The Digital (R) Evolution: Transforming Business Models



 \mathbf{I}

T

 (\mathbf{f})

 \bigcirc





۲

The Britt Technology Impact Series is made possible by a generous donation from Tuck and Dartmouth alumnus Glenn Britt, former CEO and Chairman of Time Warner Cable, and his wife, Barbara Britt. In giving the gift, Glenn stated: "The role of business people is to understand the possibilities created by new technologies, recognize unmet consumer or business needs they could fulfill, and determine if the new technology and the customer needs can be put together in a business model that makes sense." The Center for Digital Strategies structures the Britt Series so it highlights relevant aspects of a set of technologies, examines business models and illustrates how consumer and corporate needs are being met.

Joan Magretta explained the simplistic genius of business models in a 2002 HBR article entitled, *Why Business Models Matter*, by explaining "They are, at heart, stories—stories that explain how enterprises work. 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?"

Business models are at the core of the enterprise (or should be) because they are fundamental to how that enterprise thinks about serving its customers and solving a particular problem of set of problems. New digital technologies increase both the types of problems experienced by enterprises and the methods available to solve those problems.

Today, we are experiencing rapid growth in the types of business models enabled by digital technologies. They are transforming traditional industries and creating entirely new categories. Digital technologies enable radically new go-to-market approaches and product/service combinations. Entire value chains are impacted, creating new customer value propositions and monetization paths.

Business model changes enabled by technology are causing disruption across all sectors of the global economy. Established businesses must recognize these changes and transform their organizations to both mitigate new threats and take advantage of new opportunities created by digital technologies.

The 2015-16 Britt Technology Impact Series (BTIS) explored the challenges and opportunities driven by digital technologies in a series titled, "The Digital (R)Evolution: Transforming Business Models."





RECOGNIZING AN URGENT PROBLEM

Silicon Valley is coming. So said JPMorgan Chase CEO, Jamie Dimon in his 2015 letter to shareholders. The statement was meant to describe the rise of FinTech companies as a threat to traditional banks, but the sentiment is applicable across the business landscape today. Digital companies making use of new and emerging technologies and business models and not weighed down by legacy systems and process are increasingly competing with entrenched enterprises across all industries.

This report is designed to evaluate the opportunity created by digital transformation, understand the factors and technology trends driving change, evaluate the speed of change, and outline recommendations executives can use to transform their businesses to meet the emerging threats from digital disruptors.



Urgency Driving Digital Transformation

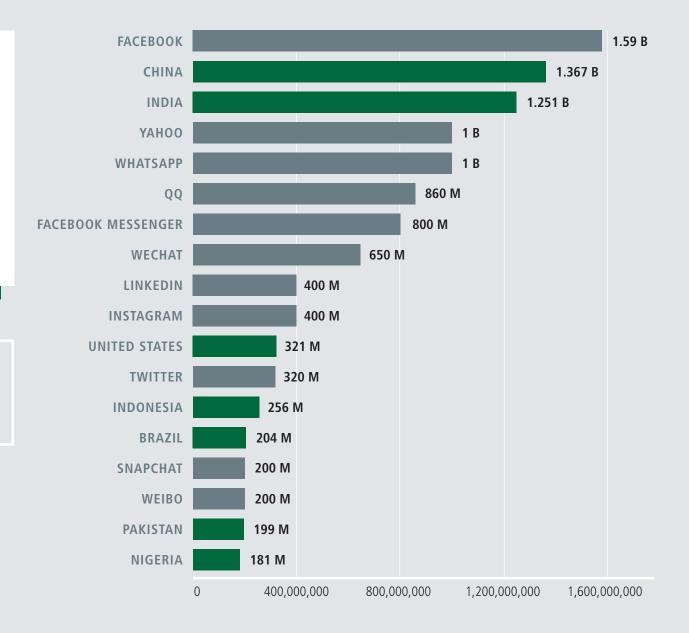
The pace at which technology is transforming all business sectors is staggering. This is largely driven by the sheer volume of people and devices now in use around the world. The availability of technology, and the rapidly advancing capabilities of technology, are driving innovation and new businesses forward at an incredible rate. In fact, social media platforms have overtaken the largest countries in the world in terms of population.

With billions of customers and devices all creating one giant interconnected network, businesses need to rethink how they operate and structure themselves, or risk losing in the digital age. Executives need to understand the profound change as the world embraces emerging technologies.

COUNTRY POPULATIONS AND APP USERS

"By 2020, more than seven billion people and businesses, and at least 30 billion devices, will be connected to the Internet. With people, businesses and things communicating, transacting, and even negotiating with each other, a new world comes into being — the world of digital business."

> APP COUNTRY



Source: Business Insider

The Six Megatrends from the World Economic Forum

In 2015, the World Economic Forum's Global Agenda Council on the Future of Software and Society set out to help people prepare for changes enabled by software. They identified six digital megatrends that are expected to have an out-sized impact on the world in the coming decades. Those trends are:

PEOPLE AND THE INTERNET – How people connect with others, information and the world around them is being transformed through a combination of technologies. Wearable and implantable technologies will enhance people's "digital presence", allowing them to interact with objects and one another in new ways.

COMPUTING, COMMUNICATIONS AND STORAGE EVERYWHERE – The continued rapid decline in the size and cost of computing and connectivity technologies is driving an exponential growth in the potential to access and leverage the internet. This will lead to ubiquitous computing power being available, where everyone has access to a supercomputer in their pocket, with nearly unlimited storage capacity.

THE INTERNET OF THINGS – Smaller, cheaper and smarter sensors are being introduced – in homes, clothes and accessories, cities, transport and energy networks, as well as manufacturing processes.

ARTIFICIAL INTELLIGENCE (AI) AND BIG DATA – Exponential digitization creates exponentially more data – about everything and everyone. In parallel, the sophistication of the problems software can address, and the ability for software to learn and evolve itself, is advancing rapidly. This is built on the rise of big data for decision-making, and the influence that AI and robotics are starting to have on decision-making and jobs.

THE SHARING ECONOMY AND DISTRIBUTED TRUST – The internet is driving a shift towards networks and platform-based social and economic models. Assets can be shared, creating not just new efficiencies but also whole new business models and opportunities for social self-organization. The blockchain, an emerging technology, replaces the need for third-party institutions to provide trust for financial, contract and voting activities.

THE DIGITIZATION OF MATTER – Physical objects are "printed" from raw materials via additive, or 3D, printing, a process that transforms industrial manufacturing, allows for printing products at home and creates a whole set of human health opportunities.

6

WORLD ECONOMIC FORUM TIPPING POINTS EXPECTED TO OCCUR BY 2025

As part of its research to uncover the digital trends impacting businesses, the World Economic Forum surveyed business leaders around the world on whether or not they expect a specific "event" or technology to be adopted by the year 2025. The results from that survey revealed the likelihood that these key tipping points (greater than 50% adoption) would occur in the next decade. The Council identified 21 examples of these tipping points which will have far-reaching impacts on human health, the environment, global commerce and international relations.

Center Executive Director, Hans Brechbühl, is a member of the World Economic Forum's Global Agenda Council on the Future of Software & Society responsible for creating the Deep Shift report.

Source: Deep Shift: 21 Ways Software Will Transform Global Society, Global Agenda Council on the Future of Software & Society, World Economic Forum (November 2015)

10% of people wearing clothes connected to the internet	91.2
90% of people having unlimited and free (advertising-supported) storage	91.0
1 trillion sensors connected to the internet	89.2
The first robotic pharmacist in the US	86.5
10% of reading glasses connected to the internet	85.5
80% of people with a digital presence on the internet	84.4
The first 3D-printed car in production	84.1
The first government to replace its census with big-data sources	82.9
The first implantable mobile phone available commercially	81.7
5% of consumer products printed in 3D	81.1
90% of the population using smartphones	80.7
90% of the population with regular access to the internet	78.8
Driverless cars equaling 10% of all cars on US roads	78.2
The first transplant on a 3D printed liver	76.4
30% of corporate audits performed by Al	75.4
Tax collected for the first time by a government via a blockchain	73.1
Over 50% of internet traffic to homes for appliances and devices	69.9
Globally more trips/journeys via car sharing than in private cars	67.2
The first city with more than 50,000 people and no traffic lights	63.7
10% of global gross domestic product stored on blockchain technology	57.9
The first AI machine on a corporate board of directors	45.2

%



Digital Is Causing Disruption

Digital businesses are already creating significant disruption, and that disruption is expected to spread. The growth is both due to innovation by digital businesses and the inability of traditional businesses to respond, as Forrester Research found in a recent survey:

ANYONE WHO HAS AN IDEA AND IS AN ENTREPRENEUR CAN LAUNCH A SITE. IT'S JUST THAT EASY.

- CARLY ROSENBERG T'05, BLUEFLY



FORRESTER®

Forrester finds that 93% of global business and technology decision makers believe that digital technologies will disrupt their business over the next 12 months.

But also finds that just 15% believe they have the right people and skills to execute a digital strategy.



Source: Forrester/Russell Reynolds 2014 Digital Business Survey

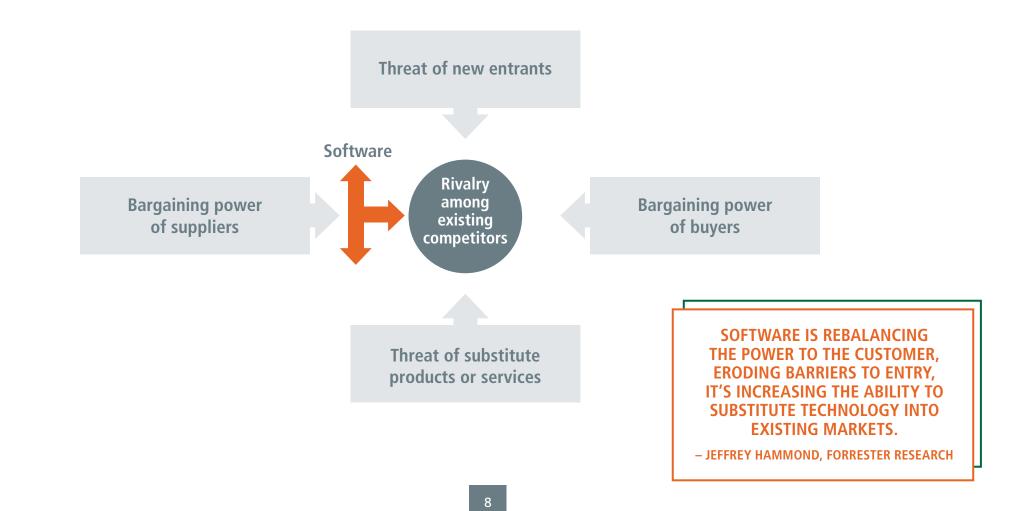


The best digital companies are, software companies identifying gaps in existing industries and business

models that can be improved upon and/or exploited to better serve customers or offer services at a lower price than traditional businesses.

It's not only the gaps that matter, as Donna Vinci of Bank of Queensland pointed out in a discussion about the impact of Uber. Technological disruptions impact other industries and entire value chains. In the case of Uber, it not only changes the way cars are purchased and used, but has significant impact on the entire value chain, such as insurance. Vinci pointed out, "these changes have knock-on effects of disruption all through the value chain."

As Forrester's Jeffrey Hammond highlights, "Software is rebalancing the power to the customer, eroding barriers to entry, it's increasing the ability to substitute technology into existing markets." He provided the following diagram to show just how software is filling gaps and disrupting traditional businesses:

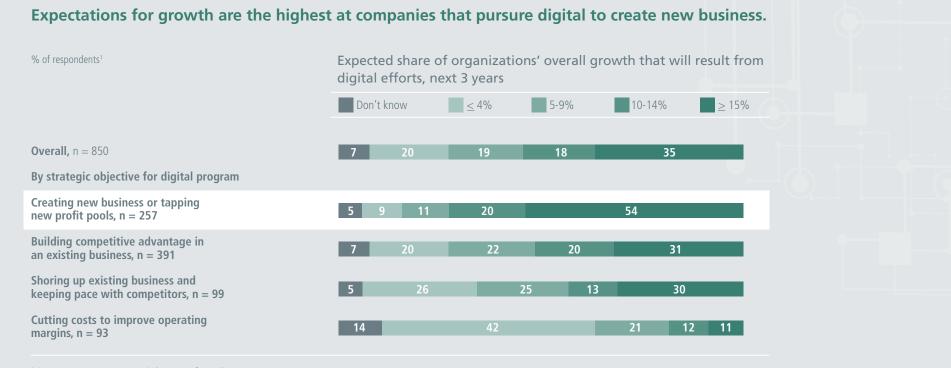




Digital Programs Are Driving Growth Expectations

Digital technologies aren't only creating problems for traditional businesses; they're also expected to drive growth for most companies. Pressure on chief executives to grow their businesses using digital strategies are fueling anxiety at the same time they are creating opportunities.

McKinsey survey results demonstrate just how important digital programs are for driving growth, with more than half of executives in a recent survey indicating these programs are expected to create new business and profit pools.



¹Figures may not sum to 100%, because of rounding

Source: McKinsey Global Survey results The digital tipping point

With such significant focus on digital as a growth engine, executives need a better understanding of the specific factors driving digital disruption to be able to respond to threats and develop strategies to drive growth with digital technologies.



UNDERSTANDING FACTORS DRIVING DISRUPTION

Digital technologies are driving immense change across all sectors of the economy. But why? Referencing Porter's Five Forces, Jeffrey Hammond of Forrester Research explained:

"Software is doing three things at once: making it easier for new entrants to come into the market, increasing bargaining power of buyers, and making the threat of substitute products or services easier than at any other point in time."

Agreeing with Hammond, Michael Krigsman of CXOTalk.com referenced Marc Andreesen, in his landmark article, *Why Software Is Eating the World*. In that article, Andreesen explained, "All of the technology required to transform industries through software finally works."

While it's true the reality has frequently failed to meet the promise of digital disruption, that's no longer the case. Software, infrastructure and strategy are all mature enough to deliver on that promise. As software and the supporting technologies now work, it's important to evaluate specific factors driving innovation and disruption.

A LOT OF THESE TECHNOLOGY CHALLENGES THAT WE HAVE DIDN'T NECESSARILY NEED TO BE ADDRESSED WHEN THINGS WERE GOOD. EVERYONE WAS MAKING MONEY, MARGINS WERE GOOD. THAT'S INCREASINGLY UNDER PRESSURE AND WE REALIZED WE NEEDED TO ADAPT.

– JOHN BURNETT T'09, STATE STREET BANK

Factors Driving Business Model Disruption

According to McKinsey, there are seven factors driving business model disruption:

- **1.** New pressure on prices and margins
- 2. Competitors emerging from unexpected places
- **3.** Winner-takes-all dynamics
- 4. Plug-and-play business models
- 5. Growing talent mismatches
- **6.** Converging global supply and demand
- 7. Relentlessly evolving business models—at higher velocity

This is an excellent list, but there is one more factor that must be added: the emergence of the customer as a much more powerful player in business relationships and transactions. And technology is changing customers in unforeseen ways.

As Altimeter Group Analyst, Brian Solis, notes, "If consumer behavior is evolving as a result of technology, businesses either compete to get ahead of it, they perpetually react to it, or they belittle it. One of the most problematic aspects around digital maturity is that technology is both part of the solution and also part of the problem."



TRANSFORMING INTO A SOFTWARE COMPANY

SOFTWARE CAN SOLVE BUSINESS PROBLEMS.

- CARLY ROSENBERG T'05, BLUEFLY

A key path forward for traditional businesses facing digital disruption is to transform their businesses to be more software-first in their mindset. Essentially, businesses need to become software businesses themselves, or at least think like one.

While this isn't a prescription for all companies, even the most physical businesses have already transformed into digital, software-focused companies. McKinsey outlines several reasons transforming your business to think like a software company, including:

ENHANCING interactions among customers, suppliers, stakeholders, and employees

IMPROVING management decisions as algorithms crunch big data from social technologies or the Internet of Things

ENABLING new business or operating models, such as peer-to-peer product innovation or customer service

FORRESTER'S JEFFREY HAMMOND OUTLINED FOUR SPECIFIC SKILLS COMPANIES MUST MASTER TO TRANSFORM IN A SOFTWARE COMPANY:

CUSTOMER
EXPERIENCES SOFTWARE PRODUCT
THINKING RAPID, ITERATIVE
DEVELOPMENT ECOSYSTEM
BUSINESS MODELS

Taken together, these four principles illuminate why design thinking has become so important in the modern digital age. It's not a surprise that design firms, such as IDEO and frog design, have risen to prominence during the digital age.

Frog focuses on design thinking, but also further deepens their approach with emphasis on experience strategy. As frog's Patrick Kalaher D'91 explains, "Experience Strategy choreographs interactions between people, products, and services over extended periods of time."



Experience Strategy as a Path to Digital Transformation

Frog focuses on building lasting experiences for its customers. To support it in this endeavor, the design firm created a framework that focuses on three key imperatives for experience strategy:



DON'T JUST MAKE THINGS

Break the cycle of building a newer, faster, cheaper version of the same product by focusing on customers and their needs. Building a new product is secondary to identifying customer need.



CREATE ANCHOR POINTS

Anchor points create positive customer experiences and build reliability into customer relationships.



ORGANIZE FOR SUCCESS

The structure of your organization will be reflected in the products you create. Think about the type of products you create and whether your existing organizational structure reflects those products.

Building on its three imperatives of experience strategy, frog advocates for building an experience platform, consisting of products, strategy, design and your organization, all aligned to build better experiences for customers.

FOCAL POINTS TO BUILD AN EXPERIENCE PLATFORM

Signature Product Design – Drive change in organizational thinking through the launch of lighthouse products

Connected Ecosystems – Connect your products and services together into more effective ecosystems to capture greater value

Unified Experiences – Provide the tools and strategies to align your user experience across disparate teams.

Creative Culture & Processes – Empower teams to work more creatively collaboratively to address user needs.

Organizational Impact – Change your organizational culture from engineering driven to human centered.



Think Like a Software Developer

Software thinking is important when transforming your business. Jeffrey Hammond of Forrester Research outlined several traits of modern software applications that are both excellent guidelines for building software solutions and also important strategic advice for traditional businesses applying software thinking at their companies.

SEVEN TRAITS OF MODERN APPLICATIONS, APPLIED TO BUSINESS STRATEGY

- **1. Omni Channel Clients** Think about the many ways you can and do reach your customers and address them in a coordinated manner, whether digitally or in traditional channels
- **2. Deployed on Elastic Infrastructure** Cloud solutions allow greater adaptability and should be leveraged for infrastructure deployment; Additionally, think about future needs and growth of your business and leverage the most adaptable solutions possible
- **3. Aggregate Discrete Services** Stop managing discrete services and instead find ways to aggregate those services in a coherent way
- **4. Use Managed APIs** You don't need to build everything anew; APIs are a great way to link systems and information together; Similarly, think about disparate systems and teams at your organization and find ways to enable connections internally that benefit your business



- 5. Integrate Open Source Software Open source software allows you to rapidly develop and deploy solutions without starting from scratch; in your business, find ways to leverage existing resources internally or externally through partnerships and rapidly build solutions
- **6. Employ Continuous Delivery** Software developers never stop delivering product, whether its updates or new releases or entirely new products; Think about the many ways you can continually develop and deliver products and services to your customers
- **7. Gather Fast Feedback** Software development is a perpetual iterative process to make improvements and fix issues; Take a look at how you gather feedback and make adjustments to your business and apply the same principles of constant feedback loops and improvement to products and services

Thinking like a software company can help traditional businesses adapt to the change caused by digital disruption and transform into a leading digital business.

DEEPER DIVE: WHAT IS AGILE?

The Agile software development framework was created to help developers create better software, and it can help your business digitally transform.

What is Agile Software Development?

Agile Software Development is an umbrella term for a set of methods and practices based on the values and principles expressed in the Agile Manifesto. Solutions evolve through collaboration between self-organizing, cross-functional teams utilizing the appropriate practices for their context.

VALUES OF AGILE SOFTWARE DEVELOPMENT

1. Individuals and interactions over processes and tools	2. Working software over comprehensive documentation	3. Customer collaboration over contract negotiation	4. Responding to change over following a plan
---	---	--	---

PRINCIPLES OF AGILE SOFTWARE DEVELOPMENT

1.

Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.

6.

The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

11.

The best architectures, requirements, and designs emerge from self-organizing teams.

2.

Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.

7.

Working software is the primary measure of progress.

12.

At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

3.

Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.

8.

Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.

4.

Business people and developers must work together daily throughout the project.

9.

Continuous attention to technical excellence and good design enhances agility.

5.

Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.

10.

Simplicity--the art of maximizing the amount of work not done--is essential.

TAKEAWAY:

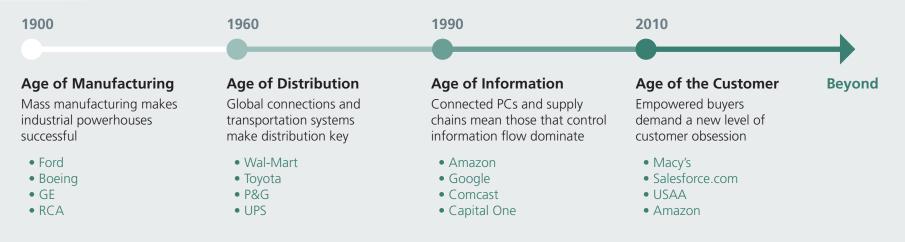
Both legacy systems and thinking harm your ability to react quickly to changing dynamics. Applying Agile philosophy to business strategies is an effective way to transform your organization.



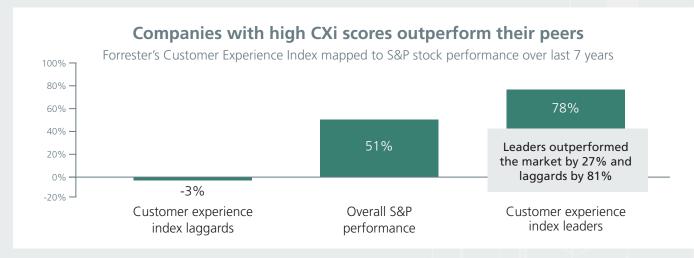
RECOMMENDATIONS FOR ENTERPRISES

RECOMMENDATION #1: Focus on the Customer

Effective digital transformations start with a clear understanding of your customer. We live in the Age of the Customer, so any digital transformation should start with customer empathy.



Knowing your customer leads to demonstrated improvements in performance, according to Forrester Research:





RECOMMENDATION #1: Focus on the Customer (cont.)

The following approaches are critical in your focus on the customer:

- Place the customer at the center of your strategy
- Identify and internalize the customer journey
- Data is important, collect it to get to know your customer
- Personalization comes from knowing your customers
- Design thinking can be used to better meet customer needs/demands
- Social is important for monitoring change

YOU HAVE TO REDEFINE THE CUSTOMER JOURNEY IN THE DIGITAL AGE. WE HAVE TO DESIGN THE DIGITAL CUSTOMER JOURNEY MUCH EARLIER IN THE PROCESS.

- TIM GUDE, VOLKSWAGEN AG

RECOMMENDATION #2: Focus on Software and Software Thinking

The economics are in your favor if you develop software solutions and apply software thinking to your business challenges.

- Leverage Open Source Tech/Code
- Design for experience
- Repeat, repeat, repeat

RECOMMENDATION #3: Design Around Experience

Focus on customer experiences, not physical products. Designing for customer experience will build durable relationships and free your business from constraints anchored to product-centric thinking.

RECOMMENDATION #4:

Continuously Innovate New Business Models and Manage Multiple Business Models at the Same Time

Business leaders must continually innovate new business models to stay ahead. Competitors will emerge with new business models on an increasing basis, and wise leaders will innovate to stay ahead. When in doubt, apply Agile to your business, not just software.

Additionally, because multiple opportunities exist to monetize components or the entirety of your business, you are now able to manage multiple business models at the same time. Never stop creating and evolving your business models!

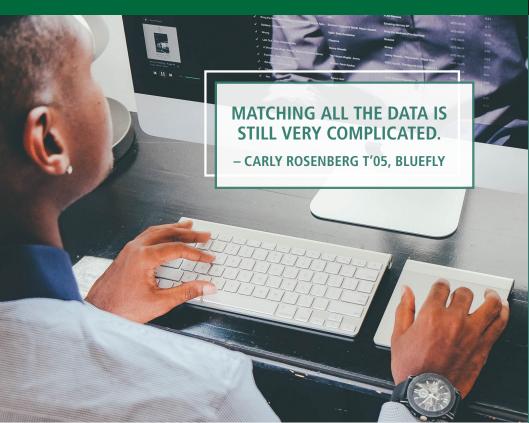


RECOMMENDATION #5: Develop a Platform/Ecosystem Strategy

When developing digital strategies and innovating on your business model, consider a platform strategy. Identifying solutions that not only support your business, but enable the businesses of others will pay off in much larger ways. Ask yourself, can you provide other businesses with a solution? If yes, consider creating a platform business.

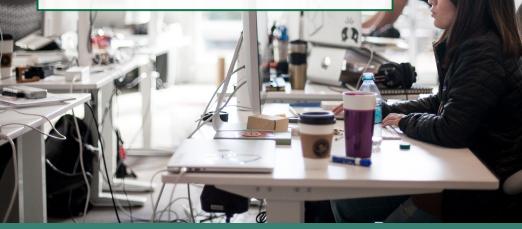
RECOMMENDATION #6: Consider Strategic Partners

You are not alone on an island. Your business already exists within an ecosystem connected to a network of customers, partners and other related businesses. Partnerships are a great way to deepen your customer relationships within that ecosystem.



WE HAVE TO REACT FASTER ON CHANGES IN DESIGNS. TAKING FEEDBACK FROM MARKETS AND BE FASTER WITH NEW PRODUCTS ENTERING THE MARKET.

- MAX BRAUN, SWAROVSKI



RECOMMENDATION #7: Build Out Data and Analytics Capabilities

Data is a significant component of digital business models and can provide strategic advantages as well as be its own business. Key questions to ask yourself when thinking about how data can support your digital business transformation include:

- What does your company know about its customers?
- What gaps exist in your data operations?
- What other sources of data can you tap into?
- Do you have the talent needed to collect, analyze and operationalize data?



RECOMMENDATION #8: Embrace Emerging Technologies

Emerging technologies will impact your business and change customer behavior. Wise executives review emerging technologies and consider future applications and business models aligned to those technologies and the changes in customer behavior they will cause.

The World Economic Forum survey results outline when emerging technologies should be mainstream, which can help executives plan for their inclusion in business models:

THE TECHNOLOGY IS MUCH EASIER, IT'S CULTURAL THAT'S HARD. YOU HAVE TO CREATE AN OPERATING MODEL THAT CLEARS THE BLOCKAGES.

- DONNA VINCI, BANK OF QUEENSLAND

2018	2021	2022	2023	2024	2025	2026	2027
• Storage for All	• Robot and Services	 The Internet of and for Things Wearable Internet 3D Printing and Manufacturing 	 Implantable Technologies Big Data for Decisions Vision as the New Interface Our Digital Presence Governments 	 Ubiquitous Computing 3D Printing and Human Health The Connected Home 	 3D Printing and Consumer Products Al and White-Collar Jobs The Sharing Economy 	 Driverless Cars Al and Decision- Making Smart Cities 	• Bitcoin and the Blockchain

and the Blockchain

RECOMMENDATION #9:

Organize for Success

A critical component of operationalizing your digital strategies is the human capital required to execute those strategies. Identifying talent requirements and organizational design limitations is a key to success. Several considerations for organizing for success:

- Consider creating a separate business unit to design, build and manage new business models/units
- Unburden teams from your company's legacy
- Allow employees and teams to operate more independently
- Avoid cannibalizing existing profits with new ventures and business units



CONTRIBUTING EXECUTIVES

Our thanks to the following executives spoke to MBAs at Tuck as part of the 2015-16 Britt Technology Impact Series.

Alex Burgess T'09 Director of Customer Experience Design Liberty Mutual Insurance



John Burnett T'09 VP, Global Strategy Emerging Technologies State Street



Max Braun CIO Swarovski



Alison Gregg Corcoran T'86 SVP, Marketing

Staples



Jeff Blackburn D'91 SVP of Worldwide Business Development Amazon.com



Phil DeGisi T'09 CMO CommonBond





CONTRIBUTING EXECUTIVES

Tim Gude

Corporate Executive Director IT Finance and HR Volkswagen AG



Jeffrey Hammond VP and Principal Analyst Forrester Research



Elisabeth Hartley T'05

Head of Portfolio Strategy and Product Development Beats by Dr. Dre



Annie Hsu T'11

Director, Strategy Frog



Patrick Kalaher D'91 VP, Technology Strategy Frog



Michael Krigsman Founder CXOTalk





CONTRIBUTING EXECUTIVES



Levi Strauss & Co



Dominic Paschel VP, Corporate Finance and Investor Relations Pandora Media

PANDORA

Carly Rosenberg T'05 CMO Bluefly

Bluefly.

Donna Vinci

Group Executive, Enterprise Solutions Bank of Queensland



Larry Weber Chairman and CEO Racepoint Global

TACEPOINE



The Center for Digital Strategies at the Tuck School of Business at Dartmouth promotes the development and implementation of digital strategies — the use of technology enabled processes to harness an organization's unique competencies and support its overall business strategies.

Alva Taylor	Associate Professor of Business Administration, Faculty Director, Center for Digital Strategies
Hans Brechbühl	Executive Director, Center for Digital Strategies, Adjunct Associate Professor
Patrick Wheeler	Assistant Director / Editor
Sonia Faciszewski	Marketing & Communications Manager / Copy Editing
Ross Dutille	Program Coordinator / Copy Editing
Heather Gere	Videography
Daniel Maxell Crosby	Videography Jones Media Center, Dartmouth College



2015-16 CDS MBA Fellows

Kaia Davis Raghav Gupta Jasmin Herrera Christopher Hogan Justin Holzwarth

Preeti Kanther

Neil Kulkarni

Mathew Sevin Robert Wilson

arth Zheng (Zane) Zheng

The CDS MBA Fellows contributed project research and conducted exclusive interviews with many of the executives which informed this report.



100 Tuck Hall Hanover, NH 03755-9000 USA 603-646-0899 | digitalstrategies.tuck.dartmouth.edu

CONNECT WITH US ON SOCIAL



www.facebook.com/CenterDigital





www.youtube.com/TheCDSatTuck

www.linkedin.com/company/tuck-center-for-digital-strategies

