



Center for Digital Transformation
Research Report



2019
**The State of Digital
Transformation in U.S.
Companies**

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Leadership for a Digitally Driven World™

Executive Summary

No industry is immune from the impact of digital technologies. While executives have recognized the urgency, many have yet to create and implement a sound digital transformation strategy. For that reason, we have been surveying companies since 2015, especially to determine what the most proficient digital transformers do differently than the rest.

To separate the best companies at digital transformation from the rest, we surveyed 186 U.S. companies to assess how they compared with competitors in using digital technology. Their responses fell into four categories: 12% (the leaders) believed they were significantly ahead of competitors; 33% were slightly ahead of their peers; 31% were on par with competitors; 24% (the laggards) were significantly or slightly behind competitors.

When we compared the behavior of the leading companies to that of the laggards, two differences immediately stood out:

1. Leading companies are far more likely than laggards to be planning and executing digital transformations. More than four out of five leaders (81%) were executing digital transformations, three times the percentage of laggards (27%).
2. Whatever their industry, leaders are far more likely to view themselves today as running software companies – i.e., firms whose core products, services, and business processes are all dependent on software to operate proficiently.

What does it mean to run a business like a software company? Our survey found that most leaders act like software companies in five distinct ways:

- **Vision:** Leaders are about eight times more likely than laggards to have a clearly defined digital transformation strategy.
- **Culture:** Leaders are significantly ahead of laggards in having a corporate culture that promotes innovation and accepts risk as a necessary precursor to progress.
- **Investment Strategy:** Leaders don't just talk about prioritizing digital transformations; they invest in it.
- **Digital Expertise:** Leaders are far ahead of the pack in having digital expertise as well as the IT infrastructure that facilitates digital transformation.
- **Business Capability Development:** Digital leaders enjoyed a large advantage in customer experience over lagging firms.

The Long Tale of Disruption

Over the last decade, digital powerhouses have disrupted one industry after another. No industry has proven to be immune from this disruption. As technologies advance, digital disruption is the new reality for all businesses.

It started with e-commerce where Amazon launched with a focus on book distribution. It was just the middleman delivering books that it acquired from a large distributor to end customers. Today, the Amazon empire includes the distribution of virtually any consumer product sold either by the company itself or by hundreds of thousands of independent retailers. It designs, produces, and sells consumer electronics, entertainment, and white labels a large number of categories. And, it is the market leader in cloud services.

Strategy professors of yore would be puzzled by a conglomerate like Amazon; yet in a digital world, its strategy is rational. And it executes with ruthless efficiency in a fashion that its competitors cannot match.

An announcement by Amazon that they are entering an industry sector sends the stock prices of its rivals plummeting. We saw this when they purchased Whole Foods and again when they entered pharmacy distribution by purchasing PillPack in 2018. Which invariably raises the question: why did rivals not act earlier?

The threat posed by software companies like Alphabet, Amazon, and Microsoft, is profound. In industry after industry, focused software companies like Heal in healthcare and Betterment in investing are targeting incumbents in their respective industries.

Innovative incumbent companies are responding forcefully. Businesses like Target and Walmart in retail, CVS/Aetna in healthcare, Delta Airlines, and many others are developing smart strategies for the digital world, leveraging their existing assets and capabilities, and acquiring new digital capabilities organically and by acquisition. But many companies are still struggling to adapt to the digital world.

No industry is immune from the impact of digital technologies. While executives have recognized the urgency, they need a plan for evaluating and implementing a digital transformation strategy. For that reason, we have been surveying companies since 2015, especially to determine what the most proficient digital transformers do differently than the rest. Read on to learn what it takes to thrive in the digital world.

Separating Leaders from Laggards

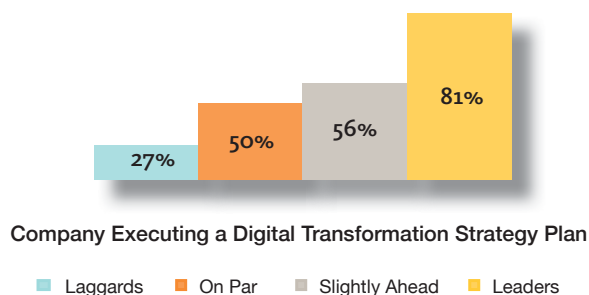
To separate the best companies at digital transformation from the rest, we surveyed 186 U.S. companies to assess how they compared with competitors in using digital technology. Their responses fell into four categories:

- 12% believed they were **significantly ahead** of competitors. We call these companies **leaders**.
- 33% were **slightly ahead** of their peers.
- 31% were **on par** with competitors.
- 24% were **significantly or slightly behind** competitors. We call these companies **laggards**.

When we compared the behavior of the leading companies to that of the laggards, two differences immediately stood out:

1. Leading companies are far more likely than laggards to be in the midst of planning and executing digital transformations. More than four out of five leaders (81%) were executing digital transformations, three times the percentage of laggards (27%). (See Figure 1.)
2. Whatever their industry, leaders are far more likely to view themselves today as running software companies – i.e., firms whose core products, services and business processes are all dependent on software to operate proficiently.

Figure 1. Digital Transformation Implementation



Despite being aware of the disruptive power of digital competition, too many companies still believe that digital disruption is confined to the technology sector, or to industries like media, music and financial services whose core product or service can be fully digitized. Such companies continue to hang on to the comforting but demonstrably false belief that the meteoric rise of technology companies like Google and Facebook holds little relevance for them. This has been a fatal mistake for incumbents in a growing number of industries.

Consider the hospitality industry. Right now, the sector is working furiously to attract and retain customers through loyalty programs and mergers (like Marriott and Starwood in 2016). One key reason: Digital players like Airbnb are leveraging the technology-enabled sharing economy to siphon off leisure travelers, especially millennials. The percentage of U.S. travelers renting private homes and apartments like Airbnb quadrupled between 2010 and 2016.¹

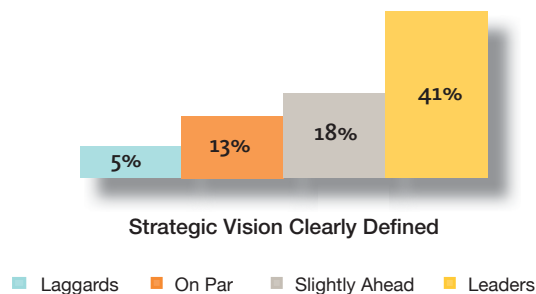
How to Act Like a Software Company

What does it mean to run a business like a software company? Our survey found that most leaders act like software companies in five distinct ways:

1. Vision: How a Company Sees Itself

Leading companies are about eight times more likely than laggards (41% vs. 5%) to have a clearly defined digital transformation strategy. [See Figure 2.]

Figure 2. The Strategic Difference



Leaders are also much more likely than laggards to use digital technologies in developing new business models and launching new businesses.

Essentially, leaders define themselves as software companies. In nearly 60% of leading companies (versus just 36% of laggards) software (including platforms, analytics and apps) is considered a key source of competitive advantage and value.

This mindset makes all the difference. An outsider might say that Peloton makes exercise equipment – a stationary bike and treadmill that are connected to the Internet and let users participate in on-demand live and archived exercise classes. But John Foley, CEO of the \$700 million (revenue) company², doesn't see it that way. "We don't want to be a stationary-bike company," he said in a magazine interview. "We want to be a disruptive tech company."

Foley has taken the idea of software-as-a-service (SaaS), popularized by companies like Dropbox, Salesforce and Cisco Webex, and adapted it to his industry. He calls what his company does "fitness-as-a-service" and imagines a world in which people pay \$100 or \$200 per month to have Peloton provide continuous upgrades to the best possible home fitness equipment.³ His investors have bought into that vision, with its latest round of financing (\$550 million) valuing the 7-year-old firm at a hefty \$4 billion.⁴

¹ Derek Thompson, "Airbnb and the Unintended Consequences of 'Disruption,'" The Atlantic, February 17, 2018, <https://www.theatlantic.com/business/archive/2018/02/airbnb-hotels-disruption/553556/>

² Griffith, Erin, "Peloton's New Infusion Made It a \$4 billion Company in 6 Years," The New York Times, Aug. 3, 2018. <https://www.nytimes.com/2018/08/03/technology/pelotons-new-infusion-made-it-a-4-billion-company-in-6-years.html>

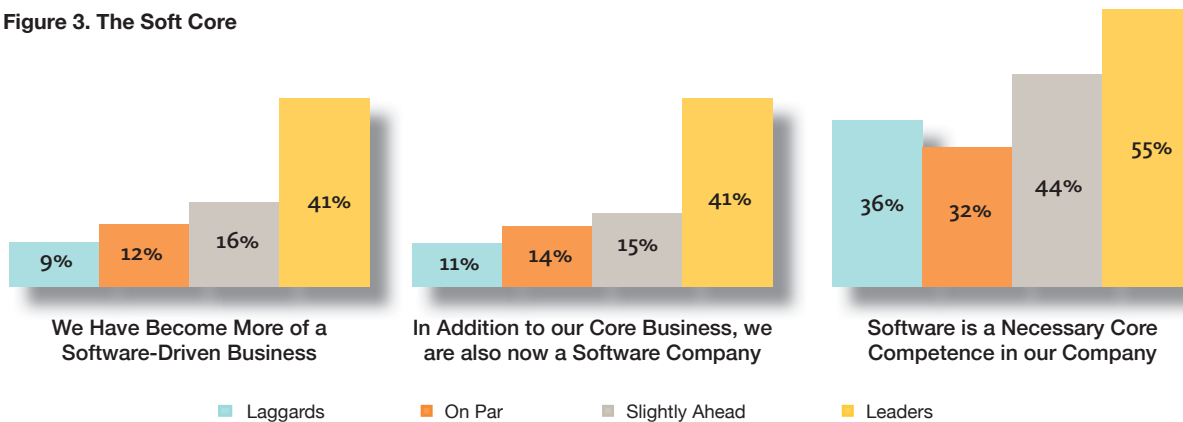
³ Schomer, Stephanie, "Peloton Unveiled a \$4,000 Treadmill -- and Everything Is Riding on It," Entrepreneur, January 9, 2018. <https://www.entrepreneur.com/article/306545>

⁴ Griffith, Erin, "Peloton's New Infusion Made It a \$4 billion Company in 6 Years," The New York Times, Aug. 3, 2018. <https://www.nytimes.com/2018/08/03/technology/pelotons-new-infusion-made-it-a-4-billion-company-in-6-years.html>

Defining their companies as software businesses allows leaders to leap over industry borders. While many people think of Amazon as an e-commerce powerhouse, the company does not. Amazon is also a cloud computing company, an entertainment producer and even a B2B distribution company. In fact, Amazon Web Services (AWS), the company's cloud computing arm, is its fastest-growing business unit. AWS pulled in \$17.5 billion in revenue while generating \$3.1 billion in operating income in 2017, thanks to margins that are much higher than those in Amazon's e-commerce division.⁵

Leaders are also much more likely to view creating and leveraging software as a core competence and see themselves as software-driven businesses. Some 41% of leading companies, in contrast to only 11% of the laggards, have also become software companies, in addition to running their core business. [See Figure 3.]

Figure 3. The Soft Core



But how could a farm, for instance, be a software company? Humans have been planting seeds and harvesting crops for thousands of years. But even in agriculture, successful established companies are making software a core competency.

For example, John Deere, once known primarily for building tractors, paid more than \$300 million to acquire a startup specializing in computer vision and machine learning. Now the company can assist its customers to better identify weeds and spray herbicides only where they're needed, potentially improving yield while reducing chemical use by 95%. This is part of John Deere's software-fueled vision to help farmers feed the growing global population by growing more food per acre while improving sustainability.⁶

Another large agricultural company, Monsanto (acquired by Bayer in 2018), spent nearly \$1 billion in 2013 to acquire The Climate Corp. The acquisition enabled Monsanto to offer hyper-personalized recommendations to farmers on improving yield and managing risk. The service uses field-data collection, advanced agronomic modeling and local weather monitoring facilitated by mobile, web-based software solutions. Monsanto sees data science as a \$20 billion revenue opportunity beyond its core business of seeds and chemicals.⁷

Then there are companies like defense contractor Raytheon. Raytheon already relies on technology to power its precision weapons, missile defense systems and sensors. But it has moved from using software as an enabler to treating it as a business opportunity. Starting in 2007, Raytheon began acquiring cybersecurity companies, unifying and rebranding them as Forcepoint. "With the Internet of things, cyber is pervasive in everything we do," Raytheon CEO Tom Kennedy said. "The entire globe has become essentially a cybereconomy."⁸

⁵Becky Peterson, Business Insider, "Amazon Web Services is Now a \$17.5 Billion Business," February 1, 2018, <https://www.businessinsider.com/amazon-web-services-2017-revenue-2018-2>

⁶Peters, Adele. "How John Deere's New AI Lab Is Designing Farm Equipment For A More Sustainable Future," Fast Company, September 11, 2017. <https://www.fastcompany.com/40464024/how-john-deeres-new-ai-lab-is-designing-farm-equipment-for-more-sustainable-future>

⁷Three sources: Monsanto Climate FieldView report from World Economic Forum (<http://reports.weforum.org/digital-transformation/monsanto-climate-fieldview/>). "Monsanto Buys Climate Corp For \$930 Million," by Bruce Upton, Forbes, October 2, 2013, <https://www.forbes.com/sites/bruceuppin/2013/10/02/monsanto-buys-climate-corp-for-930-million/#41301ba2177a>. "Climate FieldView Expands Agriculture's Largest Digital Platform," April 19, 2018, <https://climate.com/newsroom/climate-fieldview-expands-digital-platform>.

⁸Anselmo, Joe and Jen DiMascio. "Promise And Peril: Raytheon CEO On The New Technology Revolution," Aviation Week & Space Technology, January 9, 2017, <http://aviationweek.com/defense/promise-and-peril-raytheon-ceo-new-technology-revolution>.

2. Culture: The Innovation Imperative

Leaders are significantly ahead of laggards in having a corporate culture that promotes innovation and accepts risk as a necessary precursor to progress. More than three-quarters of leaders (77%) said their companies had a risk-tolerant culture of innovation. Only 34% of laggards said the same thing.

Perhaps employees at leading companies feel comfortable taking risks because they know that their CEO and other top executives support the digital transformation mission. Our survey found that almost all (91%) leaders agreed that their CEO is an active champion in using digital technology to improve business processes.

It's critical to have leaders who understand the importance of digital transformation. Many legacy print publishers with storied histories have fallen by the wayside in recent years. By contrast, Axel Springer SE, Germany's largest print publishing group, is enjoying strong revenue and earnings growth.⁹ In 2015, *The New York Times* published an article highlighting the ways in which Axel Springer CEO Mathias Döpfner prioritized digital transformation. They included sending senior managers to Silicon Valley for a nine-month immersion in American start-up culture, and acquiring *Business Insider* (a digital source of business news that had 76 million unique monthly visitors when Axel Springer acquired it in 2015¹⁰). In addition, the company cited partnerships with companies like Samsung, with which Axel Springer developed a mobile news aggregation service called Upday. The service uses algorithms to track user reading habits and serve up personalized content. All these initiatives have produced positive results. Even in 2015, these digital activities were already generating over 60% of Axel Springer's revenues and more than 70% of its operating profit – making it not just a leader, but a prophetic one.¹¹

Being a digital innovator and taking risks while others hesitate can yield big rewards for pioneers. Twenty years ago, Starbucks was one of the first companies to launch a website. It also got a jump on competitors by offering free WiFi to customers and establishing a social media presence. These early bets have paid off in a big way. While many competitors are in the early stages of setting up mobile payment terminals and building loyalty programs, Starbucks already has more than 14 million Starbucks Rewards members in its loyalty program. In addition, its mobile order and pay already accounts for 11% of its sales.¹²

There are other cultural and mindset differences that show up between leaders and laggards. For example, the vast majority of leaders (87%) have good collaboration and alignment between digital and business unit teams. Only 44% of laggards say the same.

Digital transformations can also make a company more team-oriented and collaborative. A majority (55%) of leaders agree that their company culture is moving in that direction. Barely more than one-third (36%) of laggards feel the same way.

3. Investment Strategy: Betting the House

Our research shows that leaders don't just talk about prioritizing digital transformations; they invest in it. As a result, while 42% of laggards don't have enough budget or other resources to execute their digital transformation, only 5% of leaders feel the same way.

Similarly, 37% of laggards agree that other initiatives take priority over digital transformation, while none of the leaders lets anything get in the way.

More than two-thirds of leaders (68%) have the necessary capital to invest in digital technologies, in contrast

⁹ Costello, Patrick. "Axel Springer tweaks guidance as profit, sales up," MarketWatch, November 7, 2018, <https://www.marketwatch.com/story/axel-springer-tweaks-guidance-as-profit-sales-up-2018-11-07>.

¹⁰ Shontell, Alyson. "German publishing powerhouse Axel Springer buys Business Insider at a whopping \$442 million valuation," Business Insider, September 29, 2015, <https://www.businessinsider.com/axel-springer-acquires-business-insider-for-450-million-2015-9>.

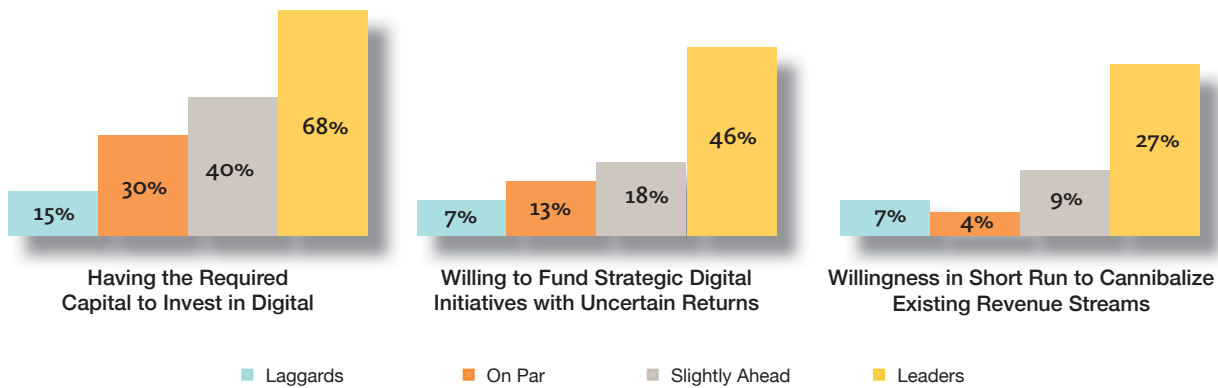
¹¹ Clark, Nicola. "An Old-Media Empire, Axel Springer Reboots for the Digital Age," The New York Times, December 20, 2015, https://www.nytimes.com/2015/12/21/business/media/an-old-media-empire-axel-springer-reboots-for-the-digital-age.html?_r=0.

¹² Foster, Liz Barrett. "5 Ways Starbucks is Innovating the Customer Experience," QSR, May 2018, <https://www.qsmagazine.com/consumer-trends/5-ways-starbucks-innovating-customer-experience>.

to less than 15% of laggards. Almost half of leading companies (46%) are willing to fund strategic digital initiatives even when the returns are uncertain. Only 7% of laggards are willing to take that leap of faith.

Leaders also are much more likely to have significantly increased investments in newer forms of software, including mobile apps, big data, advanced analytics, machine learning and open source tools during the past five years. Almost two-thirds (64%) of leaders said their firms had significantly increased investments in these areas, while less than a quarter (24%) of laggards said the same applied to their companies. [See Figure 4.]

Figure 4. Investment Evidence

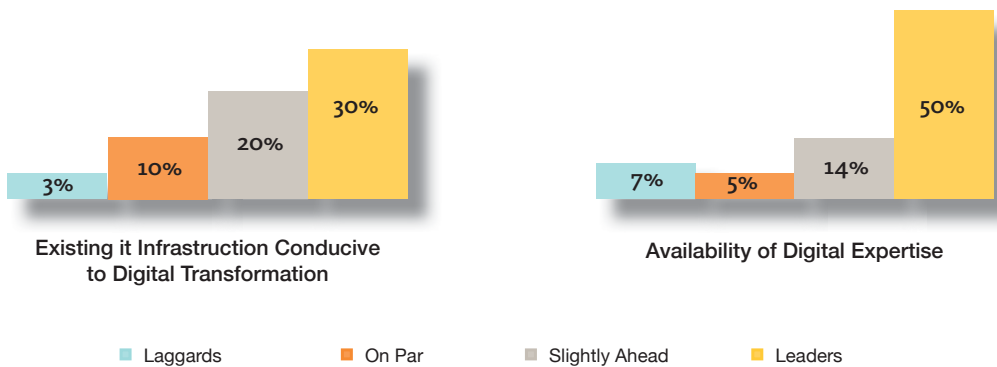


Companies like banking giant JP Morgan Chase are not afraid to bet big on digital technology. In 2015, the company spent 30% of its more than \$9 billion technology budget on digital innovations. These investments allowed the firm to serve nearly 40 million digital customers while building a private cloud environment to support over 90% of its new infrastructure needs.

4. Digital Expertise – Talent Acquisition, Talent Education

Our survey data shows that leaders are far ahead of the pack in having digital expertise as well as the IT infrastructure that facilitates digital transformation. [See Figure 5.]

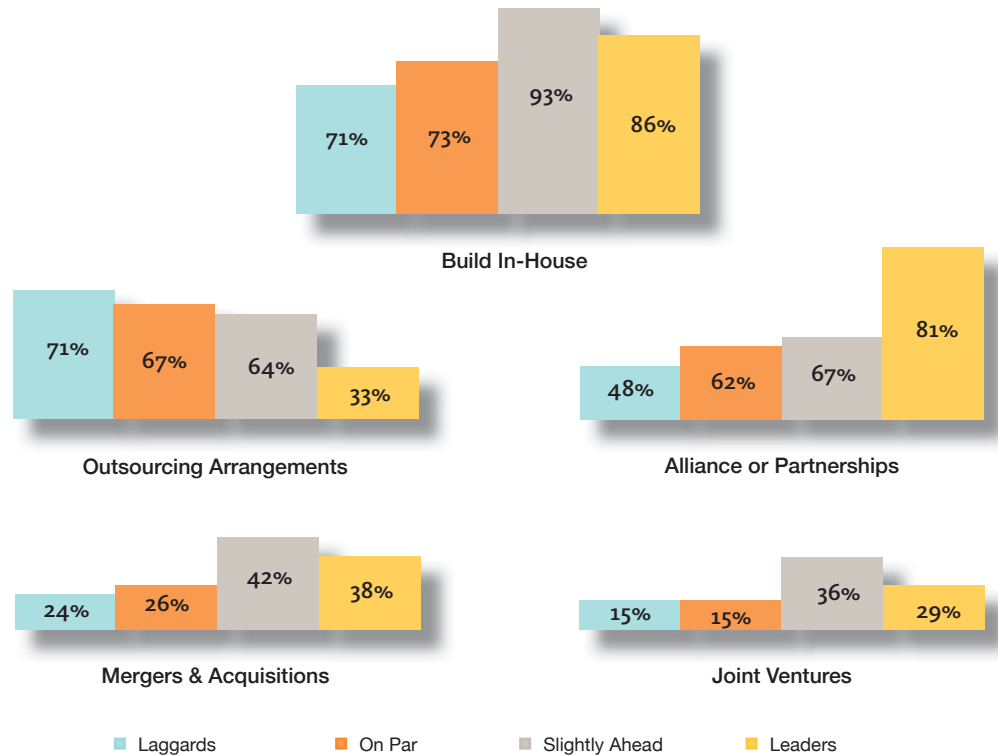
Figure 5. Infrastructure and Expertise



Digital expertise in areas such as AI, analytics, machine learning and Internet of Things is a scarce commodity. Many companies face a critical talent shortage in these disciplines.

Companies can gain digital capabilities in many ways – through alliances, partnerships, hiring digital talent, reskilling existing talent, forming joint ventures, hiring outsourcing firms or building tools and technologies in-house. Leaders are far more likely than laggards to strike alliances and partnerships to gain these skills. But they are far less likely to outsource them altogether. [See Figure 6.]

Figure 6. How Digital Capabilities Are Acquired



When companies cannot recruit the software development talent they need, they may have to turn to other options. For example, Swiss-based Schindler Group, which operates more than 1 million elevators and escalators around the world, partnered with global Chinese technology giant Huawei to analyze elevator data in real time. Using sophisticated data analytics, Huawei crunches the data in the cloud to flag potential problems before they occur. This predictive maintenance approach has helped Schindler reduce downtime by 90%, improve safety scores and lower maintenance costs by 50%.¹³

Similarly, when McDonald’s wanted to improve the functionality on its mobile app in the Netherlands, Sweden and Japan, it partnered with Plexure, a New Zealand-based company that specializes in mobile engagement software. Plexure pulled vast volumes of data from more than 40 million endpoints, processed the data in the cloud using Microsoft Azure technology, and used the resulting insights into customer behaviors to help McDonald’s give customers better, more personalized experiences and offers. After partnering with Plexure, McDonald’s saw a 700% increase in offer redemptions in the Netherlands.¹⁴

¹³ “Internet of Elevators Helps Schindler Cut Costs, Enhance Safety and Experience,” Huawei Industry Insights, <https://www.huawei.com/us/industry-insights/technology/digital-transformation/iot/internet-of-elevators-helps-schindler-cut-costs>

¹⁴ Rayner, Karen. “Boosting sales with IoT-powered customer engagement,” Plexure, February 10, 2016, <https://www.plexure.com/plexure-blog/2016/02/mcdonalds-boosts-sales-with-iot-powered-customer-engagement>

Even though these partnerships were successful, companies that recognize the importance of thinking and acting like a software company should not rely exclusively on outside expertise. In specific instances, companies may find it expedient to purchase an enterprise system, hire an outsourcing company to write software for a specific need, or even turn to widely available open-source software. But to truly gain a competitive advantage through digital technology, companies will most likely need to build some software in-house to support their key business activities.

James Bessen, executive director of the Technology & Policy Research Initiative at Boston University's School of Law, notes that proprietary software combined with complementary human or organizational capital can give firms a valuable competitive advantage in terms of productivity. By contrast, off-the-shelf systems may help companies improve their productivity or deliver better service. However, they rarely provide competitive advantage as they're available to any player in the market that can purchase them.¹⁵

Indeed, Bessen's analysis aligns with the findings of our survey, which found that leaders are less likely than laggards to turn to outsourcing to gain digital capabilities. Nearly three-quarters (71%) of laggards used outsourcing to acquire the technical capabilities they needed for their digital transformations. However, only one-third of leaders turned to outsourcing vendors, with 86% preferring to build such capabilities in-house.

Software created in-house can provide important, lasting competitive advantages. Consider the one-click ordering system that Amazon developed and patented. For many years, one-click ordering gave Amazon a major competitive advantage over other e-commerce sites that forced customers to make several clicks to complete a purchase. Today, Amazon is applying that same zeal for proprietary code to the software that underpins its highly automated Amazon Go grocery stores. If this way of shopping finds favor with consumers, Amazon will once again have used its software prowess to create a wide protective moat that competitors will have to struggle to cross.

5. Business Capability Development – Knowledge Improves the Customer Experience

Digital transformations are only successful to the extent that they enable the company to become more efficient and/or substantially improve the customer experience, thus reducing costs and/or generating more revenue.

Pure digital players like Amazon and Netflix found success because they gave customers better experiences. Amazon offers customers around the world a nearly effortless way to buy products. Netflix provides TV programming on demand, allowing viewers to watch shows when they want to.

It's clear that successful digital natives have made their mark by delivering superior customer experiences. The same is true for firms across industries that are leaders in using digital technologies.

Our survey found that digital leaders enjoyed a large advantage in customer experience over lagging firms. Nearly half (46%) of leading companies report that digital technologies have helped in delivering better customer experiences. Only 10% of laggards say the same.

Improving the customer experience takes proprietary knowhow that includes expertise to develop new products, new processes, new business models and other drivers of competitive advantage, customer interest and loyalty. Increasingly, businesses are seeking competitive advantages by using software to codify their knowhow. When knowhow is uncoded, it must be transmitted by analog means – from one human to another, with all the attendant inefficiencies and possibilities for errors to creep in.

But once a process, algorithm, formula or other form of knowhow is codified in software, it can be shared and accessed digitally, instantly, anywhere in the world, at any time, by anyone with the authorization and interest to do so. Digitization allows companies to more easily scale and monetize their knowhow.

¹⁵ Bessen, James. "The Policy Challenge of Artificial Intelligence," CPI Antitrust Chronicle, June 2018, <https://www.competitionpolicyinternational.com/wp-content/uploads/2018/06/CPI-Bessen.pdf>.

When Walt Disney Company wanted to improve the customer experience at Walt Disney World in Orlando, Florida, it did not spend \$1 billion on upgrading a ride like Space Mountain. Instead, it invested in a software platform (MyMagic). It improves the customer experience by letting guests use a digital wristband (MagicBand) as their ticket, hotel key and payment device for navigating the park. It thereby embedded knowhow about how to smooth customers' time at the park into its software.

The online and mobile app component of the program, My Disney Experience, continues to evolve as Disney constantly looks for possible improvements. For instance, the technology lets guests book skip-the-line Fastpass reservations for rides up to 30 days in advance (or 60 days in advance if they are staying at a Disney hotel). Subsequently, revenue per visitor has climbed substantially, guests have a better experience, and the park can accommodate more guests because the software has improved logistics so that each guest spends less time waiting in line for rides, food and other items.¹⁶

Carnival Cruise, operator of more than 100 ships, is also using technology to upgrade its guests' experience. Its quarter-size wearable OceanMedallion and accompanying app let guests set up port activities and designate food and drink preferences before they board. Once on board, the wearable device interacts with 7,000 sensors, 4,000 digital interaction points, hundreds of miles of cables and an on-board cloud data center to let guests do everything from unlock their stateroom to order lunch to buy a bottle of suntan lotion.¹⁷

Carnival and Disney are acting like leaders by using proprietary software to improve their operations. It gives them a better understanding of customer behavior and codifies that knowhow into software code. Our survey showed that at least 50% of leaders have used digital technology this way. The corresponding figures for laggards are far worse, with the percentage using digital technology for any of these purposes ranging from 2% to 11%.

Based on our research findings and examples, we believe the best way for executives to digitally transform their company is to think of it as a software business. That requires codifying the firm's product/service offering, business processes and other expertise and knowledge into software that can be leveraged using digital platforms.



¹⁶ Levine, Arthur. "Disney parks tech upgrades make visiting more convenient," USA Today, February 27, 2018, <https://www.usatoday.com/story/travel/experience/america/theme-parks/2018/02/27/disney-parks-magicbands-fastpasses-app/374588002/>.

¹⁷ Mottl, Judy. "How Carnival Cruise is taking customer experience to the next level," RetailCustomerExperience.com, July 12, 2018, <https://www.retailcustomerexperience.com/articles/carnival-cruise-summit-keynote/>.

Four Steps to Becoming a Software-Driven Business

Acting like a software company may help companies implement digital transformations and carve out strong competitive positions. However, it is not easy for companies to recast themselves as software firms. So exactly how can they do this?

Here are four steps companies can take to become software-driven businesses:

1. **Focus on using software to build on core competencies.** Determine what your company does well already and in which areas you could use software to increase revenue and create customer value. Look for ways that digital technology could enable dramatic improvements in operations, products or services.
2. **Codify proprietary knowhow.** Software generates proprietary data that can have beneficial ripple effects throughout your business. Disney built MyMagic to improve the logistics of moving customers through its theme parks. However, the data it retrieved has given Disney new insights into visitor behavior, including what products and services are most in demand – and therefore most profitable – throughout its properties.
3. **Rethink the business model.** As you become a software-driven business, you will acquire data that you've never had before and gain new capabilities that others might need. Investigate whether these new resources and capabilities could yield revenue, provide new services to customers or have some other beneficial impact on your business model. For instance, Amazon needed a huge data center to support its fast-growing e-commerce business. At some point, it realized other companies could also benefit from the data center capabilities it had built and turned its own cloud into the immensely profitable Amazon Web Services.
4. **Think big.** Software companies become dominant by scaling fast. Once a huge number of customers use the software, it becomes the industry standard. Operations become dependent on the software, which provides a significant (though not insurmountable) barrier to entry for competitors. It's fine to start with pilot programs to test ideas, but you should have plans to scale promising ideas quickly. Unlike with physical products or even services that have to be delivered by human providers, good software products can go viral and scale incredibly quickly. So, it makes sense to aim high and have plans in place to ramp up fast once a data-based service or product gets traction.

Conclusion: The Time to Act is Now

The world runs on software. The experiences of John Deere, Monsanto, Raytheon, Starbucks, JP Morgan Chase, Walt Disney, Carnival Cruise Lines, Axel Springer, and many more demonstrate that executives who invest, innovate, take risks and rapidly scale winning ideas can make software an engine of growth.

By taking steps toward digital transformation now, companies can achieve or preserve leadership positions in their sectors rather than scrambling to play catchup when digital disruptors show up at their gates.

Digital Transformation Survey Methodology

UC Irvine fielded its latest Digital Transformation Survey from Feb. 10 to May 30, 2018. During that time, we received responses from 186 senior executives including presidents, CEOs and other C-suite executives. Each survey response came from different companies.

A majority of the responding executives came from the manufacturing, finance, insurance and real estate. However, a number of other industries including trade, business services, professional services, information, mining/utilities and construction were also well-represented in the survey results.

Nearly two-thirds of the executives work for companies with at least \$1 billion in annual revenue.

We saw more diversity in the size of the companies represented. The largest group of executives (31%) came from companies with 10,000 to 99,999 employees. But sizable percentages also worked at smaller firms, with 25% working for companies with 1,000 to 5,000 employees and 18% representing firms with fewer than 500 employees.

About the Authors

Vijay Gurbaxani is the Founding Director of the Center for Digital Transformation and Taco Bell Professor of Business & Computer Science at UC Irvine. His research, teaching and consulting interests are at the intersection of business strategy and information technology (IT). His approach is distinctive in its use of economic principles as the lens with which to analyze strategic management questions. Vijay has extensive experience in management education and advisory services, having lectured worldwide on management issues, taught extensively in degree and executive programs, and consulted for and provided research expertise to Fortune 500 companies, technology service providers, and consulting firms.

Debora Dunkle is Director of Research in the Center for Digital Transformation in the Paul Merage School of Business at UC Irvine. She has been deeply involved for over 30 years in research on the social and economic impacts of technology and has extensive experience in the design and implementation of surveys.

About the Center for Digital Transformation

The Center for Digital Transformation, a Center of Excellence at The Paul Merage School of Business at UC Irvine, has been built on the belief that digital technologies are transforming the strategy and structure of business enterprises. The Center's vision is to be an influential voice and catalyst for advancing the competitiveness and productivity of businesses in the digital economy by providing executives with a better understanding of the dynamics of this profound technological shift and of what these forces mean for their industries and organizations.

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