their business models and their knowledge and skills development transfer systems may enjoy increased program visibility and market share, especially if they create reciprocal value, capitalize on data, and commit to innovation.[98] This section examines these transformations and introduces some practical considerations on platform design.

1. *From Pipeline to Platforms: Business Model*

As a matter of modern, proactive strategic business planning, education entrepreneurs should seriously and promptly[99] consider shifting from the common pipeline business model to a platform business model.[100] Most legal education programs currently operate under a

95. MCAFEE & BRYNJOLFSSON, *supra* note 29, at 211–12 (discussing the ClassPass fitness platform for Pilates, yoga, kickboxing, and spinning classes). McAfee and Brynjolfsson make clear "the best weapon that platforms have is control of the user interface and of the digital user experience." *Id.* at 211. They also note that as of 2017, SoulCycle has not embraced platforms. *Id.*

96. CHESBROUGH, *supra* note 12, at 68–69; *see generally Legal Education: A New Growth Vision Part II*, subsection IV.B.4 (discussing open innovation).

97. Van Alstyne et al., *supra* note 20; *see also Redefining Competition*, *supra* note 29, at 10 (noting how digital ecosystems allow for cost-efficient exploration of "new delivery channels," assessment and adjustment to "customer segments," and entry into new markets).

98. IBM INST., *IT and Professional Services: Incumbents Strike Back*, IBM 2018 GLOBALC-SUITE STUDY 3 (Apr. 2018), https://public.dhe.ibm.com/common/ssi/ecm/94/en/94014794usen/incumbents-strike-back_it-and-professional-services_94014794USEN.pdf [https://perma.unl.edu/W43J-N5ZS] [hereinafter *IT and Professional Services*].

99. *Incumbents Strike Back*, *supra* note 55, at 25 ("As platforms proliferate, every industry seems likely to feel what's been called the Amazon effect: the endless evolution and disruption of its markets. The choice – whether to own or participate in a platform, or do both – is not something organizations should postpone.").

100. CHESBROUGH, *supra* note 12, at 105 (stating that the platform business model is the most valuable because it "leverages other people's money and resources as it grows"). For example, platforms can also: (1) deliver long-term value and differentiation of services offered, (2) attract external complementors and competitors who enhance platform value, and (3) leverage inside and outside collaborators' knowledge, expertise, and resources to foster platform growth. *Id.* at 90, 102–11. Platforms have also been described as a "two-sided market between suppliers and

pipeline business model, which means that "value is created by controlling a linear series of activities."[101] Specifically, students enter the pipeline by enrolling in an education program. If they complete the required coursework, they graduate and leave the pipeline with a degree. A platform business model, on the other hand, brings together platform participants (i.e., providers, producers, and customers) in a magnetic, non-linear ecosystem of value-creating exchanges.[102] In multiple industries, platforms have dethroned incumbents by harnessing powerful combinations of economic efficiencies, network effects, compelling content, ease of use, and low prices.[103] The spectacular de-

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customers." *Id.* at 105; *see also* IBM INST., *Cognitive Catalysts*, IBM 2017 GLOBAL C-SUITE STUDY 8 [hereinafter *Cognitive Catalysts*] ("Ecosystem partners are a pipeline to the widest possible set of data – contextualized and heterogeneous data that reveals rich new patterns of possibility."); Feng Zhu & Nathan Furr, *Products to Platforms: Making the Leap*, HARV. BUS. REV. (Apr. 2016), https://hbr .org/2016/04/products-to-platforms-making-the-leap [https://perma.unl.edu/QW J5-CRWW].

101. Van Alstyne et al., *supra* note 20 (describing the "classic value-chain model"). Essentially, the multi-step, value chain process transforms raw materials into an end-product worth more. *Id.*

102. *Id.* (explaining how platforms focus on ecosystem value). Specifically, "platforms seek to maximize the total value of an expanding ecosystem in a circular, iterative, feedback-driven process." *Id.*; *see also* WIM VANHAVERBEKE & HENRY CHESBROUGH, *Classifying Open Innovation and Open Business Models*, *in* NEW FRONTIERS IN OPEN INNOVATION 55 (Henry Chesbrough et al. eds., 2014) (discussing "open or linked business models," in which inside and outside partners collaborate to jointly create customer value); *see also Incumbents Strike Back*, *supra* note 55, at 19 ("On average, platform orchestrators grow revenues faster and generate higher profits than other business models, earning market valuations as high as eight times revenue.").

103. PARKER ET AL., *supra* note 2, at 63 ("We've entered stage two of the disruption saga, in which *platforms eat pipelines*."); *see* MCAFEE & BRYNJOLFSSON, *supra* note 29, at 221 (warning that the disruptive power of platforms has only just begun); *see* Rigby, *supra* note 71, at 6 (stating "perfecting increasingly irrelevant business models is wasting money that is desperately needed to fund innovative growth"); *see also Incumbents Strike Back*, *supra* note 55, at 20 (noting differences between Platform Builders and Platform Operators). In particular, effective "Platform Operators do three things exceedingly well: create value from reciprocity . . . , capitalize on data . . . , and commit to innovation . . . ." *Id.* (internal reference omitted). Successful reciprocal relationships involve cultivating and creating mutual value "by and for the network of customers and organizations on their platforms." *Id.* at 21. The role competitors can play significantly changes under the platform business model. *Id.* (describing how six Canadian banks joined together to "establish a digital identity verification service on a blockchain platform"). Some rewards of platform participation include access to new customer and network effects. *Id.* at 11 (noting how platform operators and content-providers must work together to create seamless experiences for platform users). For some cautionary insights on platform growth and sustainability, see Feng Zhu & Marco Iansiti, *Why Some Platforms Thrive and Others Don't*, HARV. BUS. REV. (Jan.–Feb. 2019), https://hbr.org/2019/01/why-some-platforms-thrive-and-others-dont [https://perma.unl.edu/E2ZG-4AA8] (discussing essential characteristics of thriving platforms: "network effects, clustering, risk of dis-

mise of the once-giant Blockbuster video chain to scrappy Netflix's digital platform perfectly illustrates the challenge for legal education programs. Digitization represents a massive threat to programs bound to solid physical infrastructures and traditional pipeline business models. Movers—that is, those adaptive and innovative education programs that strategically shift from a pipeline to a multi-sided platform business model—can secure valuable market space to build productive education ecosystems that yield diversified revenue sources.[104] These innovators will deliver high-quality, cost-effective, complete knowledge and skill solutions to a broad range of customers—students, graduates, employers, and the professional community—thereby cultivating multiple revenue streams as well as generating valuable referrals.[105] As a thought experiment, imagine licensed practitioners subscribing to a university-curated platform that populates a vast selection of high-quality, one-hour maximum, accredited continuing education coursework with content recommendations similar to those provided by Netflix. Busy practitioners could then consume convenient and reliable on-demand or just-in-time education (e.g., after putting children to bed, on weekends, during travel/layovers, etc.)—a valuable service which has yet to fully materialize with consistent quality in the current marketplace.

2. *From Pipeline to Platforms: Teaching and Learning*

Teaching, learning, and student assessments look markedly different under a platform rather than pipeline model. Under the tradi-

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intermediation, vulnerability to multi-homing, and bridging to multiple networks").

104. DAVID S. EVANS & RICHARD SCHMALENSEE, MATCHMAKERS: THE NEW ECONOMICS OF MULTISIDED PLATFORMS 15 (2016) (providing that a multi-sided strategy facilitates interactions between more than two types of customers); *see also* JOHNSON, *supra* note 13, at 124 ("Managers must consequently understand that business model design and implementation means open-mindedly testing hypotheses and applying lessons learned, not rigid execution."); *see, e.g.*, *Learning Innovation in the Digital Age*, MCKINSEY Q. (Sept. 2017), https://www.mckinsey.com/business-functions/organization/our-insights/learning-innovation-in-the-digital-age [https://perma.unl.edu/7MNP-CMS8] (quoting Betsy Ziegler, chief innovation officer, Kellogg School of Management) (noting that the relationship between graduates and universities typically ends upon graduation, with the exception being potential alumni-donor engagement). She then asks the critical question: what can schools do to help graduates update their "skills and capabilities" over time? *Id.* The article then notes the business opportunities for lifelong learning and questions whether the traditional academic degree model makes sense in the modern era where skills and competencies are paramount. *Id.*; *see generally What Is Strategy?*, *supra* note 44.

105. Recall the initial recommendation in *Legal Education: A New Growth Vision Part I*, subsection II.C.3 to reengineer modern legal education as a referral-based service business. Subsection III.A.4 *infra* includes some references to primary source materials on emerging strategies for platform monetization.

tional law school pipeline model, student achievement is based on a single summative assessment—the law school final exam, which often constitutes 100% of the students' grade.[106] The traditional "one exam, one grade" approach adheres to the pipeline model because the professor focuses on the "flow"[107] of doctrinal knowledge from the beginning of the course until the final exam. According to learning scientists, however, final exams lack the feedback necessary for a sound pedagogical approach because students do not have ongoing opportunities to identify their content misunderstandings and cure defects.[108]

Future and student-focused law school visionary and University of Denver professor David I. C. Thomson strongly advocates for reforms to law student assessments.[109] He argues that the single final exam "that determines 100 percent of the grade — amount[s] to little more than exercises in recall and regurgitation."[110] Instead, he recommends that faculty provide students with opportunities to solve problems and employ "practice-oriented modes of instruction."[111] Professor Thomson further envisions that twenty-first century legal education will thoughtfully and seamlessly combine (1) interactive human instruction with contemporary digital teaching technologies, methods,

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106. PISTONE & HORN, *supra* note 84, at 16.

107. PARKER ET AL., *supra* note 2, at 187.

108. PISTONE & HORN, *supra* note 84, at 16; *see* Daniel Schwarcz & Dion Farganis, *The Impact of Individualized Feedback on Law Student Performance*, 67 J. LEGAL EDUC. 139 (2017); *see also* Ian Holloway & Steven I. Friedland, *The Double Life of Law Schools*, 68 CASE WESTERN RES. L. REV. 397, 412–13 (2017) (recommending student performance tracking and multiple assessments throughout the course); COMMITTEE ON DEV. SCI. LEARNING, HOW PEOPLE LEARN: BRAIN, MIND, EXPERIENCE, AND SCHOOL 244–45 (John D. Bransford et. al., eds., 2000) ("Assessment that is consistent with principles of learning and understanding should: mirror good instruction; happen continuously, but not intrusively, as a part of instruction; [and] provide information (to teachers, students, [etc.]) about the levels of understanding the students are reaching."); Vollweiler, *supra* note 24 (identifying the four elements of "effective formative feedback" as information provided to the student which is "specific, positive, corrective, and timely"). For differing perspectives on the effectiveness of law student feedback, see Ruth Colker et al., *Formative Assessments: A Law School Case Study*, 94 U. DET. MERCY L. REV. 387 (2017) and David M. Siegel, *Should You Bother Reaching Out? Performance Effects of Early Direct Outreach to Low-Performing Students*, 94 U. DET. MERCY L. REV. 429 (2017); *see generally* Paul Caron, *Symposium: The Impact of Formative Assessment—Emphasizing Outcome Measures in Legal Education*, TAXPROF BLOG (Dec. 18, 2018), https://taxprof.typepad.com/taxprof_blog/2018/12/symposium-the-impact-of-formative-assessment-emphasizing-outcome-measures-in-legal-education.html [https://perma.unl.edu/788T-9GKA] (listing 2017–2019 law review articles exploring the topic of formative assessments in legal education).

109. DAVID I. C. THOMSON, LAW SCHOOL 2.0: LEGAL EDUCATION FOR A DIGITAL AGE 66, 77–78 (2009) (advocating the use of technology as the means by which to provide students with multiple assessments and problem-solving opportunities followed by direct faculty feedback).

110. *Id.* at 77.

111. *Id.* at 77–78.

and tools, and (2) multi-year, multi-format coursework designed to guide students in the formation of their professional identities.[112] In the decades ahead, human-AI integrated law school coursework will include complex hypothetical problems (and eventually AI simulations) that enable students to study, consider, integrate, and apply ethical, moral, and personal perspectives to thorny legal situations.[113]

A digital knowledge-transfer platform model (e.g., using Canvas or Blackboard learning management system) provides the pathway forward to designing and delivering state-of-the-art legal education. In particular, digital platforms enable faculty to create, deliver, and receive value through online knowledge and skill assessments that provide both faculty and students with regular course feedback and opportunities for value-creating interactions.[114] These platforms also enable opportunities for flipped learning,[115] scaffold learning,[116]

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112. This text summarizes multiple conversations between Professor Thomson and the author. *See generally* David I. C. Thomson, *"Teaching" Formation of Professional Identity*, 27 REGENT U. L. REV. 303 (2015).

113. *Id.*; *see also* Matthew Lynch, *An Insider's View into the EdTech Market for Artificial Intelligence*, TECH EDVOCATE (Nov. 17, 2018), https://www.thetechedvocate. org/an-insiders-view-into-the-edtech-market-for-artificial-intelligence/ [https:// perma.unl.edu/JL7M-Y285] (advocating that professors use virtual scenarios as the means to "incorporate more real-world experiences into the classroom"). As a resource, he then names Cram101, Freckle Education, and Mika as leaders in this AI-education technology space. *Id.*

114. PISTONE & HORN, *supra* note 84, at 16 (discussing online competency-based learning); *see* ANAND, *supra* note 12, at 241 (discussing the benefits of building a culture of feedback); *see generally* Larry Cunningham, *Building a Culture of Assessment in Law Schools* (July 19, 2018), https://papers.ssrn.com/sol3/papers. cfm?abstract_id=3216804 [https://perma.unl.edu/M63S-UTM2] (summarizing the development of the American Bar Association's "outcome-driven accreditation standards" to be implemented by the end of 2018–2019, describing theories on how to "build a culture of assessment," and recommending strategies for integrating assessments across law school curriculum); Vollweiler, *supra* note 24 (articulating ideas and plans for changing the culture of law schools to embrace learning outcomes and assessments).

115. For a definition of flipped learning, see ROBERT TALBERT, FLIPPED LEARNING 20 (2017). Some commentators have argued that flipped learning models will result in the replacement of subject matter expert teachers with learning coaches. JERRY KAPLAN, HUMANS NEED NOT APPLY 151–52 (2015). For insights on how to incorporate the flipped learning model in law school courses, see generally Laura M. Padilla, *Whoosh – Declining Law School Applications and Entering Credentials: Responding with Pivot Pedagogy*, INT'L J. ARTS & HUMAN. (Apr. 2017).

116. Scaffold learning has been compared to training wheels on a bicycle. *See* COMMITTEE ON DEV. SCI. LEARNING, *supra* note 108, at 214; *see also* Laurie Browne et al., *Scaffolding: A Promising Approach to Fostering Critical Thinking*, 24 SCHOLE: J. LEISURE STUD. & RECREATION EDUC. 114, 114–19 (2009), http://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1040&context=rpta_fac [https:// perma.unl.edu/7DU3-7Z4A] (explaining that scaffolding fosters critical thinking through the construction and then deconstruction of cognitive supports specific to each student, which enable them to complete tasks previously beyond their abilities).

guided discussions, exercises, quizzes, simulations, and, in the future, AI-enhanced multi-player games and AI-personal tutors.[117] Further, platform-based competency assessments will allow for more personalized and purposeful education because student progress is based on subject and skills mastery rather than "seat time."[118] In addition to giving students opportunities to build and test their knowledge, competency assessments allow students to control the pace of their degree coursework instead of being subject to rigid academic calendars—a powerful program marketing strategy that will appeal to students seeking to balance work-life demands.

3. *Platform Potential: Enhance Program Visibility and Increase Market Share*

Law schools considering digital knowledge platform technologies may be intrigued by the potential to enhance program reach and reputation if such platform blossoms into a vital interconnected knowledge and skills development ecosystem.[119] Because a modular digital knowledge platform enables education programs to shift from a pipeline to platform business model, the market opportunities for new education product and service modules are boundless. Parker explains modularity as "a strategy for organizing complex products and processes efficiently. A modular system is composed of units (or mod-

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117. *See generally* Sun ah Kim et al., *Case Study: Student Customized Creative Education Model Based on Open Innovation* 5, J. OPEN INNOVATION, TECH., MKT., & COMPLEXITY (2017) (discussing the education benefits of students having opportunities for learning via trial and error).

118. PISTONE & HORN, *supra* note 84, at 14; *see* MCAFEE & BRYNJOLFSSON, *supra* note 29, at 323–25 (explaining how students of Udacity's computer programming courses demonstrate competency by submitting projects instead of exams). Udacity quickly grades student coding projects through a network of outside graders. *Id.*; *see also* ANAND, *supra* note 12, at 343 ("[E]ffective learning is not just about content; it's about purpose. It's about students taking ownership of what they need to learn. It's about students having the will to ask questions and the courage to try to answer them. It's about students taking responsibility for setting the right tone in the learning environment, for teaching others, and for learning from others, too.").

119. *See generally* Kevin Laczkowski et al., *Seeing Your Way to Better Strategy*, MCKINSEY (Nov. 2018), https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/seeing-your-way-to-better-strategy [https://perma.unl.edu/VWT7-UQQY] (discussing the competitive marketplace opportunities for digital platforms). The article lists three critical questions for leaders to consider when considering this strategy:

> What competitive advantage will the platform provide? What sort of market share does it need to capture to be considered a 'winner' and not just 'average'? Is an ecosystem of third-party players required for the digital platform to succeed, or can this be done organically—and will we be able to do it quickly enough to become the preferred platform for our customers?

Id.

ules) that are designed independently but still function as an integrated whole."[120] Khan Academy and the learning management systems offered by Canvas and Blackboard provide useful examples of what a modular platform may look like, how it can be used to differentiate education program services, and how it can bolster market share.[121] If an education program consistently and effectively delivers high-quality interactive digital student content and assessments, these stable and efficient core interactions could eventually be broadened to serve adjacent and complementary markets.[122] The expanded knowledge platform could function as a hub for cost-effective education products and services bringing to reality the foregoing thought experiment of on-demand continuing education for busy professionals. For example, the platform could deliver valued digital services including, but not limited to, accredited continuing education course work, verification of knowledge and skills of prospective employees through employer-informed digital assessments, and employer-informed digital employee training modules.[123] This approach mirrors how Amazon

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120. PARKER ET AL., *supra* note 2, at 54–55. Harvard Business School Professors C. Y. Baldwin and K. B. Clark characterize "a well-designed platform as consisting of a stable core that restricts variety, sitting underneath an evolving layer that enables variety." *Id.* at 54; *see also Operating Models for the Future of Consumption*, WORLD ECON. F. & ACCENTURE 13 (Jan. 2018), https://www.accenture.com/t20180228T040007Z__w__/us-en/_acnmedia/PDF-72/Accenture-Strategy-WEF-Operating-Models-Future-Consumption-Full-Report.pdf#zoom=50 [https://perma.unl.edu/6GDA-WZPH] (explaining the benefits of modular design). The report explains that "modular" is:

> [A] characteristic that is defined as the ability to develop and deploy a business capability that can be utilized in a flexible, repeatable way across multiple business models with minimal re-design. This is a deliberate, "plug-and-play" approach that is distinctly different from previous eras in business that were focused on driving efficiencies through linear process design for a single business use case (e.g. business process re-engineering). Modular capabilities enable the organization to adapt quickly to market changes and more easily pivot their strategies and business models.

> *Id.*

121. *See generally* VIKTOR MAYER-SCHÖNBERGER & KENNETH CUKIER, LEARNING WITH BIG DATA: THE FUTURE OF EDUCATION 23–32 (2014).

122. PARKER ET AL., *supra* note 2, at 41–42; *see also* ANAND, *supra* note 12, at 177 (discussing the benefits of offering customers with a portfolio of "one-stop", "full-service" connected products and services); *see generally* Laczkowski et al., *supra* note 119 ("[S]trategy and finance leaders should always examine adjacent markets, which may be not only attractive segments for growth but also breeding grounds for potential future competitors."). When considering a move to adjacent markets, leaders should be able to answer these questions: "In which market segments will we be able to grow profitably over time? What additional attractive markets should be considered?" *Id.*

123. ROBERT K. TOUTKOUSHIAN & MICHAEL B. PAULSEN, ECONOMICS OF HIGHER EDUCATION: BACKGROUND, CONCEPTS, AND APPLICATIONS 48 (2016) (noting Joseph Stiglitz's 1975 observation that employers view education as an "inexpensive screening mechanism for future workers"); *see also* JOSEPH E. AOUN, ROBOT-

masterfully built its original core book business by learning valuable customer and process lessons over time, eventually expanding to become the dominant digital retailer and logistics giant it is today.[124] In essence, the always-moving Amazon used a simple stand, walk, and then run strategy when building its platform business.[125]

A legal education-focused, digital knowledge platform can also connect students, educators, and employers to "massive ecosystems of talent, technology and information—at minimal cost."[126] For example, the Canvas Learning Management System uses Amazon's cost-effective cloud computing services[127] to provide education institutions with an easy-to-use digital platform that allows for teacher-student engagements; student completion of digital exercises, quizzes, discussions, and projects; student and teacher tracking of learning outcomes; and teacher performance of grading functions.[128] Not only does platform-based education benefit students by expanding the resources at their fingertips, but it also benefits educational institutions by its self-sustaining structure of value-creation, data collection, and modular inno-

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PROOF: HIGHER EDUCATION IN THE AGE OF ARTIFICIAL INTELLIGENCE 122 (Mass. Inst. Tech., 2017) ("[T]he employer will become an equal partner in delineating the contours of educational content, helping to keep it streamlined and relevant to the moment."); *see, e.g.*, Josh Bersin, *Using Design Thinking to Embed Learning in Our Jobs*, HARV. BUS. REV. (July 25, 2016), https://hbr.org/2016/07/using-design-thinking-to-embed-learning-in-our-jobs [https://perma.unl.edu/L25W-5PK4] (discussing urgent employer needs for employee training and describing some digital game solutions); *see Legal Education: A New Growth Vision Part I*, subsection IV.C.3 (suggesting that long-term financially sustainable law schools will serve as lead partners in the "worker-trainer-employer ecosystem").

124. CHESBROUGH, *supra* note 12, at 162–63; *see also* EVANS & SCHMALENSEE, *supra* note 104, at 105–09 (explaining how Amazon originally started as a single-sided firm and eventually became a multisided platform).

125. JOHNSON, *supra* note 13, at 113 (describing how Amazon continuously transforms and adapts to new market opportunities). Johnson writes:

> From its deepest roots to its greenest twigs, Amazon is built to transform. When it finds opportunities to serve new or existing customers in new ways, it conceives and builds new business models, investing for the future while continuing to extract value from the present. It demonstrates that the process of becoming never ends—and that any organization can change and grow continually, as long as its leaders are willing to invest the time, discipline, and resources in the effort.

Id.

126. SATELL, *supra* note 49, at 168.

127. *See* Henry Chesbrough, *Bringing Open Innovation to Services*, 52 MIT SLOAN MGMT. REV. 85, 88 (2011); MCAFEE & BRYNJOLFSSON, *supra* note 29, at 143 (noting that in 2016, Deutsche Bank analyst, Karl Keirstead, called Amazon Web Services (AWS) "the fastest-growing enterprise technology company in history"). McAfee and Brynjolfsson also note the important flexibility that the cloud services provide platform developers because the cloud allows them to scale up rapidly when demand increases. *Id.* at 195–96.

128. *See Canvas – Learning Management System Powered by TurnKey GNU/Linux*, AWS MARKETPLACE, https://aws.amazon.com/marketplace/pp/B00G2W4ETI [https://perma.unl.edu/S8QY-UQHN].

vation.[129] Bringing together a diverse group of thinkers and doers on a professional education platform will invariably result in rich new ideas developed by the very minds that the program fosters.

Further, a high-quality knowledge and skill development platform can harness the power of network effects and Metcalfe's Law[130] to enhance the relevance, reach, and reputation of program offerings. In particular, co-creating value on the platform fosters customer loyalty by allowing users to participate in the development of knowledge and skill innovations.[131] Well-designed and user-friendly platforms can "induce others to invest their time, money, energy, and ideas in extending your initiatives."[132] As the digital platform gains users and traction, it can serve as a powerful vehicle by which to market and deliver knowledge and skill services to customers without being subject to the limitations of time and space. Ultimately, the objective of a university-curated[133] knowledge and skills development platform is to grow and support a dynamic digital ecosystem populated with satisfied users "who are repeatedly and increasingly engaged in positive, value-creating interactions."[134]

Given the power of ICTs and digitization, the opportunities for innovation are abundant and unlimited. A university-curated platform would enable collaborations with established professional organizations on the design, scope, reach, and content of knowledge and skill development services.[135] Moreover, digital knowledge platforms may

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129. The author currently works on another article, tentatively titled *Permanent Beta: Strategies for Delivering an Immersive and Adaptive Tax Education Experience*, which examines how digital learning modules can be used to teach students practitioner-valued skills measured via competency assessments. The modules under development explore intersections of the Internal Revenue Code with tort, employment, and business law. The author's ultimate goal (over many years and iterations) is to develop interactive digital games and simulations (eventually with AI).

130. Metcalfe's Law measures the "value" of a network based on the square of the number of "nodes"—computers, servers, connected users, or otherwise—in the network. *Metcalfe's Law*, *supra* note 88.

131. CHESBROUGH, *supra* note 12, at 27.

132. *Id.* at 87.

133. *See, e.g.*, PwC, *Can You Find That Show I Didn't Know I Wanted to Watch? How Tech Will Transform Content Discovery*, PwC.COM/CISCONTENTDISCOVERY 19 (Nov. 2017), https://www.pwc.com/us/en/advisory-services/publications/consumer-intelligence-series/pwc-cis-content-discovery.pdf [https://perma.unl.edu/FG63-5Q8K] (explaining benefits of technology in content generation, curation, and distribution).

134. PARKER ET AL., *supra* note 2, at 202 ("The real question, which you should never lose sight of, is: are people happy enough with the ecosystem to continue participating in it actively?"). Please recall Harvard Business Professor Theodore Levitt's emphasis on delivering "customer satisfactions" discussed in *Legal Education: A New Growth Vision Part II*, section III.B and D.

135. *See generally* JUMA, *supra* note 18, at 169, 171–72 (observing that working with established organizations serves as a way to "acquire dominant roles in the mar-

enable the law school and other complementary organizations (i.e., complementors, competitors, and frenemies) to co-evolve, forming integrated systems that grow together.[136] Based on these interactions, users will hopefully view the legal education program that uses platforms in two ways—as a business model and as a digital knowledge resource—to be a valuable, contemporary, comprehensive knowledge and skills development partner.

4. *Platform Design: Open Versus Closed*

Ideally, an education platform will attract and support productive collaborations between users and innovation partners.[137] At the outset, law school leaders will need to decide whether to be a platform owner or participant.[138] If a program elects to own and develop a platform, the degree of openness and subsequent licensing agreements represent critical early design decisions. Open platforms enable any user to access and contribute to content.[139] Closed platforms, in contrast, regulate the right to add, modify, and use content.[140]

Decisions about whether to structure the platform as open or closed (or a balance thereof) require thoughtful consideration during the design phase, followed by regular monitoring and adjustment after

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ket and define path dependence"). As a result, aligning with the standards and requirements of the American Bar Association (ABA), American Institute of Certified Public Accountants (AICPA), and state continuing education programs may be a worthwhile collaborative endeavor.

136. *Id.* at 169. Again, joint ventures between universities and other entities are outside the scope of this Article but deserve careful examination as such venture may prove financially beneficial for all parties. *See Legal Education: A New Growth Vision Part II*, section IV.A & subsection IV.B.4 (explaining how complementors, competitors, and frenemies can function as ecosystem partners); *infra* note 197.

137. Carlos Denner dos Santos Jr., *Changes in Free and Open Source Software Licenses: Managerial Interventions and Variations on Project Attractiveness*, 8:11 J. INTERNET SERV. APPLICATIONS 2 (2017) (discussing how digital, asynchronous collaborations can generate new production activities).

138. *Plotting the Platform Payoff*, *supra* note 23, at 19–20 (examining some benefits and detriments of being a platform provider or platform participant and the various roles participants play in platform ecosystems). The IBM study provides some practical steps for leaders to consider when considering and building platforms. *Id.* at 24–25. The IBM study also identifies important considerations for platform participants. *Id.* at 26–27.

139. PARKER ET AL., *supra* note 2, at 130 ("A platform is 'open' to the extent that (1) no restrictions are placed on participation in its development, commercialization, or use; or (2) any restrictions—for example, to conform with technical standards or pay licensing fees—are reasonable and non-discriminatory, that is, they are applied uniformly to all potential platform participants.").

140. *Id.*; *see also* Van Alstyne et al., *supra* note 20 (discussing open versus closed architecture and governance).

launch.[141] Steve Jobs framed the "open versus closed" dilemma as the choice between integration and fragmentation.[142] Open systems are fragmented, which creates challenges for monetization and intellectual property protection.[143] However, open innovation—both digital platforms and platform business models—efficiently integrates internal and external sources of content.[144] On the other hand, because closed systems are controlled, such structure may undermine opportunities for organically growing user exchanges and platform value. According to Angel Diaz, IBM's vice-president of cloud architecture and technology, open platforms are critical to innovation.[145] Forward-oriented organizations seeking to become a valued and essential digital partner should, therefore, embrace open platforms to cultivate ecosystems of talent, technology, and information.[146]

To find balance, platform owners may focus on select "key features" that remain closed and allow open innovation to cultivate others.[147] Although outside the scope of this Article, the following issues are integral to achieving platform quality, growth, and sustainability: (1) content curation (e.g., filters, controls, limits), (2) scaling (e.g., adapting to increases in user interactions and content), (3) data collection and analytics,[148] (4) monetization,[149] (5) bundled or unbundled

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141. Van Alstyne et al., *supra* note 20; PARKER ET AL., *supra* note 2, at 131; *see also* Brooke Manville, *Are Platform Businesses Eating the World?*, FORBES (Feb. 14, 2016), https://www.forbes.com/sites/brookmanville/2016/02/14/are-platform-busi-nesses-eating-the-world/#6851827861a2 [https://perma.unl.edu/E9X4-YW7S] (discussing potential issues that platform businesses can face).

142. PARKER ET AL., *supra* note 2, at 131. After initial strong resistance to open systems, Jobs reversed course and decided to open Apple's iPhone platform in late 2007—in hindsight, a brilliant strategic decision which led to a decade of Apple App store dominance and quality control—which has only been challenged slightly by the combined forces of Google Play and third-party app stores in 2017. Sarah Perez, *App Annie: Android to Top iOS in App Store Revenue This Year*, TECHCRUNCH, https://techcrunch.com/2017/03/29/app-annie-android-to-top-ios-in-app-store-revenue-this-year/ [https://perma.unl.edu/ZCN6-MUJ4]; *see* ANAND, *supra* note 12, at 21 (discussing how Apple's App store involved strategic choices to create a marketplace and platform for connection). Anand adds, "The lesson is clear: Superior products are great, but strategies that exploit connections are better." *Id.*; *see also* TECHSTUFF, *Open vs Closed: A TechStuff Debate*, NPR (June 15, 2018), http://one.npr.org/i/620246350:620246352 [https://perma.unl.edu/3N5T-HXS8] (providing an audio debate of open and closed systems).

143. PARKER ET AL., *supra* note 2, at 131.

144. CHESBROUGH, *supra* note 12, at 24.

145. SATELL, *supra* note 49, at 161 (describing IBM's Bluemix cloud platform and how it represents a complete ecosystem of the "best customers, best developers, and the best resources," which opens vast opportunities).

146. *Id.* at 168.

147. PARKER ET AL., *supra* note 2, at 132. Openness decisions will also affect participation of managers, sponsors, developers, and users. *Id.* at 135.

148. *Id.* at 25–29 (providing observations on curation and scaling as well as the power of "data-driven network effects").

services,[150] and (6) governance.[151] Above all, because creative activity stems from users, it is important to be aware that "participants will use the platform in ways you never anticipated or planned."[152] Analyzing platform interactions may yield unexpected patterns that uncover seed ideas which may eventually grow into exciting value-creating interactions and market expansion strategies.[153]

B. Data and Metrics

As programs shift from pipelines to platforms, data functions as the essential "integration glue"[154] because data can reveal important

149. *See generally* EVANS & SCHMALENSEE, *supra* note 104, at 30–34, 91–95 (discussing revenue sources, paid versus free price structures, and potential subsidies); *see also* MCAFEE & BRYNJOLFSSON, *supra* note 29, at 153–63 (examining supply and demand, complements, developer motivations, and monetization opportunities of various apps); PARKER ET AL., *supra* note 2, at 106–28.

150. MCAFEE & BRYNJOLFSSON, *supra* note 29, at 145–49 (discussing how platform economics, Moore's law, combinant and recombinant innovation, and pricing models (e.g., bundled, unbundled, and subscription) will radically reshape industries); *see* KAPLAN, *supra* note 115, at 100–01 (discussing how Amazon's annual Prime shipping fee achieves multiple market advantages by resolving customer friction points (e.g., product cost/price comparison and delivery), generating consistent revenues, delivering a sticky platform which fosters customer loyalty, and providing a means for collecting additional customer data); *see also* ANAND, *supra* note 12, at 44–47 (offering illustrations and analyses of various bundles for hypothetical customers of the New York Times paper and digital news products); *see generally* William James Adams & Janet L. Yellen, *Commodity Bundling and the Burden of Monopoly*, 90:3 Q. J. ECON. 475–98 (Aug. 1976).

151. PARKER ET AL., *supra* note 2, at 157–82; *see generally* EVANS & SCHMALENSEE, *supra* note 104, at 55–166 (detailing Part II of MATCHMAKERS: Building, Igniting, and Operating Matchmakers).

152. PARKER ET AL., *supra* note 2, at 58.

153. *Id.* at 59; *see, e.g.*, Zhu & Furr, *supra* note 100 (describing Lego's accidental discovery of a new business opportunity). Zhu and Furr explain:

> Shifting from a product mindset to a platform mindset can be downright counterintuitive—indeed, several of the firms we studied discovered new platform opportunities almost by accident and in spite of their own missteps. For example, Lego Mindstorms (the entry-level robotics toy) emerged as a platform only after a Stanford graduate student hacked the robotic-controller code. Lego's leaders initially had a product-mindset reaction: They sent a cease-and-desist letter to protect the "fixed" value pie. But after some reflection, they saw the hacking as a sign of untapped value on the demand side. If Lego turned the Mindstorms software into a platform, then it could be used as an education or experimentation tool, not just a toy, and the company would sell many more units and bring many more users into the ecosystem. So Lego switched course—and mindset—to embrace a hybrid business model.

> *Id.*

154. PARKER ET AL., *supra* note 2, at 75. Some strategies to consider when transitioning from a pipeline to platform model include: "follow the rabbit strategy," "piggyback strategy," "seeding strategy," "marquee strategy," "single-side strategy," "producer evangelism strategy," "big-bang adoption strategy," and "micromarket strategy." *Id.* at 89–99; *see also* MIT, *8 Ways to Launch a Successful Digital Plat-*

insights that may lead to program efficiencies, pedagogical innovations, and cost-containment. Market leaders collect and use data, whereas laggards do not.[155] Importantly, data and metrics may highlight innovation pathways for students and teachers as well as for law school sustainability.

1. *Data and Learning Metrics: Students and Teachers*

Big data and predictive analytics will soon transform knowledge work, and as a result, shift the relationships and roles of teachers and students.[156] In the future, data collection, algorithms, and analytics will help identify approaches for fostering sustainable, scalable, replicable, and pedagogically sound teaching and learning methods.[157] These insights can be used to develop flexible templates that easily enable faculty to integrate their specific doctrinal and skills content with the use of digital platforms.[158] However, in order to not fall into the "best practices trap," digital innovation teams, instructional designers, and faculty should remain mindful that codification of best practices may over the long term stifle creativity and innovation.[159]

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form, MIT SLOAN EXECUTIVE EDUC. INNOVATION@WORK BLOG (Oct. 30, 2016), https://executive.mit.edu/blog/8-ways-to-launch-a-successful-digital-platform [https://perma.unl.edu/G6Y6-SH3N].

155. PARKER ET AL., *supra* note 2, at 219–20 ("If competitors don't have the data, they can't create the value—which means they can't create the interactions, which further limits their access to data."). For some insights on the power and persuasive abilities of effective data science teams, see Scott Berinato, *Data Science & the Art of Persuasion*, HARV. BUS. REV. (Jan.–Feb. 2019), https://hbr.org/2019/01/data-science-and-the-art-of-persuasion [https://perma.unl.edu/3U8W-KVLN] (identifying six talents needed in a competent data science team: (1) "project management," (2) "data wrangling," (3) "data analysis," (4) "subject expertise," (5) "design," and (6) "storytelling").

156. MARTIN FORD, RISE OF THE ROBOTS: TECHNOLOGY AND THE THREAT OF A JOBLESS FUTURE 94 (2015) (predicting that data "will increasingly be used to substitute for human qualities such as experience and judgment" and will shrink the need for "an extensive human analytic and management infrastructure").

157. STANFORD UNIV., ARTIFICIAL INTELLIGENCE AND LIFE IN 2030, at 33 (2016), https://ai100.stanford.edu/sites/default/files/ai_100_report_0831fnl.pdf [https://perma.unl.edu/LYF9-K4TA] ("Online courses are not only good for widespread delivery, but are natural vehicles for data collection and experimental instrumentation that will contribute to scientific findings and improving the quality of learning at scale."); *see also* REIS, *supra* note 31, at 194 (explaining that pilot projects will provide valuable information about the success or failure of the factors, features, and elements used and examined in the experiments). Reis observes that when small sample sizes in pilot projects (e.g., MVPs tested on 100 customers or less) identify promising innovation pathways, scaling up represents the next logical and productive step to capture more data and insights. *Id.* at 231, 265.

158. REIS, *supra* note 31, at 194 (discussing how successful projects may be systematized and converted into valuable templates useful to others).

159. Carmichael, *supra* note 64 (discussing with Professor Anand the "best practices trap" which often overlooks the inter-relationships and connections that may be foreclosed when seeking to identify a single best practice); *Strategy and the In-*

A data-driven approach starkly contrasts with the anecdotal experiences that historically have driven legal education.[160] Data coupled with learning science insights can substantially improve the knowledge and skill know-how transfer process with empirical proof, not just guesses (even educated ones) about what works and what does not.[161] Over time, legal education can move from anecdotes to data-validated pedagogy.[162]

Data already provides digital education innovators with crucial insights and information for improving their knowledge and skill development products and services.[163] For example, the nonprofit Khan Academy's data analytics team[164] collects data on each student's interaction so that statistical reports and models can be created to determine student proficiency.[165] Teachers and parents can also monitor student progress on a digital dashboard.[166] In university courses, Stanford's computer science professor Andrew Ng collects information on every student interaction to shape course content.[167] The data includes information about when students stop watching videos, revisit

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ternet, *supra* note 44 (warning also that a focus on "best practices" may lead to lost opportunities for product and service differentiation); *see* ANAND, *supra* note 12, at 211 (reflecting Porter's view that if there was a single, correct way of doing things, strategy would be unnecessary); *see also* MULLER, *supra* note 64, at 57 (questioning those experts who peddle the models and tools of "best practice").

160. Holloway & Friedland, *supra* note 108, at 11 (examining "brain science and the science of learning").

161. *Id.* at 18 ("Using learning science as a canvas for legal education transforms the assumptions, process and environment for the students from 'anecdata' to a firmer foundation.").

162. COMMITTEE DEV. SCI. LEARNING, *supra* note 108, at 216, 219, 226, 229–30, 235–39, 242–45, 248–70, 276–84. Vollweiler, *supra* note 24 (discussing the role of data in improving teaching and learning). She also warns:

> [S]chools must be cautious not to collect data simply for the sake of collecting data, but rather to ask the right questions in data collection and to use it. Data collected must give us more than just numbers of students who failed to meet certain benchmarks, but instead give us that information in a specific and timely fashion as to what wasn't met where and when, to ensure programs of legal education can make adjustments in the teaching to improve student learning. Merely documenting failed teaching and learning without a path to correct it is a useless exercise . . . .

Id. (internal citations omitted).

163. PwC BOT.ME: A REVOLUTIONARY PARTNERSHIP: HOW AI IS PUSHING MAN AND MACHINE CLOSER TOGETHER 6 (2017), https://www.pwc.in/assets/pdfs/consulting/digital-enablement-advisory1/pwc-botme-booklet.pdf [https://perma.unl.edu/N8U9-YQUJ] (noting how online universities use data to "track which students are getting 'stuck' on what concepts and optimizing the courses to fit their learning styles"); *see Leading Through Connections*, *supra* note 54, at 33.

164. In 2013, Khan Academy's data analytics department comprised fully one-fifth of its staff. MAYER-SCHÖNBERGER & CUKIER, *supra* note 121, at 23–32.

165. *Id.*

166. *Id.*

167. *Id.* at 1–8.

the same lesson several times, or review related or supporting materi-
als.[168] He analyzes this data to determine what academic content and
teaching approaches foster student knowledge and skills develop-
ment.[169] Professor Ng weaves spot quizzes into video lectures to gauge
student content absorption and retention.[170] He also collects data on
homework assignments to track areas where students are having diffi-
culty.[171] Professor Ng uses this data when analyzing student achieve-
ment, curriculum effectiveness, and his teaching performance.[172]

Access to data allows leaders to draw insights and translate them
into action.[173] As programs continue to collect more student data and
measurements, this information will allow educators to combine quali-
tative assessments with quantitative information when evaluating
the effectiveness of curriculum and teaching and learning methods.[174]

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168. *Id.*

169. *Id.*

170. *Id.*; *see, e.g.*, *The Balance Sheet*, HOTSHOT, https://www.hotshotlegal.com/courses/
balance-sheets [https://perma.unl.edu/B4VR-DDMK] (explaining balance sheets
followed by an online quiz). Subscriptions are available for law students, lawyers,
law school, and law firms. *Pricing*, HOTSHOT, https://www.hotshotlegal.com/pric-
ing [https://perma.unl.edu/G8FZ-EC4M].

171. MAYER-SCHÖNBERGER & CUKIER, *supra* note 121, at 1–8.

172. *Id.* Professor Ng's data analysis revealed puzzling anomalies in student video les-
son viewing and reviewing. For example, students would typically watch videos
in sequence but "around lesson 7, they'd return to lesson 3." *Id.* Professor Ng
investigated this pattern and concluded that he should restructure the course to
include additional review of basic math skills before introducing lesson 7 materi-
als. *Id.*

173. *Leading Through Connections*, *supra* note 54, at 33.

174. *See, e.g.*, *Bliss Talks Law Teaching Reform on New Legal Realism Blog*, HARV. L.
SCH. NEWS (Feb. 19, 2018), https://clp.law.harvard.edu/news-post/bliss-talks-law-
teaching-reform-new-legal-realism-blog/   [https://perma.unl.edu/V533-YSKQ];
John Bliss, *Law Teaching Reform*, NEW LEGAL REALISM PROJECT BLOG (Feb. 12,
2018),   http://newlegalrealism.org/2018/02/12/bliss-on-law-teaching-reform./
[https://perma.unl.edu/7WCS-PUV6]; *see also* ABA, *ABA Standards and Rules of
Procedure for Approval of Law Schools 2016–2017*, https://www.americanbar.org/
content/dam/aba/publications/misc/legal_education/Standards/2016_2017_stan-
dards_chapter3.authcheckdam.pdf [https://perma.unl.edu/FD23-BYZC] (discuss-
ing objective and competency requirements for law schools). ABA Standard 302
requires law schools to establish "learning outcomes" that "include competency"
in:
    (a) Knowledge and understanding of substantive and procedural law;
    (b) Legal analysis and reasoning, legal research, problem-solving, and
    written and oral communication in the legal context;
    (c) Exercise of proper professional and ethical responsibilities to clients
    and the legal system; and
    (d) Other professional skills needed for competent and ethical participa-
    tion as a member of the legal profession.
Id. For CPAs, see *150 Hour Requirement for Obtaining a CPA License*, AICPA,
https://www.aicpa.org/becomeacpa/licensure/requirements.html [https://
perma.unl.edu/8YTS-AEQX]. Also recognizing that the "electronic age makes
conducting business across state borders an everyday occurrence," AICPA pro-
vides for CPA mobility. *History of CPA Mobility*, AICPA, https://www.aicpa.org/

For example, data can provide educators with valuable quantitative insights about past student performance and predictions of potentially fruitful areas for pedagogical exploration and experimentation,[175] especially in the ongoing development of effective know-how transfer learning models and competency assessments.[176] For students, data-informed learning will provide them with real-time, personalized feedback and individualized learning plans.[177] Eventually, AI digital tutors will deliver "one-on-one, expert-to-pupil tutoring delivered in a conversational style"[178] coupled with active, real-life-inspired problem solving[179] and suggestions for supplemental study materials and assessments.[180]

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advocacy/state/substantialequivalencyandpracticemobility.html [https://perma.unl.edu/MU83-76AR]. AICPA defines "substantial equivalency" as requiring "examination (passage of the Uniform CPA Examination), experience (the one-year experience requirement), and education (the 150-hour education requirement)." *Id.*

175. MAYER-SCHÖNBERGER & CUKIER, *supra* note 121, at 9–22.

176. Mikus Dubickis & Elina Gaile-Sarkane, *Transfer of Know-How Based on Learning Outcomes for Development of Open Innovation*, 3:4 J. OPEN INNOVATION: TECH., MARKET, COMPLEXITY 4, 9 (2017).

177. MAYER-SCHÖNBERGER & CUKIER, *supra* note 121, at 9–22.

178. *See, e.g.*, PRESIDENT'S COUNCIL OF SCI. & TECH., *Letter to the President* 2–3 (Sept. 2014), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/PCAST_worforce_edIT_Oct-2014.pdf [https://perma.unl.edu/E5HE-BFG7] (stating the Defense Advanced Research Projects Agency (DARPA) Digital Tutor tool "simulates the educational effects of one-on-one, expert-to-pupil tutoring delivered in a conversational style and emphasizing active and authentic problem-solving via a scalable platform"). The Digital Tutor was developed by "interviewing, closely observing, and digitizing the specific tutoring techniques and practices of individuals who were experts in both subject matter and education." *Id.* at 2.

179. COMMITTEE ON DEV. IN THE SCI. OF LEARNING, *supra* note 108, at 207, 209, 212 (discussing importance of problem solving and bringing into the classroom the experiences of community practitioners).

180. *Id.* at 221–24 (discussing tutoring programs, including the Sherlock digital electronics troubleshooting program used by the U.S. Air Force); *see* Ryan Johnston, *How Artificial Intelligence Is Helping Pearson Refocus Assessment Technology*, EDSCOOP.COM (July 6, 2018), https://edscoop.com/how-artificial-intelligence-is-helping-pearson-refocus-assessment-technology [https://perma.unl.edu/8XGN-VBZH] ("Tim Bozik [of Pearson], called a move from evaluating 'what' a student's answer is to 'how' a student reached that answer — will involve implementing a new level of artificial intelligence into its product and service line."). Further, Pearson Education Vice President, Milena Marinova, explained that advancements in machine learning/AI will enable student learning to be liberated from "siloed, rule-based systems" because AI can detect patterns and trends in student performance that may indicate the need for teacher intervention. *Id. But see* STANFORD UNIV., *supra* note 157, at 33 ("One might have expected more and more sophisticated use of AI technologies in schools, colleges, and universities by now. Much of its absence can be explained by the lack of financial resources of these institutions as well as the lack of data establishing the technologies' effectiveness.").

As more data is collected about what constitutes effective teaching and learning, analytics will provide insights that can guide the development of successful knowledge and skill know-how transfer processes by identifying the types, forms, and quantities of interaction that support student engagement, content retention, and skills development.[181]

2. Data and Innovation Metrics: Program and Platforms

Former Intel CEO Andrew Grove reportedly said, "If you can't measure it, you can't manage it."[182] While this philosophy initially appears solid, legal education entrepreneurs should remain vigilant of the hazards of short-term, measurement-based mindsets.[183] As emphasized throughout this three-part Article series, a long-term perspective is essential for visionary enterprises like Amazon and Google to achieve seemingly impossible goals when viewed from the limited perspective of present day capabilities and technologies. With this caution in mind, metrics can still provide valuable insights for mapping potentially productive pathways forward.

To build vigorous education innovation ecosystems, it is necessary to study, measure, and manage institutional resources.[184] Programs

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181. PARKER ET AL., *supra* note 2, at 219–20.

182. Martin Curley, *The Evolution of Open Innovation*, 3 J. INNOVATION MGMT. 9, 15 (2015); *see, e.g.*, GROVE, HIGH OUTPUT MANAGEMENT, *supra* note 55, at 17–18 (discussing the importance of measurements in identifying and improving organization functions and outputs).

183. MULLER, *supra* note 64, at 145 (examining the role of metrics in recent financial and business scandals and warning of the perils of short-termism when "*only* what gets measured—and potentially penalized—gets done").

184. Anders Richtnér et al., *Creating Better Innovation Measurement Practices*, MIT SLOAN MGMT. REV. (Sept. 17, 2017), http://sloanreview.mit.edu/article/creating-better-innovation-measurement-practices [https://perma.unl.edu/4TGY-T9NW]; *see also* Mark Krawitz et al., *How Higher-Education Institutions Can Transform Themselves Using Advanced Analytics*, MCKINSEY & CO.: SOCIAL SECTOR (Aug. 2018), https://www.mckinsey.com/industries/social-sector/our-insights/how-higher-education-institutions-can-transform-themselves-using-advanced-analytics [https://perma.unl.edu/J9RK-78JM] (identifying some challenges universities face when "building their analytical capabilities" and "deploying best practices"). The McKinsey consultants emphasize the importance of maintaining a long-term perspective and then set out the following action steps to promote success: (1) "articulate an analytics mandate that goes beyond compliance," (2) "establish a central analytics team with direct reporting lines to executive leaders," (3) "win analytics buy-in from the front line and create a culture of data-driven decision making," (4) "strengthen in-house analytical capabilities," and (5) "do not let great be the enemy of the good." *Id.*; *see generally* Nicolaus Henke et al., *The Age of Analytics: Competing in a Data-Driven World*, MCKINSEY GLOBAL INST. 9, 63, 69 (Dec. 2016), https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-age-of-analytics-competing-in-a-data-driven-world [https://perma.unl.edu/Z327-ZDQN] (describing the capabilities of data and analytics and envisioning how data fueled technologies and predictive analytics will radically

must analyze the successes and failures of the knowledge and skills development methods they presently use, as well as the successes and failures of the projects and initiatives designed to further innovation mission trajectories more broadly. In addition to the more targeted analysis of which learning and teaching methods succeed in the physical and digital classroom, data analytics can provide insights into a program's vitality on a macro scale.[185] Because platforms generate lots of heterogeneous data, education entrepreneurs will harvest this data to continuously identify innovation pathways, recalibrate strategies and operations, uncover unmet customer needs, and deliver value.[186]

As higher education fully embraces platform models, digital teaching and learning exchanges require new measurements.[187] For example, platform metrics should measure user interactions in terms of quantity and frequency, as well as collect data on other indicators and factors that provide insights into the nature and quality of interactions.[188] Over time, this data may reveal opportunities to improve user engagement and experiences.[189] Specific platform goals may include, but are not limited to, creating valuable user exchanges, fostering a vibrant community, and stimulating organic growth.[190] Over time, platform metrics can illuminate fruitful pedagogical and engagement pathways which are "actionable, accessible, and auditable."[191] Leaders must be vigilant, however, to avoid (1) collecting "vanity met-

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reshape industries such as education, healthcare, media, and retail through "radical personalization").

185. REIS, *supra* note 31, at 149–50 ("Companies that cannot bring themselves to pivot [i.e., structured course correction] to a new direction on the basis of feedback from the marketplace can get stuck in the land of the living dead, neither growing enough nor dying, consuming resources and commitment from employees and other stakeholders but not moving ahead.").

186. *See Incumbents Strike Back*, *supra* note 55, at 22.

187. PARKER ET AL., *supra* note 2, at 186–87 (discussing the differing metrics of pipelines and platforms); *see also* CHESBROUGH, *supra* note 12, at 25 (noting how the service sector may provide guidance in developing metrics such as customer satisfaction, lifetime value of customer, customer retention and referral rates, etc.).

188. PARKER ET AL., *supra* note 2, at 186–87.

189. Sarah Green Carmichael, *How AI Is Already Changing Business*, HBR IDEACAST (July 20, 2017) (interview with Erik Brynjolfsson), https://hbr.org/ideacast/2017/07/how-ai-is-already-changing-business.html [https://perma.unl.edu/BU7Y-73BK] (discussing how Sebastian Thrun, Udacity online learning system founder, uses data to improve customer service and sales operations). Specifically, Thrun fed customer engagement transcripts to a machine learning algorithm that highlighted patterns of phrases and answers. *Id.* This facilitated employee productivity, additional sales, and more satisfied customers. *Id.*

190. PARKER ET AL., *supra* note 2, at 187.

191. *Id.* at 202 (citing RIES, *supra* note 31). Metrics should meet the "3 A's test," in which they are "actionable, accessible, and auditable":
(1) Actionable means the metrics "provide clear guidance for strategic and managerial decisions" and relate to the success of the enterprise.

rics" that thwart clear-eyed assessments of project, process, or program data, (2) "metric fixation" that may stifle innovation and undercut long-term growth, and (3) "obsessive measurement disorder" that prioritizes quantification at the expense of other valuable programs and activities.[192]

Data analytics also represents a powerful energizer for business model and education service innovations.[193] According to a 2017 MIT Sloan Management Review research study, organizations that possess "analytical maturity"—also known as "analytical innovators"—identify, create, and drive innovations that foster marketplace advantages.[194] For example, analytical innovators graft together data and

(2) Accessible means the metrics "are comprehensible to the people who gather and use the information."

(3) Auditable means the metrics "are real and meaningful" and are based on "clean, accurate data, precisely defined, and reflecting the reality of the business as perceived by users." *Id.*

192. REIS, *supra* note 31, at 39 (explaining that "vanity metrics" are those that are "designed to look as good as possible" and may obscure the truth); *see also* MULLER, *supra* note 64 at 17–18 (articulating the concept of "metric fixation," which seeks to find relationships "between measurement and improvement" that can provide transparency and accountability). Muller warns: "Trying to force people to conform their work to preestablished numerical goals tends to stifle innovation and creativity—valuable qualities in most settings. And it almost inevitably leads to a valuation of short-term goals over long-term purposes." *Id.* at 20. Further, the development of successful metrics requires a great deal of specific knowledge about the unique organization, community, and context which may not be easily consolidated into "universal templates and formulae." *Id.* at 134. Because measurement demands judgment and some problems are not "soluble by metrics," leaders face significant challenges in knowing (1) what to count, (2) what the collected information actually means, (3) what is the value or usefulness of the information (or more information), (4) what is the cost of acquiring the metrics, (5) whether the metrics may have distortions, and (6) what action to take or not take. *Id.* at 134, 176–83. Muller further explains that "Obsessive Measurement Disorder" represents "an intellectual dysfunction," which views quantification as essential for improved management. *Id.* at 155.

193. Sam Ransbotham & David Kiron, *Analytics as a Source of Business Innovation: The Increased Ability to Innovate with Analytics Is Producing a Surge of Benefits Across Industries*, MIT SLOAN MGMT. REV. (Feb. 28, 2017), https://sloanreview. mit.edu/projects/analytics-as-a-source-of-business-innovation/ [https://perma. unl.edu/BN2P-HJME] (summarizing a 2016 study of 2,602 executives, managers, and data professionals that found: (1) data and analytics provides competitive advantages, (2) "innovation from analytics is surging," (3) "data governance fosters innovation," and (4) "smart machines create opportunity for innovative thinking"). *But see* MULLER, *supra* note 64, at 171–72 (arguing that metric fixation "impedes innovation" and "promotes stagnation" because trying out new ideas involves experimentation, risk, and often failure).

194. Ransbotham & Kiron, *supra* note 193 (defining the "three levels of analytics maturity" as follows: (1) analytical innovators "have an analytics culture, make data driven decisions, and rely on analytics for strategic insights and innovative ideas"; (2) analytical practitioners "have adequate access to data and are working to become more data driven," but "use analytics primarily to effect operational improvements"; and (3) the analytically challenged "still rely more on manage-

analytics with an organization's existing (i.e., un-siloed) rootstock of products, services, or processes to sprout both incremental and breakthrough innovations.[195] Further, organizations that embrace open innovation may find synergies when they cross-pollinate their data, knowledge, and expertise with outside organizations[196]—including competitors, complementors, or frenemies.[197] Over time, analytics may help leaders and organizations identify verdant, ordinary, and hardscrabble soil conditions so that they can strategically focus their resources and energies on fertilizing areas of fruitful abundance and avoid non-producing pursuits.

When measuring innovation and collecting data, three common traps include "(1) overestimating or underestimating the value of innovation measurement, (2) measuring only the parts as opposed to the whole, and (3) overlooking the political power of innovation measures."[198] Developing and adjusting innovation mission trajectories requires leaders to take a holistic view of "innovation inputs, activities, and outputs" to see the connections forming the "heart of busi-

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ment intuition than data for decision making . . . [and] struggle with data access and quality and lack data management skills").

195. *Id.* (discussing "data-driven innovation").

196. *Id.* (quoting Peter Levin, senior research scientist at Intel, who notes the benefits of collaboration but also recommends that participants agree to protocols for "data and algorithm access, limits, and exchange rules"). An important caution: as universities embrace data collection, stringent data governance and protection protocols must be implemented, updated, and continuously monitored to avoid data breaches. *See* MAYER-SCHÖNBERGER & CUKIER, *supra* note 121, at 33–42. Data governance refers to "the general management of key data resources in a company or organization," including data use, storage, maintenance and security, information flows, and the overarching IT infrastructure. *Data Governance*, TECHOPEDIA, https://www.techopedia.com/definition/16904/ data-governance-dg [https://perma.unl.edu/45L7-QPBA]. Privacy issues and concerns deserve careful consideration but are outside the scope of this Article. *See generally* PEDRO DOMINGOS, THE MASTER ALGORITHM: HOW TO QUEST FOR THE ULTIMATE LEARNING MACHINE WILL REMAKE OUR WORLD 270–76 (2015).

197. CHESBROUGH, *supra* note 12, at 90; J. Scott Armstrong & Terry Clark, *Review of Barry J. Nalebuff and Adam N. Brandenburer, Co-opetition 1. Revolutionary Mindset that Redefines Competition and Co-operation 2. The Game Theory Strategy That's Changing the Game of Business*, 61 J. MARKETING 92–95 (1997); *see* Adam A. Brandenburger & Barry J. Nalebuff, *Inside Intel*, HARV. BUS. REV. (1996); Jose Teixeira et al., *Lessons Learned from Applying Social Network Analysis on an Industrial Free/Libre/Open Source Software Ecosystem*, 6:14 J. INTERNET SERVS. & APPLICATIONS 2 (2015) https://jisajournal.springeropen.com/ articles/10.1186/s13174-015-0028-2 [https://perma.unl.edu/V99M-RBJD] (examining "coopetition," which is a hybrid of competition and cooperation); *see also Plotting the Platform Payoff*, *supra* note 23, at 12–13 (noting how "Reinventors"— those organizations that outperform in operating efficiency and revenue growth/ profitability—frequently collaborate with their competitors, a relationship sometimes called "frenemies" to create new products and services).

198. Richtnér et al., *supra* note 184.

ness strategy and competitive advantage."[199] As such, the establishment of accurate innovation measurements involves examining three phases: assessment, improvement, and deployment.[200] Assessment identifies existing innovation measurements, scrutinizes current innovation goals, and sets priorities.[201] The improvement phase continually refines measurements as well as assesses and realigns the portfolio of innovation plans, processes, and projects.[202] During the improvement phase, necessary adjustments are made to achieve innovation mission trajectories.[203] Last, during the deployment phase, leaders establish routines for measuring innovation targets, reporting schedules, and building supportive networks (e.g., follow-up, training, mentoring, etc.).[204] As briefly discussed *infra* in subsection IV.B.3, leaders can use OKRs and these innovation measurements to provide continuous feedback and promote organizational dexterity.[205]

On a human level, organizations that fully embrace data analytics and machine learning report that "smart machines" have unbound humans from tedious, menial duties so that they can focus on "higher-value-added tasks."[206] To the extent that higher education can be au-

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199. *Id.*; *see* ANAND, *supra* note 12, at 207; *see also* Henderson, *supra* note 80, at 465 (explaining that when determining whether to venture forward on a particular path or into a niche market, "the only tools we have to cope with our 'low data, high risk' environment are imagination and empathy").

200. Richtnér et al., *supra* note 184; *see also* MCGRATH, *supra* note 13, at 132 (describing an "innovation dashboard"). The dashboard tracks ideas submitted (both pace and frequency); employee training sessions held and workshops on specific topics; progress of each employee's training; innovation project status (e.g., development phase, budget, and funds spent); and "lessons learned" information about successful and unsuccessful projects initiated, launched, redirected, or scrubbed. *Id.*

201. Richtnér et al., *supra* note 184. Some questions to ask in the assessment phase include: "Do your current innovation measurement practices help or hurt your ability to achieve your innovation goals and priorities? To what extent are the current practices aligned with the overall company strategy?" *Id.*

202. *Id.* Some questions to ask in the improvement phase include: "Do you have a balanced set of measures for your innovation portfolio, processes, and projects? Do you have the right number of measures? To what extent are the measures aligned with your strategy?" *Id.*

203. *Id.*

204. *Id.* During the deployment phase, leaders should "review and revise their innovation measurement practices regularly" and "develop a process for reevaluating the innovation measures and for examining the cause-and-effect relationships between measures and results." *Id.*

205. *Leading Through Connections*, *supra* note 54, at 32.

206. Ransbotham & Kiron, *supra* note 193; *see also Cognitive Catalysts*, *supra* note 100, at 12–13 (predicting that AI and cognitive technologies will free leaders and employees from the drudgery of routine tasks, thus enabling them to "think up new innovative ideas," solve complex issues, and even perhaps "enhance their emotional intelligence"). The 2017 IBM report also states: "New technologies don't just create engaging experiences for customers; they create rich new sources of data – data that reveals what is distinctly human within each interaction. In

tomated to include digital quizzes, skills assessments, and eventually AI-tutors and AI-enhanced simulations and games with instant student feedback, data and analytics represent essential new plant varieties in a state-of-the-art legal education garden. To validate these evolving teaching processes, products, techniques, and potential faculty assessments, programs will need to work with faculty and data experts in the development of effective data collection, criteria review, analytic tools, and algorithms.[207] Successfully doing so requires the insights and capabilities of analytics teams, subject-matter experts, and organization leaders who work together to weigh a variety of data points while always being mindful, alert, and ready to correct the potential pernicious effects of algorithmic bias and inscrutability.[208]

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turn, the intricate patterns and correlations reveal the whole human being and expose new ways to create value." *Id.* at 20.

207. *See, e.g.*, Erik Brynjolfsson & John Silberholz, *'Moneyball' for Professors?*, MIT SLOAN MGMT. REV. (Dec. 14, 2016), https://sloanreview.mit.edu/article/moneyball-for-professors/ [https://perma.cc/AP6K-N8E4] (asserting that during the tenure determination process, "data-driven models can significantly improve decisions for academic and financial committees" if used in conjunction with subjective assessments). *But see* Paul Basken, *UT-Austin Professors Join Campaign Against Faculty-Productivity Company*, CHRON. OF HIGHER EDUC. (Jan. 24, 2018), https://www.chronicle.com/article/UT-Austin-Professors-Join/242332?cid=DB&elqTrackId=dbca2e081e984df0add785135f942d97&elq=bod1199539264114af29a72b6450e78d&elqaid=17584&elqat=1&elqCampaignId=7729 [https://perma.unl.edu/Y699-5E39] (describing faculty resistance to Academic Analytics at the University of Texas).

208. Alex Campolo et al., *AI Now 2017 Report*, NYU/AI NOW INST. 13–21 (2017), https://ainowinstitute.org/AI_Now_2017_Report.pdf [https://perma.unl.edu/LS99-8KMR] (discussing AI bias). The AI Now report further explains:

AI is not impartial or neutral. Technologies are as much products of the context in which they are created as they are potential agents for change. Machine predictions and performance are constrained by human decisions and values, and those who design, develop, and maintain AI systems will shape such systems within their own understanding of the world. Many of the biases embedded in AI systems are products of a complex history with respect to diversity and equality.

Id. at 18; *see* Will Knight, *Biased Algorithms Are Everywhere, and No One Seems to Care*, MIT TECH. REV. (July 12, 2017), https://www.technologyreview.com/s/608248/biased-algorithms-are-everywhere-and-no-one-seems-to-care/ [https://perma.unl.edu/38L9-6GAZ]; *see* MCAFEE & BRYNJOLFSSON, *supra* note 29, at 51; Chris DeBrusk, *The Risk of Machine-Learning Bias (and How to Prevent It)*, MIT SLOAN MGMT. REV. (Mar. 26, 2018), https://sloanreview.mit.edu/article/the-risk-of-machine-learning-bias-and-how-to-prevent-it [https://perma.unl.edu/4TXX-E4MK]; Jackie Snow, *"We're in a Diversity Crisis": Cofounder of Black in AI on What's Poisoning Algorithms in Our Lives*, MIT TECH. REV. (Feb. 14, 2018), https://www.technologyreview.com/s/610192/were-in-a-diversity-crisis-black-in-ais-founder-on-whats-poisoning-the-algorithms-in-our/ [https://perma.unl.edu/3YD9-CZ6T]; Paul Teich, *Artificial Intelligence Can Reinforce Bias, Cloud Giants Announce Tools for AI Fairness*, FORBES (Sept. 24, 2018), https://www.forbes.com/sites/paulteich/2018/09/24/artificial-intelligence-can-reinforce-bias-cloud-giants-announce-tools-for-ai-fairness/#51c7cdf29d21 [https://perma.unl.edu/69LM-HUX7] ("Ultimately, the best answer to addressing bias in trained machine

C. Pricing Models, Strategic Cannibalization, and Cost Containment

As discussed in *Legal Education: A New Growth Vision Part I*, Part IV, which completes a strategic inflection point analysis of legal education, financially-astute students increasingly demand value for the tuition paid. Specifically, they want to graduate with low debt and strong employment prospects. To deliver such education value, law school leaders should explore emerging education pricing models, consider strategic cannibalization, and focus on cost containment and process efficiencies.

1. Pricing Models and Strategic Cannibalization

For future-focused programs, digital knowledge and skill development platforms enable radical rethinking and rebooting of higher education pricing models and business strategies. As discussed in *Legal*

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learning models will be to build transparent models."); Charles Towers-Clark, *Can We Make Artificial Intelligence Accountable?*, FORBES (Sept. 19, 2018), https://www.forbes.com/sites/charlestowersclark/2018/09/19/can-we-make-artificial-intelligence-accountable/#5e419a33364e [https://perma.unl.edu/QLC2-FGR8] (describing IBM's new software service to "detect bias in AI models and track the decision-making process"); Jonathan Vanian, *IBM Debuts Tools to Help Prevent Bias in Artificial Intelligence*, FORTUNE (Sept. 19, 2018), http://fortune.com/2018/09/19/ibm-artificial-intelligence-bias/ [https://perma.unl.edu/4XLE-768L]; Rhys Dipshan, *Do We Need a Private Right of Action Against Machine Bias?*, LEGALTECHNEWS (Oct. 11, 2018), https://www.law.com/legaltechnews/2018/10/11/do-we-need-a-private-right-of-action-against-machine-bias/ [https://perma.unl.edu/BH6B-CNY2]; Nicole Kobie, *Amazon's HR Proves Artificial Intelligence Is Truly Dumb*, IT PRO (Dec. 8, 2018), https://www.itpro.co.uk/machine-learning/32505/amazon-s-hr-proves-artificial-intelligence-is-truly-dumb [https://perma.unl.edu/X366-M292] (describing how Amazon's now-scrapped AI system exhibited algorithmic bias against female job candidates because the AI's neural networks trained on flawed data sets comprised of Amazon's historically male past hires); *see also* Timnit Gebru, *Understanding the Limits of AI: When Algorithms Fail*, MIT TECH. REV. (Mar. 26, 2018), https://events.technologyreview.com/video/watch/timnit-gebru-ai-limits-algorithms-fail/ [https://perma.unl.edu/M4HY-V8JE] (discussing the limitations of AI); *What Does AI Mean for Ethics and Diversity?*, YOUTUBE (May 29, 2018), https://youtu.be/VbAj19fHsaw [https://perma.unl.edu/PU9U-CMJB] (analyzing AI bias and methods of preventing it); Jonathan Vanian, *IBM Debuts Tools to Help Prevent Bias in Artificial Intelligence*, FORTUNE (Sept. 19, 2018), http://fortune.com/2018/09/19/ibm-artificial-intelligence-bias/ [https://perma.unl.edu/9J5F-DTHE] (discussing AI bias and IBM's solutions for removing this bias); *see generally* CATHY O'NEIL, WEAPONS OF MATH DESTRUCTION: HOW BIG DATA INCREASES INEQUALITY AND THREATENS DEMOCRACY (2016) (discussing deleterious effects of big data and algorithms on teacher evaluations, credit decisions, criminal justice, etc.). For a brief news report on recent algorithmic bias litigation, see Marissa Cummings, *Federal Lawsuit Settled Between Houston's Teacher Union and HISD,* HOUSTON PUB. MEDIA (Oct. 10, 2017), https://www.houstonpublicmedia.org/articles/news/2017/10/10/241724/federal-lawsuit-settled-between-houstons-teacher-union-and-hisd/ [https://perma.unl.edu/CA4Y-6957].

Education: A New Growth Vision Part I, subsections IV.B.1 and III.B.4, students carefully calculating the return on investment of legal education are discouraged by the rising cost of law school tuition without a correlating increase in employment marketability.[209] As the year 2020 approaches, traditional tuition models no longer control as several universities offer digital alternatives.[210] Instead of rising in lockstep with each passing year, tuition prices should reflect what the market will bear, and programs should adjust their costs accordingly.[211] Programs that charge the same tuition for on-campus and

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209. *But see* Amy Y. Li, *Dollars and Sense: Student Price Sensitivity to Law School Tuition* 31–34 (AccessLex Inst. Research, Paper No. 18-09, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3216204 [https://perma.unl.edu/C2WU-H3FW] ("[Students are willing to] apply to and enroll at law schools despite increases in tuition and fees. At private law schools and at law schools in third and fourth tiers, first-year students are even willing to pay higher net costs. This study reveals that there is in fact, a lack of price sensitivity in legal education.").

210. TOUTKOUSHIAN & PAULSEN, *supra* note 123, at 305–09 (considering opportunities and limitations of online education and how age and family considerations influence student choice); *see also* Yvonne Dutton et al., *Assessing Online Learning in Law Schools: Students Say Online Classes Deliver*, 96 DENV. L. REV. (forthcoming 2019) (finding that law students who have families or work full-time especially appreciate opportunities for asynchronous course work).

211. On the issue of controlling costs, Grove says to:

> price for what the market will bear, price for volume, then work like the devil on your costs so that you can make money at that price. This will lead you to achieve economies of scale in which the large investments that are necessary can be effective and productive and will make sense because, by being a large-volume supplier, you can spread and recoup those costs.

GROVE, ONLY THE PARANOID SURVIVE, *supra* note 38, at 52; *see also* MICHAEL E. PORTER, COMPETITIVE STRATEGY: TECHNIQUES FOR ANALYZING INDUSTRY AND COMPETITORS 17 (1980) (explaining how strategies focusing on price are unsustainable since the competition can match lower prices); *see generally* TOUTKOUSHIAN & PAULSEN, *supra* note 123, at 231–74 (discussing "Higher Education Revenues and Expenditures"); WILLIAM J. BAUMOL, THE COST DISEASE: WHY COMPUTERS GET CHEAPER AND HEALTH CARE DOESN'T xvii (2012) ("[T]he cost disease asserts that the costs of health care, education, and the live performing arts, and a number of other economic activities known as the 'personal services,' are condemned to rise at a rate significantly greater than the economy's rate of inflation, as indeed they have through the period for which data is available. This is because the quantity of labor required to produce these services is difficult to reduce."). Baumol concludes that "even if health care and education keep getting more expensive, our earnings will grow fast enough to make these services affordable." *Id.* at 181. In evaluating Baumol's cost disease theory, Chesbrough argues that "the fields of education, health care, and government" as growing segments of the economy represent a "weakness (an inability to streamline and improve their activities relative to other sectors of the economy), not a strength." CHESBROUGH, *supra* note 12, at 192. Although Baumol acknowledges some productivity increases due to technological innovations (e.g., automation) and the potential displacement of low-skill employees, it is unclear if his cost disease theory regarding health, education, and other professional personal services will remain valid once AI and IA technologies redefine the work of white-collar knowledge workers. *See, e.g.*, *id.* at

distance learners must make concerted, continuously improving ef-
forts to bring distance learners into the full education experience. Pro-
grams that offer only video-recorded faculty lectures for distance
learners without supplemental resources unwittingly till the field for
market disruptors to develop lower cost, innovative programs that
provide substantially equivalent education experiences for on-campus
and distance learners.[212]

Experiments in progress by Northern Arizona University, Georgia
Tech, and the University of Colorado represent promising innovations
in public higher education pricing models.[213] Northern Arizona Uni-
versity currently experiments with a Netflix-like subscription that of-
fers online students personalized learning.[214] Such a model gives
students ongoing access to program resources supported by platforms,
thereby shifting the customer relationship from a lump-sum purchase
(i.e., tuition payments) into a long-term, ongoing revenue stream.[215]
Georgia Tech offers different tuition structures for campus-based ver-

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39–42, 117 (discussing automation, but not AI or IA). As discussed throughout
this Article, technology may serve as a means to contain education costs through
human and process efficiencies.

212. *See generally* TOUTKOUSHIAN & PAULSEN, *supra* note 123, at 149–96 (examining
how supply, demand, and equilibrium influence the market price for higher edu-
cation services); *see also* Dutton et al., *supra* note 210, at 12 (reporting that online
classes provided students with practical opportunities to "apply" the subject mat-
ter being studied in the form of digital quizzes, exercises, and projects).

213. *See* Martin Pritkin, *Return on Investment: The Core Challenge for Legal Educa-
tion and the Legal Profession*, NAT'L JURIST (Aug. 21, 2017), http://nationaljur
ist.com/national-jurist-magazine/return-investment-core-challenge-legal-educa
tion-and-legal-profession [https://perma.unl.edu/3U8D-XD23] (noting how the
fully-online, not ABA-accredited Concord Law School at for-profit Kaplan Univer-
sity charges $12,000 per year for tuition); *see also* LINKNER, *supra* note 26, at 85
(discussing flipping and inverting traditional business models to obtain opera-
tional and marketplace advantages). Linkner cites Costco as an example of a
flipped model because Costco makes a majority of its profits on membership fees
rather than marking up products. *Id.* Linkner offers the following formula for
model inversion: "Instead of _____ [the traditional approach, what the rest of
the industry does, what you've been doing to date], let's flip the model and do
this: _____ [often the polar opposite]." *Id.* (brackets in original).

214. *Personalized Learning Program*, N. ARIZ. U., http://pl.nau.edu/ [https://perma.
unl.edu/G9NK-N2UY]; *see also How "Personalized Learning" Can Put College in
Reach*, PBS (Sept. 19, 2017), http://www.pbs.org/video/making-the-grade-
1505859272/ [https://perma.unl.edu/CPZ9-5J6Z] (describing Northern Arizona
University's personalized learning program through the experience of current
and former students).

215. CHESBROUGH, *supra* note 12, at 15; *see also* LINKNER, *supra* note 26, at 80–82
(describing how Dollar Shave Club CEO reinvented the sale of razor blades
through "market model innovation"); *see generally* Daniel McCarthy & Peter
Fader, *Subscription Businesses Are Booming. Here's How to Value Them*, HARV.
BUS. REV. (Dec. 19, 2017), https://hbr.org/2017/12/subscription-businesses-are-
booming-heres-how-to-value-them [https://perma.unl.edu/5M82-3D98] (discuss-
ing how "not all customers are 'created equal'" and "what matters most [is] creat-
ing durable, long-term value through customer acquisition, retention, and

sus digital students. For example, the 2018–2019 tuition for Georgia Tech's Master of Science, Computer Science thirty-hour degree depends on a student's residency status and whether the student attends on campus or online.[216] For price-conscious students, Georgia Tech's online program delivers a high-quality education at a significant cost savings (total tuition is approximately $7,000).[217] In November 2017, the University of Colorado (CU) Regents approved a $20 million "moon shot" to overhaul CU's online education programs.[218] By fall 2022, CU will offer a bachelor's and master's level degree at a fixed cost of $15,000 (including books and fees).[219] Some interesting current developments in legal education merit monitoring. For example, the recently completed University of Illinois at Chicago (UIC) and John Marshall Law School merger may provide students with significant tuition cuts.[220] UIC Chancellor Michael Amiridis and John Marshall Dean Darby Dickerson agree that John Marshall's current annual tuition of $47,000 should drop and align with the in-state tuition at University of Illinois College of Law of $35,000.[221] Also, State

development – and to worry less about surface-level metrics like sales growth in a vacuum").

216. *Online Grad Programs Offer Degrees at Significant Savings*, PBS (Sept. 5, 2017), http://www.pbs.org/video/online-grad-programs-offer-degrees-at-significant-savings-1504655768/ [https://perma.unl.edu/Q9DQ-4ARC]; *see also* GA. TECH C. COMPUTING, https://www.omscs.gatech.edu/home [https://perma.unl.edu/JK7F-D8JF] (listing the online degree cost as approximately $7,000); *2018–2019 Tuition and Fee Rates Per Semester*, GA. TECH SCH. COMPUTER SCI., http://www.bursar.gatech.edu/student/tuition/FY_2019/FY19-all_fees.pdf [https://perma.unl.edu/TA54-8GLQ] (indicating that the 30 hour on-campus basic tuition cost [graduate rates for master's degree] is approximately $17,250 [$575 hour] for in-state residents and $35,730 [$1,191 hour] for non-residents).

217. GA. TECH C. COMPUTING, *supra* note 216; *see also* Mark Lieberman, *A College Prices Its Online Program 60% Less*, INSIDE HIGHER ED (July 11, 2018), https://www.insidehighered.com/digital-learning/article/2018/07/11/berklee-college-music-defies-conventional-wisdom-low-price [https://perma.unl.edu/CRA9-VJ9D] (explaining Fall 2018 tuition for Berklee College of Music: $59,880 online program; $171,520 campus program).

218. Elizabeth Hernandez, *CU Regents Approve 'Moon Shot' Overhaul of Online Education*, BOULDER DAILY CAMERA (Nov. 16, 2017), http://www.dailycamera.com/cu-news/ci_31460005/cu-regents-approve-moon-shot-overhaul-online-education [https://perma.unl.edu/ZA76-GU5B]. *But see* Daniel W. Drezner, *Twilight of the MOOCs?*, FOREIGN POL'Y MAG. (July 22, 2013), http://foreignpolicy.com/2013/07/22/twilight-of-the-moocs/ [https://perma.unl.edu/3M7W-UZAL] (predicting tension between the potentially competing goals of lowering education cost and ensuring education quality).

219. Hernandez, *supra* note 218.

220. Jack Crittenden, *What UI Chicago and John Marshall Law School Merger Will Mean for Legal Ed*, NAT'L JURIST (July 24, 2018), http://www.nationaljurist.com/national-jurist-magazine/what-ui-chicago-and-john-marshall-law-school-merger-will-mean-legal-ed [https://perma.unl.edu/HG6D-F8UJ].

221. *Id.* ("If a tuition cut is realized, it would make John Marshall the least expensive law school in the Windy City, giving it a recruiting edge over rivals DePaul University, Chicago-Kent College of Law and Loyola Law School, Chicago.").

University of New York (SUNY) Canton and the University of Buffalo School of Law now offer students an opportunity to save a year's tuition when obtaining a law degree.[222] Under this joint program, participating students complete three years of undergraduate coursework at SUNY Canton followed by three years of juris doctorate studies at Buffalo School of Law.[223]

For accredited hybrid J.D. programs, high tuition remains the dominant pricing model. The recent ABA waiver granted to Syracuse University, which allows it to offer a hybrid-online law degree program, provides exciting opportunities for digital legal education innovation. For the 2018–2019 academic year, Syracuse charges students the same tuition for its residential and online J.D. programs at $49,300.[224] Charging the same tuition for online and on-campus tuition obviously causes no damage to traditional law school revenue. Short term, this "straddling" approach may make sense for the school,[225] but it does not persuasively address online students' reasonable concerns about paying for physical resources they do not use.[226]

The decision on whether to cannibalize current services presents challenging questions and potential market opportunities.[227] Accord-

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222. Kevin Shea, *New Program to Provide Shorter, Cheaper Road to Becoming a Lawyer*, WATERTOWN DAILY TIMES (Dec. 3, 2018), http://www.watertowndailytimes.com/news05/new-program-to-provide-shorter-cheaper-road-to-becoming-a-lawyer-20181203 [https://perma.unl.edu/ZBZ5-WA7J].

223. *Id.*

224. *Jdinteractive FAQs*, SYRACUSE U., http://jdinteractive.syr.edu/faqs/ [https://perma.unl.edu/3D5T-FKN3]; *Cost of Attendance*, SYRACUSE C.L., http://law.syr.edu/financial-aid/cost-of-attendance [https://perma.unl.edu/KG9R-MW2D] (providing 2018–2019 tuition information for Syracuse Law School). Similarly, at the University of Denver, the 2018–2019 per credit tuition for the part-time J.D. program (weekly online classes and weekend on campus classes) is $1,687. For 2018–2019, full-time (30 credits) tuition is $50,610 and part-time (22 credits) tuition is $37,114. *2018–2019 Cost of Attendance*, U. DENV., https://www.du.edu/financialaid/law/cost/ [https://perma.unl.edu/FDJ6-HYDW]. For some insights on "[h]acking the J.D," see Jackie Gardina, *How One Small California Law School Is Reinventing Legal Education*, SANTA BARBARA & VENTURA COLLEGES L.: THE COLLEGES L. BLOG (Mar. 5, 2018), https://www.collegesoflaw.edu/blog/2018/03/05/hybrid-jd-program-backstory/ [https://perma.unl.edu/3FYC-XG8C] (describing the law school's innovations and mission to provide "affordable, accessible, and quality legal education" for the next generation of law students). For 2018, total J.D. tuition cost at the Santa Barbara and Ventura Colleges of Law is $67,620. *Id.*

225. *What Is Strategy?*, *supra* note 44 (explaining that an organization that is a straddler "grafts new features, services, or technologies onto the activities it already performs").

226. *See* Lieberman, *supra* note 217 (quoting Berklee College of Music's president, Roger Brown: "I think there is no way around the fact that when you study online, you don't get the same physical resources, you don't get to be in a classroom with your classmates . . . . If I were an online student I'd say, why am I paying for that?").

227. Because cannibalization sounds violent, education entrepreneurs may prefer using words "reinvention" and "rebirth" when describing the difficult process of or-

ing to Steve Jobs, "If you don't cannibalize yourself, someone else will."[228] Thus, in the long term, education entrepreneurs may find it wise to carefully evaluate whether it may be better to strategically cannibalize segments of the education products and academic portfolio to clear pathways for future unified innovations.[229] So while tradi-

ganization renewal and reinvention. The image of a beautiful butterfly emerging from a chrysalis is much more satisfying than focusing on the dying caterpillar. Julian Birkinshaw, *Telling a Good Innovation Story*, MCKINSEY Q. (July 2018), https://www.mckinsey.com/featured-insights/innovation-and-growth/telling-a-good-innovation-story [https://perma.unl.edu/SUM2-3MTR].

228. WALTER ISAACSON, STEVE JOBS 408 (2011); *see* LINKNER, *supra* note 26, at 49–51 ("Refusing to embrace new products or processes because they might prove to be more effective than the existing ones is an illogical exercise in magical thinking . . . . Those who focus all of their energy on simply holding on to what they have will never be able to reach out for more. By clinging to the past, they are choosing to become obsolete."); *see also Strategy and the Internet*, *supra* note 44, at 124 ("In many cases, the Internet complements, rather than cannibalizes, companies' traditional activities and ways of competing."); Scott D. Anthony, *Combatting Cannibalization Concerns*, HARV. BUS. REV. (Feb. 18, 2011), https://hbr.org/2011/02/combating-cannibalization-conc [https://perma.unl.edu/WDG2-PRU7] (recommending the following to address cannibalization concerns: "find ways to turn the threat into an opportunity," "make sure you are doing something legitimately different," and "remember [that] cannibalization isn't really in your control"); Sarah Green, *Why You Should Cannibalize Your Company*, HARV. BUS. REV. (Nov. 2012), https://hbr.org/2012/11/why-you-should-cannibalize-you [https://perma.unl.edu/TF3T-KDVT] (interview with James Allworth) (describing how Jobs focused on building the best product and "if that meant that they had to cannibalize existing business plans to do that, that's fine"). *But see* Steve Landis, *Beware of the Cannibal in Your Product Line*, HARV. BUS. REV. (June 13, 2013), https://hbr.org/2013/06/beware-the-cannibal-in-your-pr [https://perma.unl.edu/4AHT-ZDZH] ("The value-destroying menace of cannibalisation [sic] is the dirty little secret of the innovation industry.").

229. *See* Lieberman, *supra* note 217 (quoting Debbie Cavalier, Berklee College of Music's vice president of online learning and continuing education: "We're of the mind that we'd rather cannibalize ourselves than run the risk of someone else doing that"). On the thorny subject of digital cannibalization, Anand writes: "The challenge that digital technologies pose for content businesses is often attributed to one of three things: cannibalization of traditional products by digital ones; complacency of existing managers who refuse to embrace new technologies; or worsening economics of content in a digital world." ANAND, *supra* note 12, at 73. Anand notes that even though the prospect of cannibalization can be terrifying, it provides an opportunity to imagine potentially profitable and sustainable new or complementary products and services. *Id.* at 140. He warns: "Don't be too protective of your core. Eat your lunch today, or others will." *Id.* at 330. For example, when developing Amazon.com, Bezos's team experimented with several formats but ultimately decided on a model that "put third-party sellers on the same page as the Amazon.com offer page, creating massive potential for cannibalization, but also whole new revenue opportunities from now more productive third-party sellers." MCGRATH & MACMILLAN, *supra* note 80, at 60–61. For some specific ideas on how to revamp legal education, see, e.g., David I. C. Thomson, *How Online Learning Will Transform Legal Education*, RES. HANDBOOK ON DIGITAL TRANSFORMATION 23–37 (F. Xavier Olleros & Majlinda Zhegu eds. 2016) [hereinafter Thomson, *How Online Learning Will Transform Legal Education*] (examining

tional pricing models currently hold firm for ABA accredited online J.D. education (hybrid or hybrid-flexible "HyFlex" format), education entrepreneurs should consider various strategies to grow market share. For example, future-focused law schools may (1) follow Georgia Tech's lead and use technology and process efficiencies to offer online students with lower cost, digital degrees; (2) deliver a combination of bundled and unbundled campus and digital education offerings that are tailored, differentiated, practitioner-informed, and omni-channel (with an end goal of human-AI integration); or (3) aggressively pursue value innovation to provide learners with a completely different education experience that represents a radical and "forward leap in value."[230] Such bold, contrarian moves could radically redefine and reshape the J.D. education marketspace by addressing student concerns about tuition costs and debt incurred; expanding the program's access and geographical reach; and delivering quality, timely, and relevant legal education to diverse communities of scholars.

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how law schools can both control tuition costs and provide better instruction by rethinking the three-year curriculum and embracing digital technologies). In response to calls to eliminate the third year of legal education, Professor Thomson instead recommends that law schools can potentially control costs by radically reengineering the curriculum and shifting the "rote forms of information transfer – including parts of the first year – to a well-designed online learning program." *Id.* at 36–37.

230. For some insights about "HyFlex" education, see Jackie B. Miller et al., *Student Choice, Instructor Flexibility: Moving Beyond the Blended Instructional Model*, 1:1 U.AIR.: ISSUES & TRENDS EDUC. TECH. 8, 8–9 (2013) ("[Dr. Brian] Beatty (2010) defines HyFlex courses to be those that 'enable a flexible participation policy for students whereby students may choose to attend face-to-face synchronous class sessions or complete course learning activities online without physically attending class.'"). For some insights on bundling and unbundling, see Justin Fox, *How to Succeed in Business by Bundling – and Unbundling*, HARV. BUS. REV. (June 24, 2014), https://hbr.org/2014/06/how-to-succeed-in-business-by-bundling-and-unbundling [https://perma.unl.edu/Z2DC-MDUR] (interview with Marc Andreessen and Jim Barksdale); *see also* ANAND, *supra* note 12, at 46. Anand writes:

> The magic behind bundling comes from a simple insight: View customers in terms of their preferences for separate products and they look very different—making it impossible to charge each the full amount of what they're willing to pay. View them in terms of their preferences for the bundle and they look *very similar*—allowing you to charge both the maximum amount they're willing to pay.

Id. For an introduction to value innovation, see *Legal Education: A New Growth Vision Part II*, subsection IV.B.3; *see generally* W. CHAN KIM & RENÉE MAUBORGNE, BLUE OCEAN STRATEGY: HOW TO CREATE UNCONTESTED MARKET SPACE AND MAKE THE COMPETITION IRRELEVANT 104 (2005) (providing that value innovation strategy "embraces the entire system" of an enterprise to make a forward "leap in value"); *see also* W. Chan Kim & Renée Mauborgne, *Value Innovation: The Strategic Logic of High Growth*, HARV. BUS. REV. 65 (July–Aug. 2004) (providing that value innovation provides customers with a completely different experience—often at substantial cost savings—by eliminating superfluous features or processes rooted in standard industry operations.).

These differing pricing models present strategic choices for education programs: whether to focus on short-term gain or on long-term customer relationships. To analogize to the world of cattle and dairy ranching, one can either have steak for dinner tonight, or milk, cheese, and butter for years. The choices are not mutually exclusive, however, if programs embrace digital platform-based learning. For instance, under a short-term pipeline business model, a program would charge for specific degrees and expect no further interaction besides the possibility of future referrals and alumni donations. In contrast, under a long-term platform business model, a program could provide formal education that leads to degrees, certifications, or both, but also offer myriad unbundled or strategically bundled services,[231] such as subscriptions for accredited continuing education, technology training, and other industry-relevant, just-in-time skills development courses. Further, a subscription approach may result in an overall more positive customer lifetime value[232] because the program would serve as a convenient, cost-effective, and—most importantly—comprehensive and unified learning resource for current and future legal professionals.

To that end, programs could consider a menu of options when pricing platform services. For example, a program may offer a fixed price for degrees (with completion time stipulations), subscriptions for con-

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231. KIM & MAUBORGNE, *supra* note 230; *see, e.g.*, Joni Hersch, *Increasing Diversity by a New Master's Degree in Legal Principles*, 67:1 J. LEGAL EDUC. 86 (2017) (proposing a master of legal principles degree [M.L.P.] for students who successfully complete the 1L curriculum but do not complete full J.D. curriculum); *see also* Megan M. Carpenter, *Legal Education Unbundled (and Rebundled)*, 50 U. TOL. L. REV. 265 (2019) (describing how forward-thinking legal education programs can create a sustainable business model by unbundling and bundling their offerings to meet market demands).

232. Kevin Chao et al., *Subscription Myth Busters: What It Takes to Shift to a Recurring-Revenue Model for Hardware and Software*, MCKINSEY & CO. (Dec. 2017), https://www.mckinsey.com/industries/high-tech/our-insights/subscription-myth-busters [https://perma.unl.edu/CM5F-SH3S]. Although Chao et al. focus on hardware and software subscriptions, the same rationale applies for law schools in making the decision to only offer degrees or lifetime knowledge and skills development services. Significantly, Chao et al. provide wise insights on customer lifetime value:

> It may seem counterintuitive that you can increase customer lifetime value through subscription pricing. After all, your customers can and will do the math on a subscription's total cost of ownership and won't always be willing to pay a significant premium over the expense of a perpetual license. However, we have observed that there is almost always a window where the economics are favorable for both the vendor and the customer. The reason is simple: if you can prove the business value of your software to customers and ensure their success, churn will remain low and you will maintain customer loyalty for much longer than the initial business case of three to five years. They will gladly keep paying for business value, but not for what might become "shelfware."

Id.

tinuing education and skills training, and à la carte options.[233] Berlitz, a global language training company, implemented a similar structure in response to declining enrollments.[234] Students can now enroll in classes (in-person or online) with fixed times or flexible schedules, connect with their global peers, watch recorded lectures, and take digital quizzes.[235] In addition to this restructuring, Berlitz eliminated its traditional shock-inducing upfront payment plan and replaced it with more affordable subscriptions and group pricing options.[236] Gleaning inspiration from current experiments in higher education and successful models in other industries can help legal education programs update their pricing structures to keep programs both profitable and competitive in the marketplace.

2. *Cost Containment and Process Efficiencies*

Savvy law school entrepreneurs recognize that digital revamping may result in cost containment opportunities inside the program. Successful cost-containment requires programs to evaluate their existing business models and then "scrutinize all of their transaction costs— that is, the money they spend" on delivering education services.[237] These costs include, but are not limited to, advertising, marketing, and fundraising; administrative expenses; employee compensation (wages, salaries, benefits, etc.) and payroll taxes; information technology; education content production and delivery; professional (legal, accounting, and lobbying) fees; insurance; books; etc.[238]

Business process reengineering (BPR) experts can analyze all of these education program processes and make recommendations for efficient integration, redesign, and deployment or redeployment of human and technology resources.[239] After this review, education lead-

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233. *See id.* (identifying some reasons why customers prefer subscriptions: flexibility, smaller up-front costs, transparency, simplicity, ability to cancel, etc.). For some insights on subscription opportunities and challenges, see Tony Chen et al., *Thinking Inside the Subscription Box: New Research on E-commerce Customers*, MCKINSEY & CO. (Feb. 2018), https://www.mckinsey.com/industries/high-tech/our-insights/thinking-inside-the-subscription-box-new-research-on-ecommerce-consumers [https://perma.unl.edu/95C7-3CWH] ("[C]onsumers quickly cancel services that don't deliver superior end-to-end experiences.").

234. MCGRATH, *supra* note 13, at 141–44.

235. *Id.* at 143.

236. *Id.* at 143–44 (describing how Berlitz's transformation into global, digital classrooms uncovered a thriving demand for Arabic language lessons).

237. PARKER ET AL., *supra* note 2, at 73–74.

238. *See generally Form 990: Return of Organization Exempt from Income Tax*, INTERNAL REVENUE SERVICE (2017).

239. Hsin Hsin Chang, *Critical Factors and Benefits in the Implementation of Customer Relationship Management*, 18 TOTAL QUALITY MGMT. 483, 485 (2007) (defining BPR as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed"). BPR compresses verti-

ers can reengineer their business model and product-service delivery processes to deliver high-quality, frictionless education engagements and interactions for in-person and online students.[240] For example, at BYU-Idaho, radical program redesign yielded significant cost savings.[241] BYU-Idaho now focuses exclusively on undergraduate education, operates on a year-round schedule with modular curriculum, combines online and physical learning in a hybrid model, facilitates peer instruction, and integrates teaching and learning technologies.[242] Based on BYU-Idaho's experiences, BPR analysis of legal education services can identify areas that would benefit from system and process efficiencies with the express goals of ensuring customer satisfaction and reducing costs. Beyond delivering cost efficiencies and satisfied customers, BPR also may foster organization agility and opportunities for growing the most complex and elusive form of innovation—value innovation.[243]

Ultimately, the financial survival of legal education programs depends on a simple question: Will students pay for the knowledge and skills products and services offered by a particular education program? A second, no-less-important question asks: Is the program using its resources—both professional and financial—in the most efficient way possible? In 2013, NYU Professor Brandenburger presciently warned that disruptors will change the higher education marketplace by offering tiered pricing, alternative formats, and other technology innovations.[244] As discussed in *Legal Education: A New Growth Vision Part I*, the SIP is here, and disruption has begun. Be-

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cal management layers and re-imagines work flows, processes, and practices, often involving a complete redesign of all business processes with a customer focus. *Id.* at 485–86. A follow-on project may be to develop "mousetrap teams" which seek to holistically redesign and build a "better mousetrap" by developing "fluid systems and processes that enable operating leverage and efficiency." LINKNER, *supra* note 26, at 75; *see also* Robert G. Fichman et al., *Digital Innovation as a Fundamental and Powerful Concept in the Information Systems Curriculum*, 38 MIS Q. 329, 332 (2014) (discussing process innovation).

240. *See* PARKER ET AL., *supra* note 2, at 74 (identifying some additional areas of inquiry, such as the benefits or detriments of (1) internal versus external processes, (2) external sources of new value, (3) collaboration with competitors, and (4) value enhancements via data, curation, etc.).

241. *See generally* CHRISTENSEN & EYRING, *supra* note 64, at 249–300 (describing how in 2005 former Harvard Business School Dean, Kim Clark, took the helm as president of BYU-Idaho and began his mission to raise quality and lower costs). To make a clear break from the status quo, in his inaugural address, Clark declared that "we are not bound by tradition." *Id.* at 251.

242. *Id.* at 249–300.

243. Value innovation is discussed in *Legal Education: A New Growth Vision Part II*, subsection IV.B.3.

244. Adam Brandenburger, *Higher Education at a Strategic Inflection Point*, STERN OPPORTUNITY (Oct. 16, 2013), http://sternoppy.com/2013/10/higher-education-at-a-strategic-inflection-point/ [https://perma.unl.edu/5Q9U-VPV3].

cause students expect value for the tuition paid (and student debt incurred), programs must demonstrate that their specific knowledge and skill development services merit the premium tuition charged. Tradition-bound programs—unless they are super elite—may struggle to make compelling arguments in support of their high tuition.[245] Programs must also ensure that their costs are manageable, and their revenue streams are sustainable.

In sum, future-focused programs that combine human expertise with digital technologies to provide students with high-quality, data-validated, market-valued knowledge and skills can differentiate their offerings and therefore justify premium tuition costs. If a legal education program also committed to a "moon shot" that delivers high-quality, market-valued education at reduced cost, fixed cost, or both, such a program could completely redefine and dominate the higher education industry. Last, programs that adopt platform-based initiatives can reap the financial benefits of a data-validated education structure that becomes more affordable as technology advances and more profitable and efficient as more students enroll.

D. Current Offerings and Room for Growth

Recently developed and emerging forms of digital education show potential if they are given the time and space to mature. Significant opportunities will emerge once legal education programs, led by digital innovation teams, launch, nurture, and sustain innovation growth factories that join together faculty doctrinal expertise, community practitioner needs, and digital technologies. The combination of creativity, customer input, determination, data, and patience will foster robust knowledge and skill development ecosystems.

1. MOOCs: Minimum Viable Products (MVPs) with Promise

Technology's transformation of education has only just begun. Take, for example, massive open online courses (MOOCs) which have been likened to the "Napster" of higher education.[246] After several

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245. *But see* Li, *supra* note 209, at 33–34 (finding "a lack of price sensitivity in legal education").

246. MICHAEL BARBER ET AL., AN AVALANCHE IS COMING 41 (2013), http://www.avalancheiscoming.com/ [https://perma.unl.edu/HK28-73PU]. Barber references Clay Shirky's 2012 Blog post, *Napster, Udacity, and the Academy*. CLAY SHIRKY (Nov. 12, 2012, 12:31 PM), http://www.shirky.com/weblog/2012/11/napster-udacity-and-the-academy/ [https://perma.unl.edu/NC5W-BHDA]. Shirky writes that while the long-term viability of current MOOC providers remains an open question, but like disruptive Napster, MOOCs have already proven that "[i]t's possible to educate a thousand people at a time, in a single class, all around the world, for free." *Id.*; *see also* Melissa A. Schilling, *What's Your Best Innovation Bet*, HARV. BUS. REV. (July–Aug. 2017) (analyzing how a technology breakthrough [e.g., Napster] and ever-changing customer needs radically transformed

years of hype and "inflated expectations,"[247] MOOCs (both platform-based and in lecture format) have taken root.[248] MOOCs represent the lowest hanging digital fruit because recording and digitally transmitting faculty lectures is simple, relatively inexpensive, and expands on current capabilities and excess capacities.[249] Although some platform-based MOOCs include auto-graded assignments, mid-terms, and final exams,[250] educators place typical MOOCs into the category of "least productive pedagogy," a category that includes lectures and multiple-choice tests.[251] Improvements like personalized student-faculty interactions to facilitate application of doctrinal concepts and problem-solving could elevate MOOCs' pedagogical status,[252] but offering these interactions would increase production costs. An ideal balance has yet to be found, but MOOCs represent an important development in digi-

the music industry). For an interesting 2001 book review of early-stage digital disruptors in the music industry, see Clay Shirky, *Where Napster Is Taking the Publishing World*, HARV. BUS. REV (Feb. 2001), https://hbr.org/2001/02/where-napster-is-taking-the-publishing-world [https://perma.unl.edu/SC77-6PHW].

247. Ry Rivard, *Beyond MOOC Hype*, INSIDE HIGHER ED (July 9, 2013), https://www.insidehighered.com/news/2013/07/09/higher-ed-leaders-urge-slow-down-mooc-train [https://perma.unl.edu/JLT2-TDES] (describing MOOCs path through Gartner's "hype cycle" where a "much-hyped product goes from a 'peak of inflated expectations' to a 'trough of disillusionment' before institutions figure out how to really use and benefit from a new technology"); *see* Laura Pappano, *The Year of the MOOC*, N.Y. TIMES (Nov. 2, 2012), https://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html [https://perma.unl.edu/D4AC-VU5E]; *see also* JOHN MARKOFF, MACHINES OF LOVING GRACE: THE QUEST FOR COMMON GROUND BETWEEN HUMANS AND ROBOTS 56 (2015) (describing Sebastian Thrun and Peter Norvig's fall 2011 free online course "Introduction to Artificial Intelligence" delivered to 160,000 signed-up students, but only a fraction of the students actually completed the course). The Thrun-Norvig AI course transmitted from the Stanford campus to students world-wide "became a global 'Internet moment.'" *Id.*

248. Coursera, EdX, and Udacity, three MOOCs closely aligned to prestigious U.S. universities (Stanford, MIT, and Harvard, respectively), are charting new paths for education delivery. Coursera offers two hundred courses from more than thirty universities and reports more than one million registered learners. BARBER ET AL., *supra* note 246, at 42.

249. *See generally* Robin Chase, *We Need to Expand the Definition of Disruptive Innovation*, HARV. BUS. REV. (Jan. 7, 2016), https://hbr.org/2016/01/we-need-to-expand-the-definition-of-disruptive-innovation [https://perma.unl.edu/BCW7-QPPV]; Norm Smallwood & Dave Ulrich, *Capitalizing on Capabilities*, HARV. BUS. REV. (June 2004), https://hbr.org/2004/06/capitalizing-on-capabilities [https://perma.unl.edu/N6GQ-BM2M].

250. Steven Leckart, *The Stanford Education Experiment Could Change Higher Learning Forever*, WIRED (Mar. 20, 2012), https://www.wired.com/2012/03/ff_aiclass/ [https://perma.unl.edu/69G3-DSES].

251. Rivard, *supra* note 247 (quoting Carol Geary Schneider, head of the Association of American Colleges and Universities, who notes that MOOCs may prove beneficial in flipped classrooms where faculty can "spend less time lecturing in class and more time engaging students").

252. *See id.* (noting faculty concerns about how to protect intellectual property).

tal education. Ease of access—that is, a mobile phone with an internet connection—alone will ensure that MOOCs and online learning gain market share.[253] For global students with limited access to high-quality education, MOOCs provide valuable knowledge services.[254] Although MOOCs are currently underwhelming in terms of pedagogically sound and socially engaging student learning experiences,[255] they should not be dismissed entirely.[256] Instead, they should be improved by seeking student input[257] and incorporating nascent technologies.

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253. *See generally* Miri Barak et al., *Motivation to Learn in Massive Open Online Courses: Examining Aspects of Language and Social Engagement*, 94 COMPUTERS & EDUC. 49 (2016) (studying motivations and engagement patterns of global MOOC course completers and non-completers); *see also* PARKER ET AL., *supra* note 2, at 265–68 (discussing potential for significant higher education market disruption due to platform-based global classrooms); MCAFEE & BRYNJOLFSSON, *supra* note 29, at 308 (quoting futurist Ray Kurzweil's 2012 observation: "A kid in Africa with a smartphone has access to more information than the president [sic] of the United States did fifteen years ago").

254. Drezner, *supra* note 218; *see* Leckart, *supra* note 250 (highlighting international students from 190 countries registered for Sebastian Thrun and Peter Norvig's "CS221: Introduction to Artificial Intelligence" 2011 online course); *see also* Monika Hamori, *Can MOOCs Solve Your Training Problem?*, HARV. BUS. REV. (Jan.–Feb. 2018), https://hbr.org/2018/01/can-moocs-solve-your-training-problem [https://perma.unl.edu/DNJ2-UT59] (explaining how "modular MOOCs" can help employees develop valuable and usable work skills "more so than universities, which may be too slow to adapt traditional offerings to the constantly evolving requirements of the marketplace and may require many years of study").

255. *See* POLICANO, *supra* note 24, at 17 (questioning whether "on-line learning will be an effective alternative to traditional teaching or its ultimate replacement"). In the decades ahead, Policano predicts that introductory courses will be taught by elite faculty in an MOOC format, upper-level courses will be a hybrid of digital and in-person learning experiences, and small personalized classes will feature direct faculty-student personalized interactions. *Id.* at 18–19; *see also* Eric Westervelt, *The Online Education Revolution Drifts Off Course*, NPR (Dec. 31, 2013), https://www.npr.org/2013/12/31/258420151/the-online-education-revolution-drifts-off-course [https://perma.unl.edu/2B2Q-DQLK] (describing how MOOCs are currently transforming to include opportunities for human connection in response to lackluster early student review and low course completion rates).

256. *See* Grove's warnings about the "trap of the first version," which obscures the ability to see the potential of a new approach. GROVE, ONLY THE PARANOID SURVIVE, *supra* note 38, at 112–14 (challenging skeptics to consider whether the first version shows the potential of being a "10x" improvement, and if so that version may represent the beginning of an SIP).

257. Leckart, *supra* note 250 (noting that students are often eager to provide professors with ideas for improving digital education experiences).

2. *Future of Education: Human Expertise United with Omni-channel Platforms and AI*

Technology presents exciting opportunities for facilitating and supporting know-how[258] transfer processes for two important customer bases: students and the professional community. Once legal education (and perhaps continuing education) programs seamlessly combine human expertise with omni-channel platform technologies, a lively landscape of high-quality, cost-effective knowledge and learning development services will explode like a desert "superbloom" after a long drought.[259]

For students enrolled in degree programs, digital technologies can be a powerful partner when there is a "constructive alignment" of teaching, learning, and competency assessments.[260] In the next three decades, exciting potential education advancements include: personalized learning,[261] pedagogically-sound games and simulations,[262]

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258. Dubickis & Gaile-Sarkane, *supra* note 176, at 3. "Know-how" refers to a "level of knowledge about the way how something should be done." *Id.*

259. Angela Fritz, *This Desert in the Southwest Is Experiencing a Wildflower 'Super-bloom'*, WASH. POST (Mar. 8, 2017), https://www.washingtonpost.com/news/capital-weather-gang/wp/2017/03/08/this-park-in-the-desert-southwest-is-experiencing-a-wildflower-superbloom/?utm_term=.dd330d40bc38 [https://perma.unl.edu/9S6H-WFCA].

260. Dubickis & Gaile-Sarkane, *supra* note 176. Learning outcomes define "what knowledge, skills and attitudes the know-how receiver is able to demonstrate in behavior after the know-how transfer process is completed successfully." *Id.* at 4. The Dubickis and Gaile-Sarkane know-how transfer model generally involves: (1) defining specific learning outcomes, (2) selecting teaching, learning, and assessment methods and metrics, (3) encouraging stakeholder participation, (4) developing beta-test versions of student teaching and learning modules, (5) iterating, testing, and refining teaching and learning modules, and (6) engaging in continuous process of assessment, reassessment, and refinement of the know-how transfer modules. *Id.* at 9; *see also* Chiappinelli, *supra* note 83, at 13 (discussing coursework structured in "competency modules rather than as traditional doctrine-based courses"); Thomson, *How Online Learning Will Transform Legal Education*, *supra* note 229, at 31 (describing a digital adaptive learning module that provides students with additional questions if the student answers incorrectly the first review question); Vollweiler, *supra* note 24 (articulating a "technical plan" designed to improve learning outcomes and assessments, which consists of identification of learning outcomes [e.g., overall mission and near-, mid-, and long-term goals]; building an assessment team; formulating plans that include curriculum redesign and the data and metrics to be collected and monitored; testing the validity of these assessments; and continuously evaluating and recalibrating the learning outcomes and assessments based on collected data and human insights).

261. RICHARD SUSSKIND & DANIEL SUSSKIND, THE FUTURE OF THE PROFESSIONS 202, 221 (2015) (envisioning that education of the future will pair "world-class online lectures" with personalized learning tailored to individual student needs); *see* Erik Brynjolfsson et al., *New World Order: Labor, Capital, and Ideas in the Power Law Economy*, FOREIGN AFFAIRS (July–Aug. 2014), https://www.foreignaf-

learning interactions featuring haptics,[263] augmented, virtual, extended, or mixed reality,[264] and eventually, AI digital tutors.[265]

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fairs.com/articles/united-states/2014-06-04/new-world-order [https://perma.unl.edu/A7GA-5L3S]. Brynjolfsson et al. assert:

> Online learning can provide students with access to the best teachers, content, and methods regardless of their location, and new data-driven approaches to the field can make it easier to measure students' strengths, weaknesses, and progress. This should create opportunities for personalized learning programs and continuous improvement, using some of the feedback techniques that have already transformed scientific discovery, retail, and manufacturing.

Id.

262. Barbara Kurshan, *The Intersection of Learning and Fun: Gamification in Education*, Forbes (Feb. 11, 2016), https://www.forbes.com/sites/barbarakurshan/2016/02/11/the-intersection-of-learning-and-fun-gamification-in-education/#5d8946549c19 [https://perma.unl.edu/ZY23-AJ3X]; *see also* Negroponte, Being Digital 204–05 (1995) (asserting that electronic games can help children develop strategic thinking and planning); *see also* Thomson, *How Online Learning Will Transform Legal Education*, *supra* note 229, at 32 (describing how faculty team-taught simulation courses would enable students representing either plaintiff or defendant to examine client issues and respond accordingly to the actions of opposing parties/counsel in dynamic human [and digital] learning environments); Eduardo M. Peñalver, *The Role of Skills Instruction in Legal Education*, 13 FIU L. Rev. 229, 239 (2018) (describing Cornell Law School's recent beta test of a "simulated contract negotiation" in the first-year contracts course). Dean Peñalver also emphasizes the need for thoughtful changes in the delivery of legal education—both in doctrinal development and practical skills training—so that students can achieve their desired career outcomes. *Id.* at 240; *see generally* Max Huffman & Cynthia Adams, *Online Simulation Courses*, 51 Ind. L. Rev. 418, 420–21 (2018) (strongly advocating for the development of online simulations because digital communications and collaborations accurately represent the modern practice of law); *see* Roberto L. Corrada, *'Ill-Structured' Simulations in Two American Law Classes: Labour Law and Administrative Law*, *in* Legal Education: Simulation in Theory and Practice 243–61 (Caroline Stevens et al. eds., 2017).

263. "Haptics" denotes any technology that uses touch—whether through vibrations, motion, or force—to control and interact with computers. *Haptic*, Techopedia, https://www.techopedia.com/definition/3637/haptic [https://perma.unl.edu/U2NE-7BQV]. Haptic technology is used primarily to create or control virtual objects or to improve the remote control of machines and devices. *Id.*

264. Kevin Kelly, The Inevitable: Understanding the 12 Technological Forces That Will Shape Our Future 211–17 (2016). Kelly predicts future workplaces will use AR to collaborate with colleagues in distant locations. *Id.* at 216–17. He also argues that AR classes will eventually "be superior" to live, real-world classes. *Id.* at 217; *see also* Daniel Newman, *Top 6 Digital Transformation Trends in Education*, Forbes (July 18, 2017), https://www.forbes.com/sites/danielnewman/2017/07/18/top-6-digital-transformation-trends-in-education/#515c128f2a9a [https://perma.unl.edu/YW8E-FNYM] (envisioning that future classrooms will feature AR, VR, and MR, games, personalized learning, AI, and redesigned learning environments).

265. *See, e.g.*, President's Council Sci. & Tech., *supra* note 178 (describing DARPA digital tutors); *see also* Nat'l Sci. & Tech. Council, Comm. on Tech., Preparing the Future of Artificial Intelligence 15–16 (2016), https://obamawhitehouse.archives.gov/sites/default/files/whitehouse_files/microsites/ostp/NSTC/preparing_for_the_future_of_ai.pdf [https://perma.unl.edu/TV44-A7SG] (analyzing digi-

As recommended above in section II.B, once a program creates digital innovation teams and identifies effective teaching and learning practices,266 an intriguing adjacent market expansion opportunity involves a university-curated, integrated, multi-source, omni-channel, digital knowledge and skills development platform that provides education solutions for students, employers, and the professional community.267 Such a digital platform would enable the program to become an indispensable community partner because the present-day workplace requires that everyone commit to a "lifetime of continuous upskilling and development."268 If the program offered competitively priced, high-quality continuing education in multiple formats (e.g., face-to-face, digital, on-demand, and/or interactive), it could position itself as a regional or national hub for specialized knowledge and skills development.269 For instance, a layered, modular—possibly unbundled—education platform could conceivably serve degree and non-degree candidates, practitioners seeking education credits, employers seeking new hires and skills verification, students from other universities who do not have depth in certain doctrinal areas, and other interested parties seeking just-in-time learning solutions.270

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tal tutor projects); U.S. Dep't Educ., Winning the Education Future: The Role of ARPA-Ed 2, 9, 15 (2011), https://www.ed.gov/sites/default/files/arpa-ed-background.pdf [https://perma.unl.edu/7MFK-6QUQ] (recommending development of digital tutors to support personalized learning, machine learning to create self-improving courses, and complex multi-level, multi-player education games).

266. Recall Amazon's decision to start by building an efficient book-buying and delivery platform and system which enabled it to expand gradually over time. *See supra* subsection III.A.3 (describing Amazon's stand-walk-run strategy).

267. *See* Lars Frølund & Morten Ziethen, *The Wisdom of the Intermediary: The Role, Function, and Ways-of-Being of the Intermediary in a Strategic Program for University-Industry Relations*, Triple Helix, Sept. 2016, at 3 (explaining how "knowledge inter-mediation" brings together people who can build connections, identify and resolve needs, and share ideas from different knowledge domains).

268. Barber et al., *supra* note 246, at 53; *see also* Kaplan, *supra* note 115, at 153 (explaining that the traditional learning and career model of "first you go to school, and when you are done, you go get a job" no longer aligns with the modern, "fast-moving labor markets"); *see generally* Bradley R. Staats, Never Stop Learning: Stay Relevant, Reinvent Yourself, and Thrive (2018).

269. Thorsten Koch & Josef Windsperger, *Seeing Through the Network: Competitive Advantage in the Digital Economy*, J. Org. Design, May 2017, at 2 (discussing benefits of digital ecosystem); *see also* Committee on Dev. Sci. Learning, *supra* note 108, at 212 (noting learning benefits of virtual learning communities and stating that "there is a strong argument for electronically linking students not just with their peers, but also with practicing professionals").

270. See *Legal Education: A New Growth Vision Part II*, subsection IV.B.4, which generally describes open innovation, and subsection III.A.4, *supra*, which provides an overview of the differences between open versus closed platform design; *see also* Exec. Office of the President, Artificial Intelligence, Automation, and the Economy 29 (2016) (discussing increasing employer demand for new hire competency assessments and cautioning providers on the importance of identify-

A total customer solution (e.g., value innovation)[271]—in the form of a dynamic, interactive, omni-channel, human-AI integrated, personalized, digital knowledge and skills development ecosystem—deserves serious consideration as education entrepreneurs formulate mid- and long-term strategies and innovation mission trajectories.[272] When em-

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ing, preventing, and correcting biased data training sets). The report describes how some firms

> are pioneering the use of games, simulations, and electronic tests to determine the "fit" of job applicants to a team. To do this, automated algorithms may be trained with data about successful team members in order to look for applicants that resemble them. One important benefit of these innovations is enabling companies to recruit and hire candidates based on demonstrated skills and abilities rather than pedigree, which will become even more critical as people gain skills on the job. But if such training sets are based on a less diverse current workforce, the biases of the existing group may be built into the resulting decisions and may unfairly exclude new potential talent.

Id.; *see generally* Daniel B. Rodriguez, *Legal Education and Its Innovations*, 13 FIU L. REV. 199, 213–14 (2018) (recommending that law schools create new markets for their legal knowledge and skills development services by providing a "menu" [e.g., bundled and unbundled] of legal education solutions tailored for paralegals, practitioners with limited licenses, and other legal education customers). On the topic of law school cost, Dean Rodriguez challenges law school leaders to consider the "disruptive" growth opportunities that may result from lowering tuition, embracing technologies, and adopting a volume-oriented business model that serves a full spectrum of legal consumers. See, e.g., the University of Kansas's December 2018 announcement of non-resident law school tuition reductions may foreshadow similar future reductions at other universities. *KU Law Reduces Tuition for Out-of-State Students*, KU TODAY (Dec. 5, 2018), http://today.ku.edu/ku-law-reduces-tuition-out-state-students [https://perma.unl.edu/3PBX-3Y9A]; *see also* Carpenter, *supra* note 231 (discussing the bundling and unbundling of legal education).

271. KIM & MAUBORGNE, *supra* note 230, at 65 ("Untapped value is often hidden in complementary products and services. The key is to define the total solution buyers seek when they choose a product or service."). For an introduction to value innovation, see *Legal Education: A New Growth Vision Part II*, subsections IV.B.3–4. As explained there, value innovation paired with open innovation and platforms may eventually yield a total customer solution.

272. PRESIDENT'S COUNCIL SCI. & TECH., EXEC. OFFICE OF THE PRESIDENT, PCAST WORKFORCE LETTER TO THE PRESIDENT, 3–6 (Sept. 2014) (positing a worker-training-employer [WTE] triangle as a systemic response to labor-market changes). The report then explains the WTE triangle:

> At one vertex of the triangle are the people who either have, or need to obtain, the training and skills associated with available job opportunities. At the second vertex is the aggregate of employers who seek workers with specific skills and attributes. At the third vertex is the set of educational and training organizations that can provide prospective employees with the skills that make them attractive to potential employers . . . . Taken together, the different kinds of actors in this system compose an ecosystem.

Id. at 3; *see generally* Koch & Windsperger, *supra* note 269, at 3 (stating "digitization is first and foremost a hyper-dynamic condition to which organizations need to find responsive solutions"); HaeJung Kim et al., *Shifting Paradigms for Fashion: From Total to Global to Smart Consumer Experience*, FASHION & TEXTILES,

barking on the rocky adventure of reinventing legal education, law school leaders, faculty, and staff must be committed to adopting new mindsets, accepting uncertainty, and embracing change. Bluntly put, successful reinvention requires gritty determination and back-breaking work to till the soil and sow the seeds of change that will eventually bear fruit.

IV. PLANNING AND MOVING FORWARD

The energetic and powerful combination of "high tech" and "high touch"[273] discussed *supra* in *Legal Education: A New Growth Vision Part I*, subsection II.A.1 (describing omni-channel experiences) should generally guide education entrepreneurs as they venture forward on the wild journey toward human-AI integration. For trendspotters, the 2017 PwC study deserves special attention. It notes that 35% of the 2,500 persons surveyed expressed that their greatest concern was that technology and AI would result in a loss of human connection.[274] But the 63% of survey participants who believe human-AI integration will benefit them represent exciting and abundant marketplace opportunities.[275] This PwC customer insight, combined with Deloitte's report on media and entertainment trends,[276] should make legal education entrepreneurs salivate over the ripe innovation environment in which they find themselves. Specifically, these entrepreneurs will focus on how to cross-pollinate human connection with digital technologies. For example, the future of higher education may flourish from the planting of Apple store-inspired seed ideas which then germinate and grow into ample opportunities that deliver premium omni-channel and per-

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2014, at 8, 11 (discussing omni-channel strategies); Gallagher, *supra* note 84 (discussing omni-channel strategies for higher education).

273. John Naisbitt, Megatrends: Ten New Directions Transforming Our Lives 52 (1982).

274. PwC Bot.Me, *supra* note 163, at 3, 11.

275. *Id.* at 8.

276. Deloitte, Media and Entertainment Outlook 2017: Growth Opportunities and Challenges in an On-Demand World, (2017); *see also Legal Education: A New Growth Vision Part II*, subsection III.A.3 (examining the essential question "What do your customers want?").

sonalized user experiences.[277] Strong trends should be seized and
never wasted.[278]

In response to the inevitable questions regarding the cost of bring-
ing seedlings to fruition, education entrepreneurs should point to
PwC's survey finding that 43% of millennial and 28% of business exec-
utive participants indicated a willingness to pay premium prices for "a
hybrid service run by AI that offers direct access to humans, versus a
human-only service."[279] In addition, 63% of business executives stated
that they believed AI could "offer a superior one-to-one personalized
experience."[280] The enthusiasm is there; it waits impatiently for
solutions.

To capitalize on emerging market opportunities and prepare for a
human-AI future,[281] entrepreneurially-oriented legal education pro-
grams will develop digital and then AI strategies that intentionally
combine faculty excellence, community experts, and technology in all
dimensions of its legal education services. Leaders should also look for
opportunities where digital technologies—including blockchain[282]—

277. PwC, *supra* note 133, at 2 (identifying dimensions of platform customer exper-
iences: (1) content, (2) distribution, and (3) user experience). Georgia Tech's new
storefront model also represents an interesting experiment on how to reimagine
customer (student) experiences. *See* Lindsay McKenzie, *Imagining an Apple
Store for Online Degrees*, INSIDE HIGHER ED (Nov. 26, 2018), https://www.inside
highered.com/digital-learning/article/2018/11/26/coming-shopping-mall-near-you-
georgia-tech [https://perma.unl.edu/JCV7-UZ9Q] (describing Georgia Tech's
plans to "create storefronts for its online education programs").

278. Chris Bradley, *Hope Is Not a Strategy*, MCKINSEY & CO. (June 14, 2018), https://
www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-in
sights/the-strategy-and-corporate-finance-blog/hope-is-not-a-strategy [https://
perma.unl.edu/2EQD-PM3D] (explaining that trend riding can "jolt" bold moves
to new directions).

279. PwC BOT.ME, *supra* note 163, at 11.

280. *Id.*; *see also* SUSSKIND & SUSSKIND, *supra* note 261, at 130–31 (discussing how
technology enables "greater personalization of professional services than has
been possible in the past").

281. For some general thoughts on AI strategies, see Joe McKendrick, *Digital Strate-
gies Are So 2016: Time for an Artificial Intelligence Strategy*, FORBES (May 19,
2018), https://www.forbes.com/sites/joemckendrick/2018/05/19/digital-strategies-
are-so-2016-time-for-an-artificial-intelligence-strategy [https://perma.unl.edu/
44D5-D6EX]; *see also* Michael Chui & Sankalp Malhotra, *AI Adoption Advances,
but Foundational Barriers Remain*, MCKINSEY (Nov. 2018), https://www.mckin
sey.com/featured-insights/artificial-intelligence/ai-adoption-advances-but-founda
tional-barriers-remain [https://perma.unl.edu/T56R-DVDC] (emphasizing that
organizations must build "a strong digital backbone" so that eventually the AI
systems will have the necessary training data to build models for translating AI
insights into effective change). McKinsey then recommends the following steps to
unlock the potential of AI: (1) "make progress on your digital journey," (2) "scale
AI's impact across the enterprise," and (3) "put key enablers in place." *Id.*

282. Nikhilesh De, *Sony Details Blockchain Use for Education Data*, COINDESK (Dec.
7, 2018), https://www.coindesk.com/sony-patent-filing-details-blockchain-use-
managing-education-data/ [https://perma.unl.edu/YH2W-734C] ("In August,

can provide superior quality human and digital knowledge and skills development services and verification of education credentials. To make the transformation to hybrid human-AI services, PwC recommends that leaders and BPR experts continuously evaluate human workflows and then evaluate how technologies can support the seamless stream of value-creating human and digital interactions.[283] In moving toward the goal of being both human and digital, education entrepreneurs may find useful the following descriptions of basic innovation frameworks, critical mindset and organizational shifts, and the OKR transformation management system.

A. Innovation Frameworks

This Article describes two project allocation models, 70/20/10 and Three Horizons, which can provide education entrepreneurs with some practical ideas for integrating humans and technologies into the delivery of premium-quality legal education services.[284] Both 70/20/10 and Three Horizons require leaders to determine the customers to be served; the initiatives, projects, and programs that should be prioritized, resourced, moved, modified, or eliminated; timeframes for completion; the data collection, management, and analytic methods to be used; and how specific innovation targets will be measured.[285]

1. 70/20/10

The 70/20/10 model, launched by 3M and made famous by Google, involves a percentage-based breakdown for individuals and organizations on where to allocate time and resources in order to encourage

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Sony announced that it was working with IBM to build a suite of educational services, which would use the [blockchain] tech in part to secure student records and form part of a system for sharing that data between agreed-upon parties.").

283. PwC BOT.ME, *supra* note 163, at 17. The PwC report also states that "[a]n open mind will be the biggest asset in the near future, as the technology advances and we continue to experiment with how to use AI to solve problems . . . . Those who think practically and critically will ride the waves of these advancements instead of being left behind." *Id.*

284. For another interesting and complementary model, see MCGRATH & MACMILLAN, *supra* note 80, at 51–62 (describing the "opportunity portfolio model," which classifies and categorizes opportunities based on their "technical and execution uncertainty" and their "market and organizational uncertainty"). McGrath and MacMillan's categories include: core-enhancements similar to Horizon 1, platform launches similar to Horizon 2, and options (positioning, scouting, and stepping-stones) similar to Horizon 3. *Id.* at 198.

285. POLICANO, *supra* note 24, at 71–76 (describing how the use of transparent metrics and hard, strategy-focusing questions into specific components of current operations can help chart forward paths in higher education); *see also* Laczkowski et al., *supra* note 119 (recommending that leaders focused on making bold changes "examine their strategic choices through four critical, interdependent lenses—the company's financial performance, market opportunities, competitive advantage, and operating model").

flexibility, innovation, and entrepreneurship.[286] In 2011, Eric Schmidt, former executive chair of Google (now Alphabet, Inc.), explained how Google implemented "a system of mechanisms" for fostering innovation called the "70/20/10 system."[287] The 70/20/10 model provides that "everyone should spend 70% on their core job, 20% as part of another team, and 10% on something blue sky."[288] Employees still meet their deadlines, but this framework empowers them to be curious and get involved in other developing projects so that they may contribute and test their ideas.[289] The underlying philosophy of the 70/20/10 model is to build innovative habits and mindsets, break down thought silos, and cultivate creativity throughout the organization.[290] Another benefit of the 70/20/10 model is that it creates personal growth opportunities because it forces one to continuously question and learn, as well as be open to challenges and the risk of being found wrong.[291] Google's innovation masterstroke pairs the flexible 70/20/10 model with the focused objectives and key results (OKRs) transformation management system discussed *infra* in subsection IV.B.3.[292]

2. *Three Horizons*

The Three Horizons framework, articulated in *The Alchemy of Growth*, provides complementary guidance for forward-oriented legal programs in setting priorities, allocating time, and deploying re-

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286. Laszlo Bock, Work Rules! Insights from Inside Google That Will Transform How You Live and Lead 135 (2015) (describing how 3M's creative and freedom-oriented culture resulted in the employee discovery and corporate launch of Post-it Notes and Trizact abrasive material); *see also* Satell, *supra* note 49, at 113 (indicating that entities "need to pursue all three horizons at once, albeit in different proportions"). Google's 20% Horizon 2-time allocation allows employees to examine questions and find good problems that need to be solved. *Id.* at 189. Google's product managers focus on meeting customer needs. *Id.* at 121; *see also* Bansi Nagji & Geoff Tuff, *Managing Your Innovation Portfolio: People Throughout Your Organization Are Energetically Pursuing the New. But Does All That Activity Add Up To a Strategy?*, Harv. Bus. Rev. (May 2012), https://hbr.org/2012/05/managing-your-innovation-portfolio [https://perma.unl.edu/Q6NT-HJSL] (calling Google's 70/20/10 balance the "golden ratio").

287. Quentin Hardy, *Google's Innovation - And Everyone's?*, Forbes (July 16, 2011), https://www.forbes.com/sites/quentinhardy/2011/07/16/googles-innovation-and-everyones/#a11069e30666 [https://perma.unl.edu/2S39-4M6E].

288. *Id.*

289. *Id.*

290. *Id.*; Steven Johnson, Where Good Ideas Come from: The Natural History of Innovation 93–94 (2010) (noting that Marissa Mayer [then vice president of Google's search products and user experiences] claimed that "over 50 percent of Google's new products" originated from employee pet projects).

291. Hardy, *supra* note 287.

292. *See, e.g.*, Bock, *supra* note 286, at 135–37, 154–56 (explaining Google's 70/20/10 framework and describing how Google's Larry Page sets quarterly OKRs that align and drive corporate and individual employee goals).

sources (both human and capital).[293] Horizon 1 focuses on operating the core business and building sustaining innovations (e.g., similar to Google's 70% time/effort).[294] Horizon 2 addresses adjacent markets and capabilities by devoting time and resources to develop capabilities and innovations (20% time/effort).[295] Horizon 3 involves future long-term bets and breakthrough innovations (10% time/effort).[296] All of these Horizons must be managed concurrently, which means that program leaders must subject the products and services in each Horizon to ongoing cycles of reevaluation, refreshment, reengineering, reinvention, redeployment, removal, recycling, and rebooting.[297] This process also involves making thoughtful and important strategic

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293. MEHRDAD BAGHAI ET AL., THE ALCHEMY OF GROWTH (1999); *see* Greg Satell, *This 1 Rule Will Seriously Up Your Company's Innovation Game*, INC. (Dec. 9, 2017), https://www.inc.com/greg-satell/this-1-rule-can-seriously-up-your-innovation-game.html [https://perma.unl.edu/C488-BTPZ] (noting alignments between the *Alchemy of Growth* and 70/20/10 models). Satell describes the 70/20/10 rule as: 70% "sustaining innovation," 20% "exploring adjacencies," and 10% "building a new paradigm." *Id.* A complementary framework appears in McGrath's "Opportunity Portfolio," which identifies an organization's core business/enhancements (similar to Horizon 1), platform launches (similar to Horizon 2), and positioning options (similar to Horizon 3). MCGRATH, *supra* note 13, at 117–20; *see also* CHRISTENSEN, *supra* note 27, at 82–84, 103 (discussing the importance of resource allocation to innovation success).

294. BAGHAI ET AL., *supra* note 293, at 4–5 (noting that Horizon 1 activities "usually have some growth potential left, but will eventually flatten out and decline").

295. *Id.* at 5–6 (explaining that Horizon 2 seeks to build new revenue streams by extending current operations or embarking on new undertakings that will eventually complement or supplant some Horizon 1 activities). For some insights into adjacent market opportunities, see Van Alstyne et al., *supra* note 20; James L. McQuivey, *Finding Your Next Big (Adjacent) Idea*, HARV. BUS. REV. (Aug. 2011), https://hbr.org/2011/08/finding-your-next-big-adjacent [https://perma.unl.edu/5W3U-P8MF]; Chris Zook & James Allen, *Growth Outside the Core*, HARV. BUS. REV. (Dec. 2003), https://hbr.org/2003/12/growth-outside-the-core [https://perma.unl.edu/5LJW-T942] (reporting that almost 80% of the successful adjacent market moves were "built around insights about customer behavior"). As noted earlier, because the knowledge and skills-development needs and wants of community professionals will vary based on their career status (e.g., new graduate or seasoned professional), these unique customer-segmented insights may shape profitable pathways for the expansion of adjacent, platform-based knowledge and skill development services. *Id.*

296. BAGHAI ET AL., *supra* note 293, at 6–7. Because Horizons 2 and 3 involve searching for new opportunities, Baghai et al. encourage leaders to look for "hidden opportunities," which may be uncovered by carefully examining: customer wants and needs (existing and new customers); developing fresh products and services; reengineering and launching new delivery methods; expanding geographical reach; revising business models, structures, and alliances (e.g., complementors); and rethinking the boundaries in which the organization participates and competes. *Id.* at 51–53.

297. *Id.* at 7–8; *see* SATELL, *supra* note 49, at 113, 115; *see also* Nagji & Tuff, *supra* note 286 (stating that organizations that use a "total innovation" approach have the "strongest innovation track records" because they "articulate a clear innovation ambition; have struck the right balance of core, adjacent, and transforma-

trade-offs that serve to differentiate the products and services offered to customers.[298]

Like farmers who "must simultaneously harvest the current crop, till the ground for next season, and investigate new crops for the future," a time-horizon perspective fosters near-, mid-, and long-term planning.[299] Leaders must embrace a fluid innovation process. For example, a maturing Horizon 2 project may be ready for promotion to Horizon 1 status. Similarly, a promising Horizon 3 project may be shifted to Horizon 2 for expedited development. Regular weeding and pruning of non-viable projects in all Horizons make room for emerging ideas and revenue opportunities.[300]

Here, organization leaders must be vigilant about giving appropriate attention to each Horizon. People naturally focus on the present, and as a result, Horizon 1 projects receive priority.[301] Because Horizon 3 involves imagination and excitement, leaders also more easily devote time and resources to thinking and strategizing about blue-sky future innovations.[302] Horizon 2 projects, however, face difficulties because they are often boring, like brown dirt which must be tilled and

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tional initiatives across the enterprise; and have put in place the tools and capabilities to manage those various initiatives as parts of an integrated whole").

298. *See What Is Strategy?*, *supra* note 44 ("Strategy is making trade-offs in competing. The essence of strategy is choosing what *not* to do."); *see also* ANAND, *supra* note 12, at 212 (discussing trade-offs). Anand writes:

> Trade-offs require clear choices, yet in a world of powerful forces, it is often easier to compromise than to make difficult choices. By making trade-offs, aspects of the organization become unique and each trade-off makes the organization slightly more difficult for a competitor to emulate. A series of wisely considered trade-offs makes emulation nearly impossible.

Id.

299. Geoffrey Moore, *To Succeed in the Long Term, Focus on the Middle Term*, HARV. BUS. REV. (July–Aug. 2007), https://hbr.org/2007/07/to-succeed-in-the-long-term-focus-on-the-middle-term [https://perma.unl.edu/MEN3-J7JZ].

300. *See, e.g.*, McGrath's perspectives on disengagement strategies for anemic projects or activities. MCGRATH, *supra* note 13, at 53–74. McGrath explains that the timing and process of trimming these projects depends on the health of the business model. *Id.* at 59–60. For example, if timing can be flexible, she suggests that project or activity disengagement proceed with an "orderly migration" followed by a "garage sale." *Id.* at 60–62, 67–68. However, if the business model is in extreme distress, she recommends that rapid action—which she describes as a "Hail Mary"—is followed by a "fire sale." *Id.* at 63–67, 69–70; *see also* ANAND, *supra* note 12, at 249–51 (describing how the phenomenally successful $65 billion industrial conglomerate Danaher, headquartered in Washington, D.C., identifies and launches a short list of "three-to-five year 'breakthrough' initiatives" by systemically filtering every innovation idea through time, place, and context filters in order to see strategic connections). Danaher then divides these breakthrough initiatives into one-year initiatives for action and implementation. *Id.*

301. Moore, *supra* note 299 (stating Horizon 1 consumes substantial "time, talent, and management attention").

302. *Id.*

amended with compost[303] to prepare the soil for the next planting.[304] Neglecting Horizon 2, however, would be a fatal mistake.

Established organizations facing market stress may assume that their situation stems from failure to prioritize Horizon 3. Like so much anecdotal "knowledge," this assumption is incorrect and misleading.[305] For proof, look only to once-dominant technology companies like Kodak and Wang, which invested heavily in "ambitious and futuristic R&D agendas."[306] They ultimately failed, however, due to (1) the inability of their bold Horizon 3 projects to transition into Horizon 2 or Horizon 1 marketable products and services, and (2) leadership missteps when responding to changing ecosystems and budding market opportunities.[307] Simply put, these companies did not create

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303. *Composting 101: What Is Compost?*, BONNIE PLANTS, https://bonnieplants.com/gardening/what-is-compost/ [https://perma.unl.edu/8T97-P2ES] (explaining that compost "energizes the soil food web, which is made up of microscopic bacteria and fungi, along with earthworms, crickets, and many other life forms").

304. Moore, *supra* note 299.

305. *Id.*

306. *Id.*

307. *Id.*; *see* REIS, *supra* note 31, at 30 (emphasizing that modern, successful organizations grow existing products while simultaneously and continuously developing new ones); Satell, *supra* note 13 (attributing Kodak's failure to succeed in the digital photography business to its inability "to invent an entirely new business that could replace its cash cow [Kodak film]"); *see also* Scott D. Anthony, *Kodak and the Brutal Difficulty of Transformation*, HARV. BUS. REV. (Jan. 2012), https://hbr.org/2012/01/kodak-and-the-brutal-difficult [https://perma.unl.edu/M3QT-WJT6] (explaining four lessons that Kodak's struggles reveal: (1) failure to update business models can result in missed opportunities, (2) change and movement to the future demands urgency and determination, (3) a diversified portfolio of projects should be given time to "iterate, incubate, and grow," and (4) innovation requires diverse mindsets, investments, and perspectives "at the periphery" of the status quo); Scott D. Anthony, *Kodak's Downfall Wasn't About Technology*, HARV. BUS. REV. (July 2016), https://hbr.org/2016/07/kodaks-downfall-wasnt-about-technology [https://perma.unl.edu/B96U-LK3Q] (identifying three essential questions for digital transformation: (1) "What business are we in today?", (2) "What new opportunities does the disruption open up?", and (3) "What capabilities do we need to realize these opportunities?"); Chunka Mui, *How Kodak Failed*, FORBES (Jan. 18, 2012), https://www.forbes.com/sites/chunkamui/2012/01/18/how-kodak-failed/#f1635336f27a [https://perma.unl.edu/YP3U-XHMV] (describing how Kodak's management squandered the approximate "10-year window of opportunity" "to prepare for [digital] disruption"); Ron Adner, *Many Companies Still Don't Know How to Compete in the Digital Age*, HARV. BUS. REV. (Mar. 2016), https://hbr.org/2016/03/many-companies-still-dont-know-how-to-compete-in-the-digital-age [https://perma.unl.edu/326H-P9DX] (arguing that Kodak's bankruptcy was due to management's (1) failure to recognize and understand "ecosystem-level disruption" and (2) full-embrace of "digital photo printing" when that market was collapsing). Adner concludes: "Companies that learn the right lesson from Kodak's failure – that learn to approach their competitive strategy with a wide lens that captures ecosystem dynamics – will be more likely to respond effectively to this new generation of disruptive challenges. Those that don't risk suffering Kodak's fate." *Id.*

and nurture healthy Horizon 2 ecosystems capable of effectively competing in emerging markets.

Commitment to Horizon 2 projects will help organizations adapt to change.[308] The key to long-term sustainability "is to focus intensely on the Horizon 2 challenge. Only then will your Horizon 3 investments live to support you in Horizon 1."[309] For example, when Cisco Systems CEO John Chambers realized that the company's largest growth opportunities were in developing economies (which were originally Horizon 3), he shifted the best near-term opportunities in 138 countries into Horizon 2 project status, created a separate territory made up of these burgeoning markets, and appointed a dedicated executive to the territory.[310] Finally, he used strategic acquisitions to "help fill the Horizon 2 vacuum."[311] In another striking example, Grove and Moore's impressive transformation of Intel illustrates the importance of ensuring Horizon 2 projects can shift to Horizon 1. Specifically, Intel's nimble response to its SIP (ferocious price competition by Japanese manufacturers of memory chips) was made possible by its Horizon 2 research and investment into microprocessors.[312] As these examples show, Horizon 2 is integral to making the leap from the grand plans of Horizon 3 to the market fruitfulness of Horizon 1.

B. Moving Forward

Because digital and business model innovation represent the only firewalls to law school obsolescence, the journey forward begins with embrace of a Day 1 mindset, followed by determined organizational shifts that unite human faculty expertise with emerging technologies. For this reinvention to succeed, transformation leaders should consider and potentially follow both Jeff Bezos and Andrew Grove's astute business insights.

1. Day 1 Mindset Shift

In 2018, Jeff Bezos summarized his management philosophy in a single sentence, "Success is going to require talented experts, a begin-

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308. *See generally* Cunningham, *supra* note 114 (explaining that successful change management involves a process which brings together: strong sense of urgency, coalition of powerful players, clear and articulated vision and strategy, empowerment of individuals, reward of progress or "wins," replication of successful improvements, and program-wide dissemination).

309. Moore, *supra* note 299.

310. *Id.*

311. *Id.*

312. SATELL, *supra* note 49, at 114; *see also Legal Education: A New Growth Vision Part I*, Part III (discussing Andrew S. Grove and Gordon E. Moore's recognition and response to the strategic inflection points confronting the Intel Corporation).

ner's mind, and a long-term orientation."313 Unpacking Bezos's compact sentence reveals: (1) expert teams should be comprised of people who know their subject matter but also have the requisite emotional intelligence to work well with others (i.e., no "brilliant jerks");314 (2) team members should possess a beginner's mindset in that they actively question assumptions and rules, rethink processes from the soil up, jettison outdated models, experiment and tinker, and constantly look for fresh ideas and solutions;315 and (3) a long-term orientation provides teams the freedom to experiment, stumble, and learn, and it gives budding ideas the time and room to grow and mature into marketable innovations.316 Bezos's management philosophy coupled with Amazon's continuous Day 1 improvement mindset and leadership principles generate virtuous momentum that fuels profits and propels growth—while simultaneously terrifying traditional, slow-moving competitors.317

2. *Organizational Shift: Being Both Human and Digital*

Entrepreneurial legal education programs shifting to omni-channel, platform strategies should begin by developing transparent long-

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313. Justin Bariso, *Jeff Bezos Just Shared His 3-Step Formula for Success—and It's Absolutely Brilliant*, INC. (Jan. 31, 2018), https://www.inc.com/justin-bariso/amazon-jeff-bezos-healthcare-formula-success-1-sentence.html [https://perma.unl.edu/VD4H-TH9L].

314. *Id.* (quoting Reed Hastings, CEO of Netflix: "You don't simply want a bunch of 'brilliant jerks'").

315. *Id.*; *see also* BRADLEY R. STAATS, NEVER STOP LEARNING: STAY RELEVANT, REINVENT YOURSELF, AND THRIVE 152 (2018) (recommending that "novel insights for improvement" can often be found by taking a "novice's perspective").

316. Bariso, *supra* note 313.

317. Bezos's Day 1 mindset is discussed *supra* in the Introduction. *See Leadership Principles*, *supra* note 55 (identifying the "Leadership Principles" that make "Amazon peculiar"). Amazon's Leadership Principles are: (1) "customer obsession"; (2) ownership and long-term thinking; (3) "innovation and invention" followed by simplification; (4) diverse perspectives regularly used to test judgments and disconfirm instincts; (5) curiosity and constant learning; (6) "hire and develop the best" talent; (7) "insist on the highest standards" and ensure that work products are fixed and remain defect free; (8) big ideas can translate into a "bold direction" that inspires fresh ways to serve customer and deliver positive business results; (9) embrace a "bias for action" because "speed matters" and "calculated risk taking" can deliver significant results; (10) practice "frugality" since "[c]onstraints breed resourcefulness, self-sufficiency and invention"; (11) "earn trust" by treating others respectfully and benchmarking "themselves and their teams against the best"; (12) "dive deep" into the details and data; (13) "have backbone; disagree and commit" completely to decisions, and (14) "deliver results." *Id.*; *see also* Shira Ovide, *How Amazon's Bottomless Appetite Became Corporate America's Nightmare*, BLOOMBERG (Mar. 14, 2018), https://www.bloomberg.com/graphics/2018-amazon-industry-displacement/ [https://perma.unl.edu/2UQ3-2K3G] ("Amazon became a verb because of the damage it can inflict on other companies. To be Amazoned means to have your business crushed because the company got into your industry.").

term innovation mission trajectories. Then, to support this transformation, program leaders will invest resources in the necessary personnel, technology, organizational, marketing, and infrastructure changes for the program to become both human and digital. Most importantly, the entire organization will obsessively focus on identifying and meeting customers' current and future needs so that the legal education program consistently and continuously provides learners with up-to-date, valuable, personalized content and seamless engagement.[318] Launching omni-channel strategies will involve integrated "stages and phases"[319] of progress to align organizational capabilities with innovation mission trajectories.[320]

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318. Lin Pophal, *Multichannel vs. Omnichannel Marketing: Is There a Difference, and What Does It Mean to You?*, ECONTENT (Mar. 2, 2015), http://www.econtentmag.com/Articles/Editorial/Feature/Multichannel-vs-Omnichannel-Marketing-Is-There-a-Difference-and-What-Does-It-Mean-to-You-102361.htm [https://perma.unl.edu/79A9-72GK]. For concerns about the current education technology trend, see John Warner, *That Won't Work, Bro*, INSIDE HIGHER ED (Nov. 2, 2017), https://www.insidehighered.com/blogs/just-visiting/wont-work-bro [https://perma.unl.edu/Z73E-MFMW] (cautioning against falling for the hyped promises of education technology expounders). He then reminds educators that given the numerous ed-tech failures, actual education progress involves "a long and messy process during which unforeseeable things will happen." *Id.*; *see also* Susan Edelman, *Brooklyn Students Hold Walkout in Protest of Facebook-Designed Online Program*, N.Y. POST (Nov. 10, 2018), https://nypost.com/2018/11/10/brooklyn-students-hold-walkout-in-protest-of-facebook-designed-online-program/ [https://perma.unl.edu/M3TD-D5R5] (describing student frustrations with the Facebook-designed web-based curriculum "Summit Learning," which requires students to spend hours reading computer screens and to "teach" themselves).

319. *See* MICHAEL HEMSEY, OMNICHANNEL LOYALTY: DESIGNING THE ULTIMATE CUSTOMER EXPERIENCE 12 (Kobie Marketing, 2012), https://www.kobie.com/thought-leadership/omnichannel-loyalty.pdf [https://perma.unl.edu/BD7U-P6R4]; *see generally* Henderson, *supra* note 80, at 438 (recommending a "staged approach" for innovation consisting of "successful initiation (agenda setting and matching) and successful implementation (redesigning/restructuring, clarifying and routinizing)").

320. *Id.* at 13 (describing the shift to omni-channel as an "overhaul" instead of an upgrade); *see generally* Sven Smit, *Treat Strategy as a Journey, Not an Annual Management Junket*, MCKINSEY & CO. (June 13, 2018), https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-strategy-and-corporate-finance-blog/treat-strategy-as-a-journey-not-an-annual-management-junket [https://perma.unl.edu/AM7L-JGGG].

A preliminary action list for education entrepreneurs[321] engineering digital transformation and organizational dexterity[322] includes the following:

(1) building twenty-first century law school leadership and digital innovation teams;

(2) collecting and analyzing data (e.g., baseline development, continuous monitoring, and predictive analytics);

(3) consulting with community practitioners on potential curriculum adjustments (e.g., additions and/or deletions);

(4) incorporating the expertise of learning scientists and instructional designers when designing human-digital content;

(5) developing, testing, iterating, and refining in-person and digital content;

(6) continuously revising and updating curricula to facilitate student mastery of employer-valued doctrinal knowledge and technical skills (e.g., competency assessments);

(7) trendspotting potential modernization pathways and revising innovation mission trajectories;

(8) envisioning and embracing hybrid human-AI integrated education and personalized interactions;

(9) continuously reengineering and updating technologies and engagement methods; and

(10) wielding the "golden sword" to cut through bureaucracy that impedes forward movement (e.g., resource allocation, organizational speedbumps, etc.).[323]

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321. McDonald R. Stewart & Elias G. Carayannis, *Dystechnia: A Model of Technology Deficiency and Implications for Entrepreneurial Opportunity*, 2:1 J. INNOVATION & ENTREPRENEURSHIP (2013) ("Technology entrepreneurship seeks to shift economic opportunities from established firms and industries to new ventures by the strategic deployment or marketing of new technology inventions or innovations.") (internal citation omitted).

322. *IT and Professional Services, supra* note 98, at 5 (describing how Reinventors "combine a dynamic vision with an open culture and agile operations – and these, as our research shows, are the three stepping stones to organizational dexterity").

323. REIS, *supra* note 31, at 166–67 (explaining that leaders who wield the "golden sword" provide digital innovation teams with "air cover, secure funding, and cross-functional collaborators"). Leaders also will understand that when startup cultures embark on experiments, many of them will be failures. *Id.*; *see* Peter Dahlström et al., *The Seven Decisions That Matter in a Digital Transformation: A CEO's Guide to Reinvention*, MCKINSEY & CO. (Feb. 2017), https://www.mckinsey .com/business-functions/digital-mckinsey/our-insights/the-seven-decisions-that-matter-in-a-digital-transformation [https://perma.unl.edu/6DLD-NGKZ] (identifying the seven decisions CEOs need to make: (1) where the business should go, (2) who will lead the effort, (3) how to 'sell' the vision to key stakeholders, (4) where to position the firm within the digital ecosystem, (5) how to decide during the transformation, (6) how to allocate funds rapidly and dynamically, and (7) what to do when); *see also* CHRISTENSEN, *supra* note 27, at 82–84, 103 (discussing the importance of resource allocation to innovation success); *see generally* Is-

3. OKRs: A Brief Introduction to an Effective and Coherent Transformation Management System

As the bookend to this three-part Article series, John Doerr's book *Measure What Matters* neatly distills some of Andrew S. Grove's key ideas into practical, structured approaches for moving organizations toward achieving big goals via a coherent, connected, transparent management system.[324] The acronym OKRs stands for "Objectives and Key Results."[325] OKRs represent a "management methodology that helps to ensure that the company focuses on the same important issues throughout the organization."[326] Specifically, objectives focus on achievement and are therefore "significant, concrete, action oriented, and (ideally) inspirational."[327] Because objectives focus on "what" is to be accomplished, they clarify thinking and execution.[328] Key results are measurable, verifiable, time-focused, energetic, and urgent benchmarks that track "how" organizations achieve stated objectives.[329]

As a practical matter, organizations should narrow the number of OKRs in progress—ideally three to five—that run in parallel annual, quarterly, or monthly cycles.[330] OKRs enable an organization to gain and maintain momentum, concentrate leader and employee focus, track progress and promote accountability, stretch to achieve amazing "Big Hairy Audacious Goal[s]" and 10x innovations, develop "continuous performance management" systems, and build an energetic, inno-

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kandar Aminov et al., *Decision-making: How Leaders Can Get out of the Way*, McKinsey & Co. (June 11, 2018), https://www.mckinsey.com/business-functions/organization/our-insights/the-organization-blog/decision-making-how-leaders-can-get-out-of-the-way [https://perma.unl.edu/JK88-FLS5].

324. Doerr, *supra* note 16, at 6, 23. This Article series began with an analysis of the current challenges to legal education using Grove's book *Only the Paranoid Survive* as a framework for diagnosis, action, and growth. *See generally* Grove, Only the Paranoid Survive, *supra* note 38.

325. Doerr, *supra* note 16, at 7.

326. *Id.*

327. *Id.*

328. *Id.*

329. *Id.*; *see also* Martin Hirt, *Don't Omit This Crucial Detail from Your Strategic Roadmap: The First Step*, McKinsey (Dec. 13, 2018), https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-strategy-and-corporate-finance-blog/dont-omit-this-crucial-detail-from-your-strategic-roadmap-the-first-step [https://perma.unl.edu/A7SA-RCK8] (recommending that leaders "break the journey [innovation goals] down into six-month increments" to advance and achieve these goals). Hirt also suggests that the use of "agile sprints" may help kickstart initiatives. *Id.* For an introduction to Agile methodologies, see *Legal Education: A New Growth Vision Part II*, subsection IV.C.3, which introduces Agile and Lean Startup methodologies.

330. Doerr, *supra* note 16, at 51, 273–74.

vative culture.331 Because transformation requires thoughtful and skilled execution, education entrepreneurs determined to be Day 1 law schools should read Doerr's book and Andrew S. Grove's *High Output Management*. Further, for valuable perspectives on the rapidly changing legal education and industry landscape, the writings of Indiana Law Professor William D. Henderson, Northwestern Law Professor (and former dean) Daniel B. Rodriguez, and legal innovation expert Mark A. Cohen Esq. merit careful reading and regular monitoring for smart, forward-focused ideas and strategies in this exciting space.332 Last, it may prove beneficial to consult with change and process management experts (e.g., BPR, OKR, Agile, Lean Startup, etc.) to shepherd the transition from an ordinary law school to a dynamic, digital, human-AI integrated legal education ecosystem designed for the twenty-first century.

C. Sample Plans

Leaders determined to develop omni-channel, platform-based, and eventually hybrid human-AI legal education of the future may find of interest the following sketch of the Three Horizons and 70/20/10 models integrated with summaries of the multidisciplinary ideas presented in this three-part Article series. These sample plans may serve as starting points for ongoing, curated annual-quarterly OKR cycles that drive an organization forward and upward to achieve innovation mission trajectories.

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331. *Id.* at 33–34, 275–80. At Google, "10x" means "products and services that are ten times better than the competition." *Id.* at 138–39; *see also* Steven Levy, *Big Ideas: Google's Larry Page and the Gospel of 10x*, WIRED (Mar. 30, 2013), https://www.wired.co.uk/article/a-healthy-disregard-for-the-impossible [https://perma.unl.edu/2BCB-CLR3] (describing Page's dim view of incremental change). Levy writes, "The way Page sees it, a ten per cent [sic] improvement means that you're doing the same thing as everybody else. You probably won't fail spectacularly, but you are guaranteed not to succeed wildly." *Id.*

332. Henderson, *supra* note 80, at 402 (describing sociologist Everett Rogers's "Diffusion Curve" and explaining "that the diffusion of an innovation is a *process* that occurs through a *social system*"). Rogers identifies five "adopter" segments: "(1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards." *Id.* He notes that because the "adoption of new innovations is more of a social process of imitation than a mental process of analytical reasoning," most lawyers, law professors, and law students "won't change until they see others successfully change first." *Id.* at 403. He also observes that "[t]he most established, influential, and prestigious portions of the legal profession—large law firms, the federal judiciary, legal academia, and the ABA—tend to be tradition bound and skeptical of change that does not initiate with them." *Id.* at 421. For material to monitor, see Professors Henderson and Rodriguez's writings on the *Legal Evolution* blog at www.legalevolution.org [https://perma.unl.edu/Y2DW-F35C], and Mark A. Cohen's articles published by FORBES and on www.legalmosaic.com [https://perma.unl.edu/36W8-PJEC].

Horizon 1 (near-term) 70% Sustaining program services & building innovation culture/capacity	
Customer focus: students, graduates, and employers Program focus: reevaluate, refresh, reengineer, and remove Leader focus: identify and deliver customer value, build innovation culture and capacity, embrace new technologies Innovation components: establish innovation-entrepreneurial culture, adopt referral business model, and build knowledge and skills development platform Action list: • Build 21st century leadership team • Develop and articulate innovation mission trajectory (IMT) • Provide education services • Establish baseline measurements • Launch digital innovation teams (DIT) and ideas growth factory • Identify connections (relational, functional, and organizational) • Upgrade hardware and software • Collaborate with learning scientists and instructional designers • Explore digital innovations such as:	Projects/possible OKRs: • Collect and analyze data • Consult with community practitioners on curriculum adjustments and enhancements • Review, update, and revise curriculum and rubrics • Conduct faculty and staff technology skills training and updates • Ensure management team members complete process and innovation training (in-person, mentoring, etc.) • Build Digital Innovation Teams (DIT) and have DIT members complete process and innovation training (training, mentoring, etc.) • Embrace technology and spot/monitor trends • Start innovation pilot projects • Support multidisciplinary DIT and establish ideas growth factory • Consult with inside and outside customers (i.e., build referral networks) • Develop, iterate, test, and refine content • Increase, improve, eliminate, and expand projects, products, or services

- Flipped learning - Quizzes with instant feedback - Discussions - Projects - Exercises - Competency assessments - Spot and monitor trends; look for opportunities for convergence - Reevaluate faculty-student engagement methods (human and digital) - Design and test omni-channel student-faculty engagement methods to enhance quality of human-digital interactions - Monitor and evaluate market conditions and pricing strategies - Cull non-performing processes, projects, and methods - Consider cannibalization of current products and services	- Deploy new processes/ projects and track progress - Identify effective teaching and learning processes, approaches, and strategies - Apply pedagogically-valid (data supported) teaching and learning methods to other courses outside pilot projects - Technology skills training and updates - All faculty and staff complete process and innovation training (hybrid course) supported by DIT members - Align/adjust projects/OKRs with IMTs

Horizon 2 (mid-term) 20% Exploring emerging technologies & adjacent market opportunities	

Customer focus: students, graduates, employers, and professional community
Program focus: reengineer, reinvent, redeploy, remove, recycle, and expand
Leader/DIT focus: identify and deliver customer value, embrace new technologies, launch new education offerings, expand to adjacent markets, work toward value innovation
Innovation components: soft launch of knowledge and skills development platform, beta-test personalized instruction modules, beta-test knowledge platform to outside customers, explore open innovation model, work to diversify revenue streams, build components of platform business model
Action list:
• Shift viable Horizon 2 projects to Horizon 1
• Monitor and update innovation goals and metrics
• Cull anemic projects
• Spot and monitor trends; look for opportunities for convergence
• Explore nascent technologies
• Identify and leverage connections (relational, functional, and organizational)
	Projects/possible OKRs:
	• Explore more complex innovation projects
	  ○ Elements of future games and simulations (with employer input on content and skills)
	  ○ AR, VR, MR, or XR
	  ○ Personalized instruction modules
	• Expand/support ideas growth factories
	• Evaluate processes and project portfolios
	• Collaborate with competitors and complementors
	• Consult with inside/outside customers
	• Develop and beta-test omni-channel content for continuing education modules for professionals (platform soft launch content)
	• Develop and beta-test competency assessments that can translate into employer-informed skills verification tools (platform soft launch content)
	• Design and refine platform governance (open v. closed, core participants, etc.)
	• Lay groundwork for platform monetization (multi-sided

• Update market pricing strategies • Diversify teaching/learning revenue streams by expanding to adjacent and/or complementary markets • Monitor, adjust, and update IMTs • Consider cannibalization of current products and services	customer relationships and multiple revenue streams) • Develop multiple pricing models for continuing education and employer skills verification services (e.g., subscriptions, bundled or unbundled, etc.) • Align/adjust projects/OKRs with IMTs

Horizon 3 (long-term) 10% Imagining & building new legal education paradigm	
<u>Customer focus</u>: students, graduates, employers, and professional community <u>Program focus</u>: reengineer, reinvent, redeploy, recycle, reboot, remove, and expand <u>Leader/DIT focus</u>: identify and deliver customer value, embrace new technologies, build new paradigm for the delivery of legal education <u>Innovation components</u>: full launch of integrated knowledge/ skills development platform and platform business model, embrace open innovation and open innovation business model, envision and develop human-AI integrated learning <u>Action list</u>: • Shift Horizon 3 projects to Horizon 2 • Spot/monitor trends; look for opportunities for human-tech convergence • Monitor, adjust, and develop new IMTs	<u>Projects/possible OKRs</u>: • Think of big, blue-sky ideas • Deliver value innovation • Explore nascent technologies • Consider expansion to adjacent markets • Collaborate with competitors and complementors • Consult with inside/outside customers • Design, beta-test, and launch AI-enhanced multi-player games, simulations, and AI digital tutors • Align/adjust projects/OKRs with IMTs

V.   CONCLUSIONS

As the year 2020 approaches on the horizon, rapid and unstoppable technology change currently threatens the legal education industry by upending traditional business models and teaching methodologies. This industry chaos and uncertainty breeds bountiful market opportunities for Day 1 law schools that think big and take bold action. Further, compelling combinations of computers, ICTs, and data now make possible the once impossible dream of Harvard Law School Professor

and Dean Christopher Columbus Langdell to synthesize science with the study of law.[333]

Future-focused, survival-oriented Day 1 law schools will obsessively work toward transforming legal education into seamless human and digital learning experiences. This transformation requires law schools to create, nourish, and sustain productive knowledge and skills development ecosystems. When creating such ecosystems, the basic gardening metaphor used herein identifies the long-term, financially sustainable path forward for legal education programs. Simply put, the garden plan combines the nutrient-rich soils of faculty knowledge,[334] the seeds of innovation, the sunshine of data, oxygen from eager and dedicated learners, and the water and support of the professional community. Before planting this new garden, education entrepreneurs must clear the overgrowth of the status quo so that fresh, forward action can take root.

The challenge for legal education entrepreneurs is to cross-pollinate tradition with technology. These proactive law schools will plant a variety of seed ideas that may grow into a healthy ecosystem filled with an array of customer- and market-valued education services. To echo poet Emily Dickinson, who wrote of a flower so desirable that bees, butterflies, and hummingbirds all sought after it, legal education leaders should seek to make their programs so diverse and dynamic that they draw in and feed a rich cross-section of learners.[335] If thoughtfully designed and well-managed, these agile and innovative programs will enjoy the harvests of marketplace success and financial sustainability. To make this transformation, law school leaders and faculty therefore must behave like honeybees by continuously embracing innovation and change, exhibiting curiosity and dexterity, and

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333. *Deans of Harvard Law School*, Harv. L. Sch., https://hls.harvard.edu/about/history/hls-deans/ [https://perma.unl.edu/7G5B-MRU8] (describing Dean Langdell's emphasis on the Socratic method and belief "that the study of law should be an interactive and disciplined form of education"); *see also* Robert Stevens, Law School: Legal Education in America from the 1850s to the 1980s 52–53 (1983) (noting that Langdell's original pedagogic vision sought to introduce scientific rigor into the study of case law—like botanists studying botanical gardens). Dean Langdell served at Harvard Law School from 1870 to 1895. *Id.*

334. Faculty have an opportunity to design, test, and refine their teaching methods through in-person and technology-enhanced interactions, ensuring their years of expertise and scholarship are seamlessly united into omni-channel and personalized learning experiences.

335. "There is a flower that Bees prefer – / And Butterflies – desire – / To gain the Purple Democrat / The Humming Bird – aspire . . . ." Emily Dickinson, *No. 642: There Is a Flower that Bees Prefer—, in* The Poems of Emily Dickinson 287 (R.W. Franklin ed., 1999). Dickinson's "purple democrat" flower appears to reference "Marshall's Delight" bee balm (also known as *Monarda*); *see Monarda*, Wikipedia, https://en.wikipedia.org/wiki/Monarda [https://perma.unl.edu/75ZT-6CYT].

modeling adaptive behaviors that timely respond to changing situations and marketplace realities.

This Article opened with Marc Andreessen's warning that software, and by extension platforms, "are eating the world." This author disagrees with his bleak carnivorous assessment. Platforms instead represent powerful tools for creating vibrant, diverse education ecosystems that will develop, challenge, and inspire generations of minds to come. Modern students now expect and demand both human connection and digital technologies, which means combining "high touch" with "high tech."[336] The wise professor lecturing students in front of a white board remains important but is not sufficient. On the first day of class, students should meet both human Professor Langdell *and* digital Professor IBM Watson™.

Like the visionary technology titans of the 1990s who found their companies in SIPs, leaders of legal education programs must (1) reimagine business models and transform from pipelines to platforms, (2) enthusiastically embrace digital and curriculum innovations, (3) build and/or support powerful knowledge and skills development ecosystems, (4) act with an outsider's objectivity and extreme urgency, and (5) obsessively focus on identifying and delivering customer value. These Day 1 law school survivors will ultimately deliver omni-channel, platform-based education experiences that seamlessly combine human, digital, and eventually AI-integrated, personalized instruction for complete knowledge and skills development solutions.

While there remains time for self-disruption, each day that passes without intentional, forward progress concedes incumbent market share to disruptors. Law schools that do not innovate and instead tightly cling to their traditions and reputations will face obsolescence.[337]

Platforms, AI technologies, and ecosystems are changing—not eating—the world.

For law schools, the choice is simple: adapt or disappear.

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336. NAISBITT, *supra* note 273, at 52.

337. PISTONE & HORN, *supra* note 84, at 23; *see generally* SPENCER JOHNSON, WHO MOVED MY CHEESE: AN AMAZING WAY TO DEAL WITH CHANGE IN YOUR WORK AND IN YOUR LIFE (1998).

APPENDIX I: T-SHAPED SKILLS FOR KNOWLEDGE
PROFESSIONALS

• Soft skills (empathy, written and oral communication,
collaboration, teamwork, conflict resolution) • Ethical skills
(integrity, moral, social values) • Critical thinking skills
(creativity, ability to intuit, analogize, hypothesize, theorize,
speculate, exercise judgment, connect analytical concepts,
holistic/big picture outlook, global and cultural agility and
awareness) • Growth mindset (adaptability, resilience,
agility) • Strategic/tactical skills (spot trends, seize
opportunities, balance tradeoffs, develop holistic solutions)
• Business skills (entrepreneurship, management,
marketing, customer service) • Multidisciplinary and
systems thinking • Continuous learning skills (substantive
knowledge, technology, process improvement)

**Human
strengths**

Technical
fundamentals

Doctrinal
knowledge

Process
knowledge

Procedural
knowledge

Discipline-specific
analytic thinking

Anomalies
detection

Pattern
recognition

Simulations

Options/solutions
identification

**AI-robot
potential**

Credits:

- David Guest originated the T-shaped model concept in *The Hunt Is on for the Renaissance Man of Computing*, THE INDE-PENDENT (Sept. 17, 1991).
- *See also* Peter Rogers & Richard J. Freuler, *The "T-Shaped Engineer*," AM. SOC. FOR ENGINEERING EDUC. CONFERENCE (June 14–17, 2015), https://www.asee.org/public/conferences/56/papers/11576/view [http://perma.unl.edu/FM6E-QDTS].
- This model reflects an ongoing dialogue with my colleague, Dr. Susan M. Zvacek.

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APPENDIX III: GLOSSARY OF KEY TERMS

Algorithm:

"[A] step by step method of solving a problem. It is commonly used for data processing, calculation and other related computer and mathematical operations. An algorithm is also used to manipulate data in various ways, such as inserting a new data item, searching for a particular item or sorting an item." *Algorithm*, TECHOPEDIA, https://www.techopedia.com/definition/3739/algorithm [http://perma.unl.edu/4AWY-6XDQ].

Artificial intelligence (AI):

"[An] area of computer science that emphasizes the creation of intelligent machines that work and react like humans. Some of the activities computers with artificial intelligence are designed for include: speech recognition, learning, planning, [and] problem solving." *Artificial Intelligence*, TECHOPEDIA, https://www.techopedia.com/definition/190/artificial-intelligence-ai [http://perma.unl.edu/2475-MMDM].

Asynchronous learning model:

The asynchronous teaching and learning model uses online learning resources "to enable information sharing between people in a network." Asynchronous educational activities are not limited by time or place which enables students to complete their studies any time they prefer. Asynchronous learning methods may use digital platforms and media (e.g., online discussions, assignments, quizzes, etc.). *Asynchronous Learning*, TECHOPEDIA, https://www.techopedia.com/definition/23154/asynchronous-learning [http://perma.unl.edu/EMB6-4PNS].

Augmented reality (AR):

"AR overlays digital objects (information, graphics, sounds) on the real world, allowing the user to experience the relationship between digital and physical worlds." *Redefine Your Company Based on the Company You Keep. Intelligent Enterprise Unleashed*, ACCENTURE 30–38 (2018), https://www.accenture.com/t20180227T215953Z__w__/us-en/_acnmedia/Accenture/next-gen-7/tech-vision-2018/pdf/Accenture-TechVision-2018-Tech-Trends-Report.pdf#zoom=50 [http://perma.unl.edu/4VJX-ED5F].

Business Process Re-engineering (BPR):

"[T]he analysis, control and development of a company's systems and workflow. The principal idea behind business process re-engineering is that a company is a collection of processes that evolves

over time. Business processing re-engineering[ ] gained prominence in the 1990s, but has re-emerged as business software and enterprise applications have provided more in-depth analytics with which to evaluate business systems." *Business Process Re-Engineering*, TECHOPEDIA, https://www.techopedia.com/definition/13764/business-process-re-engineering-bpr [http://perma.unl.edu/A92D-SV4W].

Digital-first:

Asynchronous learning model. Harvard Business School's HBX program currently pioneers some "digital-first" teaching approaches which involves "intentionally distancing from or even discarding analog habits." For example, in its pilot launch of student fundamental coursework in business, accounting, and economics later called HBX CORe, HBX made several contrarian online education decisions. Specifically, the HBX design team rejected camera in back of the room, focused on small learning groups, and eliminated live faculty interactions with students (sometimes referred to as "value-added services"). BHARAT ANAND, THE CONTENT TRAP: A STRATEGIST'S GUIDE TO DIGITAL CHANGE 191, 307, 314–17 (2016).

Digital Innovation Team:

A small, full-time, energetic, self-managed, customer-obsessed multidisciplinary team made up of diverse talent focused on imagining, designing, and iterating legal education solutions that unite the best of being human and digital, with an end goal of human-AI integration. *See generally Legal Education: A New Growth Vision Part III*, subsection II.B.1.

Digital live:

Synchronous learning model. Harvard Business School also launched in 2015, HBX Live, a "virtual classroom" "where, in effect, sixty physical seats were replaced by sixty TV screens, so that learners could participate in live class discussion from anywhere in the world." BHARAT ANAND, THE CONTENT TRAP: A STRATEGIST'S GUIDE TO DIGITAL CHANGE 339 (2016).

Digitization:

"[T]he process of converting analog signals or information of any form into a digital format that can be understood by computer systems or electronic devices. The term is used when converting information, like text, images or voices and sounds, into binary code. Digitized information is easier to store, access and transmit, and

digitization is used by a number of consumer electronic devices." *Digitization*, TECHOPEDIA, https://www.techopedia.com/definition/6846/digitization [http://perma.unl.edu/M39U-Y2QS].

Dystechnia:

The flawed use of technology which creates barriers to organizational performance. McDonald R. Stewart & Elias G. Carayannis, *Dystechnia: A Model of Technology Deficiency and Implications for Entrepreneurial Opportunity*, J. INNOVATION & ENTREPRENEURSHIP 2:1 (2013), https://innovation-entrepreneurship.springeropen.com/articles/10.1186/2192-5372-2-1 [http://perma.unl.edu/S325-ZR3G].

Extended reality (XR):

"XR refers to the spectrum of experiences that blurs the line between the real world and the simulated world. The technology immerses the user through visuals, audio, and potentially olfactory and haptic cues. The two major types of XR are virtual reality and augmented reality." *Redefine Your Company Based on the Company You Keep. Intelligent Enterprise Unleashed*, ACCENTURE TECH. VISION 30–38 (2018), https://www.accenture.com/t20180227T215953Z__w__/us-en/_acnmedia/Accenture/next-gen-7/tech-vision-2018/pdf/Accenture-TechVision-2018-Tech-Trends-Report.pdf#zoom=50 [http://perma.unl.edu/B66F-6HHT].

Foundational platform:

"A multisided platform that provides core services to other multisided platforms and is therefore a 'platform for platforms.' These include Internet Service Providers (ISPs), which connect edge providers and end users. For example, Comcast makes it possible for end users to connect over the Internet to Google's search engine. Foundational platforms also include computer operating systems, or invisible engines, which provide a standard platform for app developers and end users; for example, Android provides an operating system that enables app developers to provide apps to end users and for end users to use those apps." DAVID S. EVANS & RICHARD SCHMALENSEE, MATCHMAKERS: THE NEW ECONOMICS OF MULTISIDED PLATFORMS 208 (2016).

Hybrid:

A hybrid (or blended) course involves moving "[a] significant percentage—often more than 20% but less than 100%—of traditional classroom meetings" to online activities. ROBERT TALBERT, FLIPPED LEARNING: A GUIDE FOR HIGHER EDUCATION FACULTY 153 (2017).

HyFlex:

Synchronous and/or asynchronous learning model. In 2010, Dr. Brian Beatty defined HyFlex courses as those that "enable a flexible participation policy for students whereby students may choose to attend face-to-face synchronous class sessions or complete course learning activities online without physically attending class." Jackie B. Miller et al., *Student Choice, Instructor Flexibility: Moving Beyond the Blended Instructional Model*, ISSUES & TRENDS IN EDUC. TECH. (2013), https://journals.uair.arizona.edu/index.php/itet/article/view/16464/16485 [http://perma.unl.edu/E38Y-ZLET].

Information and Communications Technology (ICT):

"[A]ll the technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions. Although ICT is often considered an extended synonym for information technology (IT), its scope is more broad. ICT has more recently been used to describe the convergence of several technologies and the use of common transmission lines carrying very diverse data and communication types and formats." *Information and Communications Technology*, TECHOPEDIA, https://www.techopedia.com/definition/24152/information-and-communications-technology-ict [http://perma.unl.edu/Z6TD-AA3J].

Innovation mission trajectory (IMT):

A fusion of modern innovation theories, an innovation mission trajectory encourages entrepreneurs to imagine the fantastic and improbable future and then design ways to implement those dreams. This process of ideation, innovation, and implementation occurs through open collaborations between multidisciplinary knowledge experts, technology professionals, and diverse entities (e.g., education, business, nonprofits, non-governmental organizations, and government) that systematically and continuously experiment (e.g., prototypes and MVPs) to create, identify, and nurture seeds of inspiration. Innovation mission trajectories are designed to be flexible in conception and application but are always iterative and dynamic (i.e., forward-moving). They require curiosity, nimbleness, agility, and adaptability. In the context of higher education, innovation mission trajectories spring from customer collaborations, defined broadly to include students, graduates, employers, and community professionals.

Intelligence amplification or augmentation (IA):

"[T]he idea that technologies can be assistive to human intelligence, rather than being composed of technologies that create an independent artificial intelligence. Intelligence amplification systems work to enhance a human's own intelligence, to improve a human decision-maker's function or capability in some way. Intelligence amplification is also known as assistive intelligence, augmented intelligence, cognitive augmentation or machine-augmented intelligence." *Intelligence Amplification*, TECHOPEDIA, https://www.techopedia.com/definition/32577/intelligence-amplifi cation-ia [http://perma.unl.edu/47JF-HVGC].

Machine learning:

"[A]n artificial intelligence (AI) discipline geared toward the technological development of human knowledge. Machine learning allows computers to handle new situations via analysis, self-training, observation, and experience. Machine learning facilitates the continuous advancement of computing through exposure to new scenarios, testing and adaptation, while employing pattern and trend detection for improved decisions in subsequent (though not identical) situations." *Machine Learning*, TECHOPEDIA, https://www.techopedia.com/definition/8181/machinelearning [http://perma.unl.edu/XPM3-734C].

Metcalfe's Law:

"[A] concept used in computer networks and telecommunications to represent the value of a network. Metcalfe's Law states that a network's impact is the square of the number of nodes in the network. For example, if a network has 10 nodes, its inherent value is 100 (10 * 10). The end nodes can be computers, servers and/or connecting users." *Metcalfe's Law*, TECHOPEDIA, https://www.techopedia.com/definition/29066/metcalfes-law [http://perma.unl.edu/SG9Z-87GS].

Minimum Viable Product (MVP):

A minimum viable product (MVP) is a "pared down version of the product" that helps test, tinker, and determine the viability of the envisioned solution. *Minimum Viable Product* (MVP), TECHOPEDIA, https://www.techopedia.com/definition/27809/minimum-viable-product-mvp [https://perma.unl.edu/3NVC-ENGV]; Jason Thomas, *Proof of Concept vs. Minimum Viable Product (And When to Use Each)*, LEAN LABS (Jan. 23, 2015), https://www.lean-labs.com/blog/proof-of-concept-vs.-minimum-viable-product-and-when-to-use-each [https://perma.unl.edu/W3PV-LWA9].

Mixed reality (MR):

Mixed reality can be in both the real and digital world. For example, the user can (1) "remain in [a] real-world environment" with digital content added to the space or (2) enter a digital environment that "replaces the real world." Quora, *The Difference Between Virtual Reality, Augmented Reality and Mixed Reality*, FORBES (Feb. 2, 2018), https://www.forbes.com/sites/quora/2018/02/02/the-difference-between-virtual-reality-augmented-reality-and-mixed-reality/#213997282d07 [http://perma.unl.edu/8FJR-4CTZ] (providing answer by Julia Tokareva, Software Development Consultant at Ruby Garage); *see* Gleb B., *VR vs AR vs MR: Differences and Real-Life Applications*, RUBY GARAGE, https://rubygarage.org/blog/difference-between-ar-vr-mr   [http://perma.unl.edu/4MHT-8BZK] (last visited Jun. 23, 2018).

Moore's Law:

Both a technology and economic theory which "states that the number of transistors that can be put on an integrated circuit to build a microprocessor doubles every eighteen months. A transistor is an on/off switch that can also amplify an electrical charge. More transistors equal more processing speed, and faster computers. Moore's Law means computers will get smaller, more powerful, and cheaper at a reliable rate." JAMES BARRAT, OUR FINAL INVENTION: ARTIFICIAL INTELLIGENCE AND THE END OF THE HUMAN ERA 139 (2013).

Multisided platform:

An enterprise "that operates a physical or virtual place (a platform) to help two or more different groups find each other and interact. The different groups are called 'sides' of the platform. For example, Facebook operates a virtual place where friends can send and receive messages, where advertisers can reach users, and where people can use apps and app developers can provide those apps." DAVID S. EVANS & RICHARD SCHMALENSEE, MATCHMAKERS: THE NEW ECONOMICS OF MULTISIDED PLATFORMS 210 (2016).

Multichannel:

Integrated technologies and tools such as audio or video content, blogs, and discussion forums. Loic Ple & Jacques Angot, *Teaching and Learning a Multichannel Experience of HRM* (2008), http://www.ufhrd.co.uk/wordpress/wp-content/uploads/2008/06/517-teaching-a-multichannel-hrm-experience_ple-et-al.pdf   [http://perma.unl.edu/UP73-4C2X].

Network effects:

A phenomenon whereby a good or service becomes more valuable when more people use it. The internet is a good example. "Initially, there were few users of the internet," and "[i]t was of relatively little value to anyone outside of the military and a few research scientists. As more users gained access to the internet," however, there were "[m]ore and more websites" to visit and more people to communicate with. "[T]he internet became extremely valuable to its users." *Network Effect*, INVESTOPEDIA, http://www.investope dia.com/terms/n/network-effect.asp [http://perma.unl.edu/YNB8-52ZS].

Objectives and Key Results (OKRs):

The transformation management system Objectives and Key Results (OKRs) focuses on structured, effective goal setting and execution. Objectives are generally concrete, action oriented and significant (and often inspirational). Objectives focus on the "what" is to be accomplished. Key results are measurable, verifiable, time-focused, energetic, and urgent benchmarks that track "how" organizations achieve stated objectives. JOHN DOERR, MEASURE WHAT MATTERS 6–7, 23 (2018).

Omni-channel:

"[S]eamless and effortless, high-quality customer experiences that occur within and between contact channels" (e.g., physical and digital environments). *Omnichannel*, WIKIPEDIA, https://en.wikipedia. org/wiki/Omnichannel [http://perma.unl.edu/CDQ7-MHGS].

Platform:

"[A] group of technologies that are used as a base upon which other applications, processes or technologies are developed." *Platform*, TECHOPEDIA, https://www.techopedia.com/definition/3411/platform [http://perma.unl.edu/L99M-J5Y8].

Prototype:

A prototype is the "original model" of a product that provides a starting point for the development and iteration of "future models" (e.g., a pencil sketch). *Prototype*, TECHOPEDIA, https://www.techo pedia.com/definition/678/prototype [https://perma.unl.edu/8X3W-8Q6N].

Strategic inflection point (SIP):

"A point in time in the life of a business when its fundamentals are about to change." ANDREW S. GROVE, ONLY THE PARANOID SURVIVE:

How to Exploit the Crisis Points that Challenge Every Company 3 (1999).

Synchronous learning model:

"Synchronous learning refers to" teaching and learning model in which students learn and interact with the instructor "in real time," but the students and instructor are not necessarily at the same physical location. The course occurs live at a specific time. Distance learners may participate via telephone, web, or video conference. *Synchronous Learning*, Techopedia, https://www.techo pedia.com/definition/23794/synchronous-learning [http://perma.unl .edu/D6L8-ZCJF].

Virtual reality (VR):

"VR visually takes the user out of their real-world environment and into a virtual environment, typically using a headset for viewing coupled with hand-held controllers to navigate the virtual space." *Redefine Your Company Based on the Company You Keep. Intelligent Enterprise Unleashed*, Accenture Tech. Vision 30–38 (2018), https://www.accenture.com/t20180227T215953Z__w__/us-en/_acnmedia/Accenture/next-gen-7/tech-vision-2018/pdf/Accen ture-TechVision-2018-Tech-Trends-Report.pdf#zoom=50 [http://per ma.unl.edu/6TEB-X54N].

XR: See Extended reality