

Cognizanti

An annual journal produced by Cognizant
VOLUME 8 • ISSUE 1 2015


Part II

Digital Business 2020:

Getting there
from here!



Cognizant



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Table of Contents

6 Editor's Note

Keeping Business Simple,
But Meaningful



8 The First Word

Deconstructing the
Digital Consumer



16 Human-Centric Design

How Design Thinking Can Power
Creative Problem-Solving, Drive
Change and Deliver Value



24 Business Assurance

The Quality Implications of
Digital Transformation



34 Talent Augmentation

Through Intelligent Process Automation,
Smart Robots Extend the Capabilities
and Creativity of Smart Humans

41 Commentary

From 'Being Digital' to Becoming
a 'Digital Being'



48 Digital Foundation

Transcending the Hype:
A Transformative IoT Emerges



58 Banking in the Digital Era

Regaining Consumer Trust

64 Commentary

Disrupt or Be Disrupted



68 Healthcare Rx

The Rise of the Empowered
Consumer



78 Benchmarking Digital

A Digital Experience
Index Is Born



82 The Last Word

Enabling the Digitally
Enhanced Business





Keeping Business Simple, But Meaningful

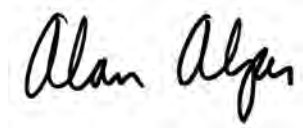
Way back in the early 1980s, management guru extraordinaire Tom Peters told captains of business that simplicity was critical to delivering meaningful and sustainable quality improvements.¹ Peters' point was, at the time, incredibly profound and foretelling: To excel, moving forward, organizations small and large needed to rid themselves of the overly complex and convoluted business processes and procedures that abounded within their four walls and throughout their key interactions and transactions with partners and customers.

Fast-forward to 2015: To thrive in the modern digital age – in which the borders have blurred between the physical and virtual, concrete and conceptual, automated and humanoid – it has become essential to keep things simple. And when you add a rich and engaging (if not clairvoyant) experience to the mix, powered by Code Halo™ thinking, the fundamentals of digital business success become resoundingly clear. (For more on Code Halo thinking, see *Cognizanti* journal, Volume 7, Issue 1.)

Sure, technological mastery remains a primary concern; you can't create a game-changing product, service, process or business model unless you've got a sound digital foundation in place, built on social, mobile, analytics and cloud technologies (aka, the SMAC Stack). And these days, you also need the technology prowess to sense and respond to the colossal currents of ambient data generated by IP-addressable and -aware devices (aka, the Internet of Things). But at a time when technological innovation is accelerating at an exponential pace, threatening to add reams of complexity to our already complicated personal and professional lives, businesses must double-down on KISS principles (or, "keep it simple, stupid"). Those that don't operate at their own peril.

This issue of *Cognizanti* journal is dedicated to the simplicity promised, but not guaranteed, by digital business, today and tomorrow. The articles herein illuminate the possibilities and pitfalls on the path to digital business, including a deep dive into the quality assurance implications of going digital; the human-centric design principles required to deliver an intuitive, rich and contextually-relevant customer experience; the uniquely human skills needed and the well-choreographed man-machine mating dance that must play out (from intelligent process automation through the IoT); the behaviors and preferences that make today's digital consumer tick; the changes banks need to make in an era of industry disruptions caused by digital; the potential of the empowered healthcare consumer; and, perhaps most importantly, ideas and inspiration for established businesses that need to jumpstart and benchmark their digital journeys.

We hope we've simply – but with necessary depth and breadth – covered the challenges that are core to your organization's digital business transformation mandate. If not, feel free to share your thoughts with me at Alan.Alper@cognizant.com, or on our e-community, Cognizant Connections <https://connections.cognizant.com/>.



¹ Thomas J. Peters, Robert H. Waterman, Jr., *In Search of Excellence*, Harper Collins, 1982.



Deconstructing the Digital Consumer

By Reshma Trenchil

As online commerce continues to grow apace, the digital consumer is becoming an increasingly complex entity, requiring a more nuanced understanding.

What drives the digital consumer? What does she look for when deciding to use a social or mobile channel to determine what to buy?

The answer: It depends!

Our recent survey of 1,458 digital consumers across the U.S. and Europe (see Appendices, page 13) reveals hidden nuances within established trends and shatters some myths associated with widespread assumptions.

Here are our insights to help consumer-facing companies transcend passive participation in the digital age and find more dynamic ways to grab the reins and control their fates.

The Lure of Shopping Online

Not surprisingly, consumers turn to online channels for time savings (80%), lower prices (56%) and convenience (65%).¹ Greater choices, the ability to see reviews from other shoppers and comparison shopping are among the other lures.

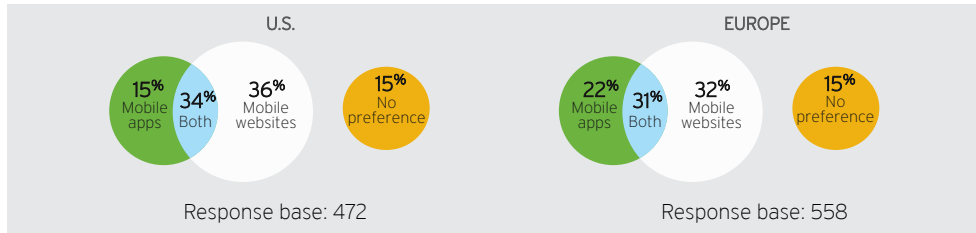
Now for the not-so-obvious findings:

- **Mobile devices still lag way behind:** The average digital shopper doesn't come armed with a tablet. Desktops or laptops remain the preferred device for online shopping (80%). Smartphones (10%) and tablets (5%) are used far less than conventional devices.
- **The myth of the app:** Consumers prefer mobile browsers to apps (see Figure 1, next page). Their reasons range from being more comfortable with the website to a reluctance to download apps for occasional use. Apps don't always work well or are unreliable, respondents report. Clearly, the hype around apps notwithstanding, consumer-facing companies should rethink their app investment strategies and whether this money might be better spent elsewhere.

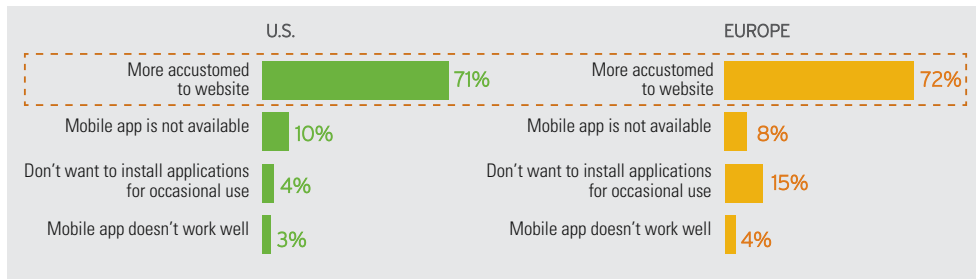
Findings that reinforce the current understanding of digital customers include:

- **Search dominates:** Across all phases of the digital shopping journey, Internet search is the dominant digital channel, outstripping social media, news media, retailers' websites, store displays and online advertising. Almost 70% of consumers start with a search engine to look for and eventually buy products online.
- **Shopping is social:** Aside from connecting with friends and family members, most digital consumers use social media to learn

Mobile Browsers Outdo Mobile Apps



Primary reason digital consumers prefer mobile websites: Familiarity



Response base: U.S. = 679; Europe = 736
 Source: Cognizant Research Center
 Figure 1

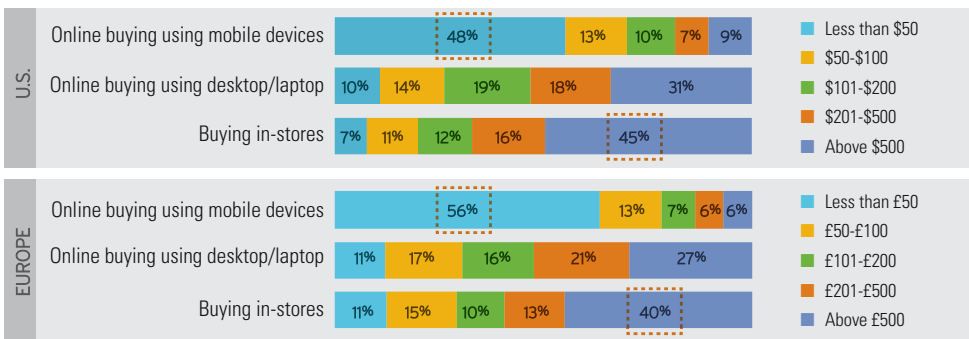
about others' experiences (51%) and about products or services (46%). A majority of digital consumers aged 18 to 44 follow brands and products on social media sites. About 35% actively share their experiences on social media, thus creating a cycle of sharing and buying.

- Brick-and-mortar still rules:** While they may spend hours on the Internet researching products and services, consumers still do most of their spending in-person (see Figure 2). Not surprisingly, payment security or the lack of it was cited as a major turnoff (77%) for shopping online.

Digital Consumers Still Spend More In-Person

Total amount spent on shopping last year

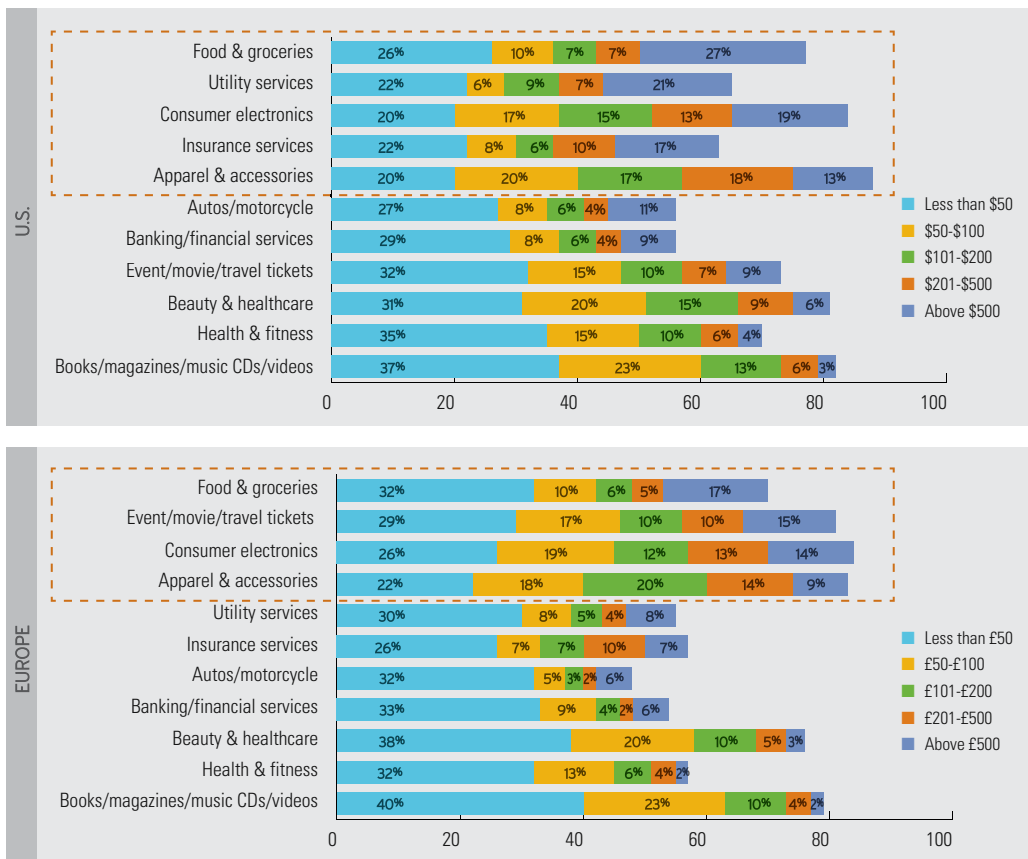
Approximately 42% of consumers spent more than 500 dollars/euros at physical stores last year, while about 52% spent less than 50 dollars/euros on mobile shopping in that timeframe.



Response base: U.S. = 679; Europe = 736
 Source: Cognizant Research Center
 Figure 2

What Digital Consumers Buy ... and How Much They Spend

Percentage of respondents who said they spent a particular amount in the last year on products/services in a given category.



Response base: U.S. = 679; Europe = 736

Source: Cognizant Research Center

Figure 3

When it comes to high online spending per category (\$500 or more annually), groceries, apparel and consumer electronics were among the top categories (see Figure 3, above). Increasingly, consumers are willing to forgo the ability to try on garments and physically select their own produce in favor of the convenience of buying online.

As a corollary, payment security and transaction cost (price plus shipping cost) are major factors influencing purchase decisions (see Figure 4, next page). Clearly, digital consumers are more apt to patronize a category or brand if they see a cost advantage.

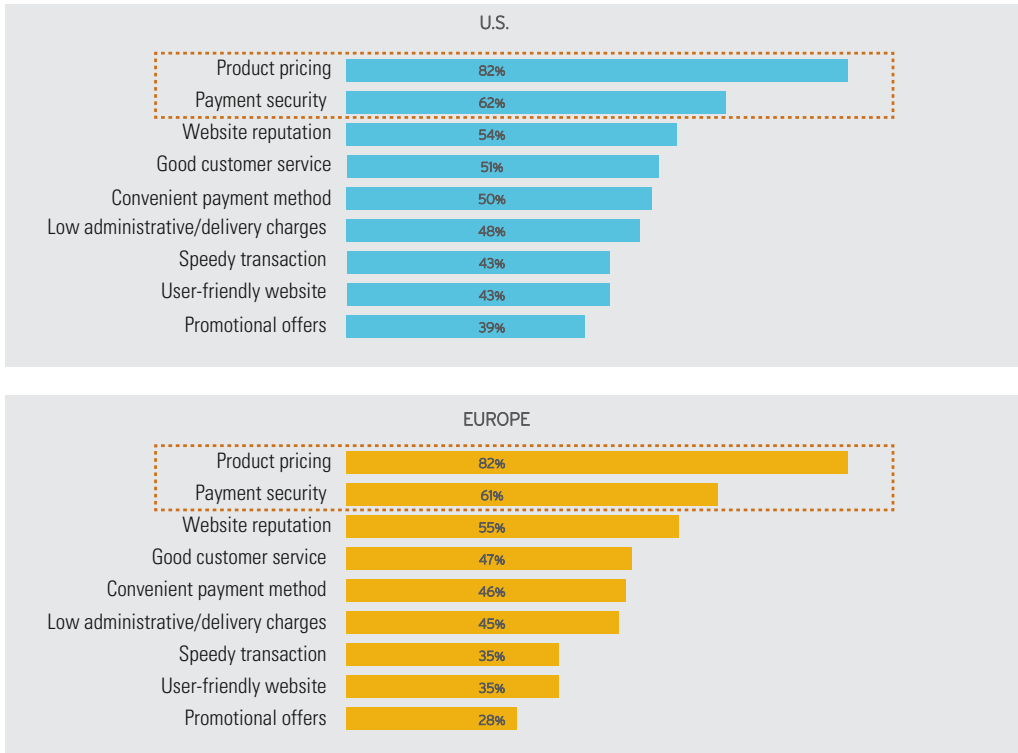
Retaining Customers: Looking Beyond Millennials

Our study indicates that age, income and motivation for shopping online were the biggest predictors of what digital consumers seek from their shopping experience.

Consumers making less than \$30,000 a year and those aged 35 to 45 whose prime motivation is cost-savings will seek the best deals, whether online or offline. Such consumers say they use their mobile devices in-store to compare prices and are drawn to coupons, free shipping and easy return policies. Discounts and promotional offers

Major Considerations for Buying Online

Pricing and security remain critical digital commerce issues.



Response base: U.S. = 679; Europe = 736
 Source: Cognizant Research Center
 Figure 4

are great ways to catch their attention. But a word of warning: They tend not to stay true to any particular channel unless there are loyalty points to be gained.

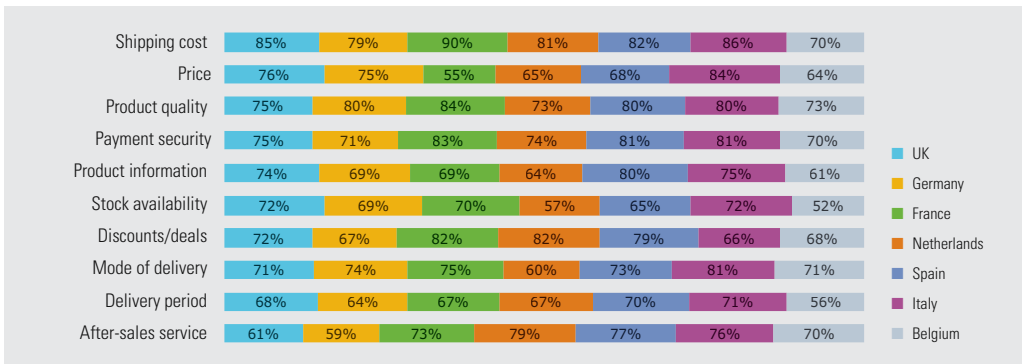
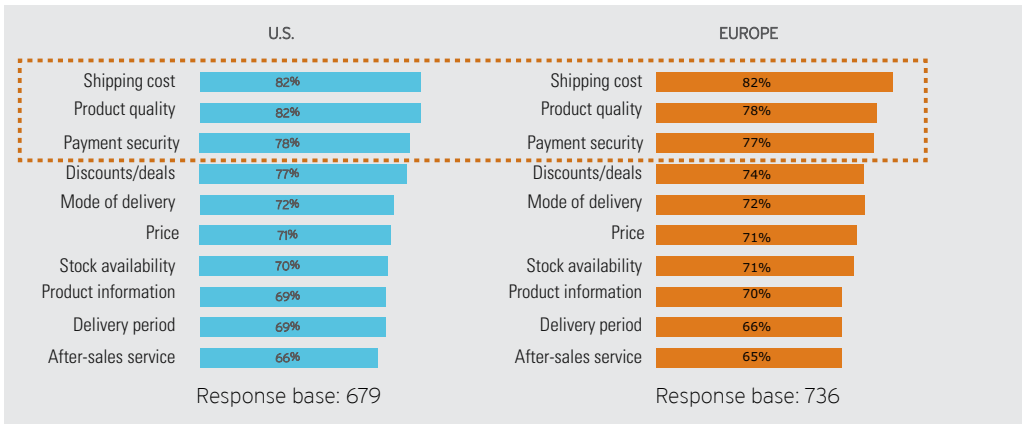
Consumers in the 25 to 34 age range tend to perform extensive online research on blogs and forums, and seek recommendations from family, friends and their large social networks. They are very comfortable with digital channels and use mobile apps and payments extensively. Reaching them through social media and highlighting payment security are effective approaches for gaining their business.

Consumers older than 55 tend to be wary of online transactions and sharing their credit card information. They also tend to be less tech-savvy and less comfortable browsing the

Internet. The potential for digital converts is high in this group. Consumer-facing companies must emphasize payment security and ease of transaction, and should continue to reach out to this group through offline means.

Perhaps the most important consumers from the seller's perspective are those who define themselves as advocates for or against a brand, product or service. They look for the best products and experiences rather than price and avidly follow brands on social media sites, make product suggestions and share their experiences. Consumer-facing companies can secure their loyalty by offering them a sense of involvement through e-mail notifications, seeking their input through online chats and discussions, and acknowledging their feedback.

Drivers of Dissatisfaction



Response base: 754

Source: Cognizant Research Center

Figure 5

Pitfalls to Avoid

Roughly 50% of digital consumers will abandon a transaction if their preferred payment option is not available. For U.S. consumers, credit cards and debit cards remain the favored payment options, with third-party platforms such as PayPal coming in as a close third. European consumers prefer online bank payments and payment gateways. PayPal is the overwhelming leader in the latter category.

Shipping costs tend to be a significant cause for consumer dissatisfaction (see Figure 5, above). Poor product quality is the second biggest consumer complaint.

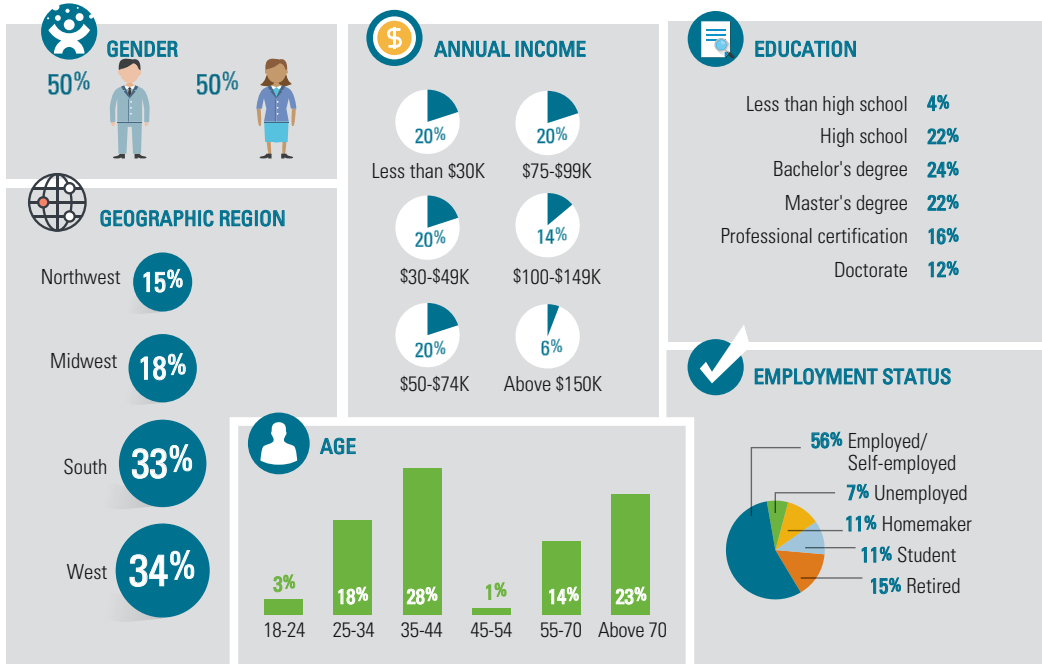
Easy Wins

To translate digital consumer insights into action, we recommend that businesses consider the following:

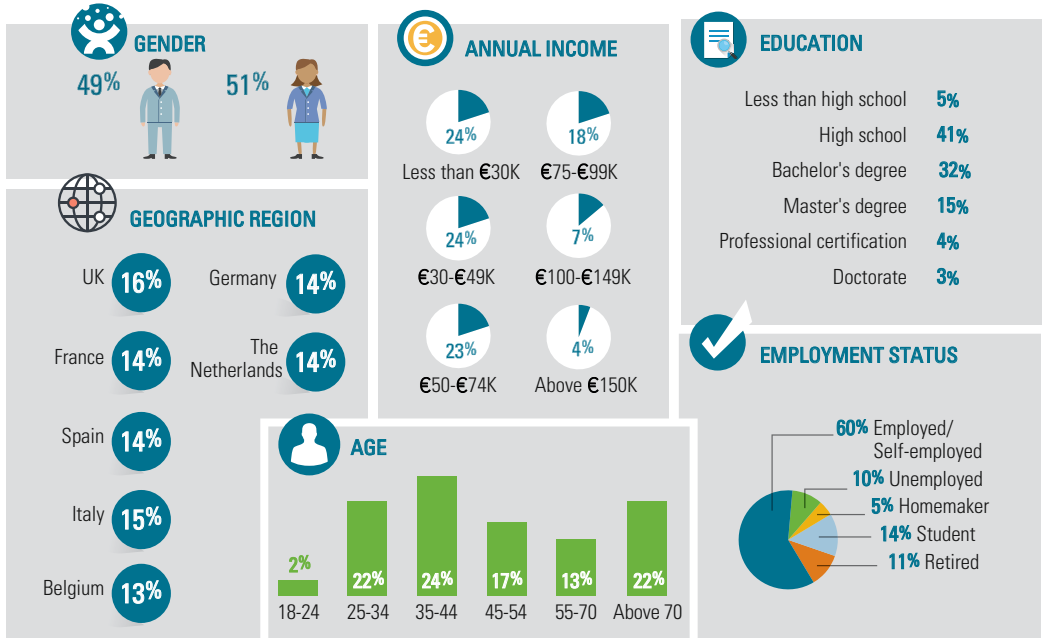
- Digital consumers use mobile devices for short and quick interactions.** Messages specifically designed for each digital channel will be the most effective, especially for smartphones.
- Mobile apps need additional features,** such as store locators, deal finders or online-ordering links to make it worthwhile for consumers to download them.
- Smartphone owners use their devices for price comparison while in the store.** As a result, retailers should aggressively use in-store technologies to track spending and enable product search, QR codes and payments.

- **Digital consumers often need help when purchasing online.** Businesses should consider the potential of live-chat support to answer their questions in real-time.
- **Consumable products show weak browse-to-buy rates.** Engage consumers with unique, interactive and targeted links, videos, newsletters, blog posts and website content.

Appendix A: Survey Demographics (U.S.)



Appendix B: Survey Demographics (Europe)



Footnotes

¹ All percentages cited in the text have been rounded.

Author

Reshma Trenchil is a Senior Manager on Cognizant's thought leadership team. She has over 14 years of experience in business news and research. Before joining Cognizant, she worked in equity research for UBS and thought leadership research at Deloitte. She has a master's degree from Boston University and a bachelor's degree from Stella Maris College. She can be reached at Reshma.Trenchil@cognizant.com.

Acknowledgments

This report is based on research conducted by Sanjay Fuloria, Senior Researcher within the Cognizant Research Center, and Marshneil Pachori, Senior Manager in Cognizant's Digital Marketing Services. The survey's intent was to uncover digital consumer interests and behaviors, and recommend ways consumer-facing companies can improve their digital marketing outreach.





How Design Thinking Can Power Creative Problem-Solving, Drive Change and Deliver Value

By Theo Forbath and Kipp Lynch

Through an iterative process of observation, ideation, rapid prototyping and testing, design thinking can help organizations craft a meaningful experience that seamlessly meshes the physical and digital interactions of people, processes and things.

The lone scientist working tirelessly in the lab discovers a breakthrough and changes everything; a sudden inspiration comes in a dream; a brainstorming session among the company's best and brightest leads to the next killer app – all of these scenarios might make for a good movie, but they rarely reflect reality.

Creativity and problem-solving are not individual endeavors, nor do they occur in isolation. Fortunately, these myths are slowly fading as companies embrace new ways of fostering innovation across their organizations. In the past, a company may have approached the creation of a new product or service by defining a set of requirements. Today, many now seek to first understand the actual human needs behind the product or service, to develop an overall experience.

This approach – often called “design thinking” – is based on developing a thorough understanding of what the user goals are from multiple viewpoints – emotional, psychological and behavioral. Through an iterative process of observation, ideation, rapid prototyping and testing, design thinking can help craft an experience that is meaningful to the person engaged with it, one that seamlessly meshes the physical and digital interactions of people, processes and things. Design thinking is not as simple as stringing together a set of methods or tools; rather, it's a mindset that draws upon the interaction of all these components (see Figure 1, next page).

Building Blocks of Design Thinking

Successful design thinking incorporates the following principles that work best when used iteratively and in combination with one another.

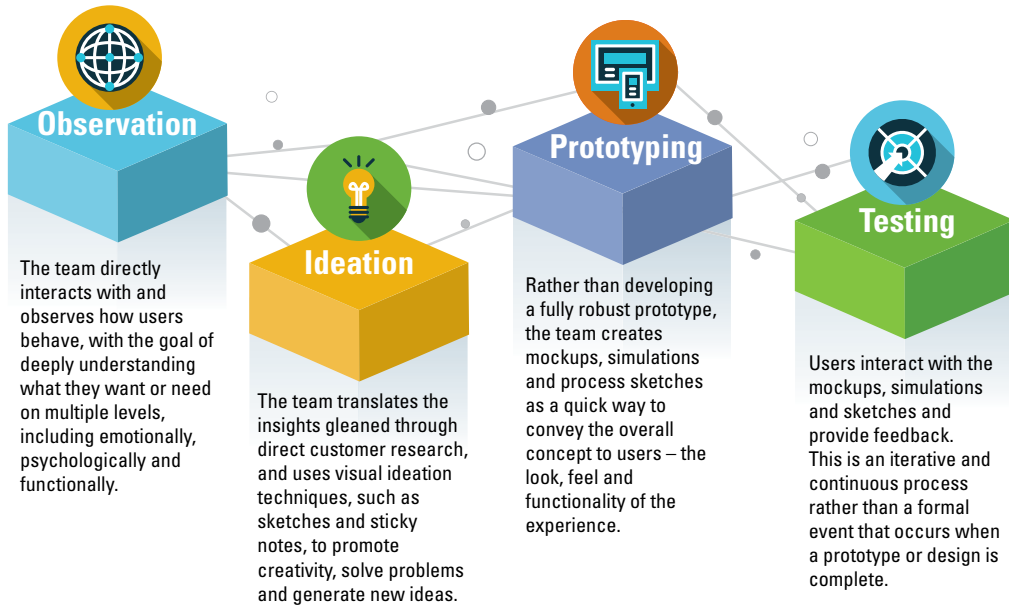


Figure 1

Especially as the world gets increasingly digitized, design thinking will be critical to defining the user experience, and it is that experience – rather than slogans, logos and marketing messages – that defines the brand. Today, user experience design delves much more deeply into creating an entire experience that meets users’ unacknowledged – and often unarticulated – needs, and mirrors how we straddle both the digital and physical worlds (see Quick Take, page 19).

Avoiding Design Thinking Mistakes

It is far too easy to focus on one component of design thinking, and downplay the rest. For example, we often see project teams start off by sketching concepts and developing prototypes and then exclaiming that they have incorporated design thinking into their process. Recently, we met with a company that was working to develop a new concept for its stores; it showed us a list of cutting-edge technologies and several interesting concepts for prototypes to take back to its senior managers. While some of the ideas were inter-

esting, the company had skipped the customer research step and hadn’t spent time with actual users. As a result, the experiences were not built around an in-depth understanding of the needs and goals of customers, resulting in wasted time and money.

Conversely, we also encounter companies that directly listen to and observe their customers, but rather than spending time ideating and sketching, they quickly jump to a list of requirements. In this case, the project begins well, as team members jot down observations on sticky notes and group them on a wall. But instead of exploring the ideas in a visual manner, the team ends up translating the notes into a spreadsheet.

Performing any one of these activities in isolation – observation, ideation, prototyping and testing – misses the critical point of design thinking, which is both a journey and a mindset. As the *Gestalt* psychologists once said, “The whole was other than the sum of its parts.”¹ By picking and choosing certain elements, the project team² is likely to miss critical insights that could change the product or service from barely acceptable to delightful.

Design Thinking = Design Doing

While many see design thinking as a new way of thinking, it is really a new way of acting and behaving. Design thinking becomes real when it is embodied in the team and is expressed as a new way of “doing.” Even though many people say they can’t draw and are reluctant to create a simple sketch, the very act of “doing” dramatically changes not only your team members’ understanding, but also your own. We call this “thinking aloud on paper,” and just as talking to yourself can help crystalize

thinking toward “what can be obtained from customers,” rather than “what can be created to delight them” – something we call a minimal delightful product.

Extending the Experience to Gain New Insights

Design thinking doesn’t end when the product or service is launched; it can and should be incorporated into the experience itself, and used to continuously refine and enhance the experience. While the human element is critical to design thinking, intelligent devices and sensors can provide additional eyes and

Design thinking becomes real when it is embodied in the team and is expressed as a new way of “doing.”

your thoughts, the act of sketching – even stick figures – alters your thinking.

Testing and validating concepts or prototypes doesn’t always have to be approached as formal usability tests, in which end-users are brought into a lab and asked to go through a series of tasks – that they fail or complete – as others take notes behind a two-way mirror. With design thinking, testing and validation are often more informal and participatory. The testing need not, and should not, be held off until the prototype is complete; rather, user feedback should come at all stages of ideation – process sketches, simple mockups, simulations, etc. A prototype or experience simulation can be taken into the field, where potential users (customers, business partners or employees) can playfully interact with it and provide genuine feedback.

At this point, many teams focus on a minimal viable product to generate quick user feedback on product features and usefulness. Unfortunately, this shifts

ears to what happens when the individual is actually engaged with the product or service, in a way that would otherwise be impractical, intrusive and unwelcome.

With the Internet of Things (IoT), increasingly sophisticated and real-time analytics and other emerging digital technologies, companies can virtually observe the consumer, uncover unmet needs and incorporate those insights as part of their experience, further blurring the borders between the physical and digital worlds.

The IoT will be an increasingly powerful aid to organizations looking to design a better experience (see related article, page 48). Devices and objects instrumented to collect and share intelligence on product usage and user behavior, both online and offline, will yield a treasure trove of real-time insights that can help organizations anticipate customer needs, inform continuous product improvement and serve up contextually relevant content and experiences.

Quick Take

Reimagining the Health Insurance Subscriber's Experience

Rethinking a product or service through design thinking is all about interacting with the customer in a new way, based on learning and anticipating never-before-unearthed insights into what the customer actually needs. We took this approach when we recently worked with a leading health insurance company to reimagine the experience it delivers to customers across a myriad of touchpoints.

To begin the process, we conducted in-person home visits to gain a firsthand understanding of the challenges that members faced when interacting with their insurer. We observed how they used various websites, not only the insurer's website but also the larger ecosystem, which included pharmacies, healthcare providers, medical information sites, such as WebMD, and even Facebook.

Contrary to the insurer's perception, the member experience was the entirety of all their healthcare interactions. The fragmentation of digital and physical tools in the healthcare and insurance space means members are forced to interact with many different systems to get an accurate understanding of their wellness.

For example, one member who was looking to treat a specific condition first went to WebMD to find treatment options, then used Google to search for specialists and treatment centers in the area. After finding several doctor names, the individual toggled between Healthgrades for reviews and the insurer's portal to see which ones were in network and then picked up the phone to check several specialists' availability. After meeting with the specialists, she had to go to the pharmacy website and billing portal, and then check her bank's website. Clearly frustrated with the entire process, she exclaimed, "I can go to an airline website and book my flight, cars, hotels and even restaurant reservations – why can't they just put everything in one place?"

Using that rich insight, we created a series of customer personas representing the priorities, concerns, behaviors and characteristics of various customer segments. We also created and tested new experience concepts with the members, such as finding a primary care physician based on the member's lifestyle – i.e., physically fit, tends to get sports injuries, vegetarian, etc. – that refined and prioritized customer needs and concerns. Spending time with the health plan members surfaced many examples of distrust, uncertainty, confusion



and frustration around insurance and healthcare, especially in the areas of understanding coverage and billing. We targeted ways to improve the experience that would overcome negative perceptions by making coverage, cost and billing information clear and consistent for members across all their physical and digital touchpoints.

We also advised the company to boost the contextual awareness of the user experience, particularly in the areas of the member's health and life stage context. Members needed a clear and easy way to get the right information where and when it was needed,

understanding of the subscriber's coverage, medical history, financial situation and current or recent life events.

Critical to this journey are digital channels that:

- Promote simplicity and clarity.
- Have contextual awareness.
- Guide members through complexity.
- Consolidate disparate but related health information.
- Keep members informed of insurance processes.

By harmonizing its digital and physical subscriber touchpoints, the insurer will eventually be able to transform from an adversarial opponent to a trusted and caring partner.

based on their personal health situation, such as determining whether to go to the emergency room.

The new user experience also needed to incorporate a greater sensitivity – and even a sense of empathy – toward members regarding major life events (such as the birth of a baby or the death of a spouse), by enabling personalization and proactive engagement from the insurer. We advised the insurer to leverage real-time data analytics, correlated with the member's profile and historical data to surface this type of contextual insight. This data should be leveraged for insights that allow the insurer to design experiences that reflect an

By harmonizing its digital and physical subscriber touchpoints, the insurer will eventually transform from an adversarial opponent to a trusted and caring partner in the eyes of its members, breaking down years of member distrust and uncertainty. Not only will these investments increase revenue and profitability for the insurer, while decreasing errors and inefficiency, but they will also increase member loyalty and satisfaction.



Creating 'Digital Oil'

Glimmers of these transformative types of user experiences are emerging at forward-thinking enterprises such as Disney. The entertainment giant has created what it calls the MyMagic+ experience, using a website, app and smart, connected wristband, to learn more about guest preferences and tailor a personalized experience for them. Before their trip, guests can share information through

The MagicBand blurs the lines between the physical features of the park, the digital capabilities of the band and the insights that Disney now has about the guest, which are also available to employees (or “cast members”) in real-time, when it means the most. For example, proactively preparing a room with a portable play crib for a family traveling with a toddler goes far toward winning the guests' appreciation and loyalty, long after that child has grown up.

The experiences that result from a design thinking process are not superficial; they necessitate changes to be made in supporting business processes, technologies and organizational structures.

the website about their personal preferences, favorite characters and resort features, and then use the app after their arrival to adjust their plans. The MagicBand, meanwhile, helps guide visitors through the park, manage ticketing and act as a wallet when paying for dining and shopping. It can unlock the guest's hotel room when needed, order food in advance of arriving at a restaurant and enable staff to greet him by name upon arrival.

Without changing a single feature about the park itself, MyMagic+ is transforming the amusement park experience by enabling data to flow to and from guests, allowing Disney to get to know its guests even better through their every interaction at the park. Disney has succeeded in merging the physical and digital worlds by turning a previously inert object – the wristband – into a gateway through which it can both understand and deliver what its guests want, when they want it.

For Disney, MyMagic+ is not only creating curated experiences, but it is also generating “digital oil” for Disney, in the form of richly refined insights from each guest wearing a MagicBand, revealed through their patterns of behavior and preferences throughout their stay.

Getting Ready for the Future of Experience Design

While there is much road to travel between today's capabilities and the emerging vision of the future, businesses should get started now on the journey to embrace and integrate design thinking throughout their organization. The experiences that result from a design thinking process are not superficial; they necessitate changes to be made in supporting business processes, technologies and organizational structures. The new customer experiences that arise will require an integration and re-orchestration of how the company relates to customers on all channels.

Our recommendations include:

- **Simultaneously apply all elements of design thinking**, such as observation, iterative ideation, rapid prototyping and frequent testing.
- **Understand every aspect of the user experience** (from the user's perspective) before selecting which technologies will be used to enable the new product or service.

- **Establish interdisciplinary teams and processes** that put customer needs, desires, emotions and motivations at the center of the product and service design.

Lastly, never lose sight that underlying all of these activities is the unwavering focus on, and empathy for, the person for whom the experience is being created in the first place.

Footnotes

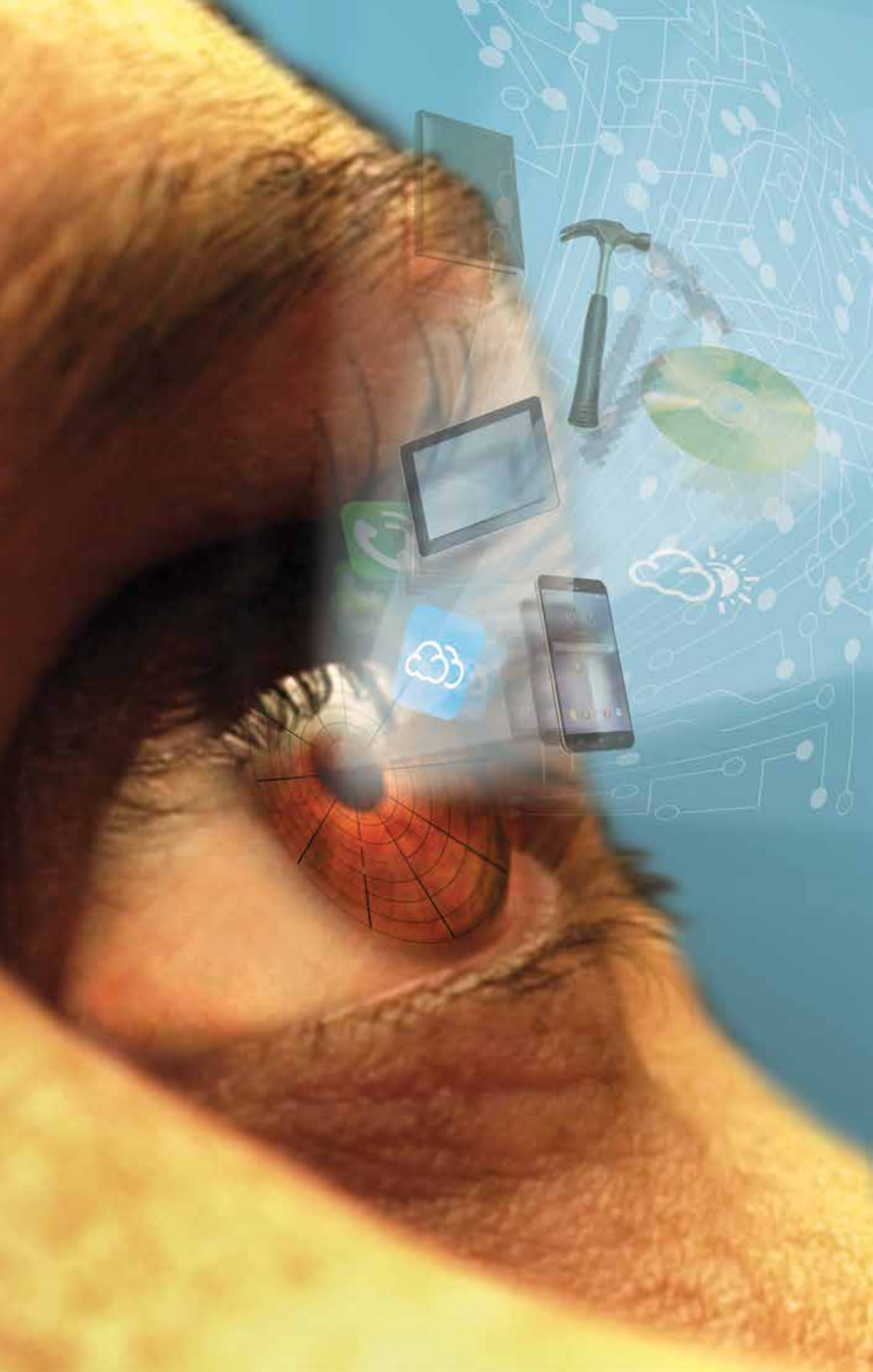
¹ https://en.wikipedia.org/wiki/Gestalt_psychology.

² With design thinking, project teams should be interdisciplinary, with members coming from multiple functions in the organization, such as engineering, finance, operation, design, IT, etc. Some team members should also be trained in design thinking principles in order to lead the stages of observation, ideation, prototyping and testing.

Authors

Theodore “Theo” Forbath is Global Vice-President of Digital Transformation within Cognizant’s Digital Works business unit, where he is responsible for leading cross-functional teams that consult, prototype and commercialize digital solutions for Fortune 1000 companies. Much of Theo’s work focuses on designing human-centric solutions, along with co-innovating with clients on ways to identify and capitalize on new revenue opportunities in the post-PC, post-TV world of the Internet of Everything. Theo regularly writes and speaks about the evolution of technology, trends in designing convergent experiences across the physical and digital worlds, along with tracking the impact of the Internet, emerging computing applications and globalization of technology adoption and product development strategies. Prior to joining Cognizant, Theo was the Global Vice-President of Innovation Strategy at frog, an industry-leading design company. Theo holds a BA with honors in philosophy and sociology from Brandeis University and attended Harvard Business School’s Executive Program on leading product development. He also holds a professional certificate in data communications from Northeastern University. Theo can be reached Theo.Forbath@cognizant.com.

Kipp Lynch is an Associate Vice-President of UX Research and Design within Cognizant’s Digital Works business unit. Kipp has worked in the user experience field for almost 20 years as a user researcher and strategist in software, website and industrial design. He brings a human-centered design approach to delivering transformational initiatives across a wide range of industries. Prior to joining Cognizant, Kipp was managing director at Electronic Ink, an award-winning design consultancy based in Philadelphia. Kipp holds a Ph.D. in cognitive science, specializing in visual perception, where he examined the optical information for the perception of movement qualities, event boundaries and social interaction in an attempt to turn the tacit knowledge of the artist into the explicit knowledge of the scientist. He can be reached at Kipp.Lynch@cognizant.com.



The Quality Implications of Digital Transformation

By Anbu G. Muppudathi, Sripriya Kalyanasundaram & Manoj Narayanan

To advance the digital business agenda, QA organizations must break loose from their traditional bug testing shackles and embrace frictionless, full-lifecycle automation and a continuous delivery approach. Doing so will ensure quality is built-in from the start, facilitating the delivery of enhanced customer experiences that burnish the brand and drive competitive differentiation.

The digitization of everything is disrupting business models, processes and strategies. Amid this business-technology sea change, three constants remain on the corporate stakeholder agenda: cost, time-to-market and customer experience. While their priority order can change over time, today's imperative is first and foremost customer experience.

These changes in focus and priority are now subtly but surely rippling into quality assurance. Historically, quality assurance has meant certifying the functionality of software, hardware or networking components, with no attention to the customer experience. Today, the customer experience represents the brand, the company and the individuals within it. This shift is forcing QA organizations to consider, from the get-go, the social and psychological impacts of the customer experience that the company's products and services deliver, simultaneously with the functionalities under development.

Another change to QA is that while it has always focused on value delivery, the proposition has shifted to accelerated time-to-value. Writing requirements and designing, building and deploying code are all considered to be "active" (productive) time, while validation is considered to be "wait" (nonproductive) time. QA professionals are now trying to increase the efficiency of the QA lifecycle by eliminating "wait" time and accelerating value-adding activities. The new attitude is that if it's done right the first time, there is no need to validate. Emerging technologies and methodologies have introduced both challenges and opportunities to this goal; hence, a well-defined digital transformation strategy is absolutely essential to the QA function.

New Mandates for QA

To understand the implications of digital transformation on QA and arrive at the next generation of quality assurance, organizations should address the following broad mandates:

- **Ensure a seamless and consistent customer experience.**

Gartner predicts that by 2020, 25 billion “things” will be connected to the Internet¹ – a phenomenon that could make the business and social implications of the Industrial Revolution pale in comparison. Due to this explosion of devices, ensuring the compatibility of applications across the plethora of networks, devices and interfaces is imperative for digital businesses to deliver a rich and meaningful user experience (see related article, page 48). As a result, ensuring impeccable quality and a consistent customer experience is pushing companies to expand the frontiers of QA.

defects but also work closely with stakeholders to prevent such defects from reoccurring. Better stakeholder collaboration can be enabled through the use of Agile techniques, such as fast prototyping, frequent iteration and the creation of user stories, replacing isolated development processes, lengthy requirements gathering and formal status meetings.

Meanwhile, increased digital connectivity has also shrunk software lifecycles drastically, even as it has expanded the number of touchpoints between initial customer engagement and after-sales service. Combined with an increased focus on the business value of technology, the shorter timeframes are blurring the demarcation between technology and the business, only adding to the mandate for Agile adoption.

One particular Agile methodology, DevOps,² combines development and operations functions to help businesses

Increased digital connectivity has shrunk software lifecycles drastically, even as it has expanded the number of touchpoints between initial customer engagement and after-sales service.

- **Speed time-to-market and business alignment through Agile development methodologies.**

The importance – and implications – of digital connectivity today cannot be overstated. Along with the constant connectivity of consumers, businesses and devices, new apps and functionalities are continuously being developed; additionally, at any given moment, our smartphone apps are either updating for more recent versions of software or are fixing bugs we do not even realize exist.

Such developments require modern-day QA techniques to not only find and fix

respond quickly and effectively to the fast pace of digital evolution. A goal of DevOps is to “build quality within” rather than ensuring quality after the fact, as QA processes are integrated into every phase of the software development lifecycle.

DevOps is not just pushing the boundaries of developing superior software; it is also ensuring impeccable accuracy and stringent quality in the products being developed, while drastically reducing cost. Its techniques have led the QA function to move away from a pure-play validation role to a contextual testing mode, thereby bucking the conventional trend of risking

quality for faster-time-to-market. This is known as digital assurance.

- **Deliver business value by addressing the risks that emerge across the digital ecosystem.**

Gartner predicts that by 2020, 60% of digital businesses will suffer a major service failure because of IT teams' inability to manage digital risks in new technology and use cases.³ Today, every business is vulnerable to the risks inherent to digitization, such as cyber theft, fraud and data loss, as nearly all organizations now interact with customers through a digital interface and increasingly depend on digital technologies for growth.

Digital risk comes in many forms, including defects that are not easily uncovered due to configuration errors, faulty integration procedures and workflow failings. Moreover, with increased customer preference for digital channels, businesses need to maintain the highest digital assurance possible to avoid irreparable damage to their reputation and bottom line.

While digital technologies are a source of new and unique business opportunities, they also introduce additional risks, some of which the digital technologies themselves can help

to resolve. For example, through intelligent process automation (IPA), QA teams can ensure the consistency and accuracy of their business rules and processes (see related article, page 34).

Five Steps to Digital Assurance

To address these challenges, many IT organizations are reconsidering their centralized and standalone models of QA and are moving toward integrating the software development supply chain into the business. Digital businesses were the first to do this, with the goals of improving efficiency, boosting effectiveness and reducing time-to-market.

By implementing the Agile/DevOps philosophy and enforcing full lifecycle automation, QA organizations can yield just-in-time process improvement metrics, and establish continuous feedback and learning mechanisms that reduce errors and accelerate time-to-value, elevating digital assurance from an amorphous goal to a data-driven reality.

To deliver digital assurance, QA organizations must embrace the following five steps (see Figure 1):

Transforming QA to Deliver Digital Assurance

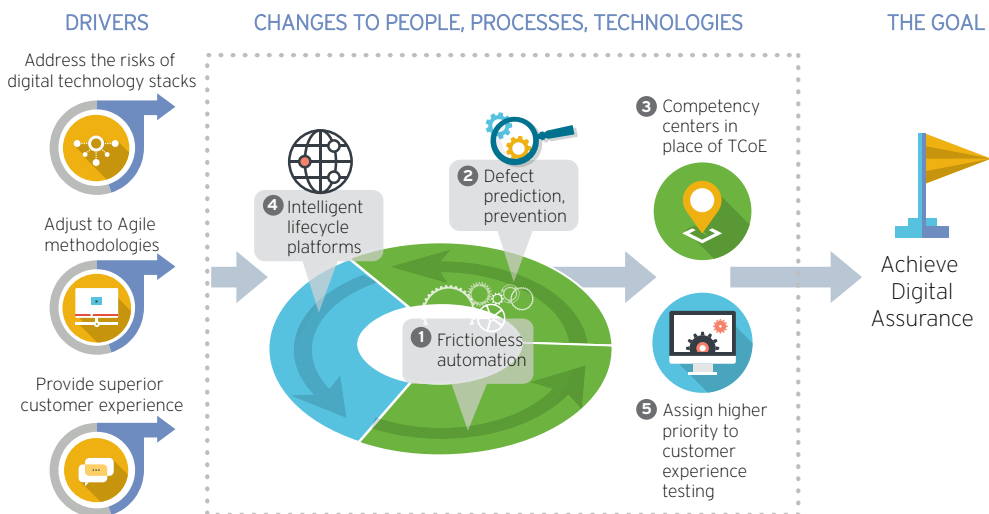


Figure 1



Focus on Frictionless Automation

Organizations should automate all “wait” time activities across the lifecycle to minimize cost and time-to-market. To move toward this goal, business should identify areas that can be completely automated and integrate them across the software development lifecycle, including requirements modeling, test design automation, test data automation, regression automation, service automation and non-functional automation.

Once these individual tracks are automated, the focus should shift to automate handshakes (interfaces) that accomplish the following:

- Provide continuous integration for developers to integrate code in a single repository multiple times a day.
- Invoke automation to compile and build applications without human intervention.
- Offer release automation for packaging and deploying code.
- Enable continuous delivery to make every atomic change releasable.

In our view, frictionless automation means enabling accelerated releases of applications into production while sustaining continuous feedback and improvement across the software development lifecycle (see Figure 2).

- **Case in point:** A major retailer has achieved more than 80% regression automation and 30% functional automation by integrating its development, QA and operations teams in key business areas and enabling continuous delivery. Doing so has reduced the retailer’s time-to-market for software builds by 50% without negatively impacting quality performance. Having proved the concept, the company is now extending this philosophy across all lines of business within the organization.



Proactively Predict, Prevent and Detect Defects

The QA function needs to transition from a “project-oriented” mindset to a “competency-based” one. Rather than serving as an instrument of measurement, QA needs to predict the resulting code quality, using measures applied to people, products, processes and profiles.

Achieving Frictionless Automation Using DevOps

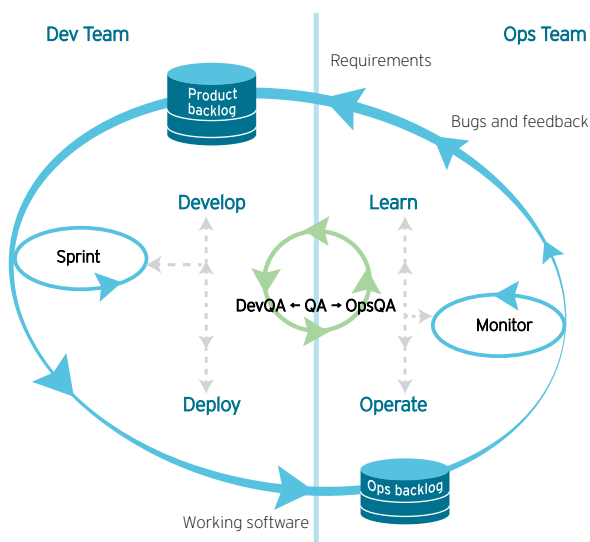


Figure 2

To develop a defect-prevention capability, QA organizations need to make extensive use of root-cause analysis, such as analyzing the correlation between defect occurrence and independent variables. Autonomic computing and IPA will also help drive this transition. As organizations continue to adopt “shift-left” approaches,⁴ QA experts will collaborate better with the rest of the IT function to foresee and prevent quality issues earlier in the lifecycle, thereby reducing the total cost of quality.

Similarly, “shift-right” approaches⁵ will help QA professionals collaborate better with the Ops function to facilitate release/deployment, and learn from post-production issues to predict and prevent quality issues. In effect, QA personnel will become DevQA⁶ when they shift-left, and OpsQA⁷ when they shift-right, which will serve to advance the enterprise’s digital business agenda. Reactive QA processes become proactive through quality intelligence and smart lifecycle platforms (see Figure 3).

- **Case in point:** Having built a robust metrics tracking and management process, a leading insurer sought options to drive shift-left efficiencies. The ability to prevent and then predict defects was achieved through a detailed analysis to identify

defect origins and their correlation with associated test cases and functionality. By analyzing requirements deficiencies, environment challenges, configuration issues, flawed design, chaotic coding and release management practices, the insurer was able to isolate weak areas. It then prioritized preventive measures to keep the defects from occurring, identified high-risk releases and predicted possible defect incidences based on precision data correlation.



Shift to Competency Centers from Testing Centers of Excellence

In the spirit of achieving outcome-based models, organizations are pushing to convert mature testing centers of excellence (TCoE) into competency centers. These centers can focus on domain expertise relevant to the lines of business, lifecycle automation capabilities, Agile practices, industry regulations and non-functional capabilities, such as usability, performance, etc. Such a transformation will demand a re-skilling of

From Reactive to Proactive QA

	Traditional QA	Digital Assurance	Value-Driven Delivery
	Application-level testing	Digital product/system/ value chain assurance	Drive better business outcomes through platforms and solutions
	Guardian for functionality, performance, security	Guardian for customer experience and the brand	Information assurance; strategy-focused as opposed to tool-focused
	Test automation	Lifecycle automation	Zero-touch automation using continuous integration
	Dev->Test->Ops	Agile, continuous delivery, DevOps	Build Dev-QA-Ops synergies
	Reactive	Proactive quality intelligence	Predictive defect analysis

Figure 3

QA professionals to enable their work in the competency center.

- **Case in point:** Nearly every high-tech organization, especially in Silicon Valley, has stopped using independent QA functions. Instead, developers and quality engineers work together in pods to drive high-frequency release cycles, supported by specialists such as business analysts and technical leads. This approach enables them to focus on “competencies” and build focus groups with specialized domain or technology talent.

Such groups improve the productivity of the entire organization, not just a few isolated areas. In our experience,

ments, etc. This will help reduce and even eliminate wait time. The phased integration of QA with the software development lifecycle will imbue applications with the ability to self-learn and self-heal, thereby reducing the need for QA in the future.

In addition, QA requires platforms that can provide a 360-degree view of quality, combining both systems of engagement and systems of record.⁸ The agents of different phases of the software development lifecycle (analyst, programmer, architect, tester, etc.) require specialized views and capabilities to guide their actions. The intelligent platform should provide the necessary controls to enable continuous delivery.

The phased integration of QA with the software development lifecycle will imbue applications with the ability to self-learn and self-heal, reducing the need for QA in the future.

converting TCoEs to competency centers is easier than starting fresh because the discipline of the TCoE will enable QA to more quickly become integrated with the development and operations teams.



Invest in Intelligent Application and Lifecycle Management Platforms

Intelligent lifecycle platforms allow users to reverse-engineer the dynamic behavior of a given software application into layers of well-abstracted architecture, delivering quick insights into requirements traceability, defect prediction, data and infrastructure require-

- **Case in point:** A leading U.S. telecommunications provider is building resiliency into its applications by allowing code to self-prepare test data and associated rules to auto-adjust the execution flow. This allows applications to self-heal and avoids costly delays due to the manual intervention that would have otherwise been needed. Comparing the time delays (application downtime due to quality issues) over a period of time, downtime was reduced by more than 90%. A critical success factor was the organization’s ability to enforce changes across the software development lifecycle processes and create a culture of collaboration among developers, QA professionals and the operations teams.



Assign Higher Priority to Customer Experience Testing, Graduating to Brand Assurance

At this stage, priorities will shift from application testing to customer experience testing. Test objectives will move beyond functional scenarios to quality through the eyes of real customers. Effort will be spent on replicating real customer scenarios, not just the applications, devices or channels being tested. Objectives, therefore, must address customers' geographic and demographic characteristics (i.e., behaviors, preferences and usage).

This means QA organizations should focus not only on traditional test assets, but also on the type of testers required, depending on the demographics, geography, culture, etc. available on-demand to simulate real-world scenarios (i.e., crowd testers). Equally important are the platforms that help QA organize the activities of these on-demand testers. Such an “outside-in” testing approach and simulation of real-world customer types and scenarios will ensure that the customer brand is protected in each business application release. The QA organization will need to find a way to integrate real-world customer feedback for an enhanced customer experience.

- **Case in point:** A leading hospitality chain is leveraging customer experience analysis to drive the changes and functionalities needed for its mobile applications. While it is still early, by leveraging direct consumer feedback, the company is able to successfully address customer desires and incorporate them as product features much more quickly than would otherwise be possible, reinforcing, if not advancing, its brand promise.

Looking Forward

The importance of QA in today's digitally-intensive marketplace extends well beyond the software development lifecycle. As QA transforms to meet and exceed ever-changing digital technology and business dynamics, it is important that leaders redefine the function's role.

As automated tools, techniques and development methodologies enable integration of QA processes across the lifecycle, businesses are better positioned to respond to digital technology disruptions within compressed timeframes, protecting and even enhancing the brand value through a superior customer experience.

Footnotes

- ¹ “Gartner Says 4.9 Billion Connected ‘Things’ Will Be in Use in 2015,” Gartner, Inc., Nov. 11, 2014, <http://www.gartner.com/newsroom/id/2905717>.
- ² DevOps is an approach to software development that is focused on streamlined communication, collaboration, integration, automation (of testing as well as coding) and measurement of cooperation between software developers and other IT functions. The term was popularized through a series of “DevOps Days” starting in 2009 in Belgium. Since then, DevOps Days conferences have been held in many countries worldwide (<https://en.wikipedia.org/wiki/DevOps>). For more, read our white papers, “How DevOps Drives Real Business Growth,” <http://www.cognizant.com/InsightsWhitepapers/How-DevOps-Drives-Real-Time-Business-Growth.pdf>, and “DevOps Best Practices Combine Coding with Collaboration,” <http://www.cognizant.com/InsightsWhitepapers/DevOps-Best-Practices-Combine-Coding-with-Collaboration.pdf>.
- ³ “Gartner Says 2015 Will See the Emergence of Digital Risk and the Digital Risk Officer,” Gartner, Inc., July 10, 2014, <http://www.gartner.com/newsroom/id/2794417>.
- ⁴ “Shift left” is the practice of focusing on quality from day one of a project in order to identify and fix defects as they arise. It also indicates continuous involvement of QA in the early phases of the software development lifecycle.
- ⁵ “Shift right” is the practice of focusing on quality post-deployment by collaborating with the operations function. This helps the organization understand customer-facing issues and use feedback to predict and prevent issues in early phases of the lifecycle.
- ⁶ DevQA refers to the QA professional who has been trained in software engineering principles and the underlying technology, improving the effectiveness of the partnership with software developers.
- ⁷ OpsQA refers to the QA professional who has been trained in the industry domain and operations discipline, such as configuration, release management and post-implementation support principles, increasing the effectiveness of the association with the business operations team.
- ⁸ Geoffrey Moore, “Systems of Engagement and the Future of Enterprise IT,” AIIM, 2011, <http://www.aiim.org/futurehistory>.

Authors

Anbu G. Muppudathi heads Cognizant’s Quality Engineering and Assurance Practice globally. His customer management responsibilities include advising the C-suite on breakthrough thinking, competitiveness, strategy, operations and transformation. He can be reached at Anbu@cognizant.com.

Sripriya Kalyanasundaram is the Global Head of Technology and Strategy within Cognizant’s Quality Engineering and Assurance Practice. Her responsibilities include setting strategy and technology direction to the practice and helping the unit’s portfolio of services adopt digital transformation across all industries. She can be reached at Sripriya.Kalyanasundaram@cognizant.com.

Manoj Narayanan is the Chief Technology Officer of Cognizant’s Quality Engineering and Assurance Practice. He is a key member of Cognizant’s QE&A leadership team in North America. He has expertise in driving quality engineering managed services solutions that are development-methodology-agnostic. Manoj has successfully built key technical organizations and centers of excellence at Cognizant. He can be reached at Manoj.Narayanan@cognizant.com.





Through Intelligent Process Automation, Smart Robots Extend the Capabilities and Creativity of Smart Humans

By Robert Hoyle Brown

Process automation is moving from the factory floor to the world of knowledge work, but ‘robots’ can’t do it alone – they need smart people to ask good questions, solve problems creatively, connect to people and manage data. Companies that calibrate smart hands with smart machines are already achieving higher productivity and superior business results.

From *The Six Million Dollar Man* to *Aliens* to *Iron Man*, pop culture has consistently adhered to the sci-fi motif of robotics augmenting human grit, creativity, determination, decision-making, adaptability and the will to succeed. But the fictional counter-narrative exists in the popular imagination as well, with humans and robots also depicted as fierce adversaries, waging a battle for superiority.

In reality, there are strong arguments for both sides. In a 2014 Pew Research Center study, technology experts were evenly divided as to whether robotic devices and a less tangible form of robots – networked and automated artificial intelligence (AI) applications – will displace more jobs than they create by 2025.¹

The truth, as usual, is in the middle. We now see a new and important type of robotics emerging that we call intelligent process automation (IPA). With IPA, smart machines augment and extend people’s uniquely human capabilities – empathy, creativity, problem-solving and drive – to deliver superior business results built on AI and machine learning.

Of course, the most common robots are the ones that make cars, unload ships, assemble products or vacuum floors. But we are now entering a new era of human-machine interface for repetitive and rote processes. Increasingly astute software tools have emerged as “the robots” for knowledge work. Humans are now working smarter with sophisticated software to automate business tasks. More importantly, these process systems are generating rich data that drives meaningful insights, value and business outcomes. And according to our recent research, IPA is contributing at least 10% to the revenue growth of early adopters.²

Going Beyond 'Swivel Chair' Workarounds

While virtually every existing business process uses technology, there's still a lot of repetitive, manual data entry, searching and collating that happens to get things done. Many process steps haven't been automated by core systems, while others rely on workarounds that require workers to toggle between multiple systems and screens to achieve last-mile integration of data. The value of this type of "swivel-chair" work can be pretty limited; if these tasks were automated, costs would decline, while speed and accuracy would rise. It would also mean that the people essential to the process could do more in less time.

In addition to collectively adding costs, sometimes these unautomated tasks can inject risk. For example, in insurance, the cost of miscoding on claims adds up to millions per year, not to mention the decline in client satisfaction resulting from multiple claims. It doesn't have to be that difficult; with automation applied, insurers can achieve 80% first-pass accuracy through auto-adjudication, and adding the technologies of IPA can raise that to as high as 99% in our estimation.

These outcomes are welcome. But the true "intelligence" value of digitization through IPA lies in the rich data and metadata that accumulates around process value chains. When real-time insights are gleaned from that data and fed back into the process – through analytics, artificial intelligence and machine learning – real transformation can begin as smart people can explore data, discover patterns and recommend appropriate actions. Take the insurer that automates its claims management process and then uses the data from its daily audit logs to detect hidden fraud patterns that could never be discovered manually.

When it comes to knowledge work, robots won't dominate humans but, rather, will work in tandem to make smart humans smarter and businesses more agile.

Process Automation Pays Dividends

To get a deeper understanding of "how far, how fast" IPA developments will play out, we recently surveyed 537 organizations in North America and Europe.³ Our study reveals that process automation is fast becoming a force-multiplier to knowledge workers in the banking, healthcare and insurance industries. Key findings include:

- **Process automation is saving substantial amounts of money, today.**

Automation is currently empowering businesses to work smarter, and reduce the number of people involved with the process; nearly one-fifth of respondents achieved greater than 15% cost savings through automation in the past year (see Figure 1, next page).

For some perspective, a decade ago the non-interest operating expense of all federally-insured banks was about \$275 billion.⁴ If the findings in our survey were applied, this expense could be reduced by 15%. That's a stunning savings of about \$40 billion. Executives predict that the number of people directly tasked with performing process delivery will decrease significantly in the coming years.

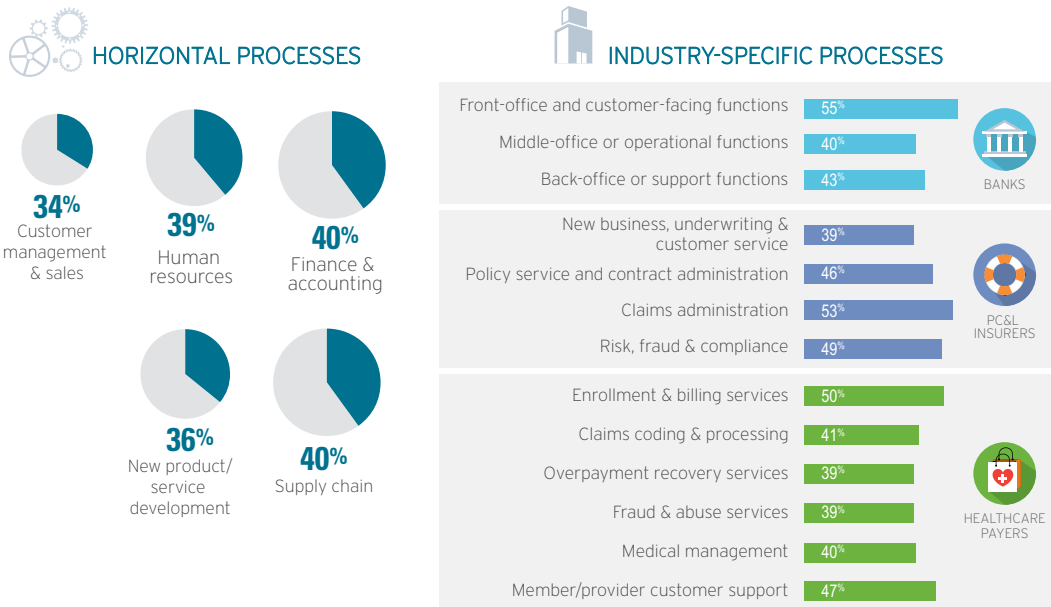
- **The data generated by automation will radically improve process outcomes.**

A far more profound benefit than cost efficiency lies in the process data and metadata generated by automation. Roughly 50% of respondents see automation (and 44% see analytics) as significantly improving processes over the next three to five years.

- **Digital value chains can reform data-rich processes.** One-third of respondents cite the direct improvement of data quality, consistency and "believability" of data to perform better analytics as an outcome of their digital initiatives. In other words, you have to "digitize to analyze." That's where merely "adding a robot" or automating an existing process falls short. Prompted by innovative competitors, a full digital re-think may be crucial to transform core processes in the future of work. By using next-generation technologies based on social, mobile, analytics and the cloud (the

Robots Enable a Money-Saving Assembly Line

Percent of decision-makers who expect to realize at least 15% cost savings across front-office, middle-office and back-office functions as a result of automation over the next three to five years.



Source: Cognizant Center for the Future of Work
 Response base: Healthcare payers: 102; PC&L Insurers: 115; Banks: 153

Figure 1

SMAC Stack), companies are completely re-imagining customer, supplier and partner interactions. And by igniting the digital information surrounding these entities – or Code Halo™ – organizations can realize business process insights in far greater fidelity than has ever been possible before.⁵

Clearly, many companies are already moving in this direction, but much more can be done. Getting there will require business leaders and decision-makers to quickly seize IPA’s vast potential. For example, while respondents report that a large percentage of their processes are currently automated (25% to 40%, in most cases), the expected increase in process automation over the next five years seems low (10% to 20%). It could be that what a lot of leaders currently regard as “automation” is driven by core IT investments (i.e., ERP, CRM, BPM and other enterprise applications). While all of these can foster automation, they will not help organizations reach the level that IPA can.

Data Generated from Automation Will Substantially Improve Process Outcomes

Interestingly, most respondents remain focused on how IPA can streamline and optimize processes rather than rethinking process work (see Figure 2, next page). However, the data generated by the increasingly astute technologies of process automation and digitization is the real prize, for businesses and workers alike. Solely applying robotic automation to an “as-is” process can fall short of the true competitive differentiation many organizations could achieve through process digitization.

That’s why when it comes to IPA, organizations need to cast a wider net. The reason: Automation opportunities are emerging at warp speed as the physical and digital worlds

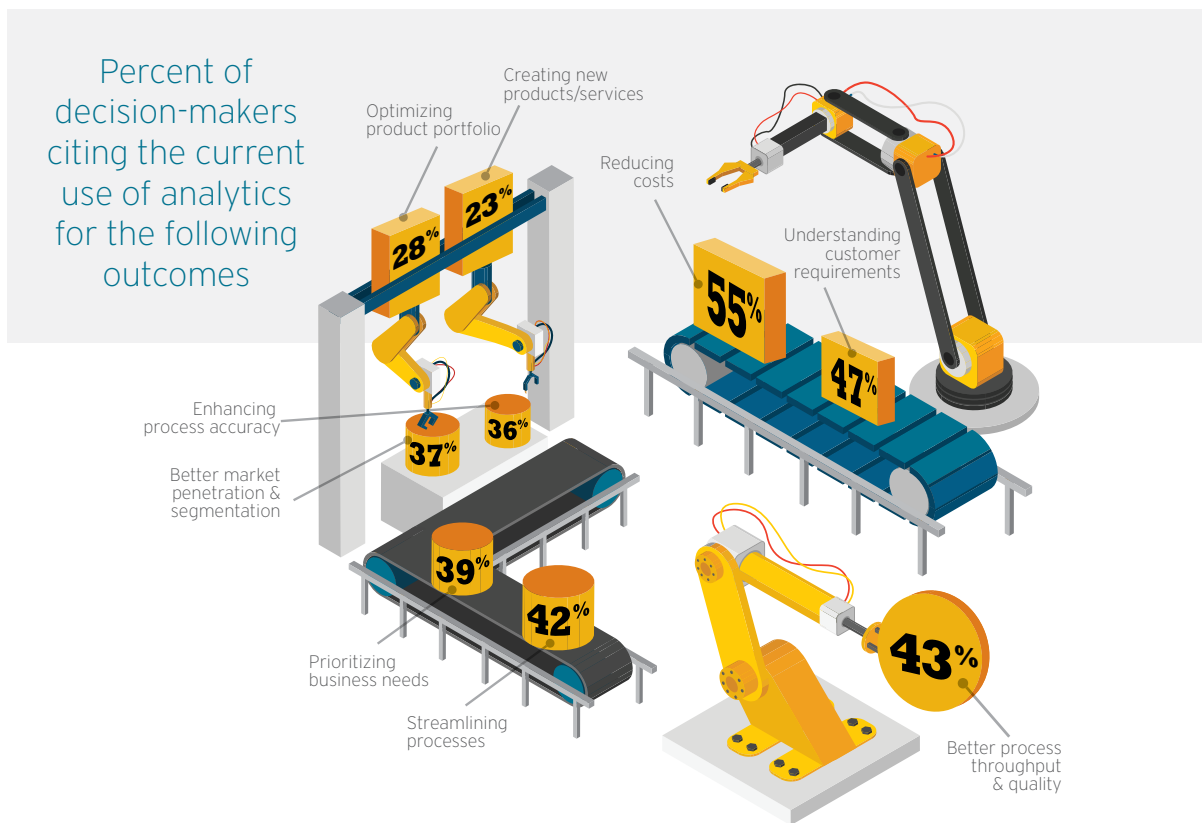
blend as one. It seems as though nearly every physical process is instrumented with sensors, telematics and “things” that drive ever-growing feedback loops of data. With advances in machine learning, artificial intelligence and big data, companies enhance their ability to predict rather than react to rapidly changing demands and expectations. Examples include real-time dynamic fleet optimization for destination and delivery capacity for logistics; analysis of driving behavior for dynamic auto insurance policy pricing; and collation of huge volumes of clinical data to optimize pharmaceutical trials.

Businesses that are already embracing these new technologies are capturing more data, improving processes and generally empowering workers to be more effective

at their jobs. In the words of Aaron Levie, the co-founder and CEO of Box: “Adding software to a broken process doesn’t make you digital. The biggest challenge is reimagining the process, not writing the software.”⁶

Respondents who are applying analytics to processes in the customer-facing and front-office realms are realizing at least 10% revenue growth from doing so (see Figure 3, next page). Additionally, one-third (32%) of respondents were well aware of the analytics value of digitized processes, citing improved quality, consistency and believability of the data they’re getting from digital process initiatives; nearly a third (28%) said process digitization led to easier data integration across processes.

Process Analytics: Show Me the Meaning (Making)

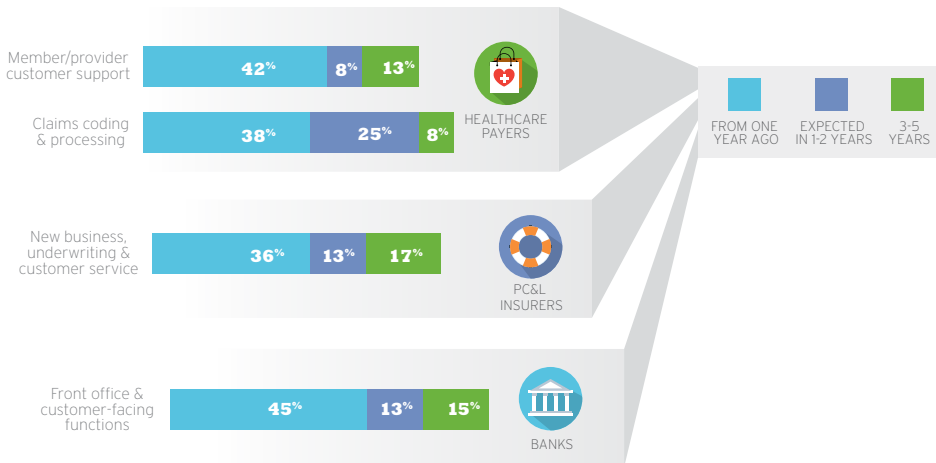


Source: Cognizant Center for the Future of Work
Response base: 537

Figure 2

Ramping up Analytics ... to Ramp up Revenue

Percent of respondents realizing/anticipating at least 10% of revenue growth achieved as a result of data analytics within the following selected industry-specific processes.



Source: Cognizant Center for the Future of Work

Response base: Healthcare payers: 102; PC&L Insurers: 115; Banks: 153

Figure 3

Getting Started with IPA

Organizations must act swiftly to close the gap between where they are now with automation and where they hope to be over the coming years. Here are a few pointers to get started:

- Perform an automation readiness assessment.** Make a detailed map of your existing processes (new product/service development, sales and customer relationship management, operations, etc.). Scan the market for minimally invasive automation technologies that would produce efficiency gains, while remaining receptive to new differentiating transformation. Some simple questions to ask prior to a process readiness assessment include: “How do I get rid of paper-based process inputs, such as invoices or claims, and get my process truly digital from the outset?” “Do the people delivering my processes today add value or inject risk?” “What are we learning about our business or industry value chain as data is analyzed, and does it help smart people to make better decisions?”
- Help humans evolve toward the work of tomorrow.** Give employees access to digital processes and machines that help them do their jobs better, smarter and with more meaningful business impact. Build your processes for humans, and use IPA to catalyze productivity, not as a wholesale worker replacement. After all, in business, it’s not about the number of people tied to “doing the process;” it’s about outcomes and helping your smart people work even smarter.
- Assign “tiger/SWAT teams,” including a mini-CIO.** There are likely many extremely valuable (and digitally-savvy) resources that would jump at the chance to become automation experts or join an IPA tiger team. We’re also starting to see more references to “chief automation officers.” Rather than ask “what can be automated,” forward-thinking practitioners will instead ask “what needs to stay human,” taking the starting point that everything, theoretically, can be automated. Physically co-locate these IPA change agents in the operational delivery arms of your business units. Keep them

The human spark is, and will remain, essential to how knowledge work is orchestrated and managed.

thinking not just about IPA, but also about the new process anatomy, data and the “art of the possible,” including participatory design/research principles.

- **Execute specific process projects – to learn fast, or “fail fast.”** Be specific – don’t place resources and “hope for the best.” IT resources landing in a business unit without work assignments are often quickly marginalized and abandoned. Identify, develop and implement solutions for process automation or digital business transformation – fast – to successfully outrun the competition.

IPA is here today – it’s quickly accelerating and disrupting the status quo. It sets the scene for smart automation, built and operated by smart people freed from the humdrum who can focus on creating greater business value.

Understanding the symbiotic relationship between humans and robots is crucial to understanding what the future holds. After all, the human spark is, and will remain, essential to how knowledge work is orchestrated and managed. What’s different is that technologies can now create more effective knowledge workers while simultaneously generating and capturing data that can improve and even transform processes, along with eliminating wasteful steps.

Despite a flood of hysteria about cyborg terminators, organizations shouldn’t be worried. Rather, they should embrace IPA’s immense savings and revenue growth opportunities – because like the latest sci-fi movie, it’s coming soon to a process near you.

Survey Methodology

Online panel-based research was conducted with decision-makers from banking and financial services, insurance and healthcare companies across North America and Europe. The sample also included companies from the pharmaceuticals, retail, hospitality and technology industries. The research was gathered from 537 respondents, representing companies with \$500 million to \$3 billion in revenue. The research instrument was fielded by an independent research agency (E2E Research) on behalf of Cognizant.

This article – which expands on themes explored in “Why Smart Hands and Machines Will Power the Second Industrial Age” (by Robert H. Brown, Cognizanti, Vol 7, Issue 1, 2014) – was adapted from the white paper “The Robot and I: How New Digital Technologies Are Making Smart People and Businesses Smarter by Automating Rote Work,” Cognizant Technology Solutions, January 2015, <http://www.cognizant.com/InsightsWhitepapers/the-robot-and-i-how-new-digital-technologies-are-making-smart-people-and-businesses-smarter-codex1193.pdf>.

Note: Code Halo™ is a trademark of Cognizant Technology Solutions.

Footnotes

- ¹ In the Pew Research survey, 48% of respondents said robots and digital agents would displace significant numbers of both blue- and white-collar workers by 2025, with many expressing concern about the resulting income inequality, mass unemployability, and breakdowns in the social order. Meanwhile, 52% said that while many jobs currently performed by humans will be substantially taken over by robots or digital agents by 2025, they have faith that human ingenuity will create new jobs and industries, just as it has done since the dawn of the Industrial Revolution. For more on the study, see “AI, Robotics and the Future of Jobs,” Pew Research Center, Aug. 6, 2014, <http://www.pewinternet.org/2014/08/06/future-of-jobs/>.
- ² “The Robot and I: How New Digital Technologies Are Making Smart People and Businesses Smarter by Automating Rote Work,” Cognizant Technology Solutions, January 2015, <http://www.cognizant.com/InsightsWhitepapers/the-robot-and-i-how-new-digital-technologies-are-making-smart-people-and-businesses-smarter-codex1193.pdf>.
- ³ Ibid.
- ⁴ “Measuring Bank Performance,” <http://wps.aw.com/wps/media/objects/3000/3072002/appendixes/ch09apx2.pdf>.
- ⁵ *Code Halos: How the Digital Lives of People, Things, and Organizations are Changing the Rules of Business*, by Malcolm Frank, Paul Roehrig and Ben Pring, published by John Wiley & Sons, April 2014, www.wiley.com/WileyCDA/WileyTitle/productCd-1118862074.html.
- ⁶ <https://twitter.com/levie/status/599045909825982464>.

Author

Robert Hoyle Brown is an Associate Vice-President in Cognizant’s Center for the Future of Work and drives strategy and market outreach for Cognizant’s Business Process Services business unit. He is also a regular contributor to the blog www.Futureofwork.com. Prior to joining Cognizant, he was Managing Vice-President of the Business and Applications Services team at Gartner, and as a research analyst, he was a recognized subject matter expert in BPO, cloud services/BPaaS and HR services. He also held roles at Hewlett-Packard and G2 Research, a boutique outsourcing research firm in Silicon Valley. He holds a bachelor’s degree from the University of California at Berkeley and, prior to his graduation, attended the London School of Economics as a Hansard Scholar. He can be reached at Robert.H.Brown@cognizant.com.

From 'Being Digital' to Becoming a 'Digital Being'

By Gary Beach

Sure, digital transformation requires strong top-down leadership and impeccable technical skills, but high-performing organizations go one step further: They find the wherewithal to acquire, nurture and retain the talent necessary to lead the charge.

"Numbers don't mean nuthin, it's people that count."

— Will Rogers

One of my favorite technology visionaries is Nicholas Negroponte, co-founder of MIT's Media Lab and author of 1995's *Being Digital*, a best-selling manifesto on digital's growing impact on global business and society.

Viewed from a 2015 lens, Negroponte's narrative appears quaint, perhaps even rudimentary. Take his PoV on how "bits will replace atoms," and "instructional manuals for computer hardware and software will become obsolete." This isn't surprising, given how quickly technology has evolved – faster than even the most astute pundit could have predicted. Yet while digital technology has already exceeded our wildest dreams (think smartphones, 3-D printing and software bots), most corporations have barely harnessed its full potential. In fact, you could say IT organizations are just finding their way, and like Negroponte's thinking, their strategies are only now entering adulthood.

Remember when you were 20 years old? You did some things well, other things not so well. You were excited about the future but uncertain of the path you would follow. You were curious, you often took ill-advised risks, but you were always learning.

Those attributes describe how, in my view, captains of the corporate world are managing the process of digitally transforming their businesses. They do some things well, other things not so well, they often take on too much risk, but they are always learning.

So, on the 20th anniversary of the digital transformation revolution, as companies around the world accelerate their embrace of digital technology, the time is ripe for CIOs and their IT leadership teams to step up and truly lead in this vital transformation.

Separating Winners from Also-Rans

If the results published in a recent *Harvard Business Review* report are on the mark, most companies are still struggling with the digital business mandate.¹ The report was produced from a survey that asked chief executive officers worldwide to rate various aspects of their company's digital maturity. In response, 19% claimed they were leaders, strong in both digital leadership and management; 47% classified themselves as followers, with digital leadership being a partial strength; and 34% categorized themselves as "laggards," with weak management in all areas of digital leadership.

How would your CEO classify your company's digital progress?

For CIOs at companies considered to be “followers” or “laggards,” the study makes clear that they have a lot of work to do. Look around: One in five corporations has gained the digital high ground – and it is more than likely that several competitors in any given industry have already broadly deployed digital technology to effectively transform their companies. Many have done

Leading companies, in fact, find and retain people who are facile with the necessary digital tools and techniques that blend the physical with the virtual, and create intuitive and meaningful experiences that not only deeply engage customers but also deliver significant competitive advantage, as measured on many fronts (ease of use, cost, revenue, etc.).

Being digital is not just about technological competency; it’s about harnessing the creativity and constructive problem-solving that is uniquely human.

so by mandating that “digital knowledge” is a company-wide, cross-functional priority, whether in IT, research/development, marketing, customer service or sales.²

From my vantage point, this mandate requires a strong digital culture that spans the enterprise and defines, if not informs, nearly every aspect of strategic decision-making. So, how does the CIO create a strong digital business culture? In my view, this requires:

- **Strong, top-down leadership** that considers digital transformation as a major business opportunity to engage with customers in meaningful new ways.
- **Great technology**, although as Nicholas Carr warns – in his 2004 book *Does IT Matter?* – information technology, in and of itself, doesn’t matter. After all, Salesforce.com, Workday, Oracle, Microsoft, Cisco and Amazon Web Services will sell their technology to anyone with a check! IT only matters when it is deeply embedded in all facets of the business.
- **Great talent.** Being digital is not just about technological competency; it’s about harnessing the creativity and constructive problem-solving that is uniquely human.

Transforming with Digital Talent

As noted by Dr. Klaus Schwab, co-founder of the World Economic Forum, the global socio-economic conference held each year in Davos, Switzerland, the key to succeeding with digital transformation is embracing “talentism” as the new capitalism.³

Ponder that for a moment. The digital talent you hire, and the digital talent you retain, will do more to determine the success of your company’s digital transformation than CEO leadership or the technology you maintain, purchase or use.

For the past eight years, I have focused on the topic of human “talent,” with particular emphasis on the “business-IT skills gap.” And I am not alone in my pursuit of this business challenge. In fact, the Society for Information Management’s 2015 IT Trends Study claims that the skills gap is the number two “most worrisome” issue for IT executives, after security (no surprise there!). While most CIOs have a technology strategy in place, few in my experience have taken time to develop a strategic human capital plan. That’s a big mistake.

So here's an idea.

Conduct an audit of your entire staff, splitting people into two talent groups: those with legacy tech skills pertaining to technology installed prior to 2010, and those with "emerging" skills – skills related to technology installed after 2010. I often get pushback from CIOs on the 2010 demarcation line. But I hold my position. And so must you.

Next, determine what percentage of your IT technology investment budget, excluding staff, is allocated to legacy technology and what percent is pegged for emerging technology, such as social business, cloud, analytics, mobility and cybersecurity.

But that's only step one. Hiring digital tech talent is not easy.

The CEB, formerly known as the Corporate Executive Board, reports that in the past two years, the number of days it takes to fill an open IT job has increased from 40 days to 70 days. What's more, this delay results in a 10% hit on overall corporate productivity.

So here's some more advice: Make your job searches for digital talent as inclusive as feasibly possible.

According to the U.S. Census Bureau's American Community Survey,⁴ 68% of U.S. citizens aged 25 or older are not college

While most CIOs have a technology strategy in place, few in my experience have taken time to develop a strategic human capital plan. That's a big mistake.

Now compare your technology and human allocations. The goal is to get to an end state at which 60% of your staff skills and 60% of your tech investment are dedicated to "emerging," transformative, digital technologies. It won't be easy. But it can be done by retiring legacy infrastructure, moving compute, storage and network to the cloud, and porting legacy applications via an aggressive application modernization plan. Moreover, it must be done, or your organization is destined to remain a "follower" or "laggard" and struggle to keep pace with leaders in your industry.

On the human side of the ledger, this exercise will reveal wide gaps in your human skill sets, particularly exposing critical shortages in emerging technology skill sets. At the very least, this approach leaves your organization with a straightforward, strategic plan on which skills to hire, train and retain staff members.

graduates. So why do CIOs, according to Boston-based research firm Burning Glass Technologies, include "bachelor's degree required" in 92% of their job postings, when only 56% of currently employed IT workers have college diplomas?⁵

This is hiring lunacy.

Of course, some emerging technology positions in areas such as data analytics and information/cybersecurity will require college degrees. But not 92% of your open positions! Direct your HR department to produce an audit of all jobs posted in the past year, separating the jobs into two groups: those that mandated "bachelor's degree required" and those that didn't. I guarantee your split will be close to the 92% level carrying the bachelor's mandate. Then ask HR the million-dollar question: Why is a college degree needed to do a specific job?

Prioritizing Digital Skills; Finding the Best and Brightest

Bachelor's degree or not, which digital skills are most difficult to hire for? I often get asked that tactical question by CIOs, and I respond by citing *Computerworld's* latest skills report,⁶ which lists jobs such as application developers, security, big data/analytics, networking and mobility.

That's a good start. But it does not begin to adequately address the strategic skills that organizations need in order to transcend the follower and laggard categories, and differentiate in an increasingly global, digital economy. To discover those skills, I highly recommend the Institute for the Future's "Future Work Skills 2020,"⁷ which introduces new skills, like how to master "cognitive load management" (i.e., processing and making sense of massive amounts of data), how to develop "cross-cultural competencies" (increasingly important in a global economy), how to leverage "new media literacy," how to "think in a novel and adaptive manner," and how to "collaborate in virtual work environments."

Granted, these are tough skills to acquire, master or showcase on a resume. So here's a tip: Require every candidate you interview, for both legacy and emerging technology positions on your staff, to showcase a portfolio of projects, preferably digital ones, that they have demonstrated, either in an education or work environment, that address the drivers and key skills highlighted in the Institute for the Future's report. And to accelerate the hiring process, spend time on the candidate's LinkedIn, Facebook and Twitter home pages. As one chief marketing executive who embraces this approach shared with me, "In 60 seconds, I can tell if a person will be a cultural fit for my company."

All this advice on talent is important. But what makes it even more important is a data

point from Cognizant's Center for the Future of Work. The Center asked IT executives in November 2014 to rate the "overall quality of a customer's experience and engagement" with their company through two lens: at the present time and three years out. Sadly, only 3% of respondents claimed the digital experience their companies deliver today is "excellent," and only 14% see this situation improving by 2017.⁸ Interpreted another way, this means that by 2017, 86% of companies see their investments in digital technology resulting in experiences that are "good" or worse. That's not "good" enough.

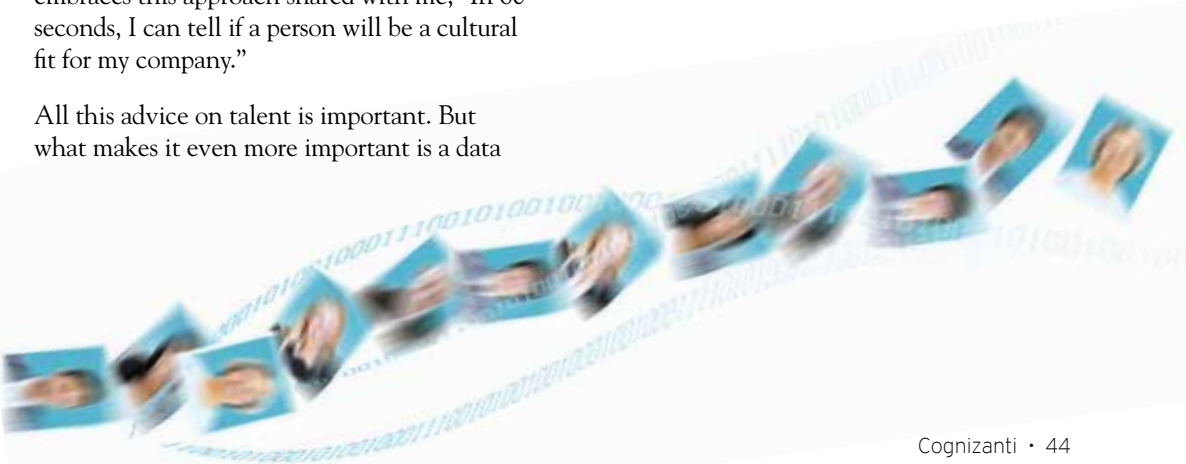
Fixing this will require the contribution of talented IT professionals and insatiable customers, who will drive digital technology deeper into every aspect of their business. If Nicholas Negroponte were to write a sequel to *Being Digital* in 2015, he might be advised to flip the title to *Digital Being* to more aptly describe the human nature of today's digital business imperative.

Without knowing it, American journalist Will Rogers did a good job of framing the priorities of this digital revolution in the early 20th century when he said, "numbers don't mean nuthin, it's people that count."

People like you. People like your staff. People like your customers.

George Westerman, a research scientist at the MIT Sloan School, recently addressed a group of CIOs at a conference on digital transformation, offering these words of advice and a stark warning: "There has never been a better time to be a great technology executive. Nor a worse time to be a mediocre one."

Here's to greatness in your quest to transforming your firm into a "digital being."



Footnotes

- ¹ “Driving Digital Business Transformation: New Skills for Leaders, New Role for the CIO,” Harvard Business Review Analytic Services, 2015, <http://red.ht/1G9mrnP>.
- ² Ibid.
- ³ Klaus Schwab, “The End of Capitalism – So What’s Next?” *The Huffington Post*, April 4, 2012, http://www.huffingtonpost.com/klaus-schwab/end-of-capitalism-_-b_1423311.html.
- ⁴ “American Community Survey,” U.S. Census, <http://1.usa.gov/1CFdPoP>.
- ⁵ Burning Glass Technologies, April 2015.
- ⁶ Mary Pratt, “10 Hottest Skills for 2015,” *Computerworld*, Nov. 18, 2014, <http://bit.ly/1NRCj3T>.
- ⁷ “The Re-working of Work,” Institute for the Future,” 2011, <http://bit.ly/1KRILdu>.
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- ⁹ George Westerman, 2015 MIT Sloan CIO Symposium, Cambridge, MA.

Author

Gary Beach is the Publisher Emeritus of CIO Magazine. He is also a guest columnist for The Wall Street Journal and author of the best-selling book “The U.S. Technology Skills Gap.” He can be reached at Garybeachcio@gmail.com and on Twitter @gbeachcio.





Transcending the Hype: A Transformative IoT Emerges

By Adithya Sastry

Despite the disappointment of overblown predictions, the Internet of Things is finally taking shape at companies across industries. Initial pilots offer a glimpse of how a tightly interconnected physical and virtual world can drive breakthroughs in worker productivity, organizational efficiency, and entirely new product and service models that radically alter customer experience and competitive dynamics.

As social, mobile, analytics and cloud technologies, or the SMAC Stack, emerge as the catalyst for today's wave of digital business innovation, the so-called Internet of Things (IoT) is beginning its transition from buzzword to breakthrough status at organizations willing to take the plunge.

After years of unrealistic prognostications and unfulfilled reality, the IoT's potential is being proved in early trial and pilot projects. The insights gained from ambient data acquired from smart, connected and instrumented objects and infrastructure are illuminating the path for businesses to enhance employee productivity, increase operational efficiency and create new business ecosystems across nearly every product and production process that can be made Internet Protocol (IP) addressable.

Certainly the IoT landscape has yet to settle out, as evidenced by the lack of technical standards (see Quick Take, page 51), concerns over data privacy, and typical worries over "operationalizing" proofs of concept at production scale or monetizing data streams that result from IoT investments. However, technologies and tools are emerging from third-party vendors and integrators to make products and services smart and secure, and organizations are beginning to work through the many challenges of where to begin, how to build a secure and scalable infrastructure, and what the ROI could eventually be.

Leading companies are staring down the risks and exploring the possibilities, moving briskly from ideation to prototyping. They believe that previous waves of Internet innovations are merely a prelude to the unprecedented changes that the IoT will bring to the way we live and work, particularly as

Leading companies are staring down the risks and exploring the possibilities, moving briskly from ideation to prototyping.

smart objects are embedded into everyday consumer experiences and production value chains.

Making IoT a Reality

In fact, experimentation is beginning to give way to pilots that progressive organizations are undertaking to advance their digital business agendas. Typical use cases include:

- Manufacturers, consumer goods and industrial equipment makers are establishing remote monitoring and maintenance capabilities.
- Energy and utility companies are instrumenting production equipment to improve operational and capital efficiency.
- Healthcare, consumer goods, travel and hospitality companies are creating new customer experiences that differentiate their brands and improve customer engagement.
- Heavy equipment manufacturers, insurers and transportation and logistics companies are improving worker safety and productivity.
- Retailers and financial services firms are extending product and service experiences to new platforms, such as wearables.

In many cases, the initiatives aren't even cast as IoT projects per se but simply as product or process improvements that happen to use the Internet as the central platform in a solution employing sensors, network, cloud and analytics technologies.



Remote Monitoring and Management of Beverage Vending Machines

One example is a major food and beverage maker that needed to better manage and monitor its fleet of expensive beverage coolers and vending machines scattered across the developing Asian markets. Because coolers were subject to rampant pilfering, the company experienced a high loss rate. Some machines literally went missing (as much as 20% internationally), while many mom-and-pop retail partners used their coolers for competitors' soft drinks. Still others did not keep their machines full, which caused numerous out-of-stock situations. At the same time, the soda vending experience was changing, as consumers were developing a taste for custom-flavored drinks that they could custom-mix at the kiosk.

As part of a revamped strategy, the company sought to roll out three different kinds of smart soft drink machines: a customized beverage dispenser equipped with a touch-screen for customers to combine syrups for their own personalized soda; large, glass-door coolers found in retail environments; and automated vending machines dispensing cans and bottles.

The company partnered with us to create a connected vending network that provided a track-and-trace capability, along with

an integrated view of machine inventory, delivering consolidated insights on what customers were choosing to consume. By combining our expertise in logistics and warehousing with our knowledge of IoT technologies, and using Microsoft Azure, we delivered a pilot of a scalable platform that could be extended to new geographies.

During testing, our approach helped decrease truck rolls and out-of-stock situations, improve warehousing operations and cut costs – all with the added benefit of enhancing the customer experience. Warehouse managers received alerts before customers needed new supplies, and customers were automatically notified before running out of syrup. At one site, out-of-stocks were reduced by 88%, and delivery



Improving Operational and Capital Efficiency in the Energy Industry

In another case, a global oilfield services giant wanted to help customers reduce their production costs, using a connected ecosystem. The company provides petroleum companies with the capital equipment, services and know-how to manage oil wells and petrochemical sites, often in harsh

During testing, our approach helped decrease truck rolls and out-of-stock situations, improve warehousing operations and cut costs – all with the added benefit of enhancing the customer experience.

drivers were able to work more efficiently, as they needed to stop only at locations on their routes that needed replenishment. Although closed-loop improvements and proprietary logistics networks have existed for decades, the opportunity to use the public Internet to create a secured network of smart vending machines allowed the company to drive new efficiencies at a sharply reduced cost.

What began as a small pilot of fewer than 400 machines is now rolling out as a solution at scale, targeting up to 2,000 machines by the end of this year.

environments such as the North Sea, Alaska, the Middle East and the Gulf Coast. With the price of oil in recent years dropping from a high of more than \$120 a barrel in 2011 to less than \$50 a barrel by mid-2015, petrochemical companies have been under significant pressure to reduce costs. We partnered with the company to prototype a smart, connected submersible pump to help combat cost pressures in the oil business and improve capital efficiency.

While submersible pumps are already available that are connected to proprietary networks, they are expensive, difficult to update and reliant on costly satellite data. Updating this type of submersible pump

continued on page 53

Quick Take

In Search of IoT Standards

For the IoT to really work as envisioned, smart devices, smart buildings and all the smart things inside them need to speak a common language, eventually interconnecting with other ecosystems. But the industry is not there yet.

Multiple industry groups, consortia and standards bodies are working to introduce standards for device connectivity, management and application development. Some of these alliances will compete with each other, while others may complement each other's efforts. Additionally, vendors such as Microsoft, Apple and Oracle also have their own approaches to IoT connectivity.

Here is a sampling of the more prominent players:



Allseen Alliance

Purpose: A nonprofit consortium focused on developing a software connectivity and services framework that enables device-to-device interoperability in business and home settings, using the AllJoyn open-source framework. The framework consists of modular services that enable discovery of adjacent devices, pairing, message routing and security, regardless of transport layer, device type, platform, operating system or brand.

Prominent members: AT&T, Qualcomm, Microsoft, Sony



Industrial Internet Consortium

Purpose: An international nonprofit consortium focused on influencing the global development standards process for the Internet and industrial systems by defining and developing the reference architecture and frameworks necessary for interoperability among industrial machines in the enterprise.

Prominent members: AT&T, Cisco Systems, General Electric, IBM and Intel



Thread Group

Purpose: An alliance of vendors, led by Google's NEST Labs, focused on developing a mesh wireless networking protocol intended to interconnect low-bandwidth devices around the home using the IPv6 protocol. Using Thread, developers and consumers can connect more than 250 devices into a low-power, wireless mesh network that also includes direct Internet and cloud access for every device.

Prominent members: Google's NEST Labs, Samsung, ARM Holdings



Zigbee Alliance

Purpose: A nonprofit association focused on driving development of ZigBee, a specification for a suite of high-level communication protocols used to connect, sense and control smart devices on a wireless network.

Prominent members: Comcast, Freescale, Philips, Texas Instruments, Itron



Open Interconnect Consortium

Purpose: A group of industry leaders formed to develop a common communication framework based on industry-standard technologies that wirelessly connects and intelligently manages the flow of information among devices, regardless of form factor, operating system or service provider. The framework, called Iotivity, is intended to enable device-to-device interoperability, including device discovery, communication, data exchange and other functions.

Prominent members: Cisco, GE Software, Intel, Mediatek, Samsung Electronics, Broadcom, Dell

required a manual software update and forced the company to manage the equipment one device at a time. The company asked us to create a “smart pump” proof-of-concept, which we did through a pilot of 200 submersible pumps connected to the Internet. Because it gave the company a single view of its fleet of deployed pumps and the ability to perform software updates remotely, the smart pump helped the oil business avoid the use of costly satellite data connections and manual, one-at-a-time software updates.

This example reveals how the IoT is displacing older forms of proprietary networking that are inflexible, prohibitively expensive to maintain and extend, and complex to manage and operate. In the digital world, simplicity and intuitive ease of use is the difference between market leadership and also-ran status.

After the pilot proved successful, the company extended the solution to a total of 2,000 submersible pumps, and is looking to test it on other types of oilfield equipment.



Remote Monitoring and Management in the Fast-Food Sector

Like most restaurant chains, a major fast-food operation was concerned about food waste across thousands of its outlets, globally. In fact, cooking at too low (or high) a temperature was translating into millions of dollars of unnecessary cost. In addition, the restaurant chain faced challenges introducing new seasonal recipes, managing consistent execution of batch cooking, and controlling exposure to the variable cost of consumables across its corporate and franchisor-owned outlets.

Applying our industry experience, we worked with the company on innovative ways to establish a “connected kitchen” that raised the visibility of batch cooking processes and gave corporate decision-makers additional control over cost and quality.

Our initial idea was to develop a “smart fryer,” deploying sensors to measure cooking attributes such as temperature, oil consumption and power usage. We envisioned smart fryers that could sense, learn and predict demand, self-optimize temperature and power consumption, and be remotely managed. Given the sunk cost in traditional fryer equipment at thousands of locations around the world, however, we quickly learned that the investment in new equipment would be prohibitive.

Within six weeks, we came up with an alternative solution to retrofit existing fryers with an inexpensive electronic sensor board and software that could provide smart fryer capabilities. We implemented the solution at four locations as a proof-of-concept, and the client is now considering extending it at scale across regions.



Empowering Patients and Improving Clinical Care with Remote Patient Monitoring

With over nine million health plan members and 180,000 employees, this non-profit organization is the largest integrated healthcare provider in the U.S. It has also been one of the most successful in finding innovative ways to reduce costs and increase the convenience of patient care. As part of these efforts, the organization wanted to explore how to improve connectivity between hospitals, clinics and medical devices to empower clinicians with remote, real-time access to patient data.

We worked with this health plan to create a remote patient-monitoring system prototype that uses smartphones to connect medical devices such as blood pressure monitors, glucose meters and wearable “bracelet” monitors in patients’ homes. The system integrates the data with an existing analytics program used in the organization’s hospitals and gives clinicians a central dashboard for a holistic, near-real-time view of a patient’s health and activities.

In this pilot, patients such as expectant mothers, diabetics and people with Alzheimer’s disease could choose to participate in remote monitoring from their homes, which reduced the number of clinic visits and, as a result, the cost of care. Not only did the health plan save on the cost of manually taking and recording visits, but the system could also send automated patient alerts. The remotely collected data provided clinicians with a broader set of vitals across time, giving them better insight into patient care.

As a result of the successful pilot, the healthcare organization is looking to expand the program as it continues to explore how digital technologies can transform the delivery, quality and experience of healthcare.



Increasing Worker Safety and Productivity in the Insurance Industry

Insurance claims adjustors are often called upon in times of crisis to do their jobs amid great stress and calamity, such as in the aftermath of major storms or accidents. A large insurance company wanted to explore how to make the job of claims adjustment safer and more productive with a hands-free wearable solution that would transform the claims adjustor workflow process.

The company asked us to help prototype a solution based on the Google Glass platform

(which, not coincidentally, Google is shifting from a consumer device to a specialized, industry-specific platform). Our solution included real-time connectivity to colleagues with specialized auto and real estate expertise, a video and image capture tool, legacy system integration to file reports, and a voice-recognition capability that allowed adjustors to do their job without the typical pen-and-paper survey process. This hands-free option would give adjustors the ability to inspect damaged property and traverse harsh environments freely. (For additional insight on this type of application, read our white paper “[Google Glass: Insurance’s Next Killer App](#)”¹ or watch our video series on our [YouTube](#) channel.²)

Getting Started with the IoT

While we believe it’s important to think big, it’s also critical to start small. A successful approach is to incorporate a rapid ideation and fast prototyping process to explore business opportunities, quickly discard those that don’t work and scale the ones that do.

In these early days of the Internet of Things, it can be valuable to experiment, especially in the absence of standards or tried-and-true frameworks. Therefore, we suggest companies work initially to identify two types of opportunities: “smart process” refinements in which the IoT is used to improve on existing business activities, and “smart product” opportunities that offer the potential to radically alter conventional business models within their own market, as well as in adjacent industries.

Depending on the complexity of the project, some companies will benefit from starting with a smart process to prove the concept, while others will see quicker success pursuing a smarter, more connected product initiative.

To develop a smart process, we recommend asking the following questions:³

- How can we exploit location data?
- What other machine state or environment data would be valuable, especially when aggregated, to the value chain?

- Can we benefit by adding remote monitoring and control? Would adding a user interface to the process lead to greater insights and opportunities to reduce cost?
- What third-party data, if introduced, would make the process more informed and capable of self-optimizing?

The following questions can help generate strategies for pursuing smart products and longer term industry disruption:

- Would real-time information add value to the customer experience of the product or service?
- Can we expand sales by charging for our product in a metered, as-a-service way?
- Would crowdsourced customer sentiment help us prioritize the product roadmap or benefit customer service?
- Which aggregated sensor information has value to our customers or partners? Could we be part of a new ecosystem, or potentially even create and own a new one?

- How would customers' social and virally shared experience of the product increase traction for the brand?

These are just some of the questions managers can ask when trying to get past the bluster of the IoT and get started on a workable strategy. Establishing a baseline experience, and sanctioning a continuous ideation and prototyping cycle, can help create the mindset and governance model needed to take advantage of the connected-things evolution of the Internet.

As the aforementioned examples reveal, leading companies are transcending the hype and are delivering business results by not only thinking big, but also starting small. Already, they are seeing improvements in worker productivity, operational effectiveness, and new product and service models that, when scaled, promise to alter the dynamics of competition in their industries.

Footnotes

- ¹ "Google Glass: Insurance's Next Killer App," Cognizant Technology Solutions, December 2013, <http://www.cognizant.com/InsightsWhitepapers/Google-Glass-Insurances-Next-Killer-App.pdf>.
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- ³ These recommendations build on presentations made during a Gartner IoT webinar <http://www.gartner.com/webinar/3000719>, and are reinforced by our client work.

Author

Adithya Sastry is an Associate Vice-President within Cognizant's Emerging Business Accelerator, and is General Manager of the company's Internet of Things business, responsible for IoT product and service development. In this role, Adithya leads a team of designers, business strategists and IoT consultants to help companies that are looking to make a start with the Internet of Things. Previously, he was leader of Cognizant's Cloud business unit and held product management leadership roles at NCR and GE. Adithya earned an M.B.A. degree at Thunderbird International School of Management and an M.S. in computer science from Arkansas State University. He can be reached at Adithya.Sastry@cognizant.com.

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Regaining Consumer Trust

By Steven DeLaCastro

Amid wavering consumer confidence, changing banking behaviors, widespread hacks and new competition, here's what traditional banks can do to rebuild trust in the digital era.

Consumer banking in the last seven years has undergone radical change. Depositing a check no longer happens at the branch or ATM but through a mobile phone. From processing payments to providing loans, financial services that were historically the sole preserve of banks are being usurped by nontraditional competitors, ranging from technology, retail and e-commerce giants, to online-only banks and digital upstarts.

Digital innovations and new consumer behaviors are significant drivers for the rise in alternative banking approaches, such as peer-to-peer lending and mobile wallets. But there is another reason that consumers are turning to new ways of making payments, storing funds, finding loans and even getting financial advice: waning trust.

According to the 2015 Edelman Trust Barometer, banking and financial services (along with the media and chemicals sectors) are the least trusted of industries, compared with technology, consumer electronics, energy, telecommunications and food/beverages.¹ Consumer trust was deeply shaken by the industry's dubious lending practices and questionable business decisions that helped spur the 2008 economic downturn; while trust has improved modestly since 2011, according to Edelman, cybersecurity threats have more recently dented banks' claims of impenetrability.

Combined with new digital technologies, the trust gap spurred by the recession presented the perfect opportunity for new competitors to encroach on traditional banking territory, as consumers – especially millennials – were just as open to simple and low-cost banking capabilities provided by a mobile app or beloved brand (like Apple or Amazon). What is more, millennial customers are more likely to switch banks than previous generations, according to the Edelman study.

What can banks do, then, to regain their footing in a quickly changing industry and earn consumer loyalty once again? Here are our recommendations for banks of all sizes:



Provide proactive communications.

Banks need to make themselves heard above the noise of new competitors, mobile apps and completely new approaches to banking, such as peer-to-peer – or crowd-sourced – lending. Localized and personalized marketing messages are one approach, and are particularly effective when the message is conveyed on the customer’s channel or method of choice. Amid the very real threat of cyber threats and credit card hacks, frequent and proactive communications with customers are also essential. As an example, Citibank and American Express recently sent out security notifications and replacement cards voluntarily when the organizations detected suspicious activity, even before legitimate fraud was found. The two companies did this both as a precaution and to reassure customers that their money and personally identifiable information were in good hands. Such proactive engagement goes a long way toward building trust.



Develop an advanced analytics capability.

Big data and advanced analytics are essential tools for understanding consumer demand, anticipating customer needs and responding to those needs in the form of relevant and even personalized offerings. When banks are perceived as more relevant, it builds consumer trust. Advanced analytics techniques are especially important for understanding customer behaviors today, as consumers bank across multiple – and increasingly digital – channels. Banks need to take an “actionable analytics” approach that not only enables high-speed trading and fraud analytics but also combines analytics, big data and business process management (BPM) technologies to deliver tangible business results, including total client visualization, campaign discovery, cost reduction, revenue optimization, client churn, client acquisition and predictive analytics.

For example, analytics can be used to identify where and why transactions were abandoned, fuel location-based offerings, align customer transactions with the least expensive channel, and discover what enhances or detracts from the customer experience. (For more on this topic, read our white papers, “[Making Analytics Actionable for Financial Institutions](#)” and “[Creating One Customer Journey Ecosystem that Meets All Banking Needs.](#)”)²



Nurture personalized relationships.

Advanced analytics is also crucial for creating more meaningful and personal customer relationships. In order to forge a lasting relationship, banks need to move beyond viewing customers as a series of disparate accounts, to understanding them as individual depositors and borrowers. Specifically, banks need to analyze customer interaction and transactional data from all bank channels and combine that with the customers' other digital activities (what we call the customer's Code Halo™³), make meaning from it and then develop tailored offerings and services that suit each consumer's preferences and needs.

For instance, if the bank sees that a longtime customer's paycheck deposits have notably increased, it could take that as an opportunity to offer a high-profile credit card. If another customer is paying multiple student loans at one time, that might indicate a positive response to an offer for student loan consolidation. Through social media, a bank could detect whether someone is planning a vacation or researching websites for a big purchase and offer a credit card with special offers for those purchase items. Or it could note that a customer toward the end of his car loan is spending time on the Web looking at new cars and insert an ad onto Cars.com for special financing rates.

Using advanced analytics-driven tools, such as customer personas and journey maps, banks can personalize pricing and credit privileges based on meaningful insights, not general demographics. Well-rated banks are already doing this, and aspiring banks will need to follow suit. (For more on this topic, see our white paper, "[For Effective Digital Banking Channels, Put Customers First.](#)")⁴



Reinforce the digital vault.

With new types of threats, cybercrime poses a real issue for banks when it comes to customer trust. Indeed, trust seems to be the driving factor behind security spending, even greater than financial loss resulting from cybercrime.⁵

The ongoing evolution of technology has resulted in a rapidly changing threat environment, posing a real learning curve for banks. Besides probing for the weakest link in the banking ecosystem, criminals are also developing new methods of attack, targeting new channels of communication as banks introduce them. For example, the user-friendly VISA payWave system, in which a customer swipes a card near a reader to buy something, makes it faster and more convenient to pay, but it also exposes the transaction to unauthorized users who can steal the information wirelessly.

Another example is the introduction of mobile banking and mobile applications. Both offer customers convenient channels for communication; equally, mobile threats such as mobile malware and "spim" (spam over instant messaging) are also among the fastest growing forms of cyberattack.⁶

Evolving technologies can also help banks meet the cybersecurity challenge. Leading organizations are looking to the latest data management, monitoring and analytics technologies to anticipate potential vulnerabilities and threat vectors, as well as the impact of these threats, to determine the most appropriate, risk-based action to take.

New tools are rapidly emerging to fill existing gaps in reactive forensics (such as e-discovery solutions) and proactive analytics (such as tools that mine significant data sets to analyze patterns and support risk-based approaches). This is particularly relevant for cybersecurity, as not all threats are equally severe and must

Quick Take

New Threats Call for New Approaches

The cyber domain is continuously evolving, providing both new opportunities and challenges for financial services institutions. To improve cybersecurity, banking organizations must elevate the topic and address threats holistically at the highest levels of the organization in a manner that they understand. In this effort, they need to:

- **Understand threats.** Just as the likelihood and impact of cybercrimes varies, so should the responses to them. For example, banks need to distinguish between attacks that are financially motivated and those that are not. In the past, malicious attacks were more the norm and were easier both to execute and defend against. With more complex layers of technology being added at an exponential rate, more recent attack vectors have concentrated on accessing customers' personally identifiable information and passwords to conduct fraudulent banking transactions and enable broader based customer identity theft. Cybercrimes that have caused the greatest financial and reputational impact, although less spoken about publicly by banks, have been those perpetrated by bank employees themselves or through the banks' technology partner networks.
- **Cooperate externally.** Banks are perceived as operating in silos, but greater external cooperation should enhance their cybersecurity efforts more broadly. Criminals often target weaker links in the banking ecosystem, and it would be in the banks' long-term interests to help third-party actors improve their own cybersecurity efforts.
- **Improve awareness.** By educating everyone from end users and employees to top management, banks must continue to improve educational efforts surrounding cybersecurity.
- **Leverage data assets with advanced analytics.** Banks have enormous amounts of data at their disposal, which they can leverage with analytics tools to detect trends and create KPIs from which to proactively counter cyber threats.
- **Make risk-based decisions.** Taking a holistic view of cyber threats requires elevating the problem to an operational risk, from which better decisions can be made more quickly, and in relation to the relative risk to the enterprise as a whole.
- **Achieve innovative maturity.** As cyber threats evolve in scope and complexity, so should the financial organization's drive and commitment to innovatively manage cyber risk, both in terms of people and technology.
- **Adopt an industry-recognized cybersecurity framework.** The National Institute of Standards and Technology (NIST) and the Federal Financial Institutions Examination Council (FFIEC) have both recently released cybersecurity frameworks that are applicable to the financial industry.⁷



be prioritized accordingly. Implementing analytics can help financial services institutions better understand what, when, why and how threats can potentially impact an organization, and the most appropriate action to take.

To improve customer relationships while simultaneously educating them on security risks, banks must embrace all lines of communication. In addition to external education, they also need to raise internal awareness. Indeed, “human behavior” is often cited as a key gap in cybersecurity among banks; for example, unless properly and consistently trained on security protocols, employees are often careless about their use of USB devices and public Wi-Fi connections. Danske Bank, which has over 20,000 employees across almost 10 countries, has learned from experience; when the bank introduced laptops to employees, it also made sure they were all encrypted.

In the end, achieving strong cybersecurity preparedness requires good technology, the right organizational structures, strong cooperation, legal support and investment (see Quick Take, opposite page).



Know when to insert the human touch.

Online and mobile channels are clearly the future of banking, particularly for digital natives but increasingly for all generations of bankers who seek the cost savings and convenience of self-service apps. According to a 2014 survey by Bank of America, nearly six in 10 (58%) respondents have used mobile check deposit; interestingly, nearly half of respondents in the 35-plus age category use this service.⁸ Banks need to combine a mobile-first mindset with a big data sensibility, as banking transactions ultimately shift into a customer experience that is similar to using Amazon’s or Netflix’s highly curated and individualized menu.

However, when problems arise with these self-service channels, reputable banks need to know – using customer Code Halos – when individual customers prefer to engage with a service representative and provide that capability at the tap of a call button.



Consider a rebirthing strategy.

In some cases, a bank’s reputation is too ingrained for it to be perceived in a new light, and in those cases, a re-branding strategy is the best course of action. For instance, some banks have created a “bank within a bank,” reinventing their brand by developing a startup operation that can act more quickly and aggressively than the legacy institution can, enabling it to compete with new nontraditional competitors. When taking this approach, banks can use the startup to target a particular demographic or banking specialty.

An example is BRE Bank, which launched mBank in 2000, a pure-play online bank. After a rapid rise to Poland’s biggest online bank and third largest retail bank, mBank expanded into the Czech Republic and Slovakia in 2007. In 2012, BRE invested \$31 million in a complete redesign of the bank to accommodate the new trends in real-time marketing, personal financial management, mobile banking and social media. At that point, it officially changed its name to mBank and adopted the online bank’s brand, focus and look-and-feel.⁹

Looking Forward

With all the changes that have occurred since the 2008 downturn, more turbulence is ahead for consumer banking. The key to remaining relevant amidst the constant change is rebuilding consumer trust. By making consumers the centerpoint of their strategies and operations – and focusing on convenience, personalization, security and digital approaches to banking – banks can be heard above the noise of new competitors and provide an experience that inspires customers to return, again and again.

Note: Code Halo™ is a trademark of Cognizant Technology Solutions.

Footnotes

- ¹ 2015 Edelman Trust Barometer, Edelman, 2015, <http://www.edelman.com/2015-edelman-trust-barometer/trust-across-industries/>.
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- ³ For more on Code Halos, please visit <http://www.cognizant.com/latest-thinking/code-halos>.
- ⁴ “For Effective Digital Banking Channels, Put Customers First,” Cognizant Technology Solutions, August 2014, <http://www.cognizant.com/InsightsWhitepapers/For-Effective-Digital-Banking-Channels-Put-Customers-First-Part-2-of-3-codex-1037.pdf>.
- ⁵ In April 2013, Charles Blauner, the chair of the Financial Services Sector Coordinating Council (FSSCC), wrote in a letter to the National Telecommunications and Information Administration: “Financial services are built upon trust from our clients, trust between our firms and the trust required to ensure the proper functioning of markets, execution of transactions and protection of information.”
- ⁶ According to the 2013 Internet Security Threat Report from Symantec, there was a 58% increase in mobile malware compared with a year earlier, and a 32% increase in the number of reported vulnerabilities in mobile operating systems during the same timeframe.
- ⁷ In February 2013, President Obama issued an executive order for NIST to develop a voluntary framework for reducing cyber risks to critical infrastructure (<http://www.nist.gov/cyber-framework/>). The FFIEC developed the Cybersecurity Assessment Tool to help institutions identify their risks and determine their cybersecurity preparedness. The assessment provides a repeatable and measurable process for financial institutions to measure their cybersecurity preparedness over time.
- ⁸ “Trends in Consumer Mobility Report,” Bank of America, 2014, http://newsroom.bankofamerica.com/sites/bankofamerica.newshq.businesswire.com/files/press_kit/additional/2014_BAC_Trends_in_Consumer_Mobility.pdf.
- ⁹ Chris Skinner, “mBank: The World’s First Mobile Social Bank within a Bank,” Financial Services Club Blog, June 19, 2013, <http://thefinanser.co.uk/fsclub/2013/06/mbank-the-worlds-first-mobile-social-bank-within-a-bank.html>.

Author

Steven DeLaCastro leads Cognizant’s Banking and Financial Services business unit’s global “Bank of Tomorrow ... Today™” digital banking program. With a wealth of expertise in bank technology and operations, software, services and consulting, he has held the titles of Chief Information Officer, Chief Operating Officer, Senior Vice-President, Managing Director, General Manager, EMEA Sales Director, Regional Country Manager, Partner and Managing Partner. Steven holds an M.B.A. and a BSc. in business administration with concentrations in operations, finance and psychology. He can be reached at Steven.DeLaCastro@cognizant.com | [Linked In: www.linkedin.com/pub/steve-delacastro/0/240/309](http://www.linkedin.com/pub/steve-delacastro/0/240/309).

Disrupt or Be Disrupted

By Prasad Chintamaneni

Non-traditional rivals and heightened global regulation are converging to create new digital opportunities for the banking establishment. To seize the high ground, banks need to think like disruptors and apply modern digital tools, techniques and partnership strategies to keep pace with accelerating change.

More than a few bankers may have flinched when the news broke in late July of Amazon's market capitalization surpassing Walmart's for the first time.¹ Walmart's revenues continue to dwarf Amazon's by a factor of five. But the fact that investors now value Amazon higher than the world's largest retailer reflects a belief that the online upstart's formidable digital business acumen offers greater growth opportunity.

Can you imagine a time when investors believe the same about banking industry disruptors, such as Lending Club, PennyMac and Prosper, vis-a-vis Bank of America, Chase and Citi? Far-fetched, perhaps. But Walmart leaders surely sensed the tilting of the playing field in 1998 when the retail giant pursued a lawsuit (ultimately settled) alleging that Amazon had stolen trade secrets.

Banks recognize the need to engage disruptive competitors, of course, and many are developing digital, mobile and other strategies to do so. But heavy compliance requirements, rising cybersecurity risks and anemic revenue growth are among the constraining realities at

a time when nimble competitors are targeting banks' high-margin businesses with innovative customer experience models.

What are banks to do in the face of these threats to their profitability and prospects?

The Only Constant Is Change

Even banks in the vanguard feel outgunned by the speed and breadth of upheaval. Today, non-banks hold two out of five loans across key lending segments, as well as a similar (and record-making) share of mortgage originations. Non-bank mortgage servicers have tripled their market share in the past three years.²

Disruptors such as those mentioned above are storming traditional bank strongholds, including personal and small business lending, wealth management, mortgage banking, commercial real estate and student loans. Unconstrained by regulatory strictures that banks face domestically and internationally, the upstarts are pursuing opportunities in crowdfunding, peer-to-peer (P2P) lending, robo-adviser investment services and payment network disintermediation, among others.³

Some disruptors will be flashes in the pan. Others, we believe, will gain critical mass and truly threaten meaningful chunks of the banking and financial services industry, a risk validated across European countries and geographies. Regardless of who emerges, the forces of disruption introduce looming challenge for banks in the immediate future, especially when considered in the context of the current regulatory environment. Yet on a somewhat longer time horizon, these two factors – disruptive competitors and increasing regulations – may well converge in ways that create new opportunities for banks.

Seizing Opportunity

The disruptors' move into banking markets to date has consisted of an array of guerilla actions rather than a frontal assault. Eventually, though, these incursions could reach a critical mass that exposes them to regulators' crosshairs.

At that point, disruptors will discover that banking is not a simple business. Institutions need a strong balance sheet and the know-how and resources to operate within a regulatory compliance and custodial framework designed to protect the money and wealth of consumers, as well as the well-being of the economy, backed by a federal government.

familiar faces in Silicon Valley and other tech centers, exploring investment and partnering opportunities. Some are creating their own startup-like cultures within key business units, such as the recent inauguration of Wells Fargo's digital lab.⁴

Banks have plenty to offer the disruptors, too. They can build value clusters based on their core platforms, exposing APIs and offering resources to help upstarts scale their offerings. Leveraging their strengths, banks can protect their client base while providing an ecosystem for innovators, and take a cut in the process.

Finally, as disruptors face the specter of greater government oversight and enforcement, banks

Even if you can't do exactly what the disruptors are doing, start incorporating some of their concepts into your business model and service offerings.

When it comes to entrusting one's life savings to an institution, banks cannot be supplanted as rapidly as Netflix replaced Blockbuster. The larger the share of loans that P2P lending platforms capture, for example, the more likely that regulators will descend.

Whether and how regulators disrupt the disruptors, banks can take steps now to capitalize on inevitable changes in the landscape.

First, realize and acknowledge that disruption is real. It may not be a direct threat to everything your bank does, but it can certainly eat away at higher-margin business.

Next, even if you can't do exactly what the disruptors are doing, start incorporating some of their concepts into your business model and service offerings. Further, explore whether to compete head-on with disruptors to protect high-margin business or find ways to work with them. Bankers have become

can become their saviors. For example, the New York Department of Financial Services is imposing a policy requiring digital currency companies to obtain a license to transmit money on behalf of customers.⁵

Bankers have long traveled the regulatory road, building compliance systems, engaging with the authorities, and continually adapting to new edicts and expectations. Disruptors that feel at home in an innovation lab might be far less comfortable navigating the Securities and Exchange Commission, Office of the Comptroller of the Currency, Federal Financial Institutions Examination Council and the halls of Congress, and would welcome some help.

Banks recognize that they face unprecedented perils today and need to act. By keeping pace with innovation, accepting inevitable change and capitalizing on their inherent and hard-earned strengths, they have a fighting chance to stay in the game.

Footnotes

- ¹ Jacob Pramuk, “Amazon Shares Surge 20 Percent, Market Cap Surpasses Walmart,” CNBC, July 24, 2015, <http://www.cnbc.com/2015/07/24/amazon-shares-surge-20-percent-market-cap-surpasses-wal-mart.html>.
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- ³ “Marketplace Lending: A Maturing Market Means New Partner Models, Business Opportunities,” Cognizant Technology Solutions, July 2014, <http://www.cognizant.com/InsightsWhitepapers/Marketplace-Lending-A-Maturing-Market-Means-New-Partner-Models-Business-Opportunities-codex989.pdf>.
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Author

Prasad Chintamaneni is President of Banking and Financial Services, leading Cognizant’s largest industry business unit globally. As global lead since 2011, Prasad is responsible for the business unit’s global P&L, including sales, business development, consulting, client relationship management and delivery. During his tenure as global lead, Cognizant’s Banking and Financial Services business has grown manyfold to become one of the largest providers of services to the banking and financial services industry, earning Cognizant fourth place on the 2015 FinTech 100.

Prasad joined Cognizant in 1999 and established key relationships with many of Cognizant’s largest banking and financial services clients, while leading Cognizant’s U.S. Eastern Region Banking and Financial Services Practice through 2006. Prior to joining Cognizant, he spent seven years in investment banking and financial services, including the last five years with Merrill Lynch as an investment banker and as a member of Merrill’s business strategy committee in India. Prasad serves on the Board of Directors of NPower, a nonprofit that assists schools, nonprofits and individuals to build technology skills by harnessing the power of the technology community. He earned his postgraduate diploma in business management from XLRI School of Management in India, following his bachelor of technology degree in chemical engineering from the Indian Institute of Technology, Kanpur, India. He can be reached at cprasad@cognizant.com.



The Rise of the Empowered Consumer

By Patricia Birch & William Shea

Market and digital forces have combined to enable the healthcare industry to treat much of what ails it – or be supplanted by newcomers who can more quickly seize the digital high ground.

Welcome to the world of the engaged, aware and empowered healthcare consumer. Transformative market forces, coupled with rapid advances in digital technologies, are placing consumers at the center of an increasingly virtualized, personalized and delocalized healthcare system.

Responding to this transformation is an existential challenge for traditional healthcare organizations – one they must master if they hope to thrive in the new digital economy. Successfully engaging the accountable healthcare consumer will require broad new capabilities, from business models based on quality of outcomes, to digitized processes that address consumer demands for product customization and more control over their care decisions.

As these objectives are accomplished, the industry can more effectively reduce waste and costs and improve efficiencies – thus solving many of its own enduring challenges while meeting the needs of a new generation of health consumers.

The Forces Reshaping Healthcare

A wide array of market forces is reshaping the healthcare industry as we know it. While many factors are in play, two will have particularly transformative impacts on traditional health insurance and care delivery models:

- **Consumerism and the expansion of direct-to-consumer retail insurance markets.** Historically, healthcare payers have relied on employer-sponsored group insurance as the dominant channel for insurance revenue. However, by 2020, industry gurus predict the majority of health insurance purchases will shift to direct-to-consumer online marketplaces. This change is being driven by two concurrent trends:
 - The Accountable Care Act's (ACA) individual mandate and the creation of state and federal public exchanges for direct-to-consumer health insurance purchases.
 - The increasing prevalence of defined contribution strategies in which large employers channel individuals to direct-to-consumer private exchanges.¹
- **Value-based care and the shifting of risk and accountability away from payers and toward providers and members.** The ACA and the Centers for Medicare and Medicaid Services (CMS) are aggressively promoting new

value-based care reimbursement models. Value-based care rewards providers when they deliver improved quality of care and achieve enhanced population health outcomes, compared with traditional fee-for-service claims-based models that reward volume of services delivered with little regard to quality.

And while the healthcare industry has grappled with these transformative market forces, a parallel set of digital and societal forces has been brewing:

- **Democratization of healthcare data.** The healthcare industry was slower than most to digitize its data sets, and historically, most data was siloed and proprietary. Data and information was “gated” and inaccessible. However, investments in electronic medical records (EMR), electronic health records (EHR) and health information exchanges (HIE) over the past decade, along with advancements in data standards and interoperability, are finally paying off. As a result, the digitized healthcare data universe is reaching a

Search the iTunes app store for health apps, and more than 22,000 results appear, ready to track all aspects of our lives – health statistics, emotional states, behavior and social environment.

- **Rapidly evolving technology.** SMAC technologies (social networks, mobility solutions, big data analytics and cloud computing), along with artificial intelligence and the Internet of Things (IoT), are poised to become tablestakes capabilities in the healthcare industry.
- **New virtualized ways of accessing healthcare.** Advances in telemedicine and telehealth, as well as the proliferation of mobile health apps and remote patient monitoring technologies, are resulting in new business models capable of delivering an increasing range of healthcare services virtually – resulting in new “unwired” and delocalized care delivery models. Search the iTunes app store for health apps, and more than 22,000 results appear, ready to track all aspects of our lives – health statistics, emotional states, behavior and social environment. Such technology is empowering individuals to quantify themselves, monitor their own health and vitals, and share data as they choose.

tipping point and is on the cusp of an era in which high-quality health information will be readily available anytime, anywhere.

- **Demographic shifts.** The millennial generation has grown up with the Internet and has different expectations regarding information and services access. They represent an ever-increasing proportion of healthcare consumers and are demanding the same level of digital consumer experience and self-service in healthcare as they routinely find in the retail and entertainment sectors. And it’s not just millennials; boomers also show increasing acceptance for using technology to research health information and interact with service providers.²

This super-convergence of the market and technology forces is now under way, setting up a “perfect storm” of disruption that will change healthcare more quickly – and in very different ways – from what one might expect. This storm is moving at “Silicon Valley

speed” and will dramatically disrupt traditional business models across the healthcare ecosystem, threatening existing players and enabling new entrants.

Disruptive Cost Transformation

We have seen this play out before: Numerous mature industry value chains have been dramatically disrupted by digital and technology forces, permanently changing their value and cost equations. Travel, financial services, music and entertainment industry supply chains have been permanently disintermediated in remarkably short order. As the world becomes more digitally intensive, these industries’ traditionally complex value chains – consisting of content creators, aggregators, producers, marketers, distributors and brick-and-mortar retailers – have transformed into “creator-to-consumer” models. The result for consumers has been a dramatic reduction in the cost of goods and services. For example, the digital disintermediation of traditional publishing supply chains has resulted in many electronic books being available for less than half the cost of their hardcover counterparts. Similarly impressive savings can be cited across numerous industries.

Next Up: Healthcare

Market, regulatory, technology and digital forces are poised to quickly accelerate across the healthcare industry, and portions of the healthcare value chain will be disintermediated, virtualized or delocalized along the way. As we have seen in other industries, the end result will be a radically transformed consumer-centric model – with accountability residing not with insurers, and not with providers, but squarely on the backs of empowered consumers.

As a result of all this anticipated disruption, an unprecedented number of new entrants and venture capital-backed solution providers are now focusing on healthcare, competing to serve the emerging accountable healthcare consumer. In fact, healthcare startups raised almost \$4 billion in venture capital in just the first quarter of this year.³

Additional threats to incumbents have originated outside the healthcare industry. New entrants from mature direct-to-consumer industries (e.g., Target, Walmart, Walgreens, AT&T, Verizon) are all looking to seize the moment and leverage their ubiquity, strong brands and proven direct-to-consumer digital strategies and investments into the new consumer-centric healthcare market.

Meanwhile, the combined effects of consumerism, value-based quality-driven care and digital technologies – from apps, to wearables, to diagnostic advances in custom medicine – are forcing incumbent healthcare stakeholders to rethink their business models. This has resulted in:

- **Continuing consolidation and M&A activity across all segments of the industry to generate economies of scale and mitigate margin pressure.** Consolidation in the health plan sector has accelerated, with major acquisitions this year.⁴ Further, there’s been an uptick in M&A activity related to executing on vertical integration strategies. Payer organizations are absorbing providers and health systems outright, or acquiring software companies that serve the provider market, in order to ensure relevance as the traditional health plan value proposition shifts in the new consumer-centric healthcare economy.⁵
- **Diversification strategies focused on higher margin, non-insurance lines of business.** Health plans, in particular, are looking to productize their insurance administration, analytics and medical management capabilities by selling them “as a service” into the emerging risk-bearing provider market. Payers are doing this in large part as a way to place their bets on the future and ensure a role for themselves as industry value chains disintermediate. And, not surprisingly, providers are increasingly interested in leasing the productized risk management and administrative services these health plans are providing.
- **Provider and health systems consolidating and reorganizing the care delivery system so they can scale to be sustainable risk-bearing organizations (RBOs) as accountability shifts and new value-based reimbursement models mature.**

As providers adopt value-based contracts, they must bear the financial risks associated with receiving payments based on achieving high-quality health outcomes. Many are going beyond just being RBOs or ACOs, and are making the leap into becoming health plans and selling health insurance products directly to consumers in new online marketplaces – further blurring the lines between payers and providers.

This is spurring investment in digital capabilities to support population health management and patient engagement, as well as in the administrative and information management infrastructure, tools and platforms that are needed to deliver better care at lower costs.

The Future: An Industry Aligned with the Accountable Consumer

All this activity will increasingly place the consumer firmly at the center of healthcare industry business models. While it is impossible to predict exactly how the industry will evolve, it is clear that successful industry players will need to cultivate the following qualities:

- **Patient-centered thinking.** This focus is fundamentally different from episode-based care and disease management. It requires new ways of designing benefits, giving more power to consumers and reimagining how care is delivered from the consumer’s perspective.
- **Agility.** Healthcare organizations will need flexibility in all aspects of their operations – from IT infrastructure and front-end interfaces to management structures – to respond swiftly to threats posed by new entrants and changing consumer demands.
- **M&A and integration competencies.** Industry stakeholders must be proficient at absorbing and launching new lines of business.
- **Change management skills.** These will be necessary to effectively implement new operating models, processes and workflows.
- **Collaboration and partnership capabilities.** Organizations will need to think innovatively about how to look beyond traditional industry boundaries to form new alliances and offer services aligned with the accountable consumer.

Healthcare’s Digital Transformation Framework



Figure 1

- **Health information technology adoption.** Healthcare organizations must accelerate their adoption of digital solutions. Digital agility and power will be necessary to compete with new entrants and to streamline operations to generate savings.

Setting Digital Priorities

Balancing these demands requires setting some clear digital priorities. The following steps can help clarify where to make initial investments:

1. **Review the market.** Consider your place in the overall market; the strategies and investments that market segments are making; and local competitors' apparent strategies, capabilities and investments.

5. **Weigh your options strategically.**

Examine the range of your investments among standard, leading and pioneering capabilities. Aim to achieve a balance between initiatives aimed at closing gaps and creating differentiation, as well as a small number of pioneering investments to implement as pilot programs.

Driving Digital Innovation at Scale

These unique market dynamics are creating a dual mandate whereby healthcare stakeholders need to continue to focus intently on operational efficiency while at the same time driving digital transformation and innovation at scale.

Develop a digital strategy that identifies where you will differentiate yourself from competitors and understand the key capabilities that enable the differentiation.

2. **Minimize gaps.** Understand today's "industry standard" alongside the future "new normal." While entities should eventually close the gaps between those poles, they also need to be aware of shifting consumer expectations and technology advances vs. doggedly checking off potentially obsolete boxes.
3. **Define your meaning of digital.** Develop a digital strategy that identifies where you will differentiate yourself from competitors and understand the key capabilities that enable the differentiation.
4. **Prioritize your investment.** Take a step back and look at the sum of your capability investment goals. Be realistic and remove the low priorities to have a better chance at achieving the more important goals.

Industry-leading organizations are recalibrating their spending accordingly, moving dollars from "lights-on" maintenance and operations projects to invest in new digital initiatives. Digital is more than just technology; it combines technology, data science, devices and design to reinvent a customer experience or business process. Successful digital enterprises will achieve enhanced efficiencies and productivity while simultaneously reimagining business processes and driving digital transformation at scale (see Figure 1, opposite page).

Given the pace of technology change, businesses need more than single-point digital solutions; they need to incorporate innovation into the organization's DNA. As digital technologies become mainstream, organizations will need to continuously innovate to maintain market differentiation based on business and clinical performance.

Digital Steps to Consumer Centricity

A U.S. nonprofit health plan with almost four million members faces strong digital competition from well-established players and venture capital-backed startups. Top-tier digital capabilities in this market are a clear competitive necessity. Economic constraints are also a reality, making it equally vital to develop a business outcomes-driven digital strategy.

The guiding principle of this health plan is to establish a high-quality member-centric experience at every touchpoint as a core business asset. To achieve that goal, we created an ROI-driven enterprise roadmap using our Digital Transformation Framework. The framework pinpoints immediate high-value initiatives, as well as the building blocks of a longer-term digital journey. These building blocks include the following actions:

1



Establish “future-first:” We identified the digital capabilities, such as mobile access, defined as critical by the health plan provider’s various lines of business stakeholders, including members.

2



Conduct a competitive assessment: We compared the digital “wish list,” such as mobility options and digital communication alternatives for stakeholders, with competitors’ current capabilities and industry trends to validate perceptions and clarify priorities.

5



Reimagine the customer experience: We envisioned new processes supported by the targeted digital capabilities, such as delivering self-service-based, always-available digital channels that members requested.

4



Develop a digital capability maturity model: We then ranked the ability of in-house systems and commercial platforms to deliver on the company's priorities.

3



Create a prioritization model:

We ranked digital targets by the health plan provider's evaluation criteria, such as tablestakes capabilities that are required to be on par with local competition; high-ROI initiatives; and true market leading-efforts, likely incorporating analytics and personalization.

After identifying more than 150 high-priority digital business capabilities, the health plan will implement our new digital healthcare platform, Cognizant Health TranZform™. TranZform offers a best-of-breed partner ecosystem, combining vetted, third-party digital “point solutions” and in-house developed apps into a common digital consumer engagement layer. TranZform will enable quick launch of “tablestakes” features and functions, and its engagement layer will ensure a consistent experience across all stakeholder touchpoints. The platform will also support foundational digital capabilities, such as powerful predictive analytics, aligned with long-term business goals.

Based on internal computations and our extensive industry experience, we expect well-planned consumer-centric digital strategies like these to reduce operations costs by 20% to 30% through automating internal processes, integrating data silos, reducing high-cost channel use, increasing speed-to-market and sales, and creating stronger engagement with members.

To enable comprehensive digital innovation at an enterprise scale, healthcare companies will need to scale up their digital initiatives by re-architecting legacy environments, connecting new solutions to existing systems, and creating the supporting capabilities necessary to bring digital ideas to enterprise scale. (See Quick Take, page 73, on how we helped one health plan begin this journey.)

Engage the Empowered Healthcare Consumer... or Else

The empowered healthcare consumer is already emerging. The trend will continue as market, regulatory and digital forces play out across the healthcare ecosystem. That said, the accountable consumer still faces numerous barriers that will persist for some time.

The industry remains burdened with legacy technologies that impede interoperability, as well as overly complex insurance products and provider contracts that defy automation and inhibit innovation. Industry participants need to address these issues by adopting standard, transparent pricing for evidence-based procedures; otherwise, disruptive new entrants, unburdened by the complex legacy of traditional players, may prevail.

Empowered, accountable consumers will not be willing to subsidize the industry's traditional inefficiencies. Instead, they will increasingly channel their healthcare spending to the health plans and providers that have invested in industry-leading, digitally optimized systems of consumer and patient engagement.

Footnotes

- ¹ “2014 Health Care Survey,” Aon Hewitt, 2014, <http://www.aon.com/attachments/human-capital-consulting/2014-Aon-Health-Care-Survey.pdf>.
- ² Cynthia LeRouge, Craig Van Slyke, Deborah Seale, Kevin Wright, “Baby Boomers’ Adoption of Consumer Health Technologies: Survey on Readiness and Barriers,” *Journal of Medical Internet Research*, Vol. 16, No. 9, September 2014, <http://www.jmir.org/2014/9/e200/>.
- ³ Brian Gormley, “Health-Care Startups Raise Record \$3.9 Billion in Venture Capital in First Quarter,” *The Wall Street Journal*, April 21, 2015, <http://www.wsj.com/articles/health-care-startups-raise-record-3-89-billion-in-venture-capital-in-first-quarter-1429633713>.
- ⁴ Major deals year-to-date include Centene’s agreement to acquire Health Net; Aetna’s agreement to acquire Humana; and Anthem’s agreement to acquire Cigna.
- ⁵ Noteworthy examples include Highmark Blue Cross Blue Shield’s acquisition of West Penn Alleghany Health Systems and Anthem’s acquisition of Caremore, a Medicare Advantage plan and operator of dozens of clinics across three states. For additional M&A activity, see: <http://www.healthcarefinancenews.com/slideshow/healthcare-mergers-and-acquisitions-2015-running-list?p=1>.

Authors

Patricia (Trish) Birch is a Cognizant Vice-President and leads the company’s Healthcare Consulting Practice and Life Sciences Practice within Cognizant Business Consulting. She has 25 years of experience in healthcare operations and management consulting. Trish is also a published author and speaker on issues facing the healthcare industry. Trish can be reached at Patricia.Birch@cognizant.com.

William “Bill” Shea is an Assistant Vice-President within Cognizant Business Consulting’s Healthcare Practice. He has over 20 years of experience in management consulting, practice development and project management in the health industry across the payer, purchaser and provider markets. Bill has significant experience in health plan strategy and operations in the areas of medical management, claims management, provider and network management and product development. He can be reached at William.Shea@cognizant.com.





A Digital Experience Index Is Born

By Anand Chandramouli, Sanjay Fuloria and Nitin Bajaj

To successfully navigate the digital transformation journey, companies need to continuously measure the full spectrum of digital services delivered to customers and then assess the quality of the digital experience. Doing so can ensure they are not only meeting user needs but also outperforming rivals near and far.

The digital re-imagining of business is upending traditional customer behavior and business practices. The next wave of business growth, efficiency and effectiveness is predicated on a robust and intuitive digital strategy. The cornerstone of that strategy is the ability to offer customers a rich and relevant digital experience: the ability to access products and services through an array of comfortable and secure digital channels (i.e., customer portals, mobile apps), with minimal or no intermediation cost.

The evolving digital ecosystem is premised on four major components: social, mobile, analytics and cloud technologies (aka, the SMAC Stack). There is no “right way” to piece together these components; the ultimate strategy will vary by company and industry. Given

the complexity involved, we believe it’s best for these technology components to be assessed individually and in a systematic way, to understand how they contribute to, or in some cases undermine, the delivery of a relevant and meaningful digital customer experience.

To succeed with digital, companies need a standard methodology and scoring mechanism that can help them understand their digital maturity in each component of the SMAC Stack vis-a-vis their competitors, and work to continuously improve it, to meet if not exceed customer expectations.

By indexing the digital ecosystem by its component parts in every major industry sector, digital strategists (CIOs, CDOs or CMOs) can more effectively plan and make informed business-technology investment decisions.

Mobile-First Experience Index

Of the four technologies in the SMAC Stack, mobile is arguably the most influential. The proliferation of mobile devices has ushered in “mobile-first” thinking at progressive companies across industries, many of which are increasingly designing their products and services to attract and delight mobile users before replicating specific offerings for laptop and desktop users.

This is why we developed the Mobile-First Experience Index, a digital maturity measurement methodology that gauges how specific features and functions contribute to a rewarding, meaningful and fulfilling customer experience, across industries.

Our Mobile-First Experience Index is the first of our Digital Experience Index series, which will measure how companies across industries fare at each layer of the SMAC Stack (see Quick Take for a metaphorical view, next page). Just as the S&P 500 index tracks broad equity markets and signals vital price information, the Mobile-First Experience Index will measure the digital savvy of organizations' mobile apps in an objective, transparent and mathematically rigorous manner. The first instance of this index will track the functionalities and services offered by the top 100 U.S. P&C insurance companies' apps (see Figure 1 for an illustrative example).

Our methodology is predicated on the “presence/absence” of application features. The index is a simple mathematical gauge of the manifestation (present or absent) of a particular mobile app feature. If a feature is present, a score is awarded based on its assigned popularity; otherwise, a zero score is given. The popularity of a feature is a simple function of the number of companies that include it in their app(s).

As with all of our Mobile-First Experience indices, the P&C Insurance Index will examine customer-facing mobile apps across a variety of mobility parameters, including:

- Customer service queries.
- Product information availability.
- Access to forms and documents.

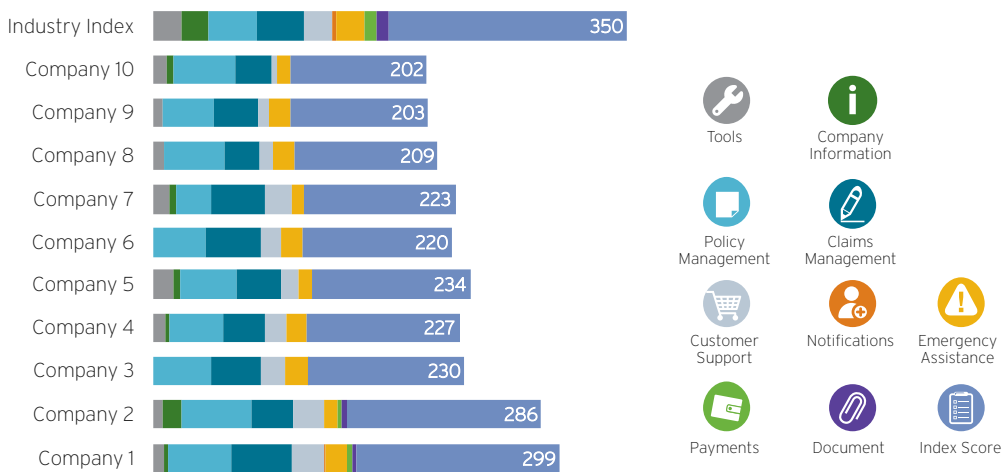
In addition to its binary measurement, the index's results can be mined for pointers to help organizations identify app features and functionalities that can propel them to industry-leading status.

The index will help answer questions such as:

- What are the mobile application features and functionalities that the top 100 companies in a sector offer?
- What transactions can customers carry out through mobile applications?
- How seamless is the customer experience that companies deliver between channels – customer portal vs. mobile app?

Indexing P&C Insurance Apps

Our inaugural Mobile-First Experience Index benchmarks the critical mobile app capabilities of leading property and casualty industry companies. Here is a sample of what the results might look like for the insurance sector.



Note: The total score represents the cumulative measure of the specific features or functions contained in an individual company's app(s).

Figure 1

Quick Take

Indexing Digital Jewels

With the proliferation of mobile devices and applications, powered by exponentially growing processor speed, we have a digital *Indrajaal*. Also known as Indra's net,¹ this term is a metaphor for interrelatedness, and visualizes the universe as a vast net, with a jewel at each vertex. Each gem represents an individual life form or unit of consciousness and is intimately connected to all the others. Thus a change in one jewel is reflected in all the others.

In today's world, every individual is a connected jewel in the digital matrix. As people interact, transact and do business, they generate an unprecedented data footprint, or Code Halo™, which when put to use, can amplify outcomes at a rate that a linear, rational mind would find difficult to comprehend.

The proliferation of digital technologies – whether mobile phones, smart devices or broadband connectivity – is often described in non-linear terms, such as “a hockey stick” (a plateau followed by a steep climb), or the silhouette of Mount Fuji. This digital *Indrajaal* must be studied in-depth and chronicled to understand the way it will transform our lives.



Gauging the Raging Digital Metamorphosis

Companies in the midst of a digital metamorphosis confront tough choices. Our digital indices are intended to guide organizations on this journey of transformation.

We firmly believe that the time is now to chronicle the unfolding digital era. The

Digital Experience Index series will help make sense of the exciting forces that are already inspiring companies to reimagine daily business transactions.

Note: Code Halo™ is a trademark of Cognizant Technology Solutions.

Footnotes

¹ Atharva Veda, Verse 8.8.6; The Avatamsaka Sutra, sourced from *Indra's Net*, a book by Rajiv Malhotra, Harper Collins, 2014.

Authors

Anand Chandramouli heads the Cognizant Research Center, which offers a range of research services. He regularly writes on capital markets, and is currently championing research as a service (RaaS) – an on-demand research service delivery model. Anand is a statistician by training and has a wide range of interests spanning economics, financial markets, strategy, philosophy and literature. He can be reached at Anand.Chandramouli@cognizant.com | <https://www.linkedin.com/pub/anand-chandramouli/52/93b/65>.

Sanjay Fuloria, Ph.D, is a Senior Researcher with the Cognizant Research Center, where he oversees primary research activities and writes thought leadership white papers based on both primary and secondary research. He also manages the unit's research as a service (RaaS) projects. He has more than 14 years of industry-related research experience. Sanjay can be reached at Sanjay.Fuloria@cognizant.com | [linkedin.com/in/sanjayfuloria](https://www.linkedin.com/in/sanjayfuloria).

Nitin Bajaj oversees research operations at the Cognizant Research Center and has over 14 years of experience in the technology, management consulting and financial services industries. His area of research interest is the intersection of personal technology, corporate culture and management. Nitin can be reached at Nitin.Bajaj@cognizant.com | [in.linkedin.com/in/nitinbajaj](https://www.linkedin.com/in/nitinbajaj).



Enabling the Digitally Enhanced Business

By Bruce J. Rogow

For established companies, digital transformation isn't straightforward and simple, but by applying the following lessons, they can quickly embrace new thinking, strategies and skills that yield short- and long-term business results.

Virtually every interview I conduct with CEOs, line-of-business executives and CIOs quickly focuses on the intersection of two major, interrelated themes:

- The business model is struggling and must be reinvented if the business is to survive or thrive.
- The organization must learn to capitalize on the new digital IT capabilities that can be a transformative catalyst for a re-invigorated, more competitive enterprise.

Everyone, it seems, is now aware of the potential impact of the Internet of Things (IoT) and foundational IT architectures built around the SMAC Stack (aka, social, mobile, analytics and cloud computing), as well as the resulting metadata, or Code Halos,¹ that

surround people, processes, organizations and devices. In fact, a recent survey conducted by a major business magazine showed that 72% of CEOs polled considered the rapid change of technology innovation to be one of their top three or four greatest challenges.²

While digital business transformation is among the most hyped terms today, most of the examples of organizations that have differentiated themselves through new forms of IT are greenfield businesses that were born digital. Most of these examples are not relevant to established, legacy Fortune 500 companies, which generate 71.9% of U.S. GDP.³

Since 2013, my interviews with CEOs, board members, business leaders and IT executives of legacy organizations reveal a desire to digitally enhance, if not transform, their companies into digital businesses.

These legacy leaders recognize the possible threats and opportunities for their businesses but are struggling with how to take advantage of digital's potential. During the past decade, most have gained the experiential learning and transformation required to enable profitable, practical, well-managed e-business capabilities. However, the ability to "do e-commerce" or field a few mobile apps isn't enough to capitalize on the contributions that enhanced digitization can make to the business.

Dissecting Digital Business Strategy; Distilling Learnings

Given their struggles, cynicism is emerging. The CEO of a major midwestern U.S. consumer products manufacturer told me: “I get it. IT offers much potential in almost every part of our business. But so far, everything we’ve tried has proven harder than expected, taken longer, had minimal if any real return, was difficult to scale across the enterprise and brought unintended consequences we hadn’t considered. We get many deliverables but very few significant outcomes. We have gone into digitalization not knowing the right questions to ask and unable to produce a roadmap.”

Starting with a realistic, objective assessment of the enterprise’s IT base and the requisite digital capabilities is a critical first step. Yet fewer than 10% of the companies that told me they were struggling with digital business transformation conducted such an assessment. Without this type of baseline assessment, any future digital efforts are likely at risk.

Simply put, the digital spectrum comprises three types of businesses related to the role and use of IT:

- **Legacy business:** An established business model with proven markets, customers, staff, products, brand, distribution, process, financials, culture, incentives, competitors, partners, systems, technologies and

Starting with a realistic, objective assessment of the enterprise’s IT base and the requisite digital capabilities is a critical first step.

In my IT Odyssey travels,⁴ I repeatedly ask legacy and digitally-oriented enterprises what has worked, what they would have done differently, and the lessons learned throughout their digital business journeys. Successful and digitally-challenged organizations were included. Of the 130 lessons learned, the following five were most often cited as critical activities.

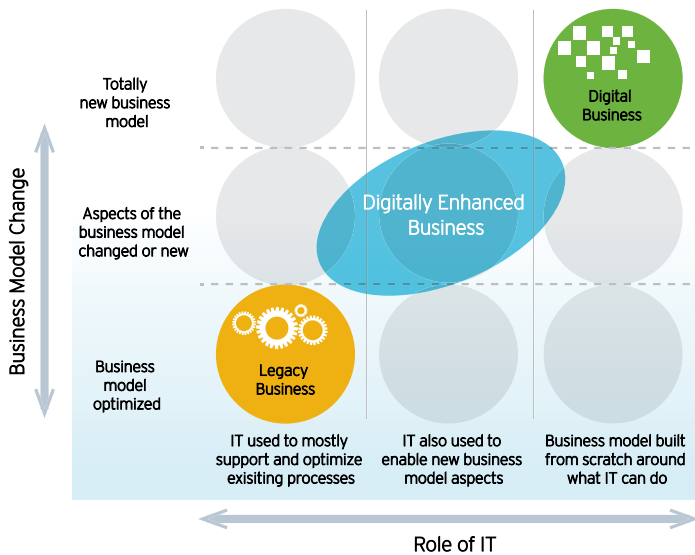
Lesson 1: Start with a crisp understanding of current-state capabilities and a realistic vision.

In my last *Cognizanti* article, “The Journey to 2020,”⁵ I identified a broad spectrum of new enabling capabilities that will be required for a business to thrive in the next decade. Building those enabling capabilities in a large enterprise is likely to take five to 10 years or more.

behaviors. In these organizations, IT essentially augments, increases the efficiency of or optimizes business processes. Hopefully, but not always, the legacy business has a solid, healthy IT base and function.

- **Digital business:** The type of business that receives all the press and pundit attention but is dramatically different from legacy businesses because it was conceived based on a concept of what today’s IT can do. From their founding, these businesses are designed to fully leverage modern SMAC technologies, employ a digital-savvy staff, have unconstrained market reach, and maintain a laser focus on e-business, unencumbered by a legacy infrastructure and ways of doing business.
- **Digitally enhanced business (DEB):** A more prudent approach for a healthy legacy business than aspiring to become a digital

Understanding the Business, Digital and IT Landscape



Source: IT Odyssey & Advisory Copyright 2015 © Bruce J. Rogow
Figure 1

business in the short- or mid-term. A DEB knows its IT base is solid and is converting its existing business model to take advantage of what today’s IT can deliver and enable tomorrow to support necessary business model change (see Figure 1).

The most common errors cited by my interview subjects were launching digital efforts on a weak IT base or reaching beyond available digital enablement capabilities. An analysis of technical debt⁶ – including systems, skills, infrastructure, data quality, architecture, IT management processes and governance – is essential. If major weaknesses are found, a remediation strategy is the next step.

Lesson 2: Add an experienced CIO to the board of directors.

Typically, boards of directors have at best a conversational knowledge of IT, from either a historical or modern frame of reference. The new digital age requires a higher level of

IT consideration and stewardship, beyond just risk and security. Many struggling DEB efforts revealed by my interview subjects were stymied or complicated at the board of directors’ level.

To work around this, I believe at least one person on the board should be a CIO with practical digital leadership experience. He or she should be able to organize a board digitization sub-committee and ensure that the board asks the right questions. A vendor executive may be on the board, but there must be a person with the knowledge of what it takes to enable digitization operationally and strategically across the organization.

The CEO of a retailer told me: “All our digital strategy problems started because we on the board didn’t know the right questions to ask, and we didn’t have a grasp of complicating issues such as technical debt. We have so much more to learn. The addition of an experienced CIO [on the board] has gotten us back on a healthy track.”

Lesson 3: Recognize that digitization demands a three-tiered management structure.

The journey to a DEB or digital business is a major endeavor. One of my previous *Cognizanti* articles, “Innovation: Not a Choice But a Series of Choices,”⁷ highlights the role that dedicated and well-chosen leaders play at the endeavor, program and project levels. This is exceptionally critical in any digital business initiative.

Many C-level executives struggling with digital business transformation said they had treated further digitization as a sideshow with disbursed activities and management. They viewed it as a set of independent one-off projects or activities rather than as an extended journey. Inadequate consideration was given to necessary enabling programs, ongoing support or follow-up assessments. A more formal leadership structure is required across management tiers, with each level tasked with discrete responsibilities and talents. Jumping from an amorphous digital vision to individual projects doesn’t work.

A logistics company found that this type of mapping exercise helped identify which digital efforts offered the highest likelihood of early success, as well as which enabling capabilities required the most immediate buttressing; taken together, these insights provided a roadmap to guide their planning and progress. At the endeavor level, decision-makers could see that they needed resources who were familiar with the use of social media within their industry, rapid deployment of Agile software, customer mobile support processes, and staff who could support those customers.

Next, an organizational development and/or operations executive should be assigned to continually assess digital readiness, skills, incentives for digital programs, organizational structures, adequate funding, economic return from digitization efforts, organizational learning and ongoing support across the enterprise.

What seems to work is when organizations create a digital success enhancement vehicle, such as a dedicated leadership group or centers of digital excellence. One CEO described accelerating DEB progress through what he termed a blend of “hunter

Jumping from an amorphous digital vision to individual projects doesn’t work.

Lesson 4: Use a digital opportunity vs. readiness analysis as a baseline and then execute to a continually refreshed digitization roadmap.

This lesson typically has numerous components. First, organizations must map opportunities presented by SMAC or Code Halo™ thinking vs. the capabilities needed to conceive, design, provision, support and refresh that digital initiative.

and gatherer” initiatives. The hunter initiatives were top-down programs in the business units to target specific business opportunities. The challenge was marshaling the requisite resources and getting key people on board. Gatherer programs identified worthwhile bottom-up digital efforts to be scaled and spread across the enterprise.

As an example, a manufacturing manager in one plant gave tablets to forklift drivers, leading to a complete rethink of routing, materials handling and shop floor coordination. After a dramatic reduction in waste and improvement in on-time shipments, the manufacturer launched a company-wide deployment.

Every executive learned that digital success was as much a cultural issue as any other aspect of enablement.

At a financial services firm, a gatherer program identified an office of customer agents who used a social media scan of its customers to target specific products. The following year, a hunter program based on what that one office had done led to a more sophisticated Code Halo profile kit for all customer agents.

Lastly, a business unit review of the digitization landscape should be instituted on an appropriate cadence (quarterly, semi-annually or annually). This should include the unit's digital competitive profile, digital position and strategy, opportunities, threats, digital capability strengths, plans and projects, as well as a review of the performance, support requirements and contributions of efforts underway.

Lesson 5: There can never be enough messaging, communication, dialog and marketing of DEB efforts and progress.

The conception, provisioning and success of DEB efforts must be perceived as a critical concern by the entire business. It should be seen as enabling a brighter, more exciting future for the enterprise. Every executive I

interviewed noted that they'd learned that digital success was as much a cultural issue as any other aspect of enablement. Professional marketing and communications resources should herald DEB efforts and their success.

Reward and incentive programs were also cited as key. One CEO spoke of his company's "Shoulders Awards," given to staffers who stood on the shoulders of what another staffer had started to extend the DEB journey.

Stepping Up to the Digital Business Challenge

Few legacy businesses will be suddenly disrupted or displaced by new entrants. However, over time, new or existing entrants will likely use some form of digitization to attack aspects of nearly everyone's business.

Starting and accelerating progress on the journey to being a DEB can't happen on its own. Embracing the DEB concept and acting on lessons learned (such as those enumerated above) can help struggling organizations become DEB All-Stars. Ignoring these lessons would be a strategic mistake.

Note: Code Halo™ is a trademark of Cognizant Technology Solutions.

Footnotes

- ¹ For more on Code Halos and innovation, read “Code Rules: A Playbook for Managing at the Crossroads,” Cognizant Technology Solutions, June 2013, <http://www.cognizant.com/Futureofwork/Documents/code-rules.pdf>, and the book, “Code Halos: How the Digital Lives of People, Things, and Organizations are Changing the Rules of Business,” by Malcolm Frank, Paul Roehrig and Ben Pring, published by John Wiley & Sons. April 2014, <http://www.wiley.com/WileyCDA/WileyTitle/productCd-1118862074.html>.
- ² Alan Murray, “Myth Busting the Fortune 500,” *Fortune*, June 15, 2015.
- ³ Ibid. The 71.9% in 2014 is up from 58.4% two decades ago and 35% in 1955.
- ⁴ Each year, Bruce J. Rogow conducts independent, anonymous face-to-face interviews with over 100 business and IT executives under the IT Odyssey banner.
- ⁵ Bruce J. Rogow, “The Journey to 2020,” *Cognizanti*, Vol. 7, Issue 1, 2014.
- ⁶ Technical debt is becoming a widely used term that describes the material liability or exposure inherent in an enterprise’s current IT. It was originally an estimate related to the code or software development needed to complete an application, or elevate it to acceptable quality, performance and sustainability. Many organizations now view it as the estimate of the financial costs and effort needed to remediate the systems, infrastructure, data, tools, skills, IT processes and governance to bring the enterprise’s IT to a point of industry parity.
- ⁷ Bruce J. Rogow, “Innovation: Not a Choice But a Series of Choices,” *Cognizanti*, Vol. 5 Issue 1, 2012.

Author

Bruce J. Rogow is a Principal at IT Odyssey and Advisory in Marblehead, Mass. Known as the counselor to CIOs and CEOs on IT strategy, Bruce has for the last 15 years conducted independent, face-to-face interviews with thousands of C-level executives. Previously, he spent five years as Executive Vice-President and Head of Research at Gartner Inc. Prior to that, he was Senior Managing Principal at Nolan, Norton & Co. Bruce can be reached at Bruce@ITOdyssey.com.

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To learn more about Cognizant, please visit: www.cognizant.com.

U.S. Headquarters:

211 Quality Circle
College Station, TX 77845
Tel: +1 979 691 7700
Fax: +1 979 691 7750
Toll Free: +1 855 789 4268
Email: inquiry@cognizant.com

World Headquarters:

500 Frank W. Burr Blvd.
Teaneck, NJ 07666 USA
Phone: +1 201 801 0233
Fax: +1 201 801 0243
Toll free: +1 888 937 3277
Email: inquiry@cognizant.com

India Operations Headquarters:

#5/535, Old Mahabalipuram Road
Okkiyam Pettai, Thoraipakkam
Chennai 600 096 India
Phone: +91 (0) 44 4209 6000
Fax: +91 (0) 44 4209 6060
Email: inquiryindia@cognizant.com

European Headquarters:

1 Kingdom Street
Paddington Central
London W2 6BD
Phone: +44 (0) 20 7297 7600
Fax: +44 (0) 20 7121 0102
Email: infouk@cognizant.com

China Operations Headquarters:

Cognizant Technology Solutions
(Shanghai) Co.
Zhangjiang Hi-tech Park
Building No. 5, No.
3000 Longdong Avenue
Shanghai, Pudong China 201 203
Phone: +86 21 6100 6466
Fax: +86 21 6100 6457
Email: inquirychina@cognizant.com

Philippines Headquarters:

Cognizant Technology Solutions
Philippines, Inc.
5th & 6th Floor,
8/10 Upper McKinley Road Building
10 Upper McKinley Rd.
McKinley Hill, Fort Bonifacio
Taguig City 1634 Metro Manila
Philippines
Phone: + 63-2-976-2270
Email: inquiry@cognizant.com

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