PERSPECTIVES

VOL. 07

THE RESPONSIVE ENTERPRISE

OPERATIONS EVOLUTION: INSIDE OUT TRANSFORMATION

TATA CONSULTANCY SERVICES

An Era of Business Renaissance

It is a very interesting era in which to be an executive. Because of digital technologies, the opportunities for those who run large companies—to reimagine nearly everything from their fundamental business model to their customer offerings to the way they create demand and supply—are unprecedented.

In my travels, many of our clients' CEOs tell me this. And it absolutely holds true in our own business.

But here's the rub: these very same opportunities are available to startup companies, many of which have multiple sources of abundant capital available for the taking, from both venture capital firms and established companies that want to be part of the next disruptive success story.

When we look back at this era, I firmly believe we will find the winning companies were those that were most responsive to the ways customers wanted to do business. Such responsive enterprises reject the conventional industry wisdom about customer needs and the best ways to answer them.

And perhaps that is what is most rewarding about being part of a responsive enterprise: the chance to reimagine nearly every aspect of a business and deliver superior customer value.

N. Chandrasekaran
CEO & Managing Director

Building the Responsive Enterprise

Our latest edition of 'TCS Perspectives' begins where the previous one left off: by explaining exactly how large companies can become responsive enterprises that deliver substantial customer value and strong financial performance.

You might remember that in our previous edition we wrote about where the journey begins: by creating an exceptional customer experience, from the time a prospect learns about your business (increasingly online) to the moment the customer makes a purchase, and then throughout the customer's lifetime.

In this issue, we focus on the core attributes of responsive enterprises, many of which have nothing to do with technology: a crystal-clear vision; the willingness (in fact, the desire) to shed received industry wisdom, especially about how the customer-facing functions of marketing, sales and service need to operate; effective mechanisms for detecting emerging technologies and their potential to disrupt the business model; and the organizational structure that allows a company's internal mavericks to disrupt things effectively.

I hope the articles in this issue convey our passion about all of this, as well as our expertise from having worked with many of the world's leading companies to make it happen.

K. Ramanujam
Vice President and Global Head,
Consulting & Enterprise Solutions

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Author
Krishnan Ramanujam

Vice President and Global Head, Consulting & Enterprise Solutions

Introduction

If the legendary naturalist Charles Robert Darwin were alive today and studying business rather than biology, he might have charted some fascinating trends. Perhaps most notably, he might have found his theory of natural selection, in which the species that survive best adapt to the alterations of their habitats, rings just as true in business more than 130 years after his death.

At least, it seems that way when reading the daily headlines about companies that rise and fall in the stock tables or come and go on the Fortune 500 list. Companies that have survived, and in some cases thrived, in a sea change of technology, competition, and customer needs since the year 2000 are the ones that reacted first and best to the cross-currents in their markets.

At the turn of the century Apple stopped trying to be Microsoft in a commoditizing personal computer market. Instead, it focused its formidable design, packaging, and marketing prowess on the next digital forms of technology: music players, smartphones, and tablets. The impact has been phenomenal—on Apple and the world.

In mass-market retailing, Walmart decided that internet purveyors were to be taken seriously, and that the 1990s' web startups could ultimately become serious threats to its vast store business. The world's largest retailer, Walmart now also enjoys a thriving e-commerce business.

Apple, Walmart, and a number of other companies show the importance for all firms in every industry to be able to change much faster than they have ever changed before. They must adapt more quickly to an accelerating business environment.

Specifically, this new world compels just about every large organization to be prepared to rapidly change four fundamentals:

1 **The customer experience:** For some companies, this means having to monitor and improve the customer experience much more frequently than they have in the past. Take a big retailer like Macy's, Walmart, Sears, Tesco, or Home Depot. Where they once had to worry only about the store environment (or, for retailers like Sears, a catalog business too), in the last few years most merchants have had two additional selling environments to manage: their websites and the mobile apps that customers use on their smartphones. And these online channels have become serious revenue generators. For example, if Walmart's e-commerce business was a separate company, with its $12.2 billion in 2014 revenue,[1] it would have ranked 250th on the Fortune 500 list.[2]

2 **The business processes and technologies that enable the experience:** Rapidly improving the customer experience across all channels, in turn, requires installing new technologies that enable new business processes—that is, new ways of marketing, selling, and servicing customers.

3 **Product and service innovation processes:** Sometimes a new buying or after-sale service experience is not nearly enough to keep customers loyal. Sometimes they're looking for an entirely new product or service. The auto industry knows this well, which is why car companies continually reduce their product development cycle. All this forces companies to become faster at product innovation.

[1] Walmart, Walmart announces Q4 underlying EPS of $1.61, Feb 2015, accessed July 23, 2015, http://news.walmart.com/news-archive/investors/2015/02/19/walmart-announces-q4-underlying-eps-of-161-and-additional-strategic-investments-in-people-e-commerce-walmart-us-comp-sales-increased-15-percent

[2] Fortune, Fortune 500, 2015, accessed July 23, 2015, http://fortune.com/fortune500/

4 **The core business model:** Often even product innovation is not enough to please customers. Some want to deal with your company on a whole new basis. For example, some want to rent what you currently sell. Companies like General Electric and Uber have built business models to encourage this. Consider the consumer who wants to share a vehicle with others and rent it by the hour rather than buy or lease it outright. The goal of online taxi operator Uber is to give people an alternative to owning cars, not just an alternative to taxi cabs.[3]

All this adds up to a company that can change faster and more frequently than ever—and then be ready to change again even faster in the future. We refer to such an organization as a 'responsive enterprise'. In short, such a firm can shift rapidly to where customers want it to go next—the next buying experience they want, the new innovations they desire, or the new way they want to do business with your firm altogether.

Easier Said than Done

Being a responsive enterprise may sound easy. It is not a marketing program, or a quick-fix process improvement initiative, or a sales training exercise to get salespeople to listen better. It amounts to a transformation—whether gradual or rapid—in the way that top managers think about their company, how they organize its business processes and IT, which opportunities in their markets they pursue and ignore, and much more.

Recognizing the need for it doesn't happen overnight. Just ask General Electric, which for more than a decade has been returning to its roots as an industrial company (only those roots now include a thriving services business wrapped around its industrial products). GE's CEO Jeff Immelt told a reporter recently, "My biggest mistake was

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[3] The Washington Post, Nancy Scola, Uber's not a $40 billion startup. It's a midsized car company, December 5, 2014, https://www.washingtonpost.com/blogs/the-switch/wp/2014/12/05/ubers-not-a-40-billion-start-up-its-a-mid-sized-car-company/

… moving too slow. … There weren't a lot of people who predicted what would happen in 2008 and 2009. … We were 50-50 industrial/financing when I became CEO. That wasn't what I wanted the company to be. We could have moved faster."[4]

The story is quite different today. GE has been moving rapidly to become a responsive enterprise, and its revenue, profit, and share price have been rising steadily since the Great Recession.

Still, the GEs of the world are in the minority. Most corporate change initiatives fail. A 2008 McKinsey survey of executives found that 70% of change programs failed to achieve their goals.[5] A 2000 estimate by Harvard Business School professors Nitin Nohria and Michael Beer came up with a similar number.[6]

So what slows down companies from making major changes? We can only theorize on this point. The ability to become a responsive enterprise depends greatly on determining how to use technology to operate very differently than the competition.

Companies may falter because they can't come up with this vision.

Radically new ways of marketing, selling, manufacturing, distributing, and providing customer service can fly in the face of the experience and expertise of executives. What 50-something CXO wants to be told by a 25-year-old consultant that almost everything he knows is wrong? Not many that we have seen.

This is not at all surprising. Management expert Jim Collins, author of *Built to Last* and *Good to Great*, talked about how executives' successes can calcify their views. In another book, he outlined a five-step process in which big companies fail:

1 **Hubris born of success**
2 **Undisciplined pursuit of more**
3 **Denial of risk and peril**
4 **Grasping for salvation**
5 **Capitulation to irrelevance or death**[7]

For those who buy into Collins' theory, the question then is how to break out of the doom loop.

[4] Fortune, video interview with Immelt, June 4, 2015, accessed July 23, 2015, http://fortune.com/2015/06/04/ge-immelt-curse-fortune-500/

[5] McKinsey, 70% of Transformation Programs Fail, September 27, 2013, accessed July 23, 2015, http://www.slideshare.net/aipmm/70-26633757

[6] Harvard Business Review, Cracking the Code, May 2000, accessed July 23, 2015, https://hbr.org/2000/05/cracking-the-code-of-change/ar/1

[7] Jim Collins, How the Mighty Fall, 2000, http://jimcollins.com/books/how-the-mighty-fall.html

The Six Elements of Responsive Enterprises

In our work with many of the world's largest companies, we see six elements common to organizations that have become, or are solidly on their way to becoming, responsive enterprises:

1 — Digital DNA

2 — Business Strategy + Operations Design + IT Design

3 — Rapidly Implementable Enterprise Systems

4 — Building Skills and Talent as a Differentiator

5 — Detecting the Need for Business Model Innovation

6 — All Aboard the Change Express
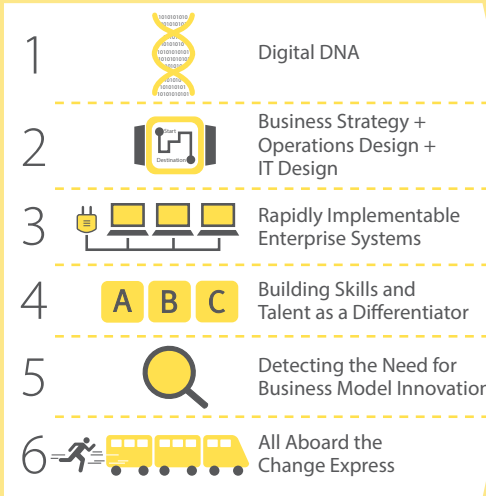
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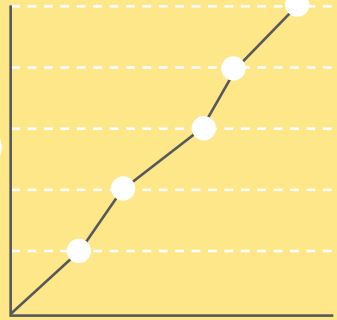
1 **Building digital DNA at the top**

2 **Melding business strategy with operations design and IT design**

3 **Relying on enterprise systems or packages and rapidly implementing them, as well the new applications necessary to connect them**

4 **Building skills and attracting talent for important jobs, then unleashing it on the jobs that will differentiate the organization**

5 **Becoming highly proficient at detecting the need for business model innovation, and then nurturing it**

6 **Getting an organization onboard a train that's moving faster than ever**

In the rest of this introductory article we'll explore these six elements in more depth and explain how the articles that follow will provide even greater detail.

1 Digital DNA at the Top

In a responsive enterprise, senior executives believe that digital technologies have revolutionized their industry—and that they will continue to do so, with major ramifications for their company.

A number of market watchers call this 'digital DNA'. In genetics, DNA refers to molecules with genetic instructions that guide an organism on its development, survival, and reproduction. In a responsive enterprise, digital DNA represents the worldview and insights that guide executives' thinking about the business. Seen this way, digital DNA shapes how executives view their company's business model and industry. They are able to build a collective and clear understanding of what customers really value, and how digital technologies could help the company deliver it.

An executive team with digital DNA will reject conventional wisdom while envisioning new ways in which digital technologies can deliver far greater value than traditional ways of doing business—and how those technologies can improve their company's performance.

A growing number of the world's most successful CEOs have such digital DNA. Two of the most illustrious ones are Jeffrey Bezos and Reed Hastings. Amazon.com's Bezos came to internet retailing with digital DNA. He studied computer science and electrical engineering at Princeton,[8] then worked in systems jobs at three Wall Street investment firms before moving to Seattle to launch Amazon in 1994.

Netflix founder Hastings started the video rental firm after selling a company that made software development tools. Hastings, who earned a master's degree in artificial intelligence at Stanford,[9] had no background in the video industry or in retail. Nonetheless, he thought there had to be a better way for consumers to rent videos than through stores.

[8] Jeffrey P. Bezos biography at Amazon.com, accessed July 15, 2015,
http://phx.corporate-ir.net/phoenix.zhtml?c=97664&p=irol-govBio&ID=69376

[9] Reed Hastings biography at Netflix investor relations website, accessed July 15, 2015,
http://ir.netflix.com/management.cfm

We go into greater detail about the C-suite attitudes that need to change in the article 'The New Mindsets of Marketing, Sales, and Service Executives.' In the final article 'First Substantiation, Then Transformation,' we explain how to enlist the entire executive team to lead a transformation initiative.

2 Melding Business Strategy, Operations Design, and IT

Digital technologies are forcing companies to rethink their business models. Business strategy, operations design, and IT strategy can no longer be separate functional boxes on an organizational chart; leaders from each group need to be part of the same team.

Twenty-five years ago, the rise of business process reengineering urged companies to weave the disciplines of business process design with IT systems design, to combine business process architects with IT architects. The reengineers' call to action: rethink the way work flows in an organization—especially work that flows across functions (such as order fulfillment, from sales to order entry to production and delivery). As reengineering gurus Michael Hammer and James Champy[10] (and others, like Tom Davenport) reported, the results were often stunning. Companies saw major improvements in cost, time-to-market, and quality in key business processes because they were no longer 'paving the cow paths' with technology by automating old, inefficient business processes.

But that calculus has changed. Companies need to think not only about reengineering their business processes, but also about whether the business model that guides the very design of their key business processes is past its prime. Consider this: No matter how well Blockbuster reengineered

[10] New York: Harper Business, Michael Hammer and James Champy, Reengineering the Corporation: A Manifesto for Business Revolution, first edition, 1993

its existing retail store processes for renting movies, Reed Hastings' Netflix was reinventing the business model of distributing video content, first through the mail and then by streaming online.

Many companies must rethink their fundamental business model. Our article 'Preparing for Disruptive Competition' by Ananth Krishnan delves into this issue. He explains how to make business model innovation—especially the type required to compete against digital disrupters—a key activity.

Simplifying the Business

After a management team determines whether the current business model is still viable, the next step is to determine whether and how to simplify it. By that, we mean three things:

1 Identifying which product and service lines to keep: For example, Procter & Gamble, the consumer products giant, in July announced the latest round in a recent spate of product shedding[11]
2 Shutting down processes and systems that supported now-extinct product lines (if no other products depend on them)
3 Building and enforcing standard processes and systems to support the products and processes that remain

[11] The New York Times, P&G Sells 43 Beauty Brands to Coty, July 9, 2015, http://www.nytimes.com/2015/07/10/business/dealbook/pg-sells-43-beauty-brands-to-coty.html

Our article 'A Cure for Complexity' maps all this out and shows the path to a simplified business environment. A key takeaway: Create standard processes by implementing commercial enterprise systems rather than creating ones from scratch. What's more, implement them in a cloud computing center that someone else owns rather than in your data center. That could shift capital expenses to operating expenses.

The article 'Operational Changes for Customer-Facing Functions' goes into detail on how marketing, sales, and service heads should work together to make sure the overall customer experience across those functions is greater than the sum of its parts. The key idea: to move quickly from customer experience designs to focused trials. Also important: doing speedy trials in just one part of the business, rather than across the whole business, and redesigning processes accordingly before implementing enterprise-wide.

The digital world also requires companies to rethink what happens after marketing and sales do their work—that is, when the customer order arrives. In 'Reinventing the Supply Chain for a Digital World' we explain what companies must do to their supply chains in the midst of three trends: continued product proliferation, micro-segmentation of customers, and the Internet of Things (IoT).

The IoT has the potential be a big game-changer for many companies since it enables feedback from the field on how a company's products are actually performing for customers (whether these products are aircraft engines, trucks, or refrigerators). As we say in that article, while marketing and service transformations are difficult, supply chain overhauls can be even more challenging.
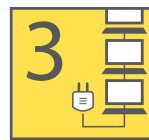
3 Embracing Enterprise Systems and Enforcing Standard Processes

The days of building big custom systems are over— especially in customer-facing functions (sales, marketing, and service) that need standard systems supporting standard business processes that can share information internally about customers. Custom systems take too long to develop and become outdated much faster.

However, enterprise systems for Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Supply Chain Management (SCM) need to be adopted much faster than in the past. That, in turn, requires companies to increasingly adopt standard processes and cloud-based software. Companies like Hasbro, API, and others have come to this realization, and they're working hard to harmonize their operational and IT infrastructure across regions.

But process and systems standardization will not be enough. Companies will need to build new systems much faster, while also making sure those new systems are designed from the start to connect to the firm's core systems.

This is especially the case for firms designing systems for digital business processes using mobile apps, the IoT, and other emerging technologies. All this means ending the use of waterfall approaches to build traditional, slowly updated systems, and replacing them with agile development techniques that weave together business process design, IT software development, and IT operations. Our article on 'High-speed IT' explains how to do that.

4 A B C Attracting and Developing Talent for the New, New Jobs

Companies need to build and attract talent for the most important jobs today and tomorrow, such as data scientists, IoT experts, and digital and social media marketers. There isn't nearly enough talent to fill many of those jobs in the next five years. Digital technologies have created entirely new roles. (Fifteen years ago, few if any companies had a search engine optimization expert.) They have also reshaped traditional roles, a fact well known to CMOs who have trained marketers on social media basics, or sales force managers who have equipped salespeople with CRM systems and tablet computers to close sales. Competition for data scientists, for example, is already fierce.

Whatever your industry, you will undoubtedly need skilled professionals who are literate in data and analytics and can turn the spotlight inward to find opportunities for improvement. Our article 'The Care and Feeding of Data Scientists' goes deep on one critical capability that every company will need for the foreseeable future: Big Data number-crunchers who can provide accurate insight into the effectiveness of company products and processes.

Recruiting is not the only source of talent. Companies should also retrain employees whose jobs are ending for the new jobs that are critical to keep in-house, for three reasons: it maintains morale; it discourages employees with substantial institutional knowledge from exiting; and it may be difficult to find top talent from the outside.

When choosing candidates for retraining, the most important quality is attitude. Select those with ability and the desire to master new skills. Allow these talented people to work on the most important projects, and be prepared to shift commodity work to third parties that can do it better and more cost effectively.

5 Accurately Detecting the Need for Business Model Innovation

Determining when to develop a new business model requires having a highly proficient radar screen for new technologies. As we say in our article on 'Sense and Respond: Finding the New Technologies That Really Matter,' over the last five years the number of new technologies has exploded. The reasons include venture capital flowing freely, software companies being able to market and distribute their products to the world over the internet, and the proliferation of online consumers. The next big trend to fuel the explosion in new technologies will be the IoT.

So how does a big company keep the right technologies on its radar screens—to, as we put it, 'sense and respond'—and keep the wrong ones off it so they aren't distracted? The latter is increasingly important, given that getting information on new technologies can involve spending lots of time and money. Our article provides a way to do the screening.

Once that radar screen is working well, managers must then set aside time to think about the business model implications of technologies that may be truly disruptive to their firm's business model. That means conducting experiments to test new business models, a topic we explore in our article on business model innovation.

6 Getting on Board a Fast-Moving Train

With so many changes in play—in business models, business processes, technologies, and skills—leaders face the monumental challenge of creating clarity out of the chaos. Clearly communicating where the company is going in this digital world—and where employees fit into that picture— is becoming a competitive advantage in itself. Otherwise, key

employees may not go along for the ride, or they may but without the passion the organization needs to transform itself.

A lack of skills in organizational design and managing cultural change is one of the biggest challenges to IT-enabled business transformation initiatives, according to the TCS-Forrester study in 2014.[12] That makes non-technical skills—managing organizational resistance to change and winning employees' buy-in to implementing new strategies—key to the success of the responsive enterprise.

To get the organization on board that faster-than-ever moving train, a company must harness the flood of customer data arriving digitally (through social media, mobile apps, and embedded sensors in products, for example). This new world of continuous feedback can help leaders reshape their companies' futures, as we explain in 'Reinventing Innovation for a World of Continuous Market Feedback.'

Moving with Conviction

As you might imagine, becoming strong in all six areas mentioned above doesn't happen overnight. It takes time, planning, and perhaps most of all conviction—the strength to hold a view that the ways of the present will not play in the future.

Building muscle in these six areas will give an organization a strong foundation for growth in the rest of the decade and beyond.

We hope this issue of *Perspectives* sparks transformation in companies that need it. Many of our clients are well down this path, and they tell us they'd never turn back.

[12] TCS, Business Transformation in a Digital Age,
http://www.tcs.com/resources/white_papers/Pages/Business-Transformation-Digital-Age.aspx

The New Mindsets of Marketing, Sales, and Service Executives

Leaders Must Adopt Six Beliefs
for Customer-Centric Transformation

Author
Lisa Hager
Global Head, TCS Salesforce.com Practice

Introduction

In a digital era in which customer interactions and expectations are radically changing, executives who run marketing, sales, and customer service teams must make significant changes to their own operations. In order to buy in to that level of transformation, these executives must first recognize that the worlds of marketing, sales, and service are in the midst of a sea change—forcing them to rethink some long-established beliefs. The right mindset is a prerequisite for operational change.

What kinds of changes are we talking about? Consider the fundamental shifts within these three categories:

- **Advertising:** Procter & Gamble (P&G), which practically invented the dominant advertising and marketing model of the late 20th century, last year cut its budget for traditional advertising by more than 14 percent (to a mere $2.64 billion), reflecting a shift in emphasis to more efficient digital channels.[13] When P&G makes a significant investment in traditional media for a campaign, there is almost always a

digital component as well. An example is its 2015 'Like a Girl' Super Bowl advertisement for 'Always Feminine' hygiene products, which enjoyed millions of online views. Significant social media discussion was also associated with the #LikeAGirl hashtag.[14]

- **Sales:** Sales teams have to learn new skills to deal with customers who are more informed about their purchases, having researched them earlier over the web or via social networks, or on the spot using a smart phone. According to a survey by AutoTrader, 79 percent of car buyers now shop online.[15] Although the purchase transaction isn't usually completed online, those consumers have a good idea of what they want (and what they should expect to pay) before they even enter a showroom. Pharmaceutical companies are making a concerted effort to connect with doctors through digital channels as sales representatives find it increasingly difficult to talk their way into the doctor's office.

- **Customer service:** Social media networks have given consumers great power to shame companies who treat them poorly. Airlines are forever under attack from consumers frustrated by delayed and canceled flights. Yet some airlines cope better than others. For example, JetBlue turns up on many 'best social media customer service' lists. More about the JetBlue example later.

While being cognizant of these broad trends, many organizations still struggle to react both to the changes and the accelerated pace of change. Mobile technology and the Internet of Things (IoT) contribute to that pace. The new reality is that every customer experience—not just interactions that take place on the web—is now becoming digital.

Given the pace of change in the market, too many companies have been slow to modernize their marketing, sales and service teams, and processes. These functions remain sluggish and compartmentalized. We believe that the reason is that company leaders are still operating with marketing, sales, and service mindsets of a bygone era. Customer-centric transformation requires that these leaders change their thinking.

[14] The Huffington Post, Why That 'Like A Girl' Super Bowl Ad Was So Groundbreaking, March 02, 2015, http://www.huffingtonpost.com/2015/02/02/always-super-bowl-ad_n_6598328.html

[15] The Detroit News, Dealers, consumers drive digital car buying revolution, May 25, 2015, http://www.detroitnews.com/story/business/autos/2015/05/25/dealers-consumers-drive-digital-car-buying-revolution/27944031/

The Mindset Shift

The following are six key beliefs that marketing, sales, and service chiefs must internalize to make their operations fit for the digital world:

1 Collecting and analyzing customer feedback must now be continual, not episodic

2 Marketing, sales, service, and product enhancement decisions all need to happen faster

3 More cross-functional generalists, not just specialists, are needed to help companies sell and market while they are servicing customers. At a minimum, sales, and service teams need to be cross-trained. Ultimately, they need to be combined or reconfigured to work more collaboratively

4 The importance of digital channels goes far beyond the direct financial transactions performed online. Increasingly, the organization as a whole is judged by how it presents itself and responds to customers through a browser or smart phone

5 Traditional corporate messaging and image management need to give way to more transparency

6 Companies need to manage by data, not intuition. In particular, they must pay attention to the emerging streams of IoT data, which give companies the ultimate truth about their performance for customers: How their products are performing in the field
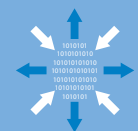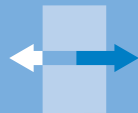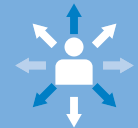
Let us explore each of these beliefs in more detail.

Gathering Continual Customer Feedback

Market research has traditionally been treated as an expensive and episodic luxury. That is a vestige of the high cost and painstaking effort once required to collect customer insights through surveys and focus groups.

Even with the advent of online consumer panels, market research has remained costly. Market research spend reached $40 billion globally in 2013, according to ESOMAR,[16] the worldwide association of market researchers. Laborious market research processes mean that customer insights take months to develop. Now such insights can be produced in weeks or days. Social media data and analytics tools enable companies to gather feedback and gain crucial insights from hundreds or thousands or even millions of customers around the globe, every day—on customer experience plus product and service offerings.

Of course, it is true that market analysis based on 'listening' to mentions of a product or brand name lacks certain qualities of traditional market research methodology, such as careful demographic selection to produce a representative sample of the population. What the social listening approach delivers is immediacy and spontaneity.

For example, Procter & Gamble is currently placing greater emphasis on social media analytics, paying attention to vocal social media users whom it can learn from—whether they are representative or not.[17]

[16] Marketing Charts, Global Market Research Spending Exceeded $40B Last Year, September 11, 2014, http://www.marketingcharts.com/traditional/global-market-research-spending-exceeded-40b-last-year-45864/

[17] Advertising Age, Will Social Media Replace Surveys as a Research Tool?, March 21, 2011, http://adage.com/article/news/p-g-surveys-fade-consumers-reach-brands-social-media/149509/

The Need for Speed

Sales, marketing, and customer service teams need to act with unaccustomed speed to change themselves, as well as their products and services. Increasingly, companies do not have the luxury to spend weeks or months debating how to respond to signals from the marketplace.

The viral effect of social media means that a company can see its reputation damaged within hours or days. That leaves no time for debate—the organization must be prepared for contingencies, and its people primed to respond proactively to reports of defective products, tone-deaf marketing, rude salespeople, or flawed service policies. Promotional opportunities spawned by social media can come and go just as quickly.

While it is easy to focus on the downside, the organizations that handle this well can actually improve their reputation. Consider JetBlue. While it cannot make every weary traveler happy, its social customer service team goes above and beyond to respond to those venting on Twitter and other social networks—with the goal of turning detractors into fans. One customer who tweeted a complaint about a $50 fee for changing to an earlier flight was surprised when he not only got a reply on Twitter but also had a JetBlue representative follow up with him in person—the social team had relayed his profile picture to a gate agent who was able to find him in the crowd. The result: A second tweet from the flyer, complimenting JetBlue on exceptional customer service.[18]

One thing to note about that example is how it crosses over from the digital world of Twitter to the physical world of the airport terminal. Think about how your company can bring online and offline customer experiences together more effectively.

Generalists Over Specialists

In the overall talent pool, companies need more cross-functional generalists, not just functional specialists in sales, marketing, and service. The divisions between functions often do not make sense from the perspective of the customer, whose perceptions are formed by the whole experience—from the marketing that brings the product to their attention, through the sales process, to the service follow-up.

Rethink the need for deep functional specialization. Employees who deal with customers need to be able to market, sell, and service the customer. Most organizations today are so compartmentalized that it is difficult to conceive of them combining those functions or getting them to collaborate at a deeper level.

A retail store associate ought to be able to process a return, rather than send a customer to the returns desk, and ideally sell the customer another product in the process. Given a tablet to carry on the floor, that same associate might be able to field customer inquiries on social media during the slow times.
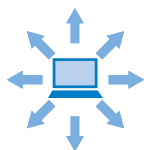
Digital Channels Rule

The mega importance of digital channels is not diminished by the fact that most purchases remain offline. While e-commerce forms only 7 percent of total retail sales in the U.S., the importance of digital channels for companies and their customers is far greater than their direct economic value.

Online channels are much more than just purchasing channels; they are channels that customers now depend on for information while making any purchase. In addition to web research at home, customers are increasingly likely to use a smart phone to find the stores for products they want.

Thus, the importance of shifting marketing and sales resources not just to the corporate website but to every channel used by the digital customer: the social media networks, search engines, digital maps and new mobile platforms such as internet-connected automobiles. The organization needs a smart, responsive presence on every digital channel.
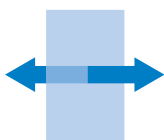
Moving from Control to Transparency
Embracing the digital era means giving up a measure of control. In the old world, companies could go to great lengths to manage their public image. Many built large corporate communications and public relations departments to increase the chances of the press writing favorably about them.

Today, however, every consumer with a smartphone and a social media account has become a reporter, ready to send nasty (or nice) messages about companies through Twitter. And the press will repeat what the public is saying about you on social media. Even without the amplification of traditional media, YouTube, Facebook, Instagram, LinkedIn, and other social networks connect billions of users around the world.

Companies such as Nestle and Coca-Cola understand this new reality and use it to connect directly with the public. Some have become veritable publishers themselves, with real-time reporting on the latest happenings in their global businesses. But for this to work, slick marketing needs to give way to more authentic messaging. Customers empowered by social media can counter the company that misrepresents itself or fails to serve its customers well.
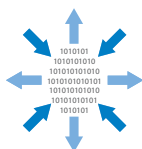
Becoming Data Driven

The successive waves of innovation associated with the web, social media, and mobile computing have introduced new data-driven ways to market, sell, and provide customer service. But these are only the beginning. As the Internet of Things era progresses, new data is flowing in on the actual performance of a company's products and services in the hands of customers.

As the recent TCS global trends study on IoT[19] found, digital technologies today provide companies with four kinds of truths about their performance for customers:

- **Supply Chain Monitoring:** The truth about products en route to customers
- **Premises Monitoring:** What customers are doing in the places in which they do business with a company
- **Customer Monitoring:** Perceptions of the truth as discerned by analyzing social media and other online comments
- **Product Monitoring:** 'The ultimate truth,' when embedded sensors and other digital technologies report on how products are actually performing for customers

[19] TCS, Internet of Things: The Complete Reimaginative Force, 2015, http://www.tcs.com/internetofthings

Premises Monitoring
Tracking customers' experience at a firm's place of business (for example, stores, branches, hotels)

Product Monitoring
Tracking products and/or services after customers purchase them

Supply Chain Monitoring
Tracking a firm's production and distribution operations

Customer Monitoring
Tracking how customers are using and what they're saying about a firm's products and services

Premises Monitoring—by putting sensors, digital cameras, and other devices in the places in which companies do business with their customers, be it a bank's branches, a retailer's stores, a lodging operator's hotels, an airline's planes and lounges, and so on

Product Monitoring—by embedding sensors, software, and other technologies into the offerings that a company brings to market, whether it's a $300 coffee machine, a $2,000 refrigerator, a $5 million haul truck that lugs tons of payload material, or a multimillion-dollar aircraft engine

Customer Monitoring—by tracking digital devices that customers carry (for example, mobile apps on their smartphones) or strap onto themselves (for example, wearable technologies such as digital wristbands)

Supply Chain Monitoring—by putting sensors, digital cameras, and other digital devices in the production and distribution operations that make and deliver their products and services to customers

Figure 1. Data Gathered via IoT Sensors Provides a New Level of User Data
Industry leaders are more likely to recognize the potential of IoT to get the ultimate truth of how they are performing for their customers

Facts about a company's performance for customers should rule decisions now, rather than intuition about that performance. Data gathered through IoT sensors represents facts rather than opinions and cannot be disputed or debated, unlike 'gut feelings' or customer comments in social media. This is why we refer to them as 'the ultimate truth'. Embedded sensors can continually report on 'in-the-field' status of products, whether these are truck engines, computer printers, or aircraft engines.

Some early examples of how companies are innovating using this data:[20]

- General Motors and Tesla are two of the leaders in embedding connected intelligence in their vehicles, not only to deliver services such as GPS navigation, but also to monitor the health of those products. Tesla also delivers product improvements remotely, such as software updates to improve the range that owners of its electric cars can drive on a single charge.
- GE uses connected telemetry in jet engines and other industrial equipment to detect when a component is about to fail and alert the customer to the need for preventative maintenance.
- Insurers offer preferential rates to drivers who are willing to agree to remote monitoring of their driving habits. Similarly, home property and casualty insurers are beginning to explore deploying home monitors that can detect the potential for water or electrical damage, with the goal of improving customer loyalty and reducing the frequency of claims.

 [20] TCS, Internet of Things: The Complete Reimaginative Force, 2015, http://www.tcs.com/internetofthings

Conclusion

Think about the number of ways your mandates from the business for marketing, sales, and service have changed since social, mobile, and cloud technologies came on the scene. Your company has changed mightily during the past few years, and is about to change more. Are you ready as a business leader to change your mindset? Consider the six beliefs discussed here that we believe marketing, sales, and service chiefs must internalize to get their operations fit for the digital world. Let go of traditional ideas about customer feedback, staffing, and digital commerce that once served you well, and be open to new ideas.

Develop talent within the organization that can help evangelize these beliefs throughout the company, especially people who can help the business make the most of data analysis.

If anyone around you is waiting for things to go back to the way they were before, you must inspire them to change their thinking too. This is the leadership challenge of a lifetime for the executives who are paying attention. The responsive enterprise of tomorrow starts with responsive leadership.

To learn more about businesses making the most out of data, see the article in this Perspectives: The Care and Feeding of Data Scientists, page 70.

To learn more about responsive leadership, read Operational Changes for Customer-Facing Functions in this volume of Perspectives, page 32.

Operational Changes for Customer-Facing Functions

Creating a Unified Customer Experience
Requires a New Level of Operational Agility

Author
Lisa Hager
Global Head, TCS Salesforce.com Practice

Introduction

Sales, marketing, and service organizations need to transform in the age of the responsive enterprise. Companies have more data about customers than ever before, from sources ranging from social media to e-commerce transactions, but many don't use it effectively. Companies must apply customer insights across the enterprise. In pursuit of this goal, companies should strive to break down internal silos while identifying new opportunities for creating and capturing value for their customers. But this customer-centric transformation tends to falter at the same level: operations.

Rather than creating a unified customer experience, companies create a series of customer experiences with marketing, sales, and service initiatives that may be innovative on their own but, as a whole, still fail to meet rising customer expectations. Existing business processes get in the way. Structural issues such as conflict between IT and sales, marketing, and operations leaders hinder progress. This requires intervention and guidance on cultural change from the CEO and other senior leaders of internal divisions.

The challenge is to react to the opportunity and the threat with urgency, but also in a deliberate, strategic way. A successful customer experience strategy breaks downs the organizational barriers of the past through the development of agile operations and delivery—to ensure a truly customer-focused, responsive company.

Companies should avoid taking a 'big bang' approach that tries to force multiple technological and organizational changes at once. Instead, approach innovation as a series of experiments, and iterate on the approach as you work toward an enterprise-wide plan. Companies need to be aggressive about getting to measurable results quickly, without rushing so much that they trip themselves up. A fast-paced but iterative approach, illustrated in Figure 2, is the best way of striking the right balance. Let us explore how to find that balance.

Challenges
Siloed CX and CRM efforts
Evolving customer expectations

Business Outcomes
Connecting the Customer Experience strategy to outcomes, all the way through the CRM implementation

Compelling CX
Insight and innovation combine to help guide companies in creating differentiated CX delivered through CRM.

Agile Ops & Delivery
Faster, iterative implementations allow companies to reach a customer-responsive state.

Human Centric Transformation

Degree of Innovation

Responsive Enterprise

Ability to Execute

Figure 2: An Agile Approach to Transforming the Customer Experience

Why is Achieving Customer Centricity so Hard?

Executing a customer-centric, responsive enterprise strategy poses many challenges, with regard to culture, organization, and technology platforms.

Beyond replacing old business models and processes, achieving customer centricity means rethinking and reimagining the business. Data and groups that used to be discrete are now being connected in new ways to build value for the customers and the company. This requires an integrated approach, including a startup mentality that breaks down the existing barriers between customer experience (CX) and customer relationship management (CRM) to meet new and evolving customer expectations.

Delivering an integrated customer experience means treating marketing, sales, service, and operations as part of a continuum. Organizations must agree to participate in joint initiatives, share data, and maximize the value they create by coordinating their activities more tightly. Frequently, the biggest challenge is getting IT, marketing, sales, and service leaders working together rather than at cross-purposes. They often do not see business problems in the same way. Consider these common obstacles:

- **IT's participation is essential, but IT should not drive business initiatives.** IT needs to have the authority and budget to address legitimate concerns such as compatibility between new processes and legacy technologies, but IT should not be allowed to veto change just because it will be technically challenging.
- **Different parts of the organization often have very different understandings and definitions of who the customer is and the customer's perceived value of the company's products or services.** These differences must be reconciled, not only at the strategic level but also at the tactical level of database schemas and business processes that ensure consistent, high-quality service.
- **Job descriptions, performance management, and processes must change, in some cases radically.** Unfortunately, change always provokes resistance. People are always at the center of disruption and change, making this more of a leadership challenge than a technological one.

- **Cross-functional processes seem threatening to organizational fiefdoms and their leaders.** Many of these initiatives do not have a senior executive who has organizational authority across multiple functions or divisions. It is essential that a cadre of leaders be created who understand successful transformational methods. In some instances, organizational structures may need to be changed to include a Chief Customer Officer, with the backing of the CEO and the board, to drive customer-centric change despite all resistance.

Confronting these challenges is not optional. Customers now expect companies to recognize them as the same person across channels; for example, giving the contact center or retail store employee insight into the customer's interactions on social media or in an e-commerce experience.

Customers appreciate multiple choices, but TCS research shows that when they switch from the channel that was their first choice to another, it is usually out of frustration.[21]

A good omnichannel experience may alleviate some of that frustration, but it is better to provide a strong positive experience in every channel, from the beginning.

Success requires understanding the core business outcomes you are trying to achieve and making sure they match customer expectations. In any interaction with a company, customers should be able to achieve their goals with as little effort as possible. Be ready to change your processes if you are not meeting that standard for basic customer service requests.

The challenges and the opportunities are intertwined. Companies are

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[21] TCS, Why So Much Omnichannel Dogma is Wrong, 2014,
http://sites.tcs.com/insights/perspectives/why-so-much-omnichannel-dogma-is-wrong/

experiencing a deluge of data flowing in from social media, mobile technology, and the emerging Internet of Things (IoT), where data-gathering sensors are embedded in products and equipment. But can we make intelligent use of this overwhelming volume of data?

Often the right question is: What is the smallest set of data that is useful? In a customer experience context, data needs to be transformed into action before an opportunity slips away. This requires companies to build business models, processes, and tools that let them act quickly to create value for the customer.

Execute

Determine > Prepare > Design → Build → Test → Deliver > Sustain

Iteration 1 - N

Governance: Value   Management   Quality & Compliance

Solution Implementation: Process   Technology   Data   People
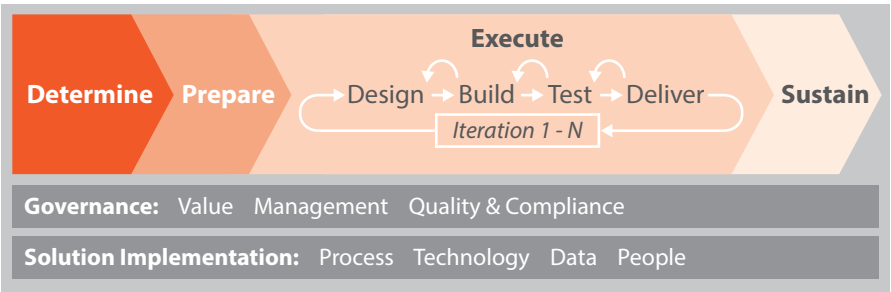
Figure 3: Tapping into Small Data Sets Allows Rapid Experimentation

Operations for the Responsive Enterprise

The goal is to create a business capable of responding to customer needs in an integrated way across communications channels and business processes (such as the interplay between sales and support). This requires frequent sampling of the customer experience, tightly linked to operations, to make the organization more responsive to customer expectations—and more competitive, as well.

This is not a small thing to accomplish, and it requires a combined enterprise strategy for information technology, organizational change management, and business process redesign that is focused on continuously applying data-driven insights to make operational changes.

To stay on track, follow these three principles:

1 **Pursue the development of an agile delivery and operations model anchored in a compelling CX strategy.** This requires a transformational delivery approach that is iterative with a focus on a 'fail fast/succeed often' production pilot. In other words, the goal is to determine quickly if the customer insights and strategy have been effectively designed, not only in terms of the technology but also the business model itself. If a change does not produce the desired results, abandon it quickly and try something new.

2 **Do not try to do it all at once.** The ideal technology and business process architecture are not obvious from the outset. For every startup that succeeds in disrupting an industry, dozens of others with different ideas about becoming 'the next big thing' will fail.

3 **Gather continual measurements to test the initial strategy and its operational deployment.** Make adjustments as needed. Companies that rigorously apply this principle to their transformation will change faster than the organization has historically been able to move.

This approach reflects the agile software development methodology and the business processes of startups that treat their innovations as experiments and quickly refine them. The iterative approach can seem inefficient at times because some of these experiments turn out to be dead ends. Yet isn't it better to test a process at a small scale and rule an idea out, than to commit to it on an enterprise-wide basis only to discover that it does more harm than good?

Companies seeking a truly customer-first culture must also build the necessary leadership. The CEO can make a tremendous difference by recognizing and rewarding high performers. These are people who:

- Understand who the customers are and how they behave, taking full advantage of data analytics
- Clearly communicate the value and purpose of the brand
- Have the ability to deliver a compelling customer experience story and strategy

These high performers can break down internal barriers and enlist the whole organization by developing agile, cross-functional teams.

Find the Gaps

Programs and processes need to be designed or redesigned to gain insights about your customers. Front-end sales and marketing processes have changed significantly in response to digital innovation, but operational processes have lagged. This includes both sales operations and contact center operations.

Companies need to focus on the whole customer experience, at every step of the customer life cycle: marketing, sales, and service tied together and reinforcing each other.

As an example of the sort of cohesion that is possible, a major retailer is planning to give tablets to sales associates on the floor of its retail stores so they can perform more service functions, such as handling returns. The logic: sales associates, so empowered, will be better equipped to sell the customer another product that will meet their needs better, as compared with an employee whose whole day is built around processing returns.

Similarly, retailers are seeking better ways of engaging with customers in stores who are carrying mobile devices—knowing that otherwise those mobile devices are likely to lead to sales for Amazon or another online retailer. Mobile technologies provide powerful tools for experimentation and iteration. For example, Coca-Cola has experimented with using Apple's low-power iBeacon on retail store displays, allowing iPhone users to get an alert when they approach a store fixture associated with a particular promotion.[22]

Meanwhile, the best contact centers are moving away from standardized scripts and training that deliver the same message, to a world where each call is handled uniquely. These companies seek to deliver different messages for different personas, different types of customers. They recognize that a human being ought to be at least as good at delivering a personalized message as a website or a mobile app. But to do so, contact center agents need to be provided with digital tools that help them do the right thing for the customer, with easily understandable prompts. It is about empowering employees to respond faster and with more sensitivity to engage customers as individuals.

The contact centers of the future are increasing customer value while also increasing revenue by using advanced analytics and Big Data to create individualized interactions with customers. The results are insights or 'next best actions' that break down organizational barriers between marketing, sales, and services to empower a customer service representative to provide customized responses. A number of leading telecommunication and media companies are using this approach to reverse perceptions of a history of poor customer service. In addition, they are supporting their service representatives with knowledge about new products, as the lines blur between media products and communications services.

[22] The Drum, Coca-Cola explores iBeacons as marketing tool for World Cup sponsorship, January 13, 2014, http://www.thedrum.com/news/2014/01/13/coca-cola-explores-ibeacons-marketing-tool-world-cup-sponsorship
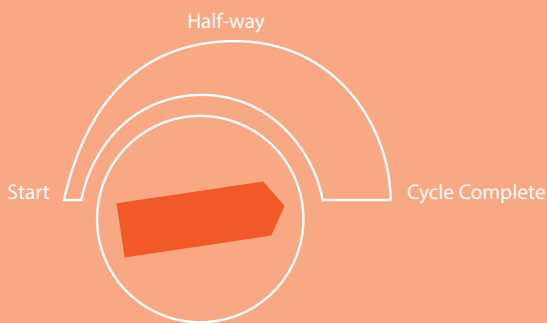
Figure 4: Intelligent Machines Connected to the IoT Equal Positive Contact with Consumers

Innovative businesses are also tapping into the possibilities of IoT technology, where a connected device can potentially report its status back to its manufacturer or an interested third party.

For example, home property and casualty insurers might soon offer to place instrumentation on home appliances where malfunctions are associated with significant losses. For example, ruptured hoses on a washing machine will often damage walls and floors before homeowners detect the issue. A sensor that detects the leak, allowing the insurer to contact the homeowner before significant damage is done, would save the homeowner a lot of aggravation and save the insurer money. This also becomes an opportunity for positive contact with the consumer. If you know your customer and what is valuable to them, you are proactively helping them, not just selling to them.

Healthcare companies also see great potential and challenge in IoT technology. A number of healthcare companies now face the task of assimilating potentially terabytes of personal data from IoT-connected consumers who want this information not only held securely but also used to create personalized, connected care. This requires new organizational structures and secure, collaborative data platforms.

It is easy to be overwhelmed by the data possibilities. The real challenge is to pin down practical steps your organization can take to capitalize on this abundance. Without a strategy for making it actionable, gathering IoT data does nothing but run up the organization's data storage expense.

Get data to an actionable platform as soon as you can. That means moving it out of the realm of abstract analytics and into operational systems. Beyond getting the data into the right table of the right database, you need to either bring it to the attention of someone who can act on it or program an autonomous response in software.

Start with a production pilot that tests your customer experience strategy and enterprise response. Have the enterprise-wide business case, but be prepared to revise your plans after six months of experience. Change is messy, and you must be willing to learn as you go.

Overcoming Barriers to Customer-Centric Organization

What obstacles will companies face during this journey? This transformation will require cultural change, process change, and a sense of urgency among the entire team. The CEO must lead the cultural change, embracing a fast new speed of operationalizing customer insights—and inspiring leaps of faith at multiple points. As job descriptions, performance management measures, and business processes change, tension rises among team members. Traditional boundaries between roles and departments will need to blur. Without sustained and strong leadership, the organization will tend to retreat to more familiar ways of doing business.

One recent survey found that business leaders believe four out of ten top-ranked companies in their industries worldwide will be displaced by digital competitors.[23]

42   [23] IMD, Digital Vortex, June 2015, http://www.imd.org/uupload/IMD.WebSite/DBT/Digital_Vortex_06182015.pdf

Conducted by Cisco in partnership with the International Institute of Management Development (IMD) in Lausanne, Switzerland, the survey found that business leaders see the potential for their industries to be disrupted by digital, customer-centric competitors, yet 43 percent said their organizations as a whole have not recognized the risk or addressed it sufficiently.

Executives in the current Fortune 1000 who want to remain there cannot afford to ignore disruptive change. While many executives know that they must react to these disruptive factors, it is not always easy to define what you are going to do, why you will do it, or the benefits of change. Progress requires a sense of urgency. Sustained transformation requires focusing the team on the long haul. You will need strong sets of leaders at multiple levels in the organization who understand the challenges of collaborative transformation and change management. Investing in building this leadership capability is key to success. The most successful companies invest not only in the technology but also their people.

TCS helped a leading financial institution achieve its first real, integrated view of the customer, across channels. Having tried and failed to achieve this goal several times previously, the company's leaders were concerned about the success of the project and allocated a significant portion of the budget for change management—getting employees to accept the new system and processes. Project leaders agreed to test the approach on a relatively small scale, even though the ultimate goal was an enterprise-wide transformation. As a result, the company was able to show

Sustained transformation requires focusing the team on the long haul. You will need strong sets of leaders at multiple levels in the organization who understand the challenges of collaborative transformation and change management.

practical results quickly. By standardizing the business process, the company not only made the process more efficient but also offered a more proactive response through increased customer service.

Employees were also pleasantly surprised to get access to better integrated tools, after years of broken promises, and readily adopted the system. Having proven the concept, the company is now better prepared to deliver on this approach with other divisions and ultimately at an enterprise-wide scale. The company's people-first strategy has been critical to success.

CEOs must also stress the importance of cross-functional teams to the success of this transformation. To build a truly responsive enterprise, companies should focus on the key areas where various functions interact, including IT, sales, marketing, service, and the C-suite. The goal: Teams with one set of assumptions, alignment, and shared commitments help the business achieve an effective, nimble decision-making process. To this end, TCS often uses decision-making frameworks that help the various groups agree on how they will turn insights into effective outcomes.

On the other hand, we have seen a number of companies whose transformations failed when it was unclear who in the organization was authorized to make decisions. In other cases, companies do not harness the cross-functional input necessary to iterate and improve processes across organizational boundaries.

CEOs should build internal capabilities to support a customer-centric focus and agile operations.

This requires the identification and grooming of high performers and an ongoing commitment to developing talent. Innovation teams can be used to create proof-of-concept programs, which test the feasibility of a given idea plus serve as a training ground for rising talent. Such teams can build new capabilities in an environment that utilizes real-world examples, often without the time constraints of a strategic program.

Conclusion

A customer-centric organization is data-driven and works to break down organizational boundaries. In a world where each customer interaction has a measurement associated with it, companies should get data to an actionable platform as soon as possible. Start with a production pilot that tests your CX strategy and ability to respond as an integrated enterprise. Create an organization that takes insight- driven CX strategies and makes them operational through continued business innovation and experimentation. Do not forget to create the needed leaders and the technology platform that supports this change. Get that right, and you will create a responsive culture.

Responsive companies know how to capture the right customer data and act on it quickly.

Your rivals are focused on knowing every aspect of your customer and your customer's experience so they can win that customer away from you. The time has come to disrupt or be disrupted.

Reinventing Innovation for a World of Continuous Market Feedback

Listening is Everyone's Job in a
Responsive Enterprise

Authors

K. Ananth Krishnan
Chief Technology Officer
Shashi Bhushan
Chief Innovation Evangelist

Introduction

Organizations are besieged with ever-increasing volumes of data from internal and external sources, including new data types, such as social sentiment data and Internet of Things (IoT) data. An important attribute of this data is that it is available continuously as a stream of customer, prospect, device, and market data that can be analyzed together in real time, or close to it. To perform and compete effectively, companies need systems, processes, and organizational structures that let businesses listen to these constant inputs and quickly react to the customer and market intelligence within them.

Watchful monitoring and analysis of consumer behaviors and market trends is essential to innovating and to safeguarding the organization's core value proposition. Gaps in a value proposition are sure to be revealed by these types of data. The risk of not monitoring these channels effectively is that other companies will. Depend on this: Someone will always find and exploit those weaknesses, bringing forth new and potentially disruptive innovations.

While Facebook, Twitter, and Amazon are touted as innovators living in a world of continuous market feedback, it is a mistake to think this mandate applies to digital businesses exclusively. Rather, the need for innovation based on this feedback is a challenge confronting all businesses, from consumer goods companies to industrial manufacturers to travel and hospitality companies. Consider Marriott or other hotel industry incumbents that are now tweaking strategies for a world that includes Airbnb or John Deere and General Electric (GE) listening to customers about pain points such as parts failures and how to prevent them.

To imbue an entire company with a passion for constant listening and analysis, CEOs will need to lead significant cultural change. IoT data, for example, can reveal unpleasant truths about how customers use products and services. In order to properly hear and react to market feedback, companies will need not only software tools for gathering and analyzing data, but also cross-functional teams and a culture of listening. Without strong executive guidance, such significant organizational and cultural change will fail. Let us examine why and how you should adjust your organization's commitment to listening to customer feedback.

Fundamental Shifts in Consumer Interaction

Why must all businesses reinvent innovation for continuous market feedback? Two new realities have caused a profound shift in how consumers interact with brands, and explain why all businesses must respond.

First, while humans have always shared information about themselves and their world—think of the Lascaux cave paintings in France, produced 50,000 years ago—the new element is that today's information is persistent, available, and analyzable.

Until about a decade ago, a dissatisfied diner could only vent unhappiness to her waiter, the restaurant owner, and perhaps friends and family. In addition to being local, her feedback was ephemeral—in most cases it was gone before her next restaurant meal. Fast forward to today. Thanks to social media sites such as Facebook, Twitter, YouTube, and Yelp, positive and negative experiences with a brand, a product, or a service can be shared, instantly, with large audiences.

These public comments are available to other consumers, competitors, and startups. The harvesting of explicit consumer data (such as social media sentiment) and implicit consumer data (such as purchase and use patterns) is providing waves of insights about customers and prospects, influencing product development, customer service, marketing, and more.

Data flowing from IoT devices will further enrich the picture. Cisco Systems predicts 24 billion networked devices and connections globally by 2019, up from 14 billion in 2014—

2019
24 Billion
Networked
Devices

2014
14 Billion
Networked
Devices
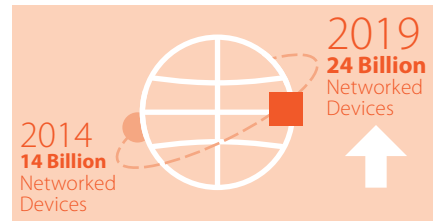
producing a flood of new information to augment purchasing and sentiment data.[24] Real-time device data is already transforming the healthcare and insurance industries, for example. Devices in vehicles and at the patient's bedside allow for usage-based pricing,

[24] Cisco, Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update 2014–2019 White Paper, February 3, 2015, http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.html

a major strategic shift for both industries.[25] What's more, IoT data may offer more accurate consumer insights than purchase or sentiment data alone. For instance, a runner may buy each new generation of a fitness band and brag on social media that he runs five miles every day. However, the band on his wrist, which records actual daily mileage, may tell a very different story.

The second new reality is the emergence of the digital consumer in both B2B and B2C. The ability to track a digital buyer's path across many interactions over time means the entirety of the value chain can be exposed, for the first time. For example, how did that hotel customer really find your company? What other options did he consider? What ratings sites did he consult? For some organizations, this type of intelligence may spark a fundamental rethinking of their value proposition, requiring them to adapt their products and services accordingly.

Listening and Leading

To innovate in light of these new realities, companies should take five key steps:

- Deploy mechanisms for listening to internal and external sources.
- Motivate the entire organization to listen. This creates a complete view of the market and the customer, rather than functional silos where it's either marketing or service's job to listen. It should be everyone's job.
- Innovate for the end consumer, not just the immediate buyer, since value chains are in constant flux, being reinvented and disintermediated by existing competitors and newcomers.
- Lead the significant culture change required when business models are reimagined and business process are transformed as a result of the insights gained by listening.
- Organize for innovation and the reality of continuous market feedback.

[25] Forbes, The Internet Of Things Isn't A Technology Fad, October 16, 2014,
http://www.forbes.com/sites/groupthink/2014/10/16/the-internet-of-things-isnt-a-technology-fad/

Reshaping the Elements of Innovation Success

The elements needed to improve an organization's listening capacity include: software platforms for listening to internal and external signals; cross-functional teams; better data analytics for data already held by the organization; and a culture of listening. Note that the goal of these investments, which may be significant, isn't to create incrementally better products and services but transformative ones. Let us take a look at each element.

While a great many organizations have learned to listen to social media in recent years, fewer are properly listening to their own employees for signals about customers and the marketplace. For example, Tata Consultancy Services (TCS) made a concerted effort to improve its own internal listening capabilities, building an internal social network platform dubbed Knome. There are currently more than 260,000 active Knome users, belonging to more than 10,000 communities.[26]

Knome not only organically surfaces solutions and new ideas, but also promotes interactions with senior management (there have been some 18,000 interactions between employees and senior management to date). To promote Knome's use, the platform also uses gamification—more than 180 kinds of 'Knome badges' and 'Karma points,' a virtual currency, are used to incentivize our employees. We have also proposed Knome as a collaboration, ideation, and gamification platform for at least 50 clients in the past six months, and have more than 10 customer pilots underway.

When it comes to organizational structures that promote listening, cross-functional teams are essential for companies that want to understand how consumers engage with products. This is especially important in emerging markets, such as India and China. Consider Procter & Gamble Co. (P&G), which has a well-documented, cross-functional team methodology for entering new markets, where consumers may use familiar products in unfamiliar ways. This approach helped P&G develop a version of its Tide laundry detergent suitable for India, where many consumers wash clothes by hand. Additionally, P&G priced the product, Tide Naturals, 30 percent lower than its closest rivals. "This made the Tide brand accessible to 70 percent of Indian consumers and has helped to significantly increase Tide's share in India," as HBR noted in an analysis of P&G's innovation approach.[27]

Another successful example is iON, a TCS cloud-based ERP software solution for the Indian manufacturing and education markets. For this offering, conceptualized in 2007, TCS spent an entire year between 2007 and 2008 conducting in-depth interactions with manufacturing companies and educational institutions to understand their business challenges and consumption patterns. In 2011, iON was named winner of the Tata Innovista award in the Promising Innovation category (out of more than 3,200 entries).

Improving the analysis of data already held by the organization can yield dramatic returns.

Examples of companies that use data analytics effectively against owned data include game company Zynga, which gathers massive amounts of information from customers. By one count, the collected game data alone generates approximately 60 billion rows of data and 10 terabytes of semi-structured data on a daily basis. Because the data showed that people were interacting with the decorative animals in Farmville, the company's Farmville 2.0 made animals much more

[27] Harvard Business Review, How P&G Tripled Its Innovation Success Rate, June 2011, https://hbr.org/2011/06/how-pg-tripled-its-innovation-success-rate

central to the game.[28] Netflix, which has always used data to decide which shows to license, launched its hit series 'House of Cards' after carefully studying the viewing habits and preferences (actor, director, plotline) of 33 million Netflix customers.[29]

Along with analyzing owned data, companies need to break down silos between information stores. For example, car companies have begun studying service records to anticipate new car buying cycles and customer needs.

British Airways (BA), a TCS customer, centralized its customer data in order to do better analysis. The company now collects data from all six of its main customer channels—ba.com, BA Holidays (a travel-planning website), brochure requests, promotions, and business partners in the travel and leisure industry—and stores it in one place. BA's marketing teams use this data to design new products and improve passenger experiences.[30] This single view of customer data captures many customers who were left out of the company's existing customer relationship management (CRM) systems. Better marketing analysis has helped BA improve customer loyalty and increase the volume of repeat business, as well as analyze market trends to win new customers. Tapping into this customer repository also

[28] Dataflo, Zynga Is A Big Data Company Masqueraded As A Gaming Company, April 04, 2015, https://datafloq.com/read/zynga-is-a-big-data-company-masqueraded-as-a-gamin/505

[29] The New York Times, Giving Viewers What They Want, February 24, 2013, http://www.nytimes.com/2013/02/25/business/media/for-house-of-cards-using-big-data-to-guarantee-its-popularity.html?_r=0

[30] TCS, TCS helps British Airways check in to a centralized customer information solution, http://www.tcs.com/SiteCollectionDocuments/Case%20Studies/tcs_travel_case_BA_UK.pdf

British Airways Case Study: A Single View of Customer Data
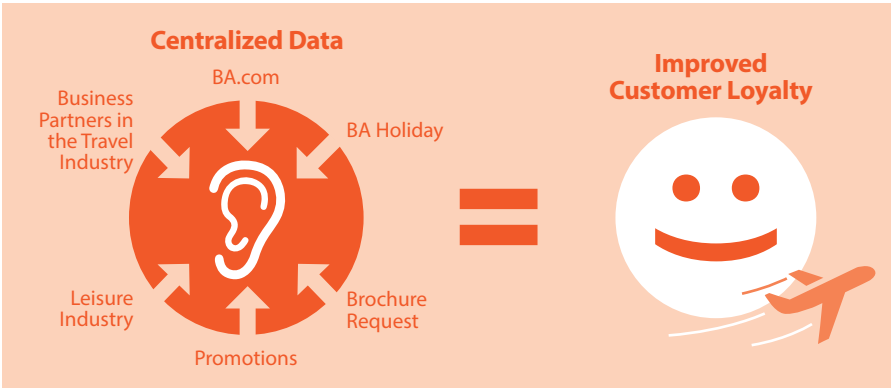
means that BA's iPad-equipped cabin crews now know a passenger's preferences and flight history.

But companies need to take care of privacy concerns. "How was your trip last month?" the flight attendant might say to a married couple, only to have the surprised wife turn to her husband and say, "What trip?" Even when customer data is scrupulously anonymized, the use of internal customer data may rile consumers and privacy rights advocates. Consider the negative publicity storm caused by Facebook's 2014 experiment during which the social media giant manipulated the news feeds of more than half a million randomly selected users, to change the number of positive and negative posts displayed.

Along with internal data, companies need to make the most of external data sources, and prepare for IoT. While still a young technology area, IoT offers intriguing possibilities and

benefits. According to our recent IoT Study, companies with IoT programs in place reported an average revenue increase of 16 percent in 2014, in the areas of business where IoT initiatives were deployed. IoT 'leaders' in that study, defined as the top-performing group of companies, netted a 64 percent average gain.[31]

These leaders are reimagining business models by using IoT data to do things like drive revenue by reselling customer data; increase support and repair revenue using product usage data; and bypass supply chain entities to restock customers directly.

Another example of IoT analytics innovation is the telecom company that figured out how to personalize applications to new buyers of high-end smartphones using phone location data collected immediately after the phone's purchase. As noted earlier, IoT data is of keen interest because it promises the ability to not just listen to a customer's explicit opinion, but his or her overall behavior.

However, harnessing IoT data involves huge culture change that may bring to light unpleasant realities for business units. Overall, investments in listening platforms and processes won't succeed without organizational cultural changes, led by the CEO. Specifically, organizations must accept and analyze input from wherever it arrives—the loading dock, the customer service agent, or the hotel maid.

Make no mistake—a push to democratize and legitimize listening sources is not easy. Consider the hotel chain whose maids all knew of a common complaint from guests that

[31] TCS IoT Study, Internet of Things: The Complete Reimaginative Force, July 2015, http://sites.tcs.com/internet-of-things/

the text on its complimentary bottles of shampoo and conditioner was "too small to read without my glasses." (Where don't you wear glasses? The shower.) Amazingly, this oft-heard complaint took decades to resolve.

Certain business functions, such as sales and marketing, are externally focused today. But elsewhere in the organization, deep in departments, there isn't much incentive to listen to the customer. At early IoT leaders GE, HP, and Intel, cultural change associated with IoT data has come straight from the top. These companies' CEOs have made using IoT data in a customer-centric way a clear priority, and put significant organizational funding and staffing resources behind it.

"Without question, the biggest barrier to the Internet of Things by a large margin is cultural," Intel's Jonathan Ballon told us in connection to our IoT Study.[32]

(Before moving to Intel last October, Ballon was heavily involved in GE's corporate strategy and the firm's software and analytics center in San Ramon, California.) "It is organizational inertia that gets in the way. People are afraid about what new technologies might reveal about the business." Listening must mean listening for the good and the bad. CEOs and leadership teams can set that tone.

[32] TCS IoT Study, Internet of Things: The Complete Reimaginative Force, July 2015, http://sites.tcs.com/internet-of-things/

Conclusion

In order to transform themselves into responsive enterprises, organizations must listen to continuous market feedback.

Above all, leaders must get companies past the "It's not my job to listen" attitude that slows down enterprise-wide progress.

If there is a lack of excitement regarding listening, how is it evangelized within the company? Is listening a centralized or distributed function? Does the mandate to listen, analyze, and react quickly come straight from the CEO?

From a technology standpoint, it is important to admit that while platforms for capturing and acting on continuous market feedback exist, they remain hard to implement. Remember, Google, Netflix, and Amazon have been at this for a decade. Organizations that still aren't doing a good job listening to their immediate customers will face an uphill struggle trying to listen to a distributed supply chain. There are also a variety of data issues, including privacy, security, quality, and interpretation. But despite the difficulties, companies must push forward in order to safeguard themselves against disruption.

Beware the line of questioning, "Why do we need to invest in this reinventing for continuous market feedback if things are already working well with our current management philosophy?"

One need not look far to find recent examples of self-satisfied industries that have been rocked by upstarts. Take ride-share services like Uber and Lyft, which in short order are replacing cab companies as the preferred means of on-demand transportation in some cities. A company's ability to hear and respond to old-world focus group data was a 'nice-to-have' strength. A company's ability to respond to today's continuous market feedback will shape its survival against nimble competitors that prioritize data analysis.

Reinventing the Supply Chain for a Digital World

Responsive Enterprises Need a
New Definition of Supply Chain Resiliency

Authors

Pari Annamalai
Senior Director, Supply Chain Management Center of Excellence
Raja Chandrashekar
Senior Director, Supply Chain Management Center of Excellence

Introduction

Companies have traditionally judged a supply chain's resilience by the ability to recover after black swan disasters and upheavals. Although preparedness for natural disasters is important, black swan events remain the exception, not the rule. A resilient supply chain in the age of the responsive enterprise must tackle a more complex challenge: it must help a company react to small, frequent changes such as those in customer expectations and demands, supply constraints, regulations, market variability, and competitor moves. This capability provides significant competitive advantage, by allowing companies to capitalize on fleeting opportunities and respond to changes in days or weeks, instead of months and quarters.

In the past, companies could manage the amount of variability their supply chains would confront, and develop strategies to deal with those variations. Today, however, business complexity is mounting relentlessly, and it is no longer possible to identify all scenarios from the start. For example, companies across vertical industry segments face

balloonling product proliferation and micro-segmentation of customers. Also, supply chains have shifted from vertically integrated systems to virtual, global networks of partners. Consumer product companies, for example, that used to own manufacturing plants, distribution centers, and trucks, now outsource much of that work.

To meet today's supply chain challenges, companies are building capabilities to predict changes, incorporate data from new sources, identify best courses of action, and implement decisions quickly.

Predictive analytics and simulation tools help companies assess and model the impact of changes and actions.

Increasingly inexpensive computing power is making it possible to use these technologies to manage supply chains at granular levels. Retailers, for example, can spot items selling faster at one location than at another and shift inventory to avoid stock outages and increase market penetration. This is an example of modern supply chain resilience: acting quickly on valuable data gleaned in everyday operations to prevent losses and promote gains. Often, however, the granularity of data being considered is not fine enough, given the availability of new data sources such as Internet of Things (IoT) devices, social analytics, and customer sentiment tools.

Reinventing the supply chain also requires overcoming significant talent hurdles. Let us explore the reasons why the supply chain wisdom of yesteryear does not work for today's digital business, and determine how to overcome the barriers to a resilient supply chain.

The Trouble with Traditional Approaches

Traditional approaches can help companies build resilience into the supply chain through excess capacity, inventory, or expedited supply chain processes. However, this flexibility comes with additional costs, thus lower margins.

Many companies also divide their products into abstract, 'manageable' categories that miss a great deal of detail. This abstraction hides information available in the supply chain which could be used to predict supply chain issues or opportunities. For example, rather than trying to forecast and manage thousands of television stock keeping units (SKUs) at a store level, an electronics retailer may focus on a few product families or categories, such as smart TVs at a regional level like Texas, instead of 42-inch smart LED TVs at a particular store. Such abstraction loses a lot of the detail which could allow the company to spot supply chain issues or opportunities and thus build resilience.

The performance-to-cost ratio of computing power has steadily improved, making it possible to manage data at a more granular level and eliminating the need to manage by abstraction. Thanks to technologies such as in-memory computing and improved analytics algorithms, companies can now analyze complex supply chain questions that used to take days or weeks, in a matter of minutes or hours. For example, one major consumer goods manufacturer uses its Internet of Things data to replan production lines based on actual demand variation once or even twice daily. Cloud computing and managed services have provided options to take advantage of technologies without laying out large capital and large teams to maintain and support the systems.

In addition, granular data about customers is much more readily available. Social media and consumer analytics can surface changes in customer tastes, expectations, and attitudes about products and services, including competitive ones. Based on popularity trends shown by social media, product can be redeployed according to demand. Social data can also reveal sentiments about specific channel partners. Incorporating this unstructured external data into analysis, along with sensor data and IoT data, can provide further insights into supply chain changes or opportunities.

Another challenge companies face is traditional thinking of supply chains as monolithic processes where all pegs are square. A single physical supply chain needs to accommodate customer needs through various channels and customer segments. Different customer segments have different expectations on service levels and costs, which will lead to different supply chain policies and approaches. Amazon.com's book division caters to everyone from casual fiction readers to students and professionals who need books in a hurry. Amazon does not have separate warehouses and trucks for each customer segment. Its supply chain is engineered to respond to different customer needs based on what they are willing to pay and how long they are willing to wait.[33]

amazon

[33] Sam Jermy, How Jeff Bezos is aiming to revolutionise Amazon distribution network, SupplyChain Digital, October 14, 2014, http://www.supplychaindigital.com/procurement/3648/How-Jeff-Bezos-is-aiming-to-revolutionise-Amazon-distribution-network

Focus on Two Goals

In the end, companies are spending too much time creating demand plans at an abstract level instead of taking advantage of the available data. To achieve a better result, businesses can use technology to automate data gathering and analysis. After all, this is a daunting task—managing millions or hundreds of millions of records and making decisions at a granular level, while keeping inventory levels low and improving service levels. Companies must also respond to regulatory and competitive surprises at a pace unheard of a decade ago.

Companies need to pursue two tactical goals:
1. **Managing supply chain data at a more precise level**
2. **More frequently**

For example, a retailer can plan the weekly demand using a SKU or store combination rather than just at the product family or category level. Forecasting turkey sales leading up to Thanksgiving will indicate that all stores will see a marked demand increase. But think of the diversity of neighborhoods in New York or San Francisco: menus for a holiday will vary widely. Data precision and speed of analysis both matter greatly for companies pursuing resilient supply chains.

Creating Precision and Visibility

As companies pursue those dual goals, IoT data, advanced analytics, and simulation technologies play important roles. Companies are currently deploying IoT technologies to improve efficiencies in logistics and capture customer and product use information. At the same time, advanced analytics help companies interpret IoT and other data to segment supply chain customers and respond more quickly to supply chain changes. Simulation tools help organizations evaluate options and identify supply chain efficiencies in their operations and drive down capital investment needs.
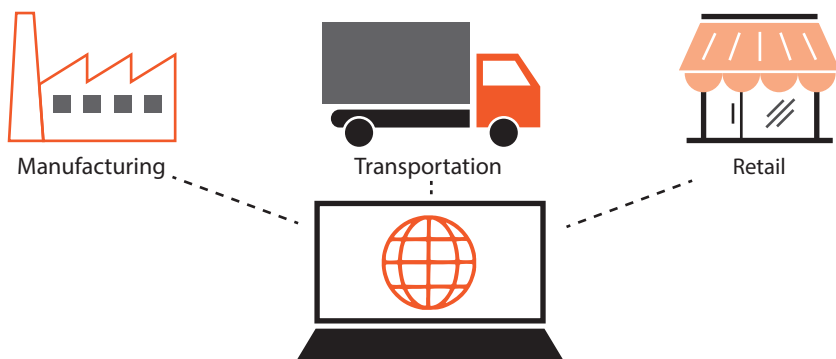
Figure 5. Supply chain as part of the IoT

How widely is IoT data being used for supply chain optimization? According to the TCS 2015 IoT report[34] supply chain monitoring is the second-most frequent use of IoT technologies, second only to mobile applications. Nearly 50 percent of European companies are using IoT technologies for this purpose, along with 43 percent of North American entities, 42 percent of companies in Asia, and 47 percent of Latin American organizations. Companies can use IoT supply chain data not only to monitor production and distribution work, but also to rethink business processes and increase sales.

HP Instant Ink is an excellent example. The company is putting sensors in printers sold in the consumer market that allows HP to anticipate when a customer needs new ink supplies and ship the ink before the customer runs out. The precision of the data also helps HP understand demand at the individual consumer level, which drives greater efficiency in manufacturing and supply chain operations. By automating demand data, HP has been able to focus its attention on business model innovation. The company realized it could pass savings onto customers and offer HP Instant Ink as a service based on usage level. For as little as $2.99 per month[35], HP Instant Ink customers receive the amount of ink they need when they need it. And HP does not lose out to its ink refill competitors.

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[34] TCS, Internet of Things: The Complete Reimaginative Force, http://sites.tcs.com/internet-of-things/
[35] http://sites.tcs.com/internet-of-things/

Amazon's recent Amazon Dash introduction is another example of a bold supply chain innovation designed to boost sales. The wireless gadget attaches to household items such as washing machines and lets Amazon Prime customers simply click a button to reorder items such as laundry detergent or paper towels.[36] That option lets Amazon offer a new convenience to Prime customers, and run a clever new maneuver around its rivals.

amazon

Advanced analytics technologies are helping companies capture and analyze large amounts of data to segment supply chains for increased precision and faster response.

At the same time, simulation and visualization tools can identify new sources of supply chain efficiency and capacity through evaluating multiple options. Consider the experience of a large pharmaceutical company. Anticipating one of its major treatments going off patent, the pharmaceutical company retooled one of its factories to start producing a new drug coming online. To the

[36] Techcrunch, Amazon's New Dash Button Hardware Offers Instant Orders For Staple Products, March 31, 2015, http://techcrunch.com/2015/03/31/amazons-new-dash-button-hardware-offers-instant-orders-for-staple-products/#.g2cg5a:7mPJ

organization's surprise, its generic competitor did not receive approval to make a version of the off-patent drug. The company suddenly found itself having to produce both drugs or take a significant economic hit.

Adding a line or using another plant would require years for regulatory approval. By using advanced simulation tools, the organization squeezed additional capacity from its plant: the company was not fully utilizing containers that moved the product between work stations and was also not washing them as frequently as it could. Simulation tools pointed the way to these straightforward opportunities that increased capacity by nearly 10 percent and allowed the company to meet demand for both treatments.

Surmounting the Obstacles

Talent challenges should not be underestimated by companies that seek to create and manage a digitally-enabled, resilient supply chain. This work requires deep company knowledge supported by expert analytical skills, which means supply chain professionals need to have greater mathematical and technology skills. Hiring and retaining such talent is becoming harder. Adding to the talent challenges in many industries, supply chain professionals with deep company knowledge are approaching retirement age. In the oil and gas sector, for example, nearly 50 percent of all employees are eligible to retire this year.[37] This is a large risk to many businesses.

[37] Magna Energy Services, Oil & Gas: An Industry of Baby Boomers, April 28, 2015,
http://magnaes.com/blog/oil-and-gas-baby-boomers/

Further compounding the talent shortage, is the perception of supply chain amongst younger workers, who may not view supply chain as a cutting edge or valuable specialty where they would want to focus their careers.

When supply chain teams have been stretched too thin, the remaining experts can become overworked, and burn out, leading to turnover.

To keep supply chain knowledge in-house, businesses need to establish retention incentives and mentoring programs to make sure that important knowledge does not walk out the door. They should also implement knowledge management and internal social collaboration systems to document employee knowledge. In some cases, companies need to take advantage of current technologies to codify knowledge of workers and reduce some of the normal or mundane decisions and delegate them to a system.

At the same time, many supply chain professionals lack advanced analytics skills. Businesses need to invest in training and recruiting to build these capabilities. The ultimate goal is to marry company experience with analytics skills—to bolster the ability to develop and test hypotheses when changes occur.

As supply chains increasingly rely on the networks of partners, the professionals who manage the partners also need excellent communication and collaboration skills. Moreover, since partners will likely be in multiple locales around the world, supply chain professionals also now need knowledge of cultural norms and expectations in order to build trust and confidence.

Conclusion

Company leaders today expect more of supply chain organizations, given the new definition of resiliency. Failing to rise to this level of resiliency will mean increased risks and missed opportunities for the business. To use a baseball analogy, supply chain leaders should ask how much further could your company hit the ball? Seek that understanding by asking these supply chain transformation questions:

- Does your organization take advantage of the data available to make more informed decisions?
- Do you foresee opportunities to capture market share or just react to changes?
- Does your organization understand what levels of capacity it has in its operations, which it can tap into without significant increases in working and investment capital? How quickly can the company put that capacity to use?

- Do your competitors take actions more frequently based on granular knowledge than your organization does?
- How much time does the supply chain team spend gathering data versus analyzing it and developing new ideas?

Digital technologies underpin the resilient enterprise's ability to capture fleeting opportunities. Companies are moving to the head of the pack by using technologies such as IoT, advanced analytics, and simulations to manage their supply chains at new levels. Like any technology transformation, however, success depends on more than the technologies themselves. To successfully reinvent the supply chain for a digital world, businesses need talent development and retention strategies that prioritize company experience, analytics expertise, and collaboration skills.

Having a supply chain that can swing back from catastrophic events is important. Competitive advantage, however, requires supply chain operations that can identify and adeptly respond to everyday events.

A responsive company must be able to react quickly to granular, near real-time data from sources such as IoT systems and social streams.

Hurricanes happen, but only once in a great while. Companies that win with partners and customers will be those that can respond to smaller disruptions with skill, speed, and flexibility.

The Care and Feeding of Data Scientists

Organizing, Engaging, and Retaining These Increasingly Vital Professionals

Author

Dr. Gautam Shroff

Vice President and Chief Scientist, TCS Research

Introduction

An enterprise that positions its data science and analysis talent improperly cannot derive maximum business benefit from it. An ill-advised organizational structure will create internal friction between groups. The company will spin its wheels analyzing data that doesn't solve core business problems, and fail to provide an appealing career path to data analysis experts. The company's more responsive competitors will be only too glad to hire these valuable data analysis professionals. How can your company avoid this fate? We will explore how to organize, engage, and retain a three-part data science team for maximum business results.

First, understand the stakes. Data science talent is today a competitive differentiator. Global spending on Big Data is growing at an average annual rate of nearly 30 percent and is expected to reach $114 billion in 2018, according to ABI Research.[38] Organizations with advanced analytics capabilities

Big Data
Global Spending
Up 30%
(annual average)

2018
$114 billion

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[38] ABI Research, Big Data Spending to Reach $114 Billion in 2018; Look for Machine Learning to Drive Analytics, September 2013, https://www.abiresearch.com/press/big-data-spending-to-reach-114-billion-in-2018-loo/

are outperforming competitors. For example, consider Netflix's success shaping its original content using analytics. The most prominent program, House of Cards, helped Netflix pass 62 million subscribers in the first quarter of 2015, setting a quarterly subscriber record.[39]

Companies now more fully appreciate that all data, not just Big Data, has value and potential. This understanding has driven up demand for data experts in a variety of specialties. Creating the right organizational structure for the data team takes on added importance given today's shortage of data scientists and analysts.

As companies seek data professionals, the challenge is two-fold, as noted in the TCS 2013 Global Trend Study, 'The Emerging Big Returns on Big Data': Companies need to find and hire data scientists who can manage large amounts of structured and unstructured data and find actionable business insights. Companies must also build trust between the data scientists and functional managers. Organizational structure can help build that trust, or damage it.

Without the right organizational chart, your company's talent retention efforts are likely to fall short. If you can't retain your data science talent, your competitors will recruit them and gain advantage. These are highly paid, highly sought after individuals. According to data science recruiting company Burtch Works, in the U.S. market, the 2015 average predictive analytics salary (non-managers) is $88,400 with a mean bonus of 11 percent, and for managers is $160,000 with a 19.1 percent bonus, with pay expected to keep rising. Data scientist salaries for non-managers average $120,000 with a mean bonus of 14.5 percent and for managers $183,000 with a 19.5 percent bonus.[40]

Average 2015 Salaries

Predictive analytics (non-managers): $88,400 + 11.0% bonus

Managers: $160,000 + 19.1% bonus

Data scientist salaries for non-managers: $120,000 + 14.5% bonus

Managers: $183,000 + 19.5% bonus

[39] Mashable, Original programming like House of Cards adds millions of Netflix subscribers, April 2015, http://mashable.com/2015/04/15/netflix-earnings-first-quarter-2015/

[40] Burtch Works, Burtch Works' Predictions – 2015 Analytics and Data Science Hiring Market, January 2015, http://www.burtchworks.com/2015/01/12/predictions-2015-analytics-data-science-hiring-market/

"Desperation for quantitative talent has clearly affected how often these professionals are besieged by recruiters," writes Linda Burtch, CEO of Burtch Works in a February 2015 article based on a flash survey of U.S. data science professionals.[41] 93 percent reported contact from a recruiter at least monthly, and 8 percent said they were contacted several times a week. How about turnover? 18.6 percent of these quantitative professionals changed jobs last year, a rate "nearly double what it is for the rest of the market," Burtch writes.

How can you organize to fight turnover and maximize results? The organizational structure of the data science team is not a one-size-fits-all proposition. Data science is not one skill. It requires three distinct skillsets that are almost impossible to find together in one person:

1 **Data Miners:** These are pure data experts, mathematicians and statisticians, who probably do not know programming. Alternatively, they are computer scientists well versed in machine learning. Miners are able to analyze data using statistics, data mining, and machine-learning techniques.

2 **Data Wranglers:** These are people with a knack for finding and getting hold of data from various parts of the enterprise, plus transforming and joining disparate datasets. These IT and computer science-oriented people are typically programmers, business intelligence (BI) experts, Hadoop experts, and the like.
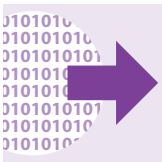
3 **Data Consumers:** These are business people who formulate strategies that exploit data. They are able to ask the right questions, both of the business managers and the miners. Consumers have the authority and budget to drive business experiments (including field work) that can validate a data-driven business strategy. Such experiments need to ask fundamental business questions that can lead to new or improved strategies.

[41] Burtch Works, Flash Survey Results: Big Data Professionals Contacted More than Ever Before, February 2015, http://www.burtchworks.com/2015/02/16/flash-survey-big-data-professionals-contacted-more-than-ever/

Finding a Home for Data Analytics

Why not just put IT in charge of data analytics teams? IT people may not know the right business questions to ask, or have the political power to run business experiments. Also, they are often not well exposed to mining and related techniques, and tend to focus on the selection of packaged tools based on feature-by-feature comparisons, rather than following a business-driven data strategy.

Conversely, line-of-business executives may not fully appreciate the depth of technology required for a successful data analytics initiative. For example, a business team could prioritize its own near-term wants over enterprise-wide data sharing goals. This is one reason 'islands' of data pop up. Furthermore, most successful data-based business strategies are cross-departmental, as with Amazon's analytics-driven approach that brings together marketing, inventory, and supply-chain data to achieve integrated demand-shaping and supply planning.

Dotted-line relationships pose their own challenges, including questions of who has the real authority. What about creating a new C-level position, a Chief Data Officer (CDO), to whom the data science team can report? For some companies, this is a smart answer. Charles Thomas, Wells Fargo's CDO, compares his role to an orchestra conductor: getting groups to work harmoniously.[42] (He reports to the CIO.[43])

[42] American Banker, Monetizing Big Data: A Q&A with Wells Fargo's Data Chief, November 2014, http://www.americanbanker.com/issues/179_212/monetizing-big-data-a-q-and-a-with-wells-fargos-data-chief-1071014-1.html

[43] The Wall Street Journal, Wells Fargo Creates CDO Role, March 2014, http://blogs.wsj.com/cio/2014/03/03/wells-fargo-creates-cdo-role/

But for other companies, a CDO role is a band-aid on a larger, underlying problem: Perhaps the IT and marketing teams are not collaborating well, or business units are reluctant to share data. There may be conflict between the CIO and CMO about who should 'own' Big Data. IT may feel it gets stuck with governance and security responsibilities, but marketing wants to drive product and service selection, for example. Sometimes a CDO is hired because the CIO and CMO can't get along, but a CDO must have the power to be more than a referee.

There is no universally applicable solution for positioning data scientists within an organization, just as there is no universal answer about how to organize an IT team. Factors that come into play include: the vertical industry, the maturity of your organization, the overall business culture, the IT culture, and the degree to which your company operates centrally or in a regional or federated manner. For many organizations, the answer is a Center of Excellence (CoE). For others, an immersion strategy, which places data teams wholly inside the business units, makes sense. Finally, some companies create a hybrid of those two models.

Factors for Organizing Data Scientists
- **The vertical industry**
- **Maturity of your organization**
- **Overall business culture**
- **The IT culture**

Three Organizational Approaches to Consider

Why is CoE the preferred choice? The data 'consumers' have to be on the business side. The 'wranglers' are IT people. With a CoE approach, the company sends 'miners' out on a project-to-project basis. The miners rotate, sharing experiences across projects. This group learns where the data lies. This approach drives data sharing when people move from project to project: Data insights don't stay confined to an isolated statistics team.

Let's consider three common approaches to organization:

- **Center of Excellence Approach:** An independent center typically headed by the Chief Data Scientist or Chief Data Officer, it oversees the company's data and analytics initiatives. Lines of business executives pursue initiatives under the center's guidance and coordination. Typically this group reports to the CEO, COO, or CMO, and not the CIO.
- **Immersion Approach:** Data experts are hired and positioned within the individual lines of business (LoBs) without centralized reporting or guidance. (However, wranglers need to remain part of IT or else they can't really enable cross-departmental data fusion.) LoB heads use data experts' services as needed. Data analysis teams report up to the CMO or marketing head (typical when marketing has created a data science team already,) or to regional business heads, in companies that operate in a very regionalized way, and where P&L owners may have their own data science units.
- **Hybrid Approach:** Data experts are managed by individual lines of business but are supported by a CoE. The common processes and vernacular for data and analytics are defined by the CoE, for use by data experts within individual units. Also, certain key data science initiatives and projects are managed centrally.

Finance
Management   Manufacturing

Sales   Quality Control
Retail

Center of Excellence Approach
An Independent Bank of Excellence
with Data Experts from every LoB

Management   Finance
Manufacturing   Sales
Retail   Quality Control

Immersion Structuring Approach
Each LoB has its own Data Experts

Finding the Right Structure

Companies should examine the three models in order to find the best fit for their particular business goals and culture. The CoE model has much to offer. Companies that have created large and well-funded analytics Centers of Excellence outlined their reasoning in the TCS 2013 Big Data study:[44] In addition to the data sharing benefits, the CoE approach preserves the data scientists' independence, their ability to provide unbiased advice to functional managers—as shown in Table 1.

Pros	Cons	Key Considerations
■ Drives enterprise-wide data sharing. ■ Centralized resource pool and unified tool selection leads to cost savings. ■ Creates processes usable across the company. ■ All business teams can tap into data teams' expertise. ■ Data teams are seen as independent and objective. ■ Oversees data hiring and gives data experts clear career path. ■ Encourages data experts to share and learn from each other, increasing team's overall skill.	■ Business units must request data talent for projects, creating organizational conflict about who gets approved. ■ Creates funding tension since business units compete for a portion of overall data analysis spend. ■ Data scientists and analysts may not specialize in any business area, so LoB knowledge doesn't accrete over time. ■ Business units may not trust data experts and could even try to block access to some data.	■ Is data science central to your business? For example, Netflix has a centralized data science organization because its business is fully dependent on analytics. ■ Are you a mature company that has used a CoE approach for other needs previously, with success? That will help win buy-in from teams. Also, you've already learned collaboration lessons. ■ Is your organization a startup, or just beginning the data science initiative? If so, a central approach may prove to be a safe and economical choice.

Table 1. The Pros and Cons of the CoE Approach

[44] Tata Consultancy Services, The Emerging Big Returns on Big Data, 2013, http://www.tcs.com/SiteCollectionDocuments/Trends_Study/TCS-Big-Data-Global-Trend-Study-2013.pdf

For example, the manager of 70 analysts at a large internet company told us that the key to helping the company increase revenue by hundreds of millions of dollars through numerous (and ongoing) tweaks of its website was extracting the analysts from the company's product units and centralizing them in a CoE. "There was a heavy bias back then for analytics to confirm what the product units were doing," he said.

Taking Big Data analysts out of the product units led to better insights—ones that product unit managers might not have wanted to hear from their teams.

General Electric, which has made Big Data and the Internet of Things (IoT) a critical part of its business strategy, says having a CoE provides a more attractive career path for Big Data professionals.[45] A CoE also gets data professionals talking and sharing, using the same language, raising the skill level of the entire team.

[45] Tata Consultancy Services, Internet of Things: The Complete Reimaginative Force, 2015, http://sites.tcs.com/internet-of-things/

The second model that we explore is the immersion approach, which places data teams inside business units. It requires a high level of business alignment and a thirst for near-constant tweaks based on customer data. This is the case at Zynga, which has said it considers itself a Big Data company, not an online gaming company, so its data experts are fully immersed in the business units.

Pros	Cons	Key Considerations
■ Alignment with business needs is strong. Data teams can move quickly on emerging business issues (for example, reacting to social sentiment or IoT data). ■ Data science teams understand business unit issues and the associated data, in depth. ■ Business unit leaders will be receptive to the data science effort, accept the output, and are likely to adopt the proposed recommendations.	■ Your company may not have enough funds to hire the number of data professionals that will be required. ■ You may struggle to recruit them in a timely way, given the talent crunch. ■ Business units with large budgets will have more flexibility to hire. But true organizational needs may lie elsewhere. ■ Data experts may be viewed as too allied with the business unit and find their objectivity questioned. ■ You may have duplication of expertise and systems, which can increase costs. ■ Data experts may not see enough of a career path, or feel stuck in a 'boring' business unit. This creates turnover.	■ If the organization is mature, you already have early lessons on where to embed data science teams to provide maximum organizational impact. ■ Has the company successfully embedded IT professionals in business units before? If so, you have already learned some collaboration lessons and fought some culture battles.

Table 2. The Pros and Cons of the Immersion Approach

This approach may suit your organization if only one business unit (or a few) will likely benefit from the data project. There is no need to rotate the team around. The company can create a cross-functional team of IT and data experts within the business unit.

Another factor to consider: For large corporations with highly autonomous regional subsidiaries, consolidation of data efforts beyond individual regions can lose focus on region-specific insights that may be key drivers of success.

Companies can also create a hybrid of the two approaches (CoE and Immersion) to capture some of the benefits of each. For example, Progressive Insurance's CIO Ray Voelker has described the company's hybrid approach as a factor that helped its Big Data efforts succeed in a timely way. Progressive Insurance uses hybrid teams to solve complex business problems, such as how to best allocate its marketing budget. In a 2013 project, a cross-functional team of IT and business analysts built a prototype that led to an internal system that by 2014 was "crunching the display ad data 200 times faster than was possible in the past," and analyzing digital display ad effectiveness down to the individual customer level, as reported in *CIO Magazine*.[46] This led to smarter media buys. (At a higher level, Progressive Insurance's total revenues rose from $18.2 billion in 2013 to $19.4 billion in 2014.[47])

[46] CIO, Progressive Insurance Uses Data Analytics to Fine-Tune Ad Strategy, September 2014, http://www.cio.com/article/2686835/data-analytics/progressive-insurance-uses-data-analytics-to-fine-tune-ad-strategy.html

[47] Media Corporate, Destination Ahead, 2014, http://media.corporate-ir.net/media_files/irol/81/81824/arInter/14_annual/assets/pdf/Progressive-2014-AR-BW.pdf

In a hybrid model, business units make their own decisions, but collaborate on selected data initiatives. The CoE defines common processes, chooses tools, and provides similar types of support to data science pros. Plus, the CoE can oversee career management and retention of data experts.

Such an approach is well suited to organizations with diverse and typically large business units that are likely to have a number of data initiatives that can derive business value independently of other units. In such cases, the CoE engenders a cadre of data professionals that can move from unit to unit, spreading best practices and at the same time learning from each experience. This eventually drives closer strategic collaboration between business units.

Conquering Cultural and Talent Challenges

Data analysis is viewed as a powerful tool to transform the company, generating tension over ownership of the effort and teams. Not surprisingly then, the biggest challenges to getting business value from Big Data are as much cultural as they are technological, the TCS 2013 Big Data study concluded.[48] When asked to rate a list of 16 challenges, companies placed an organizational challenge at the top of the list: getting business units to share information across organizational silos. This is a time for C-level executives to stress collaboration.

In another cultural challenge, data experts require the following to stay engaged and loyal:
- **Access to high-quality data**
- **An environment where data is shared**
- **Colleagues who are open to drawing conclusions about data, and**
- **Company leadership that is willing to put data-driven strategies into practice**

Companies frequently come up against two barriers here:

1. First, if the business is not willing to make changes, the data consumer's theories can't be validated, and all the work remains theoretical and on paper.
Companies must be real about experimenting with data to drive results. That's why people join companies. The reverse drives people away. Companies must decrease the latency of change. If the company becomes more agile, and willing to experiment with real dollars, then data experts will be more attracted—and more likely to stay long term.

2. Second, IT has traditionally been an information control unit rather than an information provider.
Breaking those shackles takes a lot of time and effort. There are differences between financial data and operational data. The mindset that all data correlates to a general ledger and cannot be shared needs to change. Business units may be more willing than IT to make this mindset change, but everyone must make it.

This is the point where some companies insert the CDO to drive that culture change. Business units can also drive the mindset change, by giving people the analysis they need and making data the centerpiece of the company.

Platforms also come into play here. The company needs platforms for data sharing, analysis, and collaboration. We call this nascent idea 'business data fusion': pulling raw data into a platform, with people curating the collection and

making it available to all of the business users, along with services (human or automated) to join and fuse disparate data on demand. This differs from a data warehouse, where usually only aggregated data, or some end-user BI, is carefully prepared and shared via reports.

In another cultural trap to avoid, companies may demotivate data experts with a diffused data strategy. The early stages of a data-driven strategy may be 'tell me something interesting' about the data. That's not a motivating strategy at all. The business data questions must be clear, such as 'how can we improve customer retention?' or 'how can we better spend trade-promotion dollars?'.

If executives are just saying 'we have to do something analytical', or 'get into Big Data', the company is responding to a technology trend rather than a business driver. For a web company, the overarching driver may be to increase traffic and advertising. In other large enterprises, the miners don't know the business well enough, so direction on which problems should be addressed has to come from business units.

Companies must also set aside some money to do data-driven business experimentation.

If the company doesn't try a sample of campaigns, and learn from them, then it becomes demotivating to data experts. Not all of these experiments will succeed, so don't expect a perfect record. Web companies perform such business experiments via A/B testing all the time: such as real-time price changes for two different customer models, executed on a small population, to learn which model is better.

As for the barriers to hiring data teams creatively, they start with traditional hiring methodologies and beliefs. Given the data talent shortage, companies need to think resourcefully about hiring and build a diverse data science team. What tactics can a company use?

The miners are in shortest supply and highest demand, with many going

to web companies. Look for people who have related skills, such as mathematics, industrial engineering, or operations research and train them online, using massive online open courses (MOOCs) and similar options. Companies like P&G have formed partnerships with local universities to nurture local data talent, and hopefully win future recruits. Companies including Progressive Insurance hold high school events, such as coding camps.[49]

Some companies actively recruit musicians and biologists for Big Data teams, people who have deciphered patterns in fields other than IT. David Menninger, head of business development and strategy for Pivotal, a subsidiary of EMC, told *Information Week* he hires biologists.[50] "We believe in interdisciplinary skills," he said. These creative thinkers may be a good fit for the data consumer role.

Consider where to train people from within the company to move into data teams.[51] This is an attractive option for the 'consumer' or 'wrangler' roles. Find business people who want to get exposed to data-driven reasoning or IT people who want to learn data science. Many MOOCs and online courses are available, at levels suitable for business managers. The key elements for these people to learn: how to translate what can be done with data on business strategy, how to validate strategy, and how to question the wranglers and miners. (At TCS, we have used this training strategy ourselves.)

However, for the miners, there is no substitute for people with the right background. Aspiring miners with only a little knowledge learned part-time can be damaging and dangerous to the company at worst, and ineffective at best.

[49] Thoughts on Cloud, Progressive CIO: 'We're way ahead' on Big Data, April 2015, http://www.thoughtsoncloud.com/2015/04/progressive-cio-were-way-ahead-on-big-data

[50] Information Week, Big Data Hiring: 5 Facts From The Field, February 2014, http://www.informationweek.com/big-data/big-data-analytics/big-data-hiring-5-facts-from-the-field/d/d-id/1113888

[51] Nemertes, Big Data Buy vs. Build, Staff Edition, June 2013, https://www.nemertes.com/blog/big-data-buy-vs-build-staff-edition

Conclusion

The ability to attract, organize, and retain data science talent will be a competitive differentiator for your business. Becoming data-driven is what the responsive, digital business is all about.

Company leadership should understand the three parts of the data team, communicate their business value, and make sure they understand their importance to group goals.

An interesting point on the CoE approach was uncovered in TCS' 2013 Big Data report.[52] Big Data leaders, those having the greatest early successes, point to the need for centralizing at least some of the analytics staff. Some 37 percent of leaders put their data analysts in a central group, compared with 23 percent of laggards.

Given the data talent shortage, companies must hire imaginatively and prioritize retention efforts. Companies focused on data team organization, engagement, and retention will be well positioned to meet digital business challenges.

[52] Tata Consultancy Services, The Emerging Big Returns on Big Data, 2013, http://www.tcs.com/SiteCollectionDocuments/Trends_Study/TCS-Big-Data-Global-Trend-Study-2013.pdf

A Cure for Complexity

Slimming Down to Compete Against the Focused and Fleet-Footed

Authors

Anantha P. Sekar
Global Head-Intergrated Offerings, Global Consulting Practice
Nidhi Srivastava
Global Head-IT Consulting, Global Consulting Practice

Introduction

From the largest consumer product firms to the biggest global banks, companies are slimming down to focus on their core businesses. Those that succeed can more effectively channel their resources to compete against fleet-footed competitors unencumbered by distracting businesses and product lines, or slowed down by legacy IT systems.

For example, in July, consumer products giant Procter & Gamble (P&G) decided to sell off 43 beauty product brands to Coty Inc. in a transaction worth $12.5 billion.[53] After spending $80 billion over two decades building up a high-profile portfolio, P&G concluded that those fashionable brands were a distraction. "We start thinking we are a beauty company and we spend all our time at the Oscars or the Grammys or in Fashion Week … and we don't stay focused on the consumer," CEO A.G. Lafley said about the move.[54]

[53] Procter & Gamble press release, P&G Accepts Coty's Offer of $12.5 Billion to Merge P&G Beauty Brands with Coty, July 9, 2015, accessed July 13, 2015, http://news.pg.com/press-release/pg-corporate-announcements/pg-accepts-cotys-offer-125-billion-merge-43-pg-beauty-brand

[54] Serena Ng and Ellen Byron, P&G Faces Up to Mistakes in Beauty Business, The Wall Street Journal, July 9, 2015, accessed July 13, 2015, http://www.wsj.com/articles/procter-gamble-agrees-to-sell-beauty-businesses-1436444762

Similarly, HSBC, the $55 billion global bank based in London, announced in June that it would focus on Asia (where 78 percent of its 2014 pre-tax profits came from), cut annual costs by up to $5 billion, and shrink its 250,000-person workforce by nearly 20 percent.[55] "We recognize that the world has changed and we need to change with it," Stuart Gulliver, HSBC's CEO, said in the bank's announcement.[56]

Indeed, the business world is rapidly changing, and the signposts are everywhere. For example, in the blink of an eye, about 100 venture capital-funded companies such as Uber, Snapchat, and Spotify have built billion-dollar businesses in this decade.[57] China has surpassed Japan as the world's second largest investor in R&D, and at its present rate could pass the U.S. by 2022.[58] Marketing everywhere is increasingly digital. Some 11 percent of 2015's nearly $600 billion global advertising spend will appear on mobile phones, and 29 percent of total ad outlays will go through digital channels.[59]

Major changes such as these are making life difficult for companies burdened by complexity—too many products, too many aging business processes, and too many legacy systems supporting those products and processes. As a result, a growing number of companies have embarked on major programs to weed out products, processes, and technologies that are distracting them from their core businesses. We call these initiatives 'business simplification.'

[55] Chad Bray, HSBC to Shed 50,000 Jobs in Overhaul of Global Business, The New York Times, June 9, 2015, accessed July 8, 2015, http://www.nytimes.com/2015/06/10/business/dealbook/hsbc-job-cuts-axe-25000-50000-saving-drive.html

[56] HSBC Investor Update, June 9, 2015, accessed July 8, 2015, http://www.hsbc.com/news-and-insight/2015/hsbc-investor-update

[57] Scott Austin, Chris Canipe and Sarah Slobin, The Billion-Dollar Startup Club, The Wall Street Journal, February 18, 2015, accessed July 14, 2015, http://graphics.wsj.com/billion-dollar-club

[58] Battelle and R&D magazine, 2014 Global &RD Funding Forecast, December 2013, http://www.battelle.org/docs/tpp/2014_global_rd_funding_forecast.pdf

[59] eMarketer, Advertisers Will Spend Nearly $600 Billion Worldwide in 2015, December 10, 2014, accessed July 14, 2015, http://www.emarketer.com/Article/Advertisers-Will-Spend-Nearly-600-Billion-Worldwide-2015/1011691

What's Sparking Simplification

Large established brands are increasingly vulnerable to focused, efficient, and superfast competitors—for example, Uber in the taxi business and Netflix in the broadcast industry. In the financial services sector, new entrants with new business models have been capturing market share from bigger rivals over the last decade. In the UK, Metro Bank PLC, in 2010, became the first British bank to gain a full banking license in a century. It focuses on entrepreneurs and has nearly 450,000 accounts.[60] In the U.S., investment banking powerhouse Goldman Sachs has launched mobile apps to enable online consumer lending.[61]

Startups and new, autonomous business units can avoid complexities such as plural sales channels and channel partners; variegated portfolios of products and services; broad swaths of customer types that require different types of care; and the myriad technologies and platforms required to support the entire, towering structure. Such complexities make many big enterprises slow and prevent them from competing effectively.

The complexity problem is most acute for companies that must:

- Cater to an already large and growing number of customer segments, and thus have too many products and services to support
- Offer multichannel access to customers for ordering, service, and support
- Fund enormous annual IT investments in legacy technologies to support longstanding segments of their businesses that are profitable but not growing
- Operate in many parts of the world, with associated business processes, people, and IT infrastructure tailored to each market
- Maintain relationships with a large and growing number of business partners

[60] Emma Dunkley, Metro Bank doubles lending as it focuses on business clients, Financial Times, January 21, 2015, accessed July 8, 2015, http://www.ft.com/intl/cms/s/0/c1000272-a156-11e4-bd03-00144feab7de.html

[61] Michael Corkery and Nathaniel Hopper, Goldman Sachs Plans to Offer Consumer Loans Online, Adopting Start-Ups' Tactics, The New York Times, June 15, 2015, accessed July 8, 2015, http://www.nytimes.com/2015/06/16/business/dealbook/goldman-to-move-into-online-consumer-lending.html

Executives are not blind to this reality, or to their vulnerability to asset-light, quick-moving competitors. Many big firms now worry that smaller upstarts can whisk customers away online, a growing threat with the proliferation of smart mobile devices that let new competitors jump into an established industry without the assets that in the past created significant barriers to entry. In 2014, 81 percent of more than 1,300 big-company CEOs across 68 countries said the biggest driver to transform their companies over the next five years will be technological advances—ahead of demographic trends and changes in global economic power.[62]

High-profile examples fuel this anxiety. The ride-hailing service Uber and home-reservation service Airbnb are two of the biggest. Each trades on assets that were already there—people's cars and homes. Neither startup owns these assets or employs drivers or hotel staff. Instead, their apps and systems connect consumers to services they want, at the times and locations they want, and at competitive prices, earning both companies fees and multibillion-dollar valuations.

Other digital companies have demonstrated the importance of being able to mine Big Data. In the entertainment industry, Netflix has muscled its way into TV production with shows like 'House of Cards' and 'Orange is the New Black.' The company has produced multiple hit shows after years of distributing and streaming others' programs through the mail and the internet. Netflix's distribution system gave it a decade of data on viewers' habits, data it now uses to predict what new shows will most likely succeed. And, so far, its track record has been exemplary.

[62] Fit for the future: Capitalizing on global trends, PwC 17th Annual Global CEO Survey, 2014, accessed July 9, 2015, http://www.pwc.com/gx/en/ceo-survey/2014/assets/pwc-17th-annual-global-ceo-survey-jan-2014.pdf

Who Needs Simplification—and Who Doesn't?

Not every enterprise needs to be on the front lines of business simplification. Some industries face far less pressure than others to slim down this way. From our work in this area, we have found that companies with the greatest interest in business simplification share two commonalities (see Figure 6):

- **They are highly vulnerable to competitors that don't need capital-intensive assets to compete in their sector.** Of course, Airbnb and Uber are great examples of this. They have been able to amass costly assets of their sectors—lodging establishments and taxis—without having to actually buy them. The publishing industry is another good example given that internet media don't need printing plants and trucks to get their products to market. So are online lending firms, which are betting that some consumers don't need to visit bank branches to get a loan. The alternatives to classic asset-rich telecom operators are well known. Conversely, the chemical and oil and gas industry's assets—such as high-cost chemical plants and oil wells—are not easy for competitors to duplicate.

- **They have large sunk investments in an operating model that needs major improvements or even transformation.** These companies have made heavy investments in business processes, applications, and technology infrastructure that have become burdensome. They include companies whose physical products are increasingly taking digital form yet still producing profits (and thus must be supported); they are among the firms with the greatest need for business simplification. Think of telecommunications companies with business processes and systems that support costly landline services whose customer bases are shrinking rapidly, as well as Yellow Page print directories and catalogue-based retailers whose data is increasingly being accessed online. Or consider newspaper companies with declining subscribers for their print editions (but which continue to get the lion's share of advertising revenue) while their online audience is growing.

Seen this way, industries such as retail banking, telecommunications, hospitality, and media are ripe targets for disruptors with few legacy assets and lighter operating models.

Vulnerability to Legacy Asset-Unencumbered Competition (Firms that Can Use Digital Technology to Siphon Away Customers)

High

- Technology
- Media & Entertainment
- Retail
- Financial Services
- Education
- Hospitality & Travel
- Telecom
- Healthcare Services
- Consumer Packaged Goods
- Chemicals
- Oil & Gas
- Pharmaceuticals
- Utilities

Low — High

Burden of Current Operating Model (Business Process Variations, Applications, Technology Infrastructure, etc.)

Figure 6: Which Industries Have the Greatest Need for Business Simplification?

Many companies have been trying to streamline themselves for some time. Common complexity-reduction moves include standardizing and improving business processes and enterprise IT systems, small rationalizations of product and service lines, and across-the-board headcount reductions. However, these solutions are band-aids because they don't get to the root of the complexities and the costs of the underlying IT.

The very technology that allows big companies to do it all—to operate globally, with varied offerings, to expand into new markets and customer segments, and to tailor business processes and leverage online channels—is where companies need to focus their business simplification initiatives.

The Core Elements of Simplification

Through simplification initiatives, companies can remove the complexities that come with too many products, customer segments, business processes, and technologies. These efforts have produced impressive results at a number of companies, including a leading mobile telecommunications operator, a large retail bank, a major market research firm, and a global insurer. For example, in the case of the telecommunications firm, executives came to the realization that after supporting progressive generations of mobile services (2G, 3G, and 4G), and with enhancements on the horizon, they had to simplify its offerings. Their solution was to bundle TV, phone, and mobile services into one package. This resulted in one offering to maintain, and one set of customers to serve.

In helping companies achieve such results, we have found four main elements to business simplification:

- Pruning the product and service portfolio
- Restructuring the operating model
- Boosting human capital performance
- Redesigning the business partner ecosystem

Pruning	Restructuring	Boosting	Redesigning

Figure 7 illustrates each element.
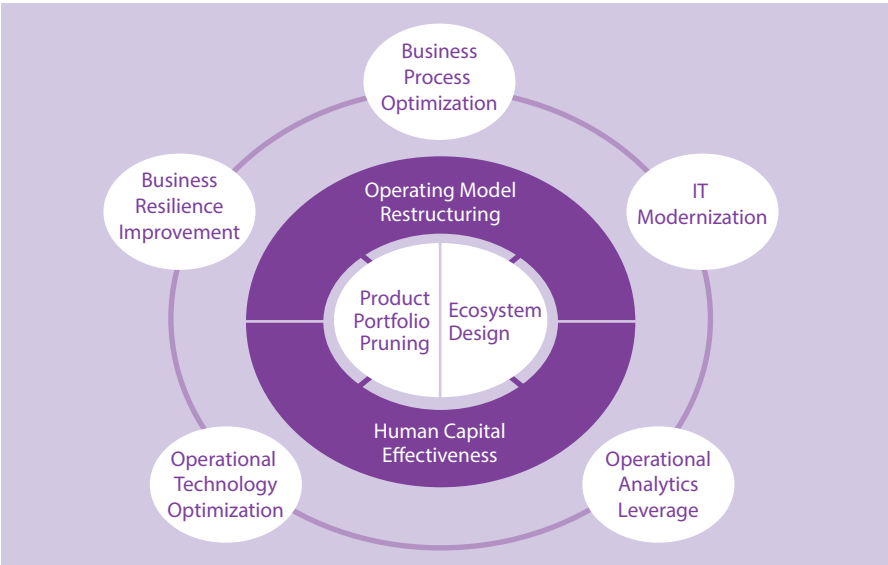
Figure 7: Key Business Simplification Levers

Pruning the Portfolio
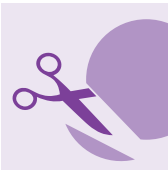
Reducing the number of customer offerings is a straightforward concept, and some companies embarking on simplification initiatives have cut their product and service portfolio by as much as 80 percent. But top management must decide what to prune in a way that supports future growth in the offerings that remain.

Doing so means, for example, designing and building products differently so they can leverage common platforms and reusable components. It also means incorporating flexibility by ensuring that supporting processes and technologies, including product design, platform design, and all associated business processes, are not hardwired to a particular product or business model.

Restructuring the Operating Model

Simplifying how a business interacts with its customers is central to improving efficiency and effectiveness. Restructuring requires redesigning the customer experience and optimizing the associated business processes.

Managers should work backwards from the customer's consumption behaviors and processes to learn about the experience of buying, using, and receiving support for its products and services. Insights about the customer journey should be used to standardize business processes and reduce variation as much as possible.

Ideally, unified processes should be created across products and brands. A large global market research firm consolidated and rationalized data, simplifying what was once multiple systems across its product lines from multiple acquisitions. The firm created one global platform for more than 20 countries, which enabled it to integrate data across media, including print, TV, radio, and internet channels. The move reduced research turnaround time by two-thirds, which enabled the firm to come up with insights about consumers' media viewing habits much faster.

It's high time (past time, actually) that companies digitize all paper-based transactions to cut costs and speed up workflows, using digital technologies to streamline common practices. For example, wearable devices that continually measure and monitor patients' vital signs free up medical staff to do other work.

Restructuring also requires optimizing IT by consolidating data centers, shifting on-premise applications to the cloud, and offshoring certain IT functions for cost effective management. For example, a top-tier U.S. bank shifted to having IT delivered as a service and funded it through operating expenses rather than through capital investments. Doing so enabled it to greatly simplify an environment that in 2010 had more than 30,000 computer servers, 20,000 databases, 200,000 desktop computers, 35 programming languages, and 4,000 business applications ranging from six months to 20 years old.

Restructuring includes putting key systems on common platforms. A large, global life insurance, annuities, and retirement services firm developed a single company portal that unified its public, retail, wholesale, and finance websites. The move gave financial advisers and consumers productivity tools, full visibility into their accounts and single sign-on capabilities across all applications. The initiative helped the company make major cuts in operating costs through reduced call center volumes, along with higher productivity for agents and customer service representatives. And it helped the firm maintain its market-leading position.

Boosting People Productivity

After reducing the number of products and services and streamlining the business processes and systems that support them, companies must make their people more productive. First, this requires standardizing business processes and training people to master them. Second, it entails giving employees the data and tools they need to do their work faster and better.

But simplification also involves identifying manual work that can be automated. This is crucial to making business simplification initiatives succeed: no longer doing work that technology can do just as well, and in some cases better.

For work that can't be automated completely, employees need information crucial to making sound decisions at their fingertips. Otherwise, if they take hours to search paper or even computer records for the data necessary to approve a loan, process an order, confirm a delivery date, or accomplish the myriad daily tasks of business, corporate productivity suffers. Giving people quick access to the information they need to do their work—and software tools that can help them do it—is essential to successful simplification.

However, in every company there is a growing proportion of work that can be automated completely. Because of rapid advancements in such technologies as robotics, artificial intelligence, sensors, and Big Data and analytics software, tasks that managers could never conceive of automating are now becoming ripe candidates. For example, many call center tasks (both sales and after-sales service) that allocate company resources to customers (for example, dispatching taxis, booking hotel rooms, and making airline reservations, to name just a few) are being done completely through software today.

Boosting the performance of human capital will be essential for the foreseeable future.

Companies whose core products and services are being disrupted by highly streamlined competitors must reduce their costs dramatically. Identifying manual tasks in sales, marketing, service, finance, and other high-cost areas that can be automated will keep companies efficient and price-competitive.

Redesigning the Partner Ecosystem

Business simplification initiatives cannot stop within the four walls of a company. Executives will find a significant amount of operations that no longer make a competitive difference but, nonetheless, must continue working. However, the question is this: Who should do that work, and who could do it better—less expensively, faster, and more accurately?

Think about the benefits and policy administration work of human resource functions, or accounts payable and receivable work in finance functions. These operations are necessary in every business, but not every business needs to do them internally. A large number of external providers exist for many back-office business processes in every industry.

Finding business partners that can take over non-differentiating business processes such as these will be particularly important in industries with 'brick-and-mortar' products that are bound to die a digital death in the near future. Think about the billions of dollars in infrastructure that supports paper check processing in banking, or print newspaper delivery and subscriptions, or paper-based bill payments and local phone directory publishing in telecom.

These asset- and people-intensive processes are supporting quickly diminishing physical products. Third parties that can take such assets off the books of banking, newspaper, telecom, and other companies—and run them competently—are becoming key players in the business landscape.

Over time, companies that rely on such business partners will want fewer but bigger partners to deal with. This will especially be the case with business partners whose business process outsourcing services are superior because they take over management of many related business activities offered piecemeal by other partners.

Some will be proficient as prime contractors that manage other independent contractors, as is seen in the engineering and construction world today. However, others will own many or all of the pieces themselves: the third-party logistics provider that handles all logistics; the online marketing provider that runs every aspect of online demand generation, from media buying and content creation to customer lead management; and the total HR talent manager (dealing with myriad tasks from employee recruiting to retirement).

The second type of business partner will make the veritable whole—an end-to-end business process—greater than the sum of its parts. They will be far more deeply involved and more effective than traditional outsourcing companies.

Overcoming the Key Challenges of Business Simplification

The quest to simplify business operations and processes is anything but simple. Three challenges loom large:

- **Simplifying too much, too fast:** Managing organizational change is an important component of a business simplification strategy. Once the goals of a business simplification program are clear, there can be an understandable rush to achieve it. However, executives must pay attention to how they achieve their goals. They can't neglect employee training programs or the communications plans that will explain the rationale for the simplification program.
- **Losing focus:** By definition, a simplification strategy needs to target a finite number of target outcomes. It is important to make a powerful business case using facts, rather than gut feelings and vague concepts, to argue for simplification.
- **Facing internal resistance:** Any simplification effort will encounter cultural resistance. To meet that challenge, top executives must drive the strategy. What's more, the program must be structured to deliver measurable business benefits early in the process. And when it comes to *where* to simplify, there should be no sacred cows in products, processes, people, or technology.

The most successful simplification initiatives focus as much on changing employee behaviors and beliefs as they do on streamlining products and processes. The best way to gain the support of employees is to achieve quick wins.

The Call for Simplification

The business world is never going to get less complicated. Companies that can move more quickly than their competitors are likely to leap ahead as the pace of business quickens. That's certainly been the case in the IT industry for decades.

But as digital technology becomes the basis of competition in nearly every sector, focus, speed, and agility will become necessities for many more companies.

That will force them to simplify their business models, product and service lines, business processes, and IT infrastructure. With the cost reduction and business efficiency improvements they can produce, these initiatives will be viewed as both arduous and necessary.

Preparing for Disruptive Competition

Making Business Model Innovation a Core Capability

Author
K. Ananth Krishnan
Chief Technology Officer

Introduction

Amid widespread digital disruption, business experts continue to urge executives in every industry to analyze their fundamental business model, and ask whether it needs revamping. This process, known as 'business model innovation,' is a strategic capability—one that is especially critical today, thanks to the disruptive effects of digital products and services. Organizations without a proficiency in business model innovation are at significant and increasing risk. Yet it is quite easy for executives to get immersed in their current business model and develop tunnel vision, seeking opportunities for growth, efficiency, and improvement only within their tried-and-true business model.

Thus successful, established leaders in a number of industries suddenly find themselves fending off new competitors that rise, seemingly without warning, from the digital sea.

Examples of businesses derailed by business model innovators abound. Blockbuster's movie rental business was upended by Netflix (movies supplied by mail, and later, streamed over the internet) and Redbox (videos dispensed by vending

machines). Borders and other bookstore chains were unsettled by online book sellers like Amazon, and now digital books. Record stores like Sam Goody's were disrupted by Apple's internet record store (iTunes) and music streaming services. Coffee machine makers such as Sunbeam Products' Mr. Coffee were upended by single-serve coffee machines from pioneers like Keurig and Nestle, and coffee consumption habits changed. In 2014, U.S. consumers spent a hefty $3.1 billion on single-serve coffee pods, up from $132 million in 2008, according to Mintel.[63]

Recent business model innovators include ride-sharing car service Uber, challenging the taxi industry, and electric car maker Tesla, challenging the automotive business with its distribution network (retail stores in shopping malls, not independent dealers) and novel maintenance scheme (updates via software downloads, not trips to a dealer's mechanic).

In all these cases, part of the failure was organizational tunnel vision caused by the very success of the existing business model. This is not entirely surprising. As the basis of the company's brand and the source of its revenue, the current model preoccupies executives. Understandably, they pursue growth, efficiency, and improvement around it. But in doing so, they may miss or dismiss transformational ideas, particularly ones that disrupt the current model.

Many organizations are keenly aware of the risk of not focusing on business model innovation. A 2014 survey by Boston Consulting Group (BCG) of 1,500 executives, found 94 percent of their companies 'had engaged in business model innovation to some degree.'[64]

While most organizations recognize the imperative of implementing a formal approach to business model innovation and experimentation, they typically struggle with how to do it well.

[63] The Seattle Times, Single-serve coffee revolution brews industry change, February 15, 2014, http://www.seattletimes.com/business/single-serve-coffee-revolution-brews-industry-change/

[64] Boston Consulting Group, Driving Growth with Business Model Innovation, October 8, 2014, https://www.bcgperspectives.com/content/articles/growth_innovation_driving_growth_business_model_innovation/

The same 2014 BCG study found only about a quarter (27 percent) of executives said their companies were 'actively pursuing' business model innovation.

Although competition is a constant, the worrisome threat is companies with digital business models, catering to consumers armed with digital technologies (smartphones, tablet computers, and wearables).

Consider what has already happened to retailers, media and entertainment companies, travel agencies, and hotels— even grocery stores and consumer packaged goods companies. All are confronting multiple new competitors. A smartphone and an Amazon Prime account are all a consumer needs to change his grocery shopping habits in a radical way. Innovation cycles are shorter. Hyper-personalization and crowdsourcing ideas from consumers have both become much less difficult.

Facing this type of innovative competition, companies can no longer shy away from transformational ideas that upend the familiar business model. They must seek these ideas out.

Why Business Model Experiments Fall Short

Business model innovation tends to be stymied by cultural obstacles. First, the notion that great ideas will rise, organically, through the corporate ranks does not match the speed at which innovations happen on the internet. Moreover, skunkworks projects and experimentation at low levels cannot generate sufficient resources quickly enough to match the competitors, who tend to be well-funded, nimble startups.

Second, business model experimentation is likely to face internal assassins. The 'not-invented-here' syndrome becomes more acute when the traditional, core business model is cannibalized by a new digital business model. Take retail banking for instance: Some consumers use branches, some use ATMs or websites, others use mobile apps. The bank must support all three customer constituencies. Meanwhile, existing customer channels within the bank will try to protect and extend their fiefdoms, even if customer behavior changes rapidly.

Risk-aversion will kill promising ideas way too soon. Some companies have tried walling off the business model innovation function, making it into its own group. The hope is that this will solve the resource-allocation and speed-to-market problem. But this will result in incomplete solutions, because some of the best, most counterintuitive ideas come from unexpected outsiders, whose thinking is not constrained by the current business model.

Walled-off innovation centers face another problem. New digital business models often require tapping into an interlinked group of business partners, a 'digital ecosystem' comprised of employees, customers, academia, and even competitors. Tapping outsiders' ideas can generate some of the most disruptive digital business models, because these outsiders reject conventional wisdom about how business must be done. Examples of tapping into a digital ecosystem include Netflix streaming services, which are run on Amazon's cloud computing services (despite the fact that Amazon is now a competitor to Netflix in the TV/movie streaming business), and airlines partnering with limousine services to improve the passenger's door-to-door experience.

Four Enablers of Business Model Innovation

To avoid cultural and organizational mistakes that can doom business model innovation goals, companies should apply the following principles:

1. **Make business model innovation top-down driven and part of the strategic planning process**
2. **Capture ideas from all levels of the organization, and from outside**
3. **Fund experiments adequately, protect them within the organization, and give them sufficient time to succeed or fail**
4. **Create a culture of patience, rapid learning, and fast decision-making**

Let us drill down on those four principles.

1 First, why should digital business model innovation be a top-down driven process that is part of strategic planning? Big ideas for new digital business are not likely to be digestible within functional budgets. And once these ideas start competing for customers against the core business, they are likely to be attacked internally. For these reasons, they need to be part of the corporate strategic planning process, backed by the CEO, CFO, and board of directors.

2 Next, top leadership must lead a cultural change that puts a priority on capturing ideas, whatever their source, internal or external. Traditional organizations are good at listening to their customers and stakeholders, their market as they see it. But to conceptualize new business models, the organization must prioritize exploring customers' entire experience, as well as customers not currently being served.

If you are a hotel company, you want to understand what parts of the travel experience are frustrating to consumers and ripe for disruption—not just the frustrations inside the hotel. When Steve Jobs pitched the Apple iPod in 1998, Sony was the market leader for music devices and Apple had zero experience with the music industry or music devices. Jobs' now historic bet that consumers wanted more from mobile music paid off. How can today's businesses use technology to mitigate the risk of getting outplayed in this way?

To begin with, open digital feedback networks inside and outside your organization to provide 'wisdom of the crowd' validation for new business models. Additionally, organizations that place value on co-innovation networks are better positioned to do effective listening and harness feedback loops. Customers and academic partners can be part of this effort.

As an example, TCS' Co-innovation Network (COIN™), created eight years ago, helps organizations get past the 'not invented here' obstacle. One of its successes has been creating iON, a cloud-based business software offering targeted to small and medium-sized businesses (SMBs) in India. This idea came from conversations and close work with our SMB customers, and knowledge of their business challenges and technology consumption habits.[65] Listening to customer needs drove iON's launch. Once the market need was identified, it was pursued, even if that meant changing product development, customer support, pricing, staffing, and other parts of TCS' existing business model.

Along with collaborative networks, businesses can harness software platforms to help them surface new ideas and assist with decision-making. An example of such a software platform is Knome, TCS' internal social network platform, which we discussed in 'Reinventing Innovation for a World of Continuous Market Feedback', pg 46. Another TCS software tool, ignio (™), provides decision-making assistance via machine learning.[66]

[65] TCS, Integrated IT-as-a-Service for SMBs,
http://www.tcs.com/offerings/ion-small-medium-business-SMB/Pages/default.aspx
[66] TCS, Ignio, http://www.tcs.com/Pages/TCS-Ignio.aspx

While encouraging bold ideas and better listening, it is important for company leaders to make the distinction between invention and innovation. Invention comes first, and should be free-wheeling and not measured by business prerogatives. It is biased toward creativity. Unlike invention, innovation requires processes and controls to convert ideas to outcomes.

There are three types of innovation: developmental innovations (incremental in nature); platform innovations (to support key business processes); and disruptive innovations (high-impact breakthroughs).

Are your company's employees and other contributors truly motivated to find such innovations?

Top innovators have found that financial compensation may not be the key here. Rather, engaging events and environments (such as design jams and hackathons, or similar events using gamification and awards) are better at incentivizing creative thinking. At Nielsen and ABN AMRO, employees participate in company-sponsored hackathons using actual company data. And VISA Europe has a 100-day proof-of-concept pilot program, which recently initiated a charitable campaign for the children of Syria. VISA is encouraging teams to move inventions to innovations quickly, via rapid prototyping.[67]

Within the Tata Group, an innovation award dubbed 'Dare to Try' deliberately tries to push different thinking by celebrating promising innovations that fail.[68] A positive byproduct: An idea that was not much use within TCS may be adopted by another Tata company. This happened with a TCS process related to safe drinking water that was later picked up by Tata Chemicals.

The Dare to Try award points to another best practice: keeping a repository of ideas that did not pan out, which may be useful at a later date or for other entities. Just as important as developing new ideas, organizations need structures for protecting them.

[67] TCS, Bringing Agility to Organizational Decision-Making,
http://www.tcs.com/research/related-insights/Pages/Bringing-Agility-Organizational-Decision-Making.aspx
[68] TATA, Tata InnoVista is an annual celebration of the innovation effort in the Tata group, April 2012,
http://www.tata.com/company/articlesinside/xqkFEPUqPbE=/TLYVr3YPkMU=

3 There should be an execution mechanism to safely try out disruptive ideas, which may require revenue and employee compensation models that differ from those of the existing business. In many large organizations, the solution to this puzzle is to let the new business model function in a separate, protected business unit.

French company BNP Paribas took this approach when launching Hello Bank, a mobile-only bank, in 2013. The idea was to launch a whole new bank in six months to address a critical business problem: The company was losing the business of 25 to 30 year old young professionals (millennials) who did not want to set foot in bank branches. Support for the effort came straight from the CEO, including resources and funding to roll it out in six months, as hoped.

Hello Bank has said it aims to have 1.4 million customers in Germany, Belgium, France, and Italy by 2017. The company wants to not only stem customer losses but also improve engagement. One recent statistic: Hello Bank in Belgium has 350,000 customers, 70 percent of whom log more than ten transactions

per month. "That's really active for youngsters," Xavier Dumon, marketing director for Hello Bank Belgium told Banking Day in a June 2015 article.[69]

4 Finally, for innovative ideas like that to develop, CEOs must create a culture of patience, rapid learning, and fast decision-making. This includes determining the organizational tolerance for failure (is it two of ten or six of ten projects?) and making systematic provisions and funding for these anticipated failures.

Validating and pursuing new ideas rapidly requires a process, assisted by software tools, and an organizational structure that supports this activity. In most cases, the failure is not the lack of ideas, but what to do with a plethora of ideas. Which of 100 ideas will actually kick out benefits to the business if funded and given an infrastructure? TCS, for instance, uses the '4Es' process:

The 4E process
- **Explore**
  (new technologies and models)
- **Enable**
  (promising ideas)
- **Exploit**
  (ideas that find market traction)
- **Evangelize**
  (within and outside the company)

[69] Banking Day, Hello bank! farewell branches, June 4, 2015,
http://www.bankingday.com/nl06_news_selected.php?selkey=18835

Smart leaders let large numbers of people, not small groups, evaluate ideas. Starbucks does this with its co-creation network: Customers submit ideas via a website,[70] rate ideas using a voting system, and get to see a list of 'Ideas in Action' that Starbucks has adopted. Heineken rolled out a co-creation system in 2012, seeking ideas to motivate customers to recycle more cans and bottles.[71] The winning idea (good for a $10,000 prize), the 'Heineken-O-Mat,' turned recycling into a game. Within TCS, putting ideas in front of a large group is one of the roles of our Knome collaboration platform.

Conclusion

Digital business model innovation will be the most difficult type of innovation for many companies because of the threat to the core business, the necessary funding, and the speed with which the business must evolve and scale up. Technology is not the main barrier.

CEOs determined to encourage digital business model innovation should make it part of strategic planning and pay close attention to cultural hurdles, engaging in the necessary change management.

As we have explored, it is imperative to break the 'not invented here' syndrome. Make provisions for project failure, and approach these events systematically, with budget. Adhere to a consistent methodology when approaching innovation, leaving the earlier stage (invention) free to roam. Seek out ideas from your entire team and outside sources such as customers, and make sure to expose ideas to a large group for input. Follow these strategies and you will nurture a team eager to find transformational ideas, even those that disrupt the current model.

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[70] Starbucks, My Starbucks Idea, http://mystarbucksidea.force.com/apex/ideahome

[71] McKinsey & Company, Three ways companies can make co-creation pay off, December 2014, http://www.mckinsey.com/insights/consumer_and_retail/three_ways_companies_can_make_co-creation_pay_off

Shifting IT Delivery into High Speed

The Entire IT Organization (Not Just Half)
Must Be Able to Build Systems Rapidly
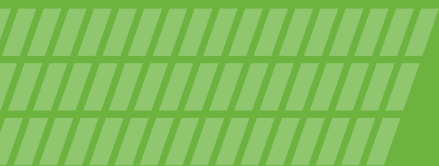
Authors

Nidhi Srivastava
Global Head-IT Consulting, Global Consulting Practice
Sorabh Singhal
Business Transformation Lead, GCP Business and Technology
Optimization Consulting, North America

Introduction

Just a few years ago, it might have been a stretch to think that a search engine company would make waves in the stalwart insurance industry. Yet earlier this year, Google announced the launch of its auto insurance comparison site[72]—its latest foray into financial services shopping tools—serving up travel insurance quotes, mortgage offers, and credit card comparisons. E-commerce expert Amazon today operates a formidable cloud computing service for businesses. Social networking site Facebook is trying to outdo media companies and become the world's largest publisher of news.[73] Gadget leader Apple aims to produce an electric car by 2020.[74]

When companies think about their biggest competitors, it is no longer simply industry rivals that keep them up at night. It is digitally native companies capable of responding rapidly to market opportunities.

[72] TechCrunch, Google Launches A New Tool To Sell Car Insurance To U.S Web Searchers, March 5, 2015, http://techcrunch.com/2015/03/05/google-compare-car-insurance-us/

[73] Fastcodesign.com, How Facebook Just Became The World's Largest Publisher, May 13, 2015, http://www.fastcodesign.com/3046246/how-facebook-just-became-the-worlds-largest-publisher

[74] Bloomberg, Apple Wants to Start Producing Cars as Soon as 2020, February 20, 2015, http://www.bloomberg.com/news/articles/2015-02-19/apple-said-to-be-targeting-car-production-as-soon-as-2020

In order to remain relevant, all companies must develop their information systems exponentially faster than in the past. They must be able to evaluate and implement a host of rapidly evolving technologies—including cloud, mobile, social, Big Data, robotics, and the Internet of Things—that may provide that next source of competitive differentiation. Gone are the multi-year IT projects of yore.

IT departments must be able to quickly respond to customer and business needs through rapid delivery of new products, services, and ideas.

That is something that companies like Google, Facebook, Amazon, eBay, and others—whose offerings and customer interactions are purely digital—have done from the start. They can build systems in days or weeks, and introduce incremental changes at seemingly hyper speed. Facebook operates in perpetual development mode with hundreds of software engineers making changes to front-end systems up to 500 times a day.[75] Amazon can deploy software changes into production in a matter of seconds.[76] Developers at Google make more than twenty code changes a minute with up to one change every second[77] during peak times. Long-established companies find themselves facing the same customer expectations for speed in improving business products and processes that are rooted in technology.

[75] Facebook, https://facebook.com//download/1411324735760067/devops.pdf
[76] YouTube, Velocity 2011: Jon Jenkins, Velocity Culture, June, 20, 2011, https://www.youtube.com/watch?v=dxk8b9rSKOo
[77] YouTube, Tools for Continuous Integration at Google Scale, August 27, 2012, https://www.youtube.com/watch?v=KH2_sB1A6lA

However, suddenly shifting from low to high gear in systems development is a tall order. As a result, many industry experts and practitioners have espoused creating pockets of high-speed development prowess outside of the traditional IT organization, or walled off within the department. But these short-term strategies yield only short-term results. And, in the end, such approaches could create as many problems as they try to solve—most importantly, in being able to connect rapidly developed systems for marketing, sales, service, and other functions to the company's core enterprise systems.

Instead, IT organizations in just about every industry should progress toward developing high-speed capabilities for all their systems. This transition will take more time than if they split IT development into the camps of rapid- and slow-speed development. But ultimately, this approach will present fewer risks and more benefits.

Limits of Two-Speed IT

For decades, large IT organizations have developed systems using a traditional 'waterfall' approach. Much like the approaches used in construction or manufacturing, waterfall is a sequential process that takes a project methodically through the various stages of development: conception, requirements analysis, design, development, testing, and implementation.

For many years—years in which the pace of product and process change was gradual—the waterfall method worked splendidly. A linear process, it was easy to understand and follow, well-structured and documented. And this approach allowed IT leaders to determine at regular intervals if the project was on the right path or needed a course adjustment.

'Waterfall' Approach to a Project

Stage One (conception) ···· ▶ Stage Two (requirements analysis) ···· ▶ Stage Three (design) ···· ▶ Stage Four (development) ···· ▶ Stage Five (testing) ···· ▶ Stage Six (implementation)

Today's businesses, however, can no longer tolerate long, drawn-out systems projects due to speed-to-market demands. New automobiles that used to take more than four years to develop can now be rolled out in less than two years. IT must be able to support this need for business speed if it is to remain relevant.

Throwing out the development methods that IT has honed for years is not easy to do. That is why some industry analysts have suggested a near-term dual approach to systems development. Last year, IT research firm Gartner Inc. introduced the concept of bimodal IT: creating two separate modes of IT delivery, one focused on stability and the other on agility. McKinsey introduced the concept of 'two-speed IT[78]: a fast-speed, customer-centric front-end running alongside a slow-speed, transaction-focused legacy back-end.

Customer Centric Front-End Function	FAST LANE
Transaction Focused Legacy Back-End	SLOW LANE
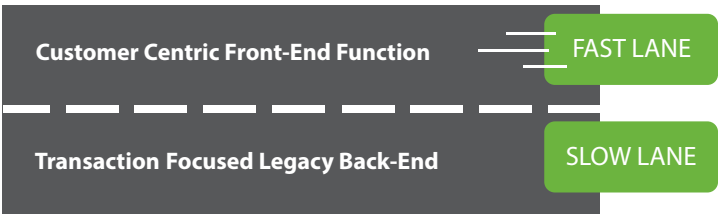
To accelerate systems development, particularly of digital marketing and other applications, some companies have put rapid systems development under a chief digital officer, completely outside the purview of the IT organization. Other IT organizations have developed pockets of high-speed development capabilities, taking the so-called 'DevOps' approach. This brings development and operations talent together on product-focused teams and incorporates agile development methodologies on certain deliverables.

[78] Bernard Golden, What Gartner's Bimodal IT Model Means to Enterprise CIOs, CIO.com, Jan. 27, 2015, http://www.cio.com/article/2875803/cio-role/what-gartner-s-bimodal-it-model-means-to-enterprise-cios.html

While these strategies offer a logical middle ground, ultimately they may deliver only limited benefits to companies that don't believe their IT functions can build new digital systems fast enough. Longer term, they may do more harm than good.

A dual-speed or segregated model creates more silos around systems development, rather than removing existing barriers that slow down development. In addition, a high-speed development group may create systems that cannot be integrated with a company's core systems at the desired speed.

As marketing, sales, service and other functions get accustomed to the more responsive development group, they may become frustrated with the pace of the legacy IT group and try to work around them.

In addition, it can be difficult to attract top talent to the lower-speed IT function. Meanwhile, DevOps integration and traditional agile approaches may leave business process design out of the equation of rapid systems development.
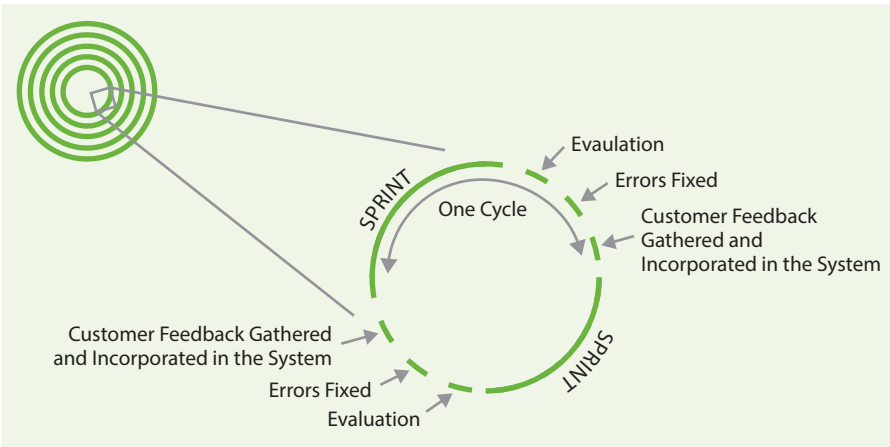
The Need for One Speed in IT: High

A better solution is to begin to shift all of IT development to a faster, more agile approach. Of course, agile systems development is nothing new. The concept was born nearly 15 years ago when a group of forward-thinking industry leaders frustrated with the pace of systems development issued their 'agile manifesto.' It proposed, among other tenets, 'responding to change over following a plan.'[79]

Thus, agile development was born. An agile development project starts off with a basic design, and developers and analysts divide the development into pieces, completing the work in short 'sprints,' at the end of which evaluation is done. Errors are fixed, customer feedback is gathered, and it is all incorporated into the system before the next iteration. What's more, the new system is capable of going live at the end of any cycle.

The approach was ideal for less complex projects, standalone systems, systems where speed to market was critical and those where flexibility in schedule and budget were welcome. While there are a number of different approaches to agile development, the philosophy is the same: getting the development process to respond to rapidly changing business requirements and market forces.

High Speed IT: Continuous Feedback and Improvement Loops

 [79] Agile Alliance, The Agile Manifesto, http://www.agilealliance.org/the-alliance/the-agile-manifesto/

In more recent years, the DevOps movement arose, with similar goals for speeding systems delivery and flexibility. Rather than throwing systems over the wall from development to IT operations (where new software is tested before going live, in a process that can take weeks), the two groups come together and use automation where possible to quickly bring new systems to life.

No doubt many IT organizations have benefited from agile and DevOps approaches. But in a world in which digital competitors are making inroads in industry after industry, these approaches aren't enough.

Companies should not just bring the work of IT developers closer to IT operations staff. They need to bring the front end of systems development—business process design—into the tent as well. TCS refers to this approach as 'BizDevOps.' It not only enables the IT function to react faster to business opportunities and changes, but also improves systems quality and stability.

It also keeps the IT and business functions in sync throughout the product lifecycle.

BizDevOps becomes an enterprise capability that spans all stakeholders in an organization, including business owners, IT architecture, design, development, quality assurance, operations, security, partners, and suppliers. Systems are developed much faster, and designed right from the start to be integrated with core systems. Integration with core systems (such as their vast databases of existing customers) is one of the key advantages that large, established companies have against small startups: A BizDevOps approach considers how systems must connect throughout all stages of rapid IT delivery.

Unlike the two-speed approach that could result in a stratified IT culture, a BizDevOps organization will attract only the best and brightest IT professionals who can step up their game to rapid delivery and deployment.

Getting There from Here

Adopting a BizDevOps environment across IT is best accomplished in three phases, with each step producing more maturity in new skills, processes, tools, culture, and partner relationships required for high-speed IT delivery. First, the new organization learns how to initiate the approach, then walk, and eventually run, as it adopts and ultimately scales an all-encompassing fast and agile approach. These three stages are described in Figure 8.

In the first stage, IT forms product teams who gain knowledge of agile development methods. During this period, a mix of agile and waterfall methods are employed. Some areas such as build, integration, and testing begin to be automated. A culture of increased collaboration and communication is introduced and IT begins to work collaboratively with vendors on BizDevOps.

During the second phase, IT operates visibly faster. Mature and dedicated product teams with multi-skilled talent emerge. Agile and BizDevOps processes are adopted at scale. The entire BizDevOps tool chain is automated and integrated. A culture of continuous collaboration, communication, and feedback loops is established. IT works with highly collaborative vendor teams with business and domain knowledge.

In the third and final stage, the IT organization runs at full speed. Fully integrated and self-sufficient teams are established and all silos are eliminated. Agile and BizDevOps processes are continuously improved. The IT organization perpetually implements new automation and integration tools. A culture of outcome-based product teams exists, and IT seeks vendors for full development and support of products.
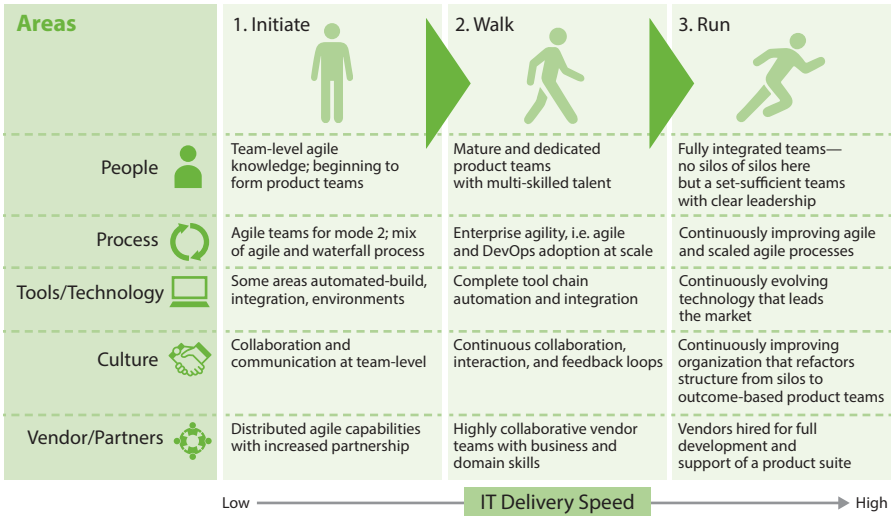
Areas	1. Initiate	2. Walk	3. Run
People	Team-level agile knowledge; beginning to form product teams	Mature and dedicated product teams with multi-skilled talent	Fully integrated teams—no silos of silos here but a set-sufficient teams with clear leadership
Process	Agile teams for mode 2; mix of agile and waterfall process	Enterprise agility, i.e. agile and DevOps adoption at scale	Continuously improving agile and scaled agile processes
Tools/Technology	Some areas automated-build, integration, environments	Complete tool chain automation and integration	Continuously evolving technology that leads the market
Culture	Collaboration and communication at team-level	Continuous collaboration, interaction, and feedback loops	Continuously improving organization that refactors structure from silos to outcome-based product teams
Vendor/Partners	Distributed agile capabilities with increased partnership	Highly collaborative vendor teams with business and domain skills	Vendors hired for full development and support of a product suite

Low ——————— **IT Delivery Speed** ——————→ High

Figure 8: 3-Steps to High Speed and High Stability IT Delivery Approach

What does this kind of speed look like in practice? Logistics provider BDP International's digital product teams have cut software delivery time in half by adopting high speed development processes that enable "better communication and collaboration with the IT department's business partners," as reported in the *CIO Journal*.[80] Developers write

[80] The Wall Street Journal, DevOps Moves Deeper Into the Mainstream: Gartner, March, 6, 2015, http://blogs.wsj.com/cio/2015/03/06/devops-moving-deeper-the-mainstream-gartner/

and quality-check software code several times a day to add functionality and address bugs, said CIO Angela Yochem, who predicted that

"As software becomes more woven into the fabric of businesses, companies will shift to more efficient methods for building, testing, and delivering it."

TCS' Head of the Banking and Financial Services Business Unit for North America, Ramana Murthy, says, "Agile is the new default for systems development." To this end, TCS has taken up a large initiative to train more than 100,000 employees this year in digital technologies such as automation and artificial intelligence.[81] These skills contribute significantly to high-speed IT initiatives of customers.

Fundamental Changes

This evolution to high-speed IT delivery requires more than just new tools and processes for faster development. It demands some fundamental changes in the IT organization and in how IT interacts with the business.

Senior IT leaders should develop a road map that articulates a vision for the new development organization and details on its operating model. Executives should create clear goals for the transformation and methods to measure the organization's success.

The IT organization should shift its emphasis from functions and tasks to products and outcomes, extricating personnel from their individual tasks and placing them on product- and outcome-centered teams. Incentives and recognition should be in line with those desired product goals and business outcomes and shared by business, development, and operations. Communities of practice and strong knowledge management (KM) systems will aid these teams.

[81] Forbes, How Indian Outsourcer TCS Is Training A Massive 100,000 Workers In Digital Tech This Year, July 10, 2015, http://www.forbes.com/sites/saritharai/2015/07/10/how-indian-outsourcer-tcs-is-training-a-massive-100000-employees-in-digital-technologies-this-year/

IT professionals will have to evolve from specialists into multi-talented utility players with a working knowledge of the business, development, and operations. Business analysts, for example, will also perform testing. Developers will not only develop, but also test, deploy, and support systems. While digital companies will most likely have those professionals on staff, most established businesses will have to look outside their organizations while reskilling their employees.

In terms of technology architecture, companies should maintain systems of record until their end of life and modernize them based on business priorities. But the end goal should be to transform system of record into lightweight, modular applications through the introduction of micro-services and dynamic application programming interfaces (APIs) so that they, too, are part of the transformation. This work should be done through iterative approaches to legacy modernization rather than high-risk, big-bang projects.

Companies must also maintain a focus on governance, particularly compliance and security. However, the goal should be to automate as much governance as possible.

Conclusion

Digital technologies—and digital competitors—will continue to dictate the speed of business. And that speed is destined to increase. Half-measures or segregated approaches to developing new systems will cause integration, cultural, staffing, and other challenges.

Companies must start transforming all of IT around a fast, more encompassing BizDevOps approach, or risk falling behind both digital companies and more nimble established companies.

Sense and Respond: Finding the New Technologies that Really Matter

How to Filter Out the Noise
and Focus on What's Important
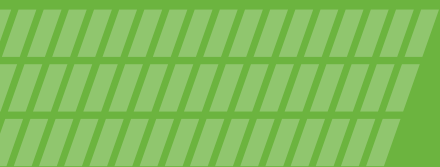
Authors

Nidhi Srivastava
Global Head—IT Consulting, Global Consulting Practice
Bhaskar Tondale
Deputy Head—Global Delivery Support and IT Architecture Practice

Introduction

The pace at which new information technologies hit the market has been accelerating this decade. Given that speed, how can big companies in all sectors determine which technologies have the potential to improve or transform their businesses? Spending time on the wrong inventions has a growing cost. If a company is late to adopt a game-changing technology, it will lose out to competitors and new market entrants. If it implements a bleeding-edge technology that fails to catch on, it has wasted time and precious resources on research and development.

This is no longer just a concern of the CIO or CTO. A recent survey found that more than anything else, the rapid pace of technological innovation keeps CEOs up at night.[82]

[82] Fortune Magazine, 2015 Fortune 500 CEO Survey, June 4, 2015, accessed July 6, 2015, http://fortune.com/2015/06/04/fortune-500-ceo-survey/

The current environment makes it difficult for executives to keep up with the tsunami of new technologies for three primary reasons:

1 **The number of technology companies is exploding.** Venture capitalists invested $48 billion in 4,356 deals in the U.S. in 2014, an increase of 61 percent in dollar terms and 4 percent in the number of deals over 2013. Software companies represented the largest sector at 41 percent of the total deals and 40 percent of the investments.[83]
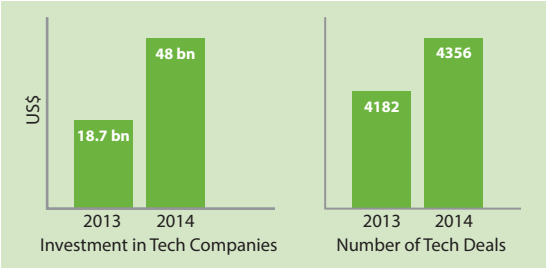
2 **The barriers to entry for technology startups have fallen.** Offshore software programmers, open-source software, and collaboration tools have lowered product development costs. Public cloud computing platforms have cut production and testing costs. Online downloads can erase distribution costs. Online search makes marketing less expensive. Crowdfunding hubs like Kickstarter ease fundraising. All of these factors make it easier for startups to bring new products to market, faster.

3 **When added together, new technologies' impact can be potent.** Consider Google Maps—the combination of mobile location services and data analytics enables Google Maps to derive the estimated time of arrival (ETA) for users in real time. The movements of thousands of mobile phone users across a city provide a useful representation of live traffic conditions. This data, along with speed limits, the actual trip durations of previous drivers, and historical average speeds combine in an analytics engine to project a user's ETA, expanding Google Maps' functionality.

In addition to these factors, five recent innovations—social media, mobile, Big Data and analytics, cloud computing, and the Internet of Things—are creating new opportunities for companies to digitize their business processes. In fact, 95 percent of companies were doing so in 2014, a TCS study found.[84] Here's the impact that recent innovations have had on businesses:

1 **Social media networks** have opened up new communication channels for consumers and businesses. For example, Facebook reported 936 million active daily users this April.[85]

2 **Mobile technologies** continue to change the way people interact with IT systems, organizations and each other. IDC projects worldwide smartphone shipments to surpass 1.4 billion in 2015, rising 11.3 percent over the previous year.[86] In early 2015, Apple said its App Store offered more than 1.4 million apps[87] and the Google Play store for Android apps had slightly more.[88] Forrester Research predicts U.S. mobile payments will reach $142 billion by 2018, more than three times the number in 2014 ($42 billion).[89]

[84] Tata Consultancy Services, The Road to Reimagination: The State and High Stakes of Digital Initiatives, TCS Global Trend Study, July 2014, accessed June 18, 2015, http://sites.tcs.com/stateofdigital/key-findings-highlights/

[85] Everett Rosenfeld, Facebook user growth crushes estimates, CNBC, April 22, 2015, accessed June 12, 2015, http://www.cnbc.com/id/102610670

[86] IDC, press release – Global Smartphone Growth Expected to Slow to 11.3% in 2015 as Market Penetration Increases in Top Markets, According to IDC, May 26, 2015, accessed June 12, 2015, http://www.idc.com/getdoc.jsp?containerId=prUS25641615

[87] Apple press release - App Store Rings in 2015 with New Records, January 8, 2015, accessed June 14, 2015, http://www.apple.com/pr/library/2015/01/08App-Store-Rings-in-2015-with-New-Records.html

[88] Steve Ranger, "iOS versus Android. Apple App Store versus Google Play: Here comes the next battle in the app wars," ZDNet, January 16, 2015, accessed June 14, 2015, http://www.zdnet.com/article/ios-versus-android-apple-app-store-versus-google-play-here-comes-the-next-battle-in-the-app-wars/

[89] Denée Carrington, "US Mobile Payments Will Reach $142B by 2019," Forrester Research blog, November 17, 2014, accessed June 15, 2015, http://blogs.forrester.com/denee_carrington/14-11-17-us_mobile_payments_will_reach_142b_by_2019

3 **Big Data and analytics** have gone mainstream and changed the way enterprises collect and store data. More than 170 organizations including Amazon.com, eBay, Facebook, Google, IBM, Yahoo, LinkedIn, The New York Times, Microsoft, Twitter and IIT Hyderabad, have implemented the Hadoop distributed file system, for example.[90]

4 **Cloud computing** provides access to data resources so enterprises don't have to build their own. A recent Cowen & Company survey in May of 95 senior executives at large firms found that 77 percent reported meaningful adoption of cloud computing, up from 56 percent a year ago.[91]

5 **The Internet of Things** creates machine networks that generate even more data. The global Internet of Things market, including devices, connectivity, and IT services, is expected to reach $1.7 trillion in 2020, growing at about 17 percent annually.[92]

It's no wonder that CEOs stay up at night worrying about keeping pace. How can technology and business executives differentiate between hope and hype?

Overwhelmed by Unproven Possibilities

The traditional scanning and testing approaches for new technologies used by many companies are no longer adequate in this volatile environment. With so many technology companies vying for their time, executives must work to not be overwhelmed.

Indeed, the din of the new has generated a measure of skepticism among IT executives. After all, the C-suite holds its IT executives accountable for any application failure or system disruption. In their desire for stability in their enterprise systems, IT executives may miss out on beneficial and transformative new technologies. (See Figure 9.)

[90] Powered by Hadoop, List of Hadoop production and education users, Apache Foundation Hadoop Wiki, accessed June 12, 2015, https://wiki.apache.org/hadoop/PoweredBy

[91] Louis Columbus, Forbes.com, As Enterprise Cloud Computing Adoption Matures, Investments in Application Development Increase, May 30, 2015, accessed June 12, 2015, http://www.forbes.com/sites/louiscolumbus/2015/05/30/as-enterprise-cloud-computing-adoption-matures-investments-in-application-development-increase/

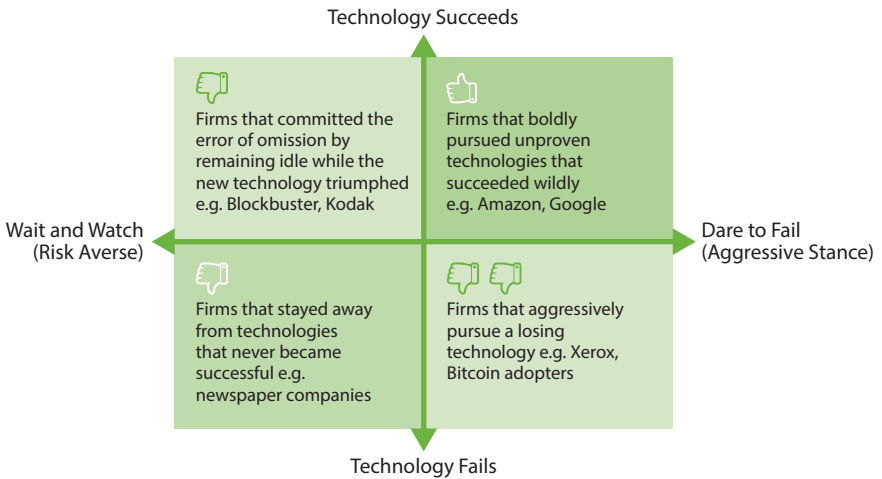[92] IDC, press release, Explosive Internet of Things Spending to Reach $1.7 Trillion in 2020, According to IDC, June 2, 2015, accessed June 12, 2015, http://www.idc.com/getdoc.jsp?containerId=prUS25658015

Technology Succeeds

Firms that committed the error of omission by remaining idle while the new technology triumphed e.g. Blockbuster, Kodak

Firms that boldly pursued unproven technologies that succeeded wildly e.g. Amazon, Google

Wait and Watch (Risk Averse)

Dare to Fail (Aggressive Stance)

Firms that stayed away from technologies that never became successful e.g. newspaper companies

Firms that aggressively pursue a losing technology e.g. Xerox, Bitcoin adopters

Technology Fails

Figure 9. Risk-Averse Versus Aggressive Stance toward Emerging Technologies

Meanwhile, business executives often want to use the freshest IT brands in pursuit of market leadership, and they can see the IT function as an obstacle to progress. This can lead to business departments developing 'shadow IT' programs, purchasing new, unapproved capabilities directly, only to assign system management and integration responsibilities to IT later.

This conflict is a recipe for trouble. When IT leaders establish programs to evaluate new technologies, they typically assign a lean staff to work with research firms and a limited number of vendors to monitor the landscape for promising opportunities. But this approach, managed centrally by top IT executives, is limited. A small team cannot analyze the fast-moving array of emerging technologies to determine what is relevant to the business. When the team later tests new technologies in a contained environment, removed from business operations, it misses chances to connect the technology to existing business processes and business executives. Relying too much on IT research firms poses similar risks.

Some companies are changing their technology evaluation strategy. A number have set up advisory boards of technologists from startups and other companies to provide insight into their operations. For example, $72 billion U.S. discount retailer Target Corp. asked for advice on its retail store design—and got candid feedback— from the CEO of Match.com, the online matchmaking service.[93]

But even this kind of effort may not go far enough. Indeed, companies need to create a new function dedicated to this mission, one that can make or break a company's future.

Sense Which Technologies are Important—and Respond

Companies that devote both business and IT resources to identifying and acting on emerging technologies—an approach we call 'sense and respond'—are far better at exploiting them. Sense-and-respond enables a company to identify the important signals amid the noise so that it can focus on what is most relevant to its business strategy.

This approach is akin to developing an early warning system for new capabilities that fit into a company's strategic vision. After identifying the most promising and relevant technologies, a company can then test how they would work in the context of their business operations. This requires an agile systems development approach. The company can then broadly implement technologies that are successfully tested.

The sense-and-respond approach to technology tracking has several benefits. The testing process can open up opportunities for business partnerships and capital investments in start-ups to foster the growth of a promising innovation. Also, by observing how a new technology aligns with business strategy, even companies outside of the technology industry can become early adopters, gaining, perhaps, a competitive advantage. Most importantly, the approach gives companies more time to make business-critical decisions because they identify opportunities for investment in emerging technologies sooner.

[93] The Wall Street Journal, Companies Set Up Advisory Boards to Improve Digital Savvy, Joann S. Lublin, June 9, 2015, accessed June 12, 2015, http://www.wsj.com/articles/companies-set-up-advisory-boards-to-improve-digital-savvy-1433895076

The Two Steps to Building a Sense-and-Respond Capability

Let's delve deeper into how to build this kind of technology-watching capability:

Step 1. Sense

Building a sense-and-respond capability requires shifting from a traditional top-down, risk-averse approach to one that is self-organizing, customer-driven, agile, and located in the center of the company's business. To do this, an organization needs:

- **Management buy-in:** Top management support ensures sufficient funding for operations, and capital to invest in technology providers whose innovations will drive company growth. A successful sense-and-respond function also benefits from the ongoing involvement of business operations experts.

- **A business focus:** The sense-and-respond function can apply a business screen to determine which innovations would dramatically improve the company's operating and financial performance. This means applying filters such as revenue drivers, cost generators, and classic measurements such as customer satisfaction. For example, a consumer goods company could regard technologies that enable marketing and activities at the point of sale as revenue generators, and therefore worth investigating and testing. An online retailer would look at pricing tools, on-time delivery enablers, and exchange and refund systems as business critical functions that could be enhanced through new technologies.

- **Good information sources:** Companies should continue to work with research firms that can provide data on emerging technologies. However, they should augment this with information from other sources including established technology vendors, venture capital firms, university research labs, competitors' public statements, media coverage, and best-practice research and industry groups.

Sources for sensing	What they can shed light on	Pros	Cons
Established technology vendors	Products in the works	May highlight what competitors are doing	Active selling of products
Startup technology vendors	Whole new product concepts that may have no technological precedent	Can provide solutions that can potentially help to differentiate	Active selling of products
IT research firms	Multiple technology vendors, products, strategies, and customer use cases	Aggregated information with a point of view	Tend to focus more on established vendors
Venture capital firms	Technology trends, proven models for technology led business setups	Insights into how new technology can be used in reinventing business models	Tend to focus on their portfolio companies
University research labs	Ideas or concepts that are nascent	Opportunity to tap into new concepts	Tend to be theoretical
Competitors' public statements (media articles, conference presentations, social media, blogs, and other content)	Point of views, new ideas	Out-of-the-box ideas that are thought provoking	Could be unstructured, inconsistent, and contradictory
Consulting and IT service companies	Best practices, industry cross-pollination ideas	Pragmatic ideas, can shed light on what peers are doing	Active selling of services
Associations and consortia	Best practices, frameworks, industry-specific reference architectures	Industry or domain specifics insights	Tend to be theoretical

Table 3. Information Sources for Evaluating Emerging Technologies. Highlights the strengths and weaknesses of various sources that assist in evaluating emerging technologies.

The sense-and-respond technology tracking function should organize interactions with information sources at regular intervals—at least quarterly, if not monthly—depending on specific business needs. Two factors are paramount in determining this frequency: the potential business impact of an emerging technology and its maturity.

Even with a structured information-gathering effort, it is worth noting that ideas can come from other sources. It pays to scan developments outside of a company's sector. For example, HP recently launched a program using sensors to provide automatic ink refills for internet-connected printers at customer sites. HP is one of several firms from a range of industries that has experimented with applications for remote sensors.

Analyzing cases from other industries can provide fresh perspectives to evaluate emerging technologies.

Step 2. Respond

After identifying technologies with the greatest business potential, organizations have to determine whether they will work. Testing will reveal how a particular technology would apply to existing business processes, or create new ones. It also will demonstrate how the new technology combines with other existing or emerging technologies, and whether it can create business value or solve an existing problem.

Using lean and agile development methods for this testing process enables an organization to mitigate the risk of failed projects (by limiting their size and scope). They also help it manage the investment required (by increasing commitments in increments after proven results). The approach calls for starting with prototypes of the new technology and collecting customer input, then developing more advanced versions and gathering additional customer feedback data.

Each step requires relatively little financial investment and poses minimal risk to the company's brand in case of failure. This method delivers the following benefits:

- It allows a company to build early prototypes and subsequent versions with incremental value, testing and pivoting rapidly when results dictate.
- Each iteration represents a step toward building a business case for broader deployment, if warranted.
- By generating rapid feedback, it provides the ability to deliver innovations in a timely manner.
- By providing that continuous feedback, it reduces the risk of delivering a solution that does not meet customer expectations—or that fails to align with business strategy.

The agile evaluation and testing process, with the involvement of business-side experts, is designed to winnow out all but the most promising technologies. Not everything that looks like an opportunity will be worth the investment. But those that are will be roll-out ready.

Sense and Respond in Action: Company Snapshots

From our experience and research, we've seen a number of companies that operate along the lines we describe, and derive value as a result. Here are three: Disney, GE, and TCS itself.

Disney: Keeping Entertainment Leading Edge

The acquisitions of innovative companies, such as Pixar and Lucasfilm, and R&D investments in television, movies, and theme parks, have yielded several benefits for the Walt Disney Company. These include state-of-the-art (and wildly popular and profitable) computer-generated animated films, RFID tags that have allowed its theme park visitors to gain easier access to rides (thereby improving customer satisfaction and loyalty), and TV content distribution via iTunes and online video (reducing distribution costs and driving new revenue).

Disney's five research divisions demonstrate the company's commitment to innovation and a diverse approach to developing it. For example, its theme park Imagineering group includes chemical engineers, software developers, and robotics experts. Under CEO Robert Iger's leadership, Disney has posted four consecutive years of record revenue.[94]

GE: Capitalizing on Technologies that Enable the Industrial Internet

Sensing that the Internet of Things was an important emerging technology area, GE invested in a new global software development headquarters near Silicon Valley, part of a $1 billion investment in developing sensor-equipped machines that it calls the 'Industrial Internet'.[95] The GE Global Software Center hired Big Data and analytics experts as well as software systems developers to support the development of smart machines—jet engines, locomotives, power turbines, and medical equipment.

Data from these machines allows for predictive maintenance and other applications that save customers money and earn GE new sources of revenue. In 2014, the Center generated $1.3 billion in revenue. GE CEO Jeffrey Immelt says its sales could reach $4 billion or $5 billion per year in the next few years.[96]

[94] Marc Graser, Disney Posts Record Revenue, 19% Gain in Profits in First Fiscal Qtr of 2015, Variety, February 3, 2015, accessed July 28, 2015, http://variety.com/2015/biz/news/record-disney-earnings-first-fiscal-quarter-2015-1201422519/

[95] GE to Open New Global Software Headquarters in California, press release, November 17, 2011, accessed June 15, 2015, http://www.businesswire.com/news/home/20111117005431/en/GE-Open-Global-Software-Headquarters-California

[96] Richard Clough, GE Sees Fourfold Rise in Sales from Industrial Internet, Bloomberg Business, October 9, 2014, accessed June 15, 2015, http://www.bloomberg.com/news/articles/2014-10-09/ge-sees-1-billion-in-sales-from-industrial-internet

**TCS: Scanning the Technology Environment
to Boost IT Services**

Our Co-Innovation Network (COIN™) acts as the firm's emerging technology radar. Through COIN, we leverage a network of partners to detect emerging technologies early in their lifecycles and develop joint go-to-market initiatives. These partners include major platform vendors (IBM, Microsoft, and SAP), technical infrastructure providers (Cisco, EMC, HDS, and HP), business software specialists, and niche technology players in machine-to-machine systems and mobile and social platforms.

COIN also extends to industry-specific organizations and relationships with leading research universities (such as MIT, Singapore Management University, Tel Aviv University, and University at California-Berkeley). Through COIN, we have fostered such emerging technologies as computational engineering, natural language processing, embedded validation and verification, and Human Machine Interface.

Sense and Respond:
The Barriers are Part of the Process

Building a sense-and-respond function requires overcoming inertia, resources that are insufficient to the task, the IT organization's default to stability, and the understandably risk-averse attitude of many business leaders who have seen so many technology promises go unfulfilled.

The sense-and-respond approach assumes nothing about the promise of any new technology, and is therefore immune to inflated expectations. It devotes resources to discovering innovations that are relevant to a company's business strategy while filtering out the majority that are not. It then tests the technology in the company's own business setting to see if it is worth further investment. Follow-on tests will demonstrate whether the new technology works with and improves business operations.

Don't Wait to Hear About the Next Big Thing

If you are hearing about a new technology for the first time from a vendor, or reading about it in the media, you're probably too late. If the technology truly has the potential to change your business operations, you should have known about it already—before it appeared in the business or technology press.

Companies with a strong emerging technology sensing mechanism have experts positioned in the field, spending time with innovators and entrepreneurs who are forming their startup or developing new technologies. And if you are there with them, your competitors are. Don't settle for being a follower.

It's understandable that enterprises are cautious. Big failures are costly. But the risk of inaction is greater. With a sense-and-respond function in place, a company can take calculated risks with emerging technologies. In this approach, failure is experienced before implementation, when the stakes are lower. The sense-and-respond function provides a structure to ensure that innovations a) are relevant to business strategy, and b) work.

Failure is inevitable. Not every investment will produce a return. But successes will pay off big. When a new technology works, it improves a company's competitive standing and opens up new opportunities for growth.

A sense-and-respond function separates the signal from the noise. It gives a company a radar screen to identify the most important and relevant new technologies. And it opens up opportunities to use emerging technologies to transform the business.
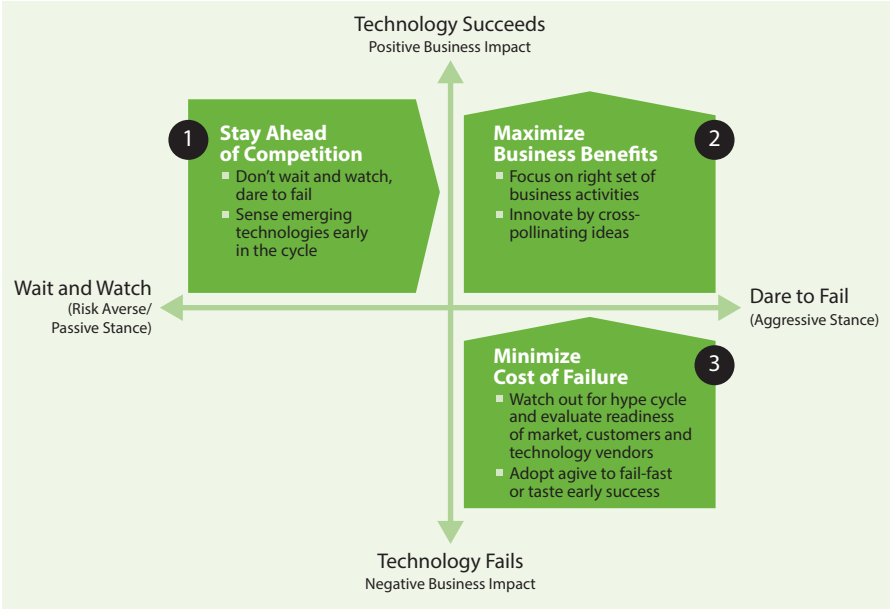

Figure 10: Three Shifts from the Traditional Technology Evaluation

The sense and respond approach, as illustrated in Figure 10, calls for changing the traditional method for detecting and acting on emerging technologies in three important ways:

First, don't wait for your competition to try out new technologies.

By the time you learn about their efforts, it will be late inthe game. Instead use the sensing capability to identify innovations worth testing.

Second, focus on the emerging technologies that could have the biggest business benefit, including those used in other industries from which you could learn.

Third, adopt agile development techniques to test new innovations in the context of your business.

Only advance those ideas that pass each test. By 'failing fast' early, you reduce the risk of failing big later. And the most important technologies to your business will find purchase in your organization.

First Substantiation, Then Transformation

Management's Case for Action
Must Be Both Airtight and Uplifting

Author
Krishnan Ramanujam

Vice President and Global Head, Consulting & Enterprise Solutions

Introduction

Many companies must now transform themselves due to the digital metamorphosis of their industries. But this is a tall order. The high failure rate of corporate transformations during the last few decades—about 70 percent, according to Harvard Business School, McKinsey & Company,[97] and other sources—shows the difficulty of any big change initiative.

A number of factors contribute to these transformation failures, all of which have been well articulated over the years, except for one: substantiation, or lack thereof. Making an irrefutable case for change at all levels of an organization is now elemental for the CEO. When one isn't made, resistance can set in, even at the top. Employees at every level go through the motions, not believing in the case for change, and often not knowing exactly what is being asked of them.

This can and must be avoided. Doing so requires an executive team to substantiate the need for transformational change—long before they plan and execute that change. As we put it: substantiation first, transformation second.

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[97] McKinsey, 70% of Transformation Programs Fail, September 27, 2013, accessed July 23, 2015, http://www.slideshare.net/aipmm/70-26633757

What Happens Without Substantiation

Why isn't an edict from a CEO—even a forceful and intimidating CEO—enough to set a transformation initiative in motion? Skepticism and denial represent potent counterforces.

Let's start with skepticism. All the dire warnings about death at the hands of digital upstarts ignore the fact that not that many big companies have actually perished due to the digital attackers. Yes, Blockbuster Inc. is out of business, and so is book retailer Borders Group. But another bookstore chain, Barnes & Noble, remains very much alive and kicking, with revenues of $6 billion in its most recent fiscal year,[98] and profits to boot. So does Eastman Kodak Co; the company is not extinct, as one might expect with all the post-mortems that have been written about it. In fact, Kodak had revenues of $2.1 billion in 2014 (although that was about half its 2010 revenues) with 7,300 employees, two years after surviving bankruptcy.[99]

Just like the boy in the Aesop fable who cried wolf one too many times, doomsayers fuel skeptics' attitudes.

But even if company leaders believe in such doom and gloom, they can still deny the warnings apply to them.

In his book 'Only the Paranoid Survive', former Intel Corp. CEO Andy Grove wrote about the type of disbelief that can happen to the management of a disrupted company. "A manager in a business that's undergoing a strategic inflection point"—Grove's 1990s' term for technology-induced

[98] Barron's, Why Barnes & Noble Could Double, May 24, 2014, http://online.barrons.com/articles/SB50001424053111904554304579573823704326750
[99] Eastman Kodak Co. 2014 Annual Report, http://investor.kodak.com/financials.cfm

disruptive change—"is likely to experience a variation of the well-known stages of what individuals go through when dealing with a serious loss," he wrote in his 1996 book.[100] Grove argued that managers are likely to go through a corporate variation of Elisabeth Kubler Ross's five stages of grief after the death of a loved one (denial > anger > bargaining > depression > acceptance). But in this case, the loss is one of market leadership, identity, control over one's destiny, and job security.

Four Stages of Business Loss			
1 **Stage One** Market Leadership	2 **Stage Two** Identity	3 **Stage Three** Control Over One's Destiny	4 **Stage Four** Job Security

The worst feeling for such managers, Grove wrote, is no longer working for a winner. The result: denial and escape, all while the clock winds down. When management ultimately accepts the firm's reality, it's often too late. That was the case at Blockbuster in 2003-2004, when it delayed entering the online video rental business that Netflix had pioneered. The Blockbuster executive in charge of the online business wasn't able to get executives running store operations, marketing, merchandising, and other functions to provide input to his plan rapidly, according to a 2012 book on Netflix.[101] Apparently, an online rental business wasn't considered critical enough. Blockbuster filed for bankruptcy in 2010 and closed its stores four years later.[102]

Weak cases for action aren't at all unusual. According to ex-Harvard Business School leadership professor John Kotter, the management teams at half of the firms he knows that have tried to transform themselves have failed at making a convincing case for it.[103] Kotter believes that making the transformation case needs to be 'Phase One' of the change process.

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[100] Doubleday, Only the Paranoid Survive: How to Exploit the Crisis Points That Challenge Every Company, Andrew Grove, 1996, p. 124.

[101] The 2012 book is - Netflixed: The Epic Battle for America's Eyeballs, by Gina Keating, http://www.amazon.com/Netflixed-Epic-Battle-Americas-Eyeballs-ebook/dp/B007X5ZE4W

[102] Huffington Post, Blockbuster Closing All of Its Remaining Retail Stores, November 16, 2013, http://www.huffingtonpost.com/2013/11/06/blockbuster-closing_n_4226735.html

[103] Harvard Business Review, Leading Change: Why Transformation Efforts Fail, 1995, https://hbr.org/2007/01/leading-change-why-transformation-efforts-fail

No argument there. But as Kotter writes, not all executives buy into this need. Some fail to make people uncomfortable with the status quo. Others delude themselves about making transformation an urgently felt need. And still others lack patience; they want to move too quickly from case-making to plan-making.

Four Elements of a Strong Case

So how do you make a bullet-proof case for transformation, one that gets all key parties willingly on board and thoroughly engaged?
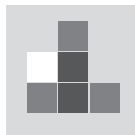To that end, we see four practices as important:

1 **Building an irrefutable argument**
2 **Making an uplifting case**
3 **Expressing the need in painstakingly plain terms**
4 **Learning from outside your sphere of competition**

Let's now dive into each practice.

1. Building the Irrefutable Argument

"Facts are stubborn things," once said John Adams, America's second president. "Whatever may be our wishes, our inclinations, or the dictates of our passion, they cannot alter the state of facts and evidence."

Nearly 250 years later, the words Adams used in defending British soldiers at the Boston Massacre trial prior to the Revolutionary War ring truer than ever. In organizations today, such 'wishes, inclinations, and passions' are shared in volume through social media, around the clock, for insiders and outsiders to see. Employees are swirling in a digital sea of opinions.

To get a company moving in a new and unified direction, management must have a solid foundation of facts that show the inescapable need for change. As management author Jim Collins explained in his 2001 bestselling book 'Good to Great', the 11 companies that Collins and his research team studied that went from good to outstanding performance "infused the entire [planning] process with the brutal facts of reality. …You absolutely cannot make a series of good decisions without first confronting the brutal facts."[104]

However, not all facts are created equal in terms of internal shock value. Of course, the highest-value facts come from customers (especially your bigger ones), their perspectives, and their intentions. CEOs such as Virgin's Sir Richard Branson are renowned for soliciting customer feedback wherever they go, and furiously writing down what they hear.[105]

Executives running transformation programs can gain significant internal momentum by interviewing key customers and convincing them to be candid.

Nearly as effective is hearing facts from the people at the front lines of a company who deal with customers— especially employees who understand customers' purchasing decisions, such as your sales force. That's been a strategy of many companies, including Pitney Bowes Inc. Collins described the turnaround of Pitney Bowes, a $3.8 billion company today that began

[104] HarperBusiness, Good to Great: Why Some Companies Make the Leap and Others Don't, 2001, pp. 63-83.
[105] Forbes.com, Seven Customer Service Lessons I Learned In One Day With Richard Branson, May 9, 2013, http://www.forbes.com/sites/carminegallo/2013/05/09/seven-customer-service-lessons-i-learned-in-one-day-with-richard-branson-video/

95 years ago manufacturing postage meters. The fact that the company remains vibrant, given that so many corporate mailings have shifted from paper to online, is a testament to its ability to get employees into the spirit of transformation. Critical to Pitney's pre-2000 transformation to a technology company, Collins explained, was getting its top executives to answer tough questions every year from the sales force, who were dealing with tough customers. "Pitney Bowes sales meetings were quite different from the 'aren't we great' rah-rah sales conferences typical at most companies," he wrote.

Wherever the facts come from, companies that want to move their transformation programs into high gear should draw on real examples of the reasons for change and the rewards for achieving that change.

Listen closely to customers about the operating complexities and financial impact of dealing with your company.

Those kinds of facts will help you compile a strong case for change. Then, getting a directional sense for how your firm should change will require real case studies of companies that have made the desired leaps. These case studies will help show your executives that transformation is not science fiction. The IT industry refers to such examples as 'use cases.' Although this is awkward shorthand, strong use cases communicate the potential benefits of transformation—

those based on real (not hypothetical) examples. The use cases give deep descriptions of the product, process, and technology changes, as well as real evidence of specific financial and operational improvements, and how they resulted from the specific changes.

2. Making the Case Uplifting

The tone in which top management presents the facts to the organization—gloom and doom, or hope and opportunity— matters as much as possessing irrefutable facts.

In our experience, people respond far better to opportunity than to fear.

The mention of a crisis can set off a wave of invention and action. But fronting it with an examination of the good things that can result is better:

- Whole new revenue sources
- New basis for competitive advantage
- Far higher customer loyalty
- A new avenue for product and service innovation

This will likely spur greater ingenuity and effort.

A number of management experts call fear an inferior motivator. One is Chip Heath, a Stanford Business School professor and co-author of several bestselling books. "People have a tendency, especially in a change situation, to focus on the negative. Lots of research supports this negative focus," he told an interviewer. "Companies, too, focus on the problems and not the bright spots." Heath so strongly believes in motivating through positive opportunities that he refers to the term 'a burning platform' as "one of the silliest pieces of business jargon. The idea of the burning platform is that people only change when they're scared. But fear, as an emotion, creates tunnel vision."[106]

[106] McKinsey Quarterly, Making the emotional case for change: An interview with Chip Heath, March 2010, http://www.mckinsey.com/insights/organization/making_the_emotional_case_for_change_an_interview_with_chip_heath

In addition to making an uplifting case, CEOs should bring employees into the process of making the case (the fact-gathering). Companies that totally outsource fact-collecting to a research or consulting firm deny employees a morale-building opportunity. As Harvard Business School Professor Rosabeth Kanter wrote in her book 'The Change Masters', "Change is a threat when done to me, but an opportunity when done by me."[107]

In his efforts to help Apple Inc. escape extinction in the late 1990s, co-founder Steve Jobs found that providing an energizing view of the future was essential to retaining key employees. One was chief product designer, Jony Ive, who's been critical to the look and feel of a number of blockbuster products that resurrected Apple into the $180 billion company that it is today. In September 1997, when Jobs became CEO (12 years after being pushed out), he assembled the firm's top executives and laid down his vision, as Walter Isaacson writes in Jobs' biography. Ive was about to quit because, as he told Isaacson, he was "sick of the company's focus on profit maximization rather than product design." Jobs told his team that their new goal was "not just to make money but to make great products." As Ive told Isaacson, "The decisions you make based on that philosophy are fundamentally different from the ones we had been making at Apple." Jobs' uplifting vision of the future convinced Ive to stay.[108]

[107] As mentioned by Rosabeth Moss Kanter in her HBR article, Change to Lead By and Live By, August 23, 2010, https://hbr.org/2010/08/seven-truths-about-change-to-l.htm

[108] Walter Isaacson, Steve Jobs, 2011, Simon & Schuster, pp. 340-345.

3. Expressing the Need in Plain Terms

Many companies spend a lot of time and money to make sure they communicate with the outside world—customers, prospects, investors, and the public.

Firms in the midst of a transformation need their best communicators to inform their own people of the reasons for a transformation and the planned path.

But too much business communication around transformation is vague and often impenetrable. Even the word 'transformation' can raise eyebrows for employees who have been through failed initiatives.

"Way too much corporate communication is overly complex," wrote Lawrence Bossidy, the ex-CEO of industrial controls manufacturer Honeywell (a $24 billion company under his watch) and co-author of the bestselling books 'Confronting Reality' and 'Execution.' This can happen when the details about a transformation haven't been thoroughly considered, he believes. At other times, an executive errs while trying to make an impression. "Sometimes this is an ego play: The communicator wishes to show that he understands things that you can't possibly grasp."[109]

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[109] Confronting Reality: Doing What Matters to Get Things Right, by Lawrence Bossidy and Ram Charan. Crown Business, 2014. p. 236.

Either way, jargon, buzzwords, vague language, and imprecision make it impossible for employees to support a leader: They can't understand the leader's desired destination. As General Electric's ex-CEO Jack Welch put it, "People must have the self-confidence to be clear, precise, to be sure that every person in their organization—highest to lowest— understands what the business is trying to achieve."[110]

As both Welch and Bossidy note, expressing ideas simply is difficult. Writes Bossidy: "One of the great leadership arts is reducing complexity to its simplest expression without being simplistic."[111] To be embraced, corporate transformations must be expressed in simple terms.

4. Learning from Outside One's Sphere of Competition

The fourth element of substantiating the need for transformation is learning from practices outside your industry. The best ideas for a new product, marketing process, production strategy, or customer experience often come from other industries. Merely following the best practices in your own industry can bring you up to par with competitors. But they can't help you leap ahead.

Learning from other industries will be particularly important in digital innovation. Companies can expect two big benefits: sparking creativity and providing hope to teams. Companies like Nike provide testimony to the creativity part. Some 15 years ago, the sports apparel giant sought ideas to boost its footwear business. Nike's engineers took

[110] Harvard Business Review, Speed, Simplicity, Self-Confidence: An Interview with Jack Welch, 1989, https://hbr. org/1989/09/speed-simplicity-self-confidence-an-interview-with-jack-welch

[111] Confronting Reality, p. 236.

inspiration from engineers who worked on shock absorbers of Formula One race cars. That eventually led to Shox shoes, and related ideas later used in some of the firm's most successful products.[112]

Every industry shares operating characteristics of other sectors. Construction companies could learn from movie production firms about managing large groups of contractors at one location. Utility companies might find they have a lot in common with telecom firms managing the mobile device experiences of consumers.

Substantiation at its Finest: Being Loaded for Bear

We hope these four elements of substantiation give you and your colleague's ideas for how to get started with your transformation initiative and how to progress toward becoming a responsive enterprise. To sum it all up, we use an American phrase: being 'loaded for bear.' It dates back to hunters who roamed the woods and had to be ready to deal with an immense land predator, the brown bear. Hunters needed stronger ammunition or more powerful rifles if they ran into these bears.

Since then, the phrase has come to mean being 'fully prepared for any eventuality, typically a confrontation or challenge.'[113]

Managers who come 'loaded for bear' in corporate transformation will have the ammunition they need—the concrete evidence, communicated well—to convince their organization that a transformation is essential. And they will be able to provide the hope necessary for success.

[112] The Holmes Report, Nike Shox the World, July 11, 2001, http://www.holmesreport.com/latest/article/nike-shox-the-world

[113] Oxford Dictionaries, loaded for bear, http://www.oxforddictionaries.com/us/definition/american_english/loaded-for-bear?q=%22loaded+for+bear%22

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