Code Rules
A Playbook for Managing at the Crossroads
By Malcolm Frank, Paul Roehrig and Ben Pring
Preface

Today’s high-flying companies – the outliers in revenue growth and value creation – are winning with a new set of rules. They are dominating their sectors by managing the information that surrounds people, organizations, processes and products – what we call Code Halos™ – to build new business and operating models.¹

Code Halos contain a richness of business meaning that forms the new basis of competition. When Code Halos scale, they spark new commercial models in a predictable five-step model that can take entire industries to “the Crossroads,” a compressed period of time in which market dominance can dramatically flip from industry stalwarts to challengers.

In this white paper, we define the new rules of success by decoding the business of meaning and the pattern of success that has emerged.
Executive Summary

What separates today’s high-flying outliers – such as Apple, Google, Amazon, Netflix and Pandora – from fast-followers and wannabes? It’s the ability to disrupt markets by capturing customer insight and market meaning from the flood of data swirling around us all. The data – or the Code Halo™ that accompanies people, organizations and devices – contains a richness of potential business meaning that far outstrips the value of bricks, mortar and other physical assets that have historically powered market leadership. Many Global 2000 companies are already acutely aware of the insights contained within these Code Halos and are working hard to step into this new competitive arena.

We believe we are in the early stages of this phenomenon, and a clear model for success is emerging, marked by the following characteristics:

- **Secular changes in business and technology are reshaping work:** Our personal technology experiences, with their heightened expectations of efficiency and elegance, are genuinely reshaping enterprise work. Changing demographics, economic volatility, new tools and a raised bar about how work should be performed has created a fertile context for business innovation.

- **Code Halos are the new basis of competition:** Code Halos – the digital record surrounding people, organizations, processes and devices – are critical to gaining new business value in almost every industry. Business and technology leaders need to follow early winners that have changed the rules of their industry by delighting end customers, improving productivity and reducing costs by focusing on Code Halos.

- **“Managing on meaning” is a key business competency:** Companies that proactively enrich their understanding of Code Halos with analytics and sophisticated algorithms are creating the knowledge base for successful competition and market disruption across industries, companies and key business processes.
• **Understanding the Crossroads Model™ is essential for winning in information markets:** Winning at the “Crossroads” – a compressed time period in which market leadership flips dramatically – requires focusing on Code Halos over hard assets. A five-stage model for success, which we detail later in this paper, has emerged.

• **The SMAC Stack™ is the new technical foundation:** New technologies – social, mobile, business analytics and cloud solutions – are converging to form a new IT architecture. The SMAC Stack is now embedded in the enterprise, and it’s helping to rewire many key knowledge processes and associated business models.

The business model pioneered by today’s performance outliers – and which has toppled numerous market-leading incumbents – is transferable to many other areas of commerce. There are some practical steps to take – today – to help win at this shift point. Leaders who succeed at the Crossroads will be rewarded with market relevance and growth in the coming years. Missing the turn means a long period of bad road that in many cases leads to what we call a corporate “Extinction Event,” as already experienced by Borders Books, Blockbuster, HMV, Circuit City, Kodak and others.

Winning at the Crossroads – a compressed time period in which market leadership flips dramatically – requires focusing on Code Halos over hard assets.
People, Devices and Code Take Business to the Crossroads

Standin’ at the crossroad, I tried to flag a ride
Didn’t nobody seem to know me, everybody pass me by.
— Robert Johnson, “Cross Road Blues,” 1936

Today we stand at the intersection of massive secular shifts in both business and technology. Many switched-on business leaders recognize that future success is not a simple extrapolation of past models. Strategies that worked even five years ago don’t work so well now. The question for these managers is no longer, “Is a fundamental change really happening?” but, “What do I do about it?”

In consulting with clients and researching multiple industries, we believe a new generation of technology — which we call the SMAC Stack (shorthand for social, mobile, analytics and cloud technologies) — is transforming industries in a consistent and repeatable manner. A pattern has emerged in which new operating models — from interacting with customers, to creating meaningful products and managing a business — are quickly becoming dominant and, in many cases, sending longstanding industry market leaders into irrelevancy. A big portion of this change is technology driven.

Many industries have recently endured what we call their Crossroads: a compressed time period in which industry leadership violently and unambiguously flips in favor of upstart challengers. For example:

• In mobile devices, between 2004 and 2012, the market capitalization for Nokia and Motorola contracted by over 90% (or a combined $84 billion loss), while Apple and Samsung gained more than $600 billion in value. (Apple’s market cap is clearly based on more than mobile phones, but mobility is a cornerstone of its DNA.)
• In book retail, between 2000 and 2012, Barnes & Noble lost about half its market value, while Borders’ value collapsed to zero. Meanwhile, Amazon’s market cap grew more than 20 times.
• In movie rentals, between 2006 and 2012, Blockbuster’s value dropped from about $5.5 billion to near zero, while Netflix grew more than 360% during the same time frame.

Importantly, within each of the aforementioned long-term industry shifts, there was a highly concentrated period of time — in all cases less than three years — when corporate fates were determined. Prior to this Crossroads, many would argue whether or not new technology models would go mainstream. Afterwards, the argument had been settled ... and always in the same way.

Some might ask, “What does this have to do with my industry?”

It’s seductive to dismiss what has already happened in other sectors as germane only to those industries or blame managers who didn’t “get it.” Or, point to the Internet as the sole disruptor or blame those sectors in particular.

But that’s a trap. These are not isolated scenarios. Looking back at over a dozen industry transformations in sectors such as books, music, hospitality, movies, etc., we now recognize that the pattern — the Crossroads — has wide applicability. Importantly, we see the same pattern emerging in many other industries, from banking to insurance to life sciences, healthcare and retail. In our view, we’re only 20% of the way into this journey.
So what is going on?

Put simply, we are on the cusp of a new commercial era in which value is derived more from information than from physical assets.

No longer is business success based exclusively on size, scale and scope of smokestacked factories and the steel, glass and cement of the industrial landscape. The traditional factors of production, such as raw materials, labor and capital, no longer form the basis of competitive advantage. While we have clearly been in the “information age” for some time, we are entering a new phase in which information is no longer simply a bolt-on to existing competitive assets but has become the competitive asset. We are in the early days of an economy in which wisdom, insight and commercial value all originate from how the data surrounding people, organizations, processes and products interacts.

We are entering a new digital epoch where the coded information surrounding people, companies and things — what we call a Code Halo — truly reshapes how we live and work. As we will demonstrate in this white paper, once Code Halos form, they begin to transform companies — and then entire industries — through a series of well-defined steps. In the following pages, we explain the pattern and, by breaking it into its discrete pieces, help you determine where your organization stands in this time of tremendous upheaval.

People, Devices and Organizations Create Code Halos

In our personal lives, we share information with social media sites, search engines, banks, healthcare payers, online communities, online stores and countless others. For each of us, this information forms a swirling, vibrant, full-bodied halo of coded information (see Figure 1).

Our Personal Code Halo

![Our Personal Code Halo Image]

Note: The logos and company names presented here are the property of their respective trademark owners and are displayed for illustrative purposes only.

Figure 1
This may sound a little mystical, so let’s get tangible. When one of the three of us walks into a store, this is what the salespeople see:

What other inferences are made by store associates? Generally, it is something like: “Here is a middle-aged, white male who’s dressed somewhat conservatively.” That’s about it.

Perhaps an experienced salesperson would go a step further and delve into the black art of selling by asking some (often annoying) qualifying questions or judge us by our body language, the manner in which we speak or our clothing. At best, sales actions will be based upon often erroneous assumptions made on extremely limited data.

This purely physical interpretation of a customer is highly limiting. Judging the three of us solely by our appearance will likely result in uniform, non-personalized treatment. After all, by the primary demographic slices, we appear to be exactly the same.

By contrast, here is what Amazon, Netflix, Apple, Pandora or Google sees each time they “look” at us (see Figure 2, below):

Our Virtual Lives Create Code Halos

Note: The logos and company names presented here are the property of their respective trademark owners and are displayed for illustrative purposes only.
Our Code Halos comprise our past buying behaviors, the songs we like, our searches, our histories, our media preferences and even our geographic location. Upon viewing an individual's Code Halo, a rich picture emerges that transcends a simple physical impression. For instance, the three of us, although we appear quite similar, actually have quite divergent tastes and interests. Linking elements of our Code Halos to a specific shopping experience enriches the interaction. By viewing our individual Code Halos, it's clear that selling to all three of us in the same manner would bore, irritate or even offend us—a terrible business decision.

Today's value-growth leaders are using Code Halos as a new platform for building relationships of mutual interest and value. The guesswork—and annoyance—of "salesmanship" is replaced by the predictability of empirical data and the true matching of tastes and desires with the right products and services. The sales process evolves from a mindset of "always be closing" to "always be suggesting" based on our halo of information and insight.

Many of us carry our virtual lives into our physical lives. We use our mobile devices to game, consume video and other media, interact with the news, navigate, pay for parking, monitor our location, make purchases, manage our health, etc. These devices—smartphones, tablets, Nike FuelBands, Google Glass, Garmin monitors, Jawbone UP devices, telematics devices for the car, etc.—amplify, transport and help manage our personal Code Halos as we move through our daily lives.

When we interact with services such as Pandora, Netflix, Google, iTunes, LinkedIn and Facebook, we actively integrate our halos of information across devices and experiences. For example, when we visit iTunes, our defined tastes in music, literature and movies—combined with our geographic location, basic demographics, reading interests, social network connections and the devices we are using—present the site with a rich Code Halo that aligns our experience with a portfolio of who we are, even beyond our music preferences.

iTunes, for its part, reciprocates with its own halo of information. Apple has immense institutional knowledge driven by its big-data initiatives, fueled by millions of customers’ musical likes and transactions and analyzed by sophisticated proprietary algorithms. The Apple Code Halo can quickly recognize the patterns in an individual consumer's Code Halo so iTunes can create a tailored user experience that was simply impossible just a few years ago.

By creating algorithms that derive meaning from billions of data points—searches, clicks, purchases, geo-location, song choice, etc.—Pandora, Spotify, Netflix, iTunes, Amazon, Google, Facebook, Twitter and others appear to simply be reading your mind. They know you because of your Code Halo.

**Code Halos Reshape the Enterprise**

Until recently, Code Halos were rooted in our personal interactions with online market leaders. However, established enterprises are now deriving meaning from Code Halos; importantly, this trend is moving rapidly into more "traditional" business sectors, changing the basis of competition throughout many industries.

**Five Types of Enterprise Code Halos**

More and more enterprise decision-makers now recognize and manage five types of Code Halos that occur with customers, products, employees, partners and other enterprises (see Figure 3).
1. **Customer Code Halos**: The new basis of customer relationships. Customer-centric Code Halos – leveraging consumer data and insights – create an enriched customer experience. Sophisticated algorithms are applied to individualized code – i.e., past usage, input given to systems such as the Amazon Betterizer, artist selections added to Pandora streams, etc. – to derive business meaning and then deliver a customized experience. This is not just reserved for companies with a “born-digital” DNA. Disney, for example, is launching Magic Band bracelets to help guide visitors through its amusement parks, manage ticketing, act as room keys, personalize the guest experience and even work as a portable bank. The Magic Band will soon transform a day at a Disney park from a one-size-fits-all experience to a highly personalized one.

2. **Product Code Halos**: Product value shifts from widgets to digits. We are moving into the era of the “Internet of things.” This trend already permeates manufacturers that use advanced sensor technology on the shop floor, but it extends far beyond factory walls. From mobile phones to GE aircraft engines to even personal grooming tools such as toothbrushes, more and more devices today are becoming network-aware. They all have the potential to generate rich Code Halos that interact with the halos of information from people, business processes and organizations, and generate streams of data ripe for deriving meaning. As Code Halos grow, the “software” of these products becomes far more valuable than their associated “hardware.” For example, with a smart toothbrush, the physical tool itself is a commodity, while brushing habits, dental hygiene history and health needs create a halo of information that is of premium value. In many sectors, new business processes, industry models and products are being formed at this Code Halo intersection.

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**Code Halos Connect Companies, Customers, Devices, Employees and Partners**

![Image](image-url)
3. **Employee Code Halos:** Employees connect to solve problems differently. Code Halos can be built around individual employees, creating new models by which knowledge work is conducted. In fact, our employee Code Halos can be far richer and more powerful than many consumer halos, as they comprise our work histories, subject matter expertise, perspectives, work styles and experiences. Employee halos facilitate getting the right work to the right person at the right time, all contextualized within a workstream – delivering the most appropriate organizational assets to the individual. In much the same way that Amazon’s consumer Code Halos and algorithms individualize the shopping experience, employee halos and organizational algorithms individualize and transform the work experience. This is changing how companies and organizations, such as Southern California Edison and Arlington County in Virginia, collaborate to capture business opportunities.⁶

4. **Partner Code Halos:** Ecosystem partners link to form value webs. With new technologies and more collaborative mindsets, traditional supply chains (primarily linear and designed for physical products) are re-forming into tightly integrated systems for sharing and co-creating knowledge assets. People will still need tangible things, but companies in life sciences, banking, insurance, healthcare and manufacturing are now using innovative technologies to create more efficient and effective partner ecosystems.

5. **Enterprise Code Halos:** Your company’s brand is a Code Halo. Think of all the digital interactions associated with your company or business unit. Information about products, clients, partners and employees creates or destroys value every day. Angry customers, positive media coverage, financial data and a million other information sources create a perception of your company as real as the bricks and rebar of a manufacturing plant. Whether you manage it or not, your company is increasingly defining itself by its Code Halo. In many cases, this halo of information has much greater clarity and authority than the efforts of your marketing department.

### A Clear Path Toward Code Halo Value

We don’t view the cautionary tales of now-extinct or displaced market leaders such as Kodak, Borders, HMV, Circuit City, Newsweek and Blockbuster as isolated or coincidental. On the contrary, we see them as illustrations of a larger trend: These “Extinction Events” were caused by management teams who ignored the transformational power of SMAC technologies and Code Halos (see sidebar, next page).

As an advisor to many of the largest corporations in the world, we interact with hundreds of executives from Global 2000 companies every year. Over the past several years, regardless of sector, many of them have voiced similar themes:

- “My customers, through the Web and social networks, now know more about our products than our salespeople do.”
- “The Sunday night computing experience of our employees is now vastly superior to their Monday morning computing experience at work.”
- “We see upstart competitors, which were dismissed only a few years ago, quickly gaining mindshare and market share because they are seemingly playing by a different set of rules.”
There’s a reason Code Halos have only started to emerge in recent years. It’s because they are built upon the SMAC Stack technologies that have lately become mainstream in our personal “consumer” lives: social, mobile, analytics and cloud. These technologies are pouring into enterprise IT at a velocity that is causing whiplash for many market-leading companies, even for those with technology mastery at their core.

The disruptive power of new business models – such as those pioneered by Facebook, Apple, Netflix, Amazon, Google, etc. – originates from these companies’ integrated application of SMAC Stack technologies to attain their business objectives. SMAC Stack technologies are the raw materials of Code Halos, and they are growing at an astounding rate.

With more products IP-addressable and connected, we’re living through an explosion of online data. Between 2008 and 2020, the amount of data being managed by corporations will grow at least 44-fold. Every day, the world creates 2.5 quintillion bytes of data – so much that 90% of the data in existence today has been created in the last two years alone. Much of this data is now being created and consumed via mobile devices. There are approximately 8 billion mobile devices in use, and by 2020, this will grow to more than 50 billion (by multiple third-party estimates). Much of this comes from people, companies and things creating and sharing Code Halos. As such, Code Halos are fueling the big data shift (not the other way around).

Importantly, Code Halos are changing the fundamental basis of competition in many industries – rather than being simply “glued onto” the traditional corporate model, in many cases, they are creating entirely new models.

But this is not a story just about technology and data. Social networks and the constant usage of mobile devices (whether by humans or embedded into machines) are creating massive amounts of data. Yet, data without meaning is just noise, and analytics without business intent just creates static. For a Code Halo to have business impact, it has to hold its shape, like a mosaic turning specific points into a full picture. It has to mean something in business terms.

Focusing on business meaning is the key to extracting the right information and applying it to a process with potential commercial implications (buying a car, brushing your teeth, maintaining an aircraft engine, going for a bike ride, renting a movie, processing an insurance claim or creating a new investment product or service).
Big data and analytics are certainly part of Code Halo thinking, but corporate commandments to “do analytics” can devolve into nothing more than an admonition for living better – like “eat your broccoli” – than a philosophy for re-imagining a business process or a company operating model. In fact, analytics and data management are essential ingredients of Code Halos, but in order to derive business meaning, the halo must leverage the full SMAC Stack and – importantly – be plugged into a vital business process.

Code Halos are already changing work at the business process level. The SMAC Stack is reshaping enterprise work by re-forming how core processes are run. In the same manner that steam, steel and electricity powered the industrial corporate model, the new technology stack delivers the essential data and insights for creating Code Halos and the new knowledge economy.

The value of Code Halo thinking comes sharply into focus when applied to real work. For instance, P&G is collaborating beyond the corporation’s four walls to generate new ideas for products and services. Disney is customizing the guest experience. Insurance companies like Allstate and Progressive are reimagining the underwriting process in line with actual driving behavior. Each of these companies has a formula for leveraging Code Halo thinking, coupled with SMAC Stack technologies, to change specific business processes, with the goal of disrupting their markets by providing a game-changing customer experience, improving productivity or dramatically cutting costs.

Our research reveals that Code Halos only produce business results – and drive metrics that matter to CXOs – when they are integrated into well-codified and well-understood business processes.
These are all symptoms of the same condition. Some business leaders fear they no longer fully understand how to lead their companies in this new context; moreover, their anxiety and concern about missed opportunity is growing. What they are articulating is the fact that their competitors have started to compete using Code Halos, and that their industry has begun moving toward the Crossroads.

Let’s examine a few fairly well-known cases where corporate success is powered by mastery of Code Halos.

- **Netflix uses code to transform the customer experience.** A pioneer of algorithm-based selling, Netflix has transformed from a fringe, marginal outsider to a key player in the fast-reconfiguring $745 billion global entertainment industry. By being open to today’s Code Halo zeitgeist — facilitating and encouraging community feedback, leveraging “prosumption” and “gamification” and adopting a “cloud-first” operations mentality — Netflix embodies the corporate characteristics that create meaning in today’s new digital era. Importantly, as it overtook the video rental establishment, it also exposed many business attributes that no longer matter (such as Blockbuster’s physical world-based retailing).

- **P&G harnesses external code innovation.** The consumer product giant’s Connect + Develop program today sees that more than 50% of the company’s new products are developed in collaboration with outside partners. P&G has created a broader community as well, and intellectual assets can even be harnessed by other companies (such as food products, plastics manufacturing, etc.).

- **UPS leverages the code of a package.** Whereas UPS was once a trucking company that used technology, today it is a technology company that uses trucks. How did this happen? UPS recognized the value of intersecting code from senders, receivers and packages along the shipping process. The proprietary DIAD device, along with data, analytics, mobile technologies and the Web, creates a more transparent, effective shipping process. Compare the success of UPS — steady growth, trading at nearly its highest level, etc. — with the U.S. Postal Service — closing offices, shuttering processing offices, scaling back services, cutting jobs — and you get a clear picture of the value of Code Halos.

Whether it’s shipping and logistics, consumer product design or movie rental, by focusing on the Code Halos associated with a core business process, these three companies reveal how powerful halos of information can be.

### A Prism for Understanding Industry Transformation Has Emerged: The Crossroads Model

In studying these dynamics, we recognize that vast industry transformations – and the resulting violent value migrations – in books, movie rentals, mobile phones, insurance, consumer goods, newspapers and travel services have all followed a similar pattern. This pattern is what we call the Crossroads Model. As companies and industries have experienced events explained by the Crossroads Model, three key events have occurred.

1. **Ionization:** A fertile context for innovation. The combination of changing economic pressures, enhanced customer expectations and new technologies creates a context and environment for the establishment of Code Halos and related new business models.
2. **The Spark**: Where Code Halos collide and business changes. Once Code Halos build, associated algorithms are also developed. New ideas and offerings are then formed, based on the intersection of Code Halos. An innovative “Spark” then quickly reshapes processes inside the enterprise, as well as at the customer interface.

3. **Enrichment**: Turning a Spark into a blaze. This is the period where Code Halos — if created and managed correctly — grow in both the numbers of users and the value of data by orders of magnitude, giving rise to new products, processes and models for value creation.

4. **The Crossroads**: Where markets flip. This is a compressed period of time — often between one and three years — where industry leadership shifts. At the Crossroads, Code Halos have reached critical mass and are creating new customer expectations and economic models. This drives a rapid, sometimes violent, swing in reputation, revenue and market value.

5. **The New Code Rush (or Extinction Event)**. After the Crossroads, companies have two widely divergent paths, with significant momentum (both positive and negative) that is extremely difficult to reverse.

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**The Crossroads Model: Winning with Code Halos**

Timing and process targets may differ, but this five-step Crossroads Model is holding true across many sectors.

For example, upon Amazon’s IPO in 1997 — in spite of the lofty valuation that the consumer e-commerce pioneer achieved amid the Internet bubble and its resulting overinflation of value — Borders and Barnes & Noble were collectively eight times the value of the online retail giant, with roughly 50 times the revenue and 100 times the customer base.

As Amazon quickly enriched its understanding of Code Halos, consumer e-commerce entered the Crossroads in 2002. By 2005, Amazon was worth twice as much as Borders and Barnes & Noble combined, and had equaled both retailers’ customer count (in similar markets such as book, movie and music retailing) and associated revenues. Just five years later, Amazon was worth 100 times more than Borders and Barnes & Noble combined, and had driven Borders to bankruptcy. In the mobile phone sector, similar dynamics have occurred; the dominant player of
the late 1990s and early 2000s – Nokia – has been replaced by organizations less focused on hardware features and more attuned to the Code Rules of a digitizing marketplace (see Figures 5 and 6). Beyond books and mobile devices, our research uncovered a similar pattern that has occurred consistently across more than a dozen industries to date.

Book Selling at the Crossroads

Mobile Devices at the Crossroads
Stage 1

Ionization: Code Halos Form and Create a Fertile Context for Innovation

Think of what the air feels and smells like before a storm arrives, just prior to a lightning strike. The air is charged. You sense it before seeing it or being able to describe it. Your hair may stand on end. The conditions — climate, humidity, static buildup — create the context for the release of an electrical charge.

The same electrified sensation can be sensed by switched-on business leaders when something — a challenge or opportunity — is imminent. From our research and client work, we know that companies everywhere are grappling with the challenges and opportunities of accelerating globalization, economic volatility, a new mindset for problem-solving and new technologies for social collaboration, mobility and business analytics. These forces are creating a charged — or ionized — context for many businesses.

Many business leaders with whom we work recognize the signs of Ionization. The following signals indicate that disruption is not far off:

• **Green shoots emerge.** Early examples of new ideas begin to take root. This could be a new technology gaining traction or a buzz surrounding seemingly innocuous small competitors that don’t appear to pose a threat (because, after all, you are much bigger). We see this today with such companies as Square in mobile banking, Waze in social GPS in automobiles, or LoseIt! in weight loss.

• **Your established competitors announce an “odd” technical initiative.** This could include a product, service or adjacent market shift that may not make sense. The DIAD from UPS … the Magic Band from Disney … the DriveWise device from Allstate … these investments may look reasonable now, but when they were introduced, they seemed to some observers as wild flights of fancy.

• **No big signposts are apparent.** There will not be a mountain of data or analysts “proving” a shift. Market researchers and analysts generally focus on the rear-view mirror more than the windshield. The signs of Ionization will be subtle at first. You will feel it before the data proves anything.

• **Customer experiences in related industries are hitting the Crossroads:** Code Halos in related industries change the expectation that customers, employees and supply chain partners have of your company. “Amazon knows me so well, and is so easy to deal with, and yet the bank I’ve gone to for 20 years doesn’t know me at all.” Such a statement is a clear sign that changing customer expectations are driving Ionization in your market.

The subtle signs are here today, and the electric charge is strengthening for many industries. Banking decision-makers are wrestling with wealth management for up-and-coming millennials. Healthcare payers are recognizing that subpar customer satisfaction renders them a set of Goliaths waiting around for David’s deadly rock. Pharmaceuticals companies understand that selling wellness is more valuable than selling pills. Some insurance carriers now use Code Halos powered by telematics to manage and monetize risk associated with actual, not assumed, driving behavior.

These leaders aren’t playing for short-term advantage. They know the business atmosphere is ionized for transformative change, and they realize steps must be taken now to win in the long run. Chances are, you already feel Ionization occurring in your market.
While the above symptoms seem somewhat nebulous, the tangible sign of growing Ionization in your market is the emergence of Code Halos. These halos can surround customers, products or employees in your industry. And they may come from unlikely sources (i.e., green shoots). But the point is, they will begin to emerge. As a diagnostic, map out your industry’s value chain and then plot Code Halos that you recognize. The scale or “success” of these halos is irrelevant at this stage of the Crossroads Model. What is relevant is the number of them and – more importantly – where they are appearing.

For example, have entities (from start-ups to established competitors) independently created Code Halos around a certain set of customers or category of products? If so, they may be onto something. (After all, how did several independent entities come to the same investment conclusions?) In looking empirically at industries that have already reached the Crossroads, the strongest regret voiced by industry incumbents is that they didn’t see the competitive Code Halos earlier.

Ionization is all about sensing change and then recognizing where Code Halos may emerge ... and launching your own. The charge you feel means a distinct business process or industry is ready for a Spark of innovation. However, the highest impact ideas will emerge from friction points in business. This is where code meets code, and leveraging opportunities at this intersection enables businesses to gain real market advantage.

**Stage 2**

**The Spark: Where Code Halos Collide and Business Changes**

Once Ionization around a business or process begins, the context is ripe for a disruptive innovation. That moment of brilliance may seem like a bolt of lightning in the rearview mirror – Google! Amazon! Zappos! Netflix! FedEx! – but at the onset, it’s just a small spark. Yet something profoundly important is occurring. In short, during the Spark phase, the Code Halo starts to turn into a successful business model.

What occurred during Ionization – recognition of Code Halos – is important, but it's only the first step. The Spark phase provides the step change in value creation – the ignition that catalyzes new opportunities – and this happens when Code Halos collide. When, for example, our personal halo of likes, interests, location and demographics combines with a corporate halo, it instantly allows that company to tailor itself to us and vice versa. The relationship immediately goes beyond that of buyer/seller, to one of mutual interest and discovery.

Take two examples:

- **Pandora creates your favorite “radio station” almost instantly.** How does it seem that Pandora is reading your mind? It happens when your Code Halo (of your musical tastes) intersects – sparks – with Pandora’s institutional Code Halo (algorithms) and information about thousands of songs. Pandora began as an attempt to better connect music with people who love it. The intent of the Music Genome Project was to create a Code Halo for music and to leverage technology and algorithms to connect the right music with the right listeners. The result is a highly customized and enjoyable experience, at incredible scale, with essentially no incremental cost to Pandora.


Quick Take

Setting Off Sparks

Want to ignite Sparks that matter to your company and customers? Here are clues to help.

- **New sources of “oil” smooth the friction between process and technology.** Amazon, Netflix and Zappos all reframed the customer experience by assembling Code Halos to solve particular challenges. They looked at buying behavior, found some simple pain points (going to a physical store, finding products from a limited selection, late fees for DVDs) and then imagined a solution where analytics were applied to personal Code Halos to improve the experience associated with physical products (books, videos, shoes, etc.). When a process is ripe for disruption, the value of the Code Halo expands, and a Spark ignites.

- **Code Halo “amplifiers” begin reshaping processes.** What is a Code Halo amplifier? Very simply, it’s any IP-addressable smart device that generates personal data to further build a Code Halo. Smartphones, tablets, PCs, appliances, packages, wristbands and automobiles – all gathering information and IP-addressable – amplify and manage Code Halos in line with specific key processes. UPS, Disney, Progressive, Allstate and others are creating new business models in which devices, data, analytics, people and organizations intersect based on the flow of information. When devices are mature enough to create meaningful information on process and participants – when they can inflate the Code Halo with information – dramatically changing business models and processes are not far behind.

- **Consumer technology invades the enterprise.** When CVS sends a message to your personal mobile device about a prescription ready for pickup, you can see how mobility is re-forming an archaic process (which traditionally included either waiting around or coming back to the store, only to be told the prescription isn’t ready yet). Insurance companies, banks and pharmacies are all rethinking their customer experience, and it often includes some meaningful use of a consumer technology. Clinical drug trials, claims processing, retail banking and many other internal “corporate” work processes are being reshaped by consumer-grade technologies and co-opted for enterprise use.

- **The product or service is regularly used.** Code Halos need to be inflated on a continual basis, and thus the information halo of a person, product or process needs to pass the “continual use” test. Thus, companies should ask, “Is this for daily use? Or, at least, for near-daily or continual use?”

**Code Halo-based solutions that succeed – and the number is growing – must progress through a rigorous learning process.**

Code-meeting-code creates a Spark that can transform business process, industry models and even how commerce is conducted. Yet the Spark needs to adhere to the four elements above: Process meeting technology; ubiquity of code amplifiers; leverage of consumer-grade SMAC Stack technologies; and continual use of the underlying code amplifier and associated business process.

The Spark is just the beginning. It’s not enough to build just an interaction platform. Code Halo-based solutions that succeed – and the number is growing – must progress through a rigorous learning process. New solutions and products must be enriched by meaning derived from a steady diet of data and information.
• **GE is raising the bar on product innovation and customer satisfaction.** GE is following the philosophy of GE Share to create smart products, such as jet engines, that are IP addressable, even in flight. Each engine creates its own Code Halo, generating some 200-plus parameters per flight record. Importantly, the engine’s Code Halo is integrated with both GE’s halo and the halos of its customers. According to CMO Beth Comstock, GE “can build a community of service professionals around a machine to help reduce maintenance costs and increase engine lifespan. Social technology will help us deliver a better engine than ever before.”

These seemingly simple ideas occurred as Sparks of wisdom and insight. They look quite straightforward in retrospect, but these early ideas have significantly altered our expectations of the customer experience, from music to jet engines.

The Spark stage is playing out across multiple industries right now. Progressive Insurance, for example, was founded in 1937. But in the late 1990s, the company’s leadership recognized that the P&I insurance industry was in a period of ionization. It realized the context was right for simple ideas that resulted in huge business advantage. Progressive was among the first insurers to use the Internet to provide policy information and carrier rate comparisons; it assiduously focused on customer experience and connecting customers with their body shops of choice.

Focusing on the customer experience and using new technologies to help improve service may seem quaint in retrospect, but Progressive recognized early on how applying Code Halos across its value chain — customer and repair shop interactions, organizational information, etc. — could spark new opportunities and fundamentally change its operating model.

Igniting a Spark is not easy, but it’s also not impossible (see sidebar, previous page). People do it every day, in fact. The real challenge is in finding the right Spark among countless ideas that are either oriented toward a customer experience or toward internal process improvements. These ideas are “sparked” when three events occur in parallel:

1. Code Halos meet algorithms, and a virtuous cycle between the two begins.
2. New business models take form as unique value propositions (to customers, employees or partners) and emerge from Code Halos.
3. Scaling begins, as both users and usage begin to grow, virally.

**Stage 3**

**Enrichment: Igniting a Spark into a Blaze**

**The Code Halo-based Business Model Begins to Scale, Rapidly**

After the Spark of a new idea, little may appear to happen, at least at first (in terms of traditional business metrics). Your CEO may ask, “How has this changed customer satisfaction metrics?” Your CFO may ask, “What has this initiative delivered to the bottom line?” At the beginning of the Enrichment phase, you’re most likely to answer these questions by looking at your shoes, meekly replying, “It hasn’t moved the needle yet on those metrics.” This period of uncertainty often creates tension for senior leaders who are betting on a telematics device, a crowdsourced product design or a mobile app for improving a business process and delivering business results. However, at this phase, those are the wrong questions.

In fact, a lot is happening in the ether. Enrichment occurs as the company learns, and the algorithms “get smart” based on meaning derived from business analytics.
Quick Take

Enriching Code, Sparking Value

Success in the Enrichment phase means meeting a few simple objectives.

• A “give-to-get” model takes hold. When you “like” something, buy a song on iTunes, enter your book preferences, “teach” Pandora about your music tastes, click to “Submit Your Innovation” to P&G or install an Allstate DriveWise device, you are giving up information – your code – to get something back. Giving iTunes your book preferences gets you highly tailored recommendations. Giving Pandora your musical tastes gets you hours of pleasurable listening. During Enrichment, this give-to-get equation takes shape and, if properly managed, grows virally. If – and it’s a big “if” – your product or service delivers meaningful returns, a growing number of customers and stakeholders will indicate a willingness to open up their Code Halos.

• Algorithms get smarter. If you interact digitally with people, companies, processes or products, you have valuable data injected into your business. Chances are pretty good that you are not fully harnessing insight from these data feeds. During Enrichment, the algorithms that convert raw data into business relevance get continuously refined. Zappos, Netflix, Pandora and Amazon evolved from simple transaction platforms into engines for managing the customer experience by focusing on Code Halos and the Enrichment process. If you’re getting smarter about clients, partners or employees, you have the right focus for Enrichment.

• Code Halos “inflate.” If you have effective algorithms and analytics processes in place to decode meaning, as well as a value proposition that resonates and delivers a balanced “give to get” equation, the Code Halos around your processes, products, customers, employees and partners will inflate with knowledge and insight. Virtual continuous interaction will ripen and deepen in a virtuous circle of “giving and getting,” in which the ratio of the code we provide is significantly outweighed by the value of the code we receive in return. The “Pandorization rule” of interaction (named in honor of the online music service Pandora) posits that the more data there is (ours individually, and everyone’s in aggregate), the more value we all receive. You’ll know more than ever about customer relationships, internal processes and devices.

• Management focus shifts from assets to information. Digitally native organizations – Pandora, Netflix, Wikipedia, Google, etc. – have assets and infrastructure, but the bulk of management attention is on code. Leaders focus on algorithms, analytics and knowledge capital. For more established players, success in the Enrichment phase means shifting long-standing focus from assets – buildings, machinery and infrastructure – to information. This does not mean ignoring everything but your data – the physical supply chain is not going away – but it does mean a significant shift in attention and emphasis. If you are getting heat for wanting too much equipment and analytics support related to making meaning of data, you are doing the right things.
Enrichment is the phase when two very important phenomena occur in parallel:

1. **Code Halos “inflate” with information from a steadily growing number of interactions.** Per the examples above, the Pandora listener interacts with the service several times a week, each time offering more personal likes and dislikes. The GE Jet Engine flies multiple flights daily, throwing off more and more data. The algorithms of Pandora and GE continually become more robust, sophisticated and accurate.

2. **Commercial models begin to mature.** Key processes can either become radically more efficient, or altered in a fundamental manner to provide more value to customers, employees and/or business partners.

   During Enrichment, more users provide more data, which drives more meaning and value. Enrichment should be viewed as a greenhouse phase that allows the new business model to grow in its proper manner. That is, the goal is not to drive immediate business success by industrial, or traditional, metrics. Managers who focus too early on “moving the needle” with “metrics that matter” can actually greatly damage – if not stop – the Enrichment process. The goal of Enrichment is to build meaningful services and solutions based on Code Halos. Once this is achieved, business results will follow (at the Crossroads).

As an example, Google doesn’t work unless we use it – a lot. Like a hot air balloon without enough heat, the PageRank algorithm “deflates” if people don’t use it. Peter Norvig, Google’s Research Director, offers insight into both Enrichment and Google’s source of competitive advantage: “We don’t have better algorithms. We just have more data.”

The goal of big data is to make meaning. It’s not just the data volume that matters; how companies make business meaning from this data is key. This period of Enrichment is critical because it’s when companies move from merely brokering interactions to making meaning of the rich streams of data about customers, processes, partners and devices.

Enrichment occurs when business analytics converts mountains of ones and zeros into real business value. Think of 2004 to 2007 when iTunes grew slowly, creating a foundation for massive growth later on (10 billion songs downloaded in 2010, exploding to 20 billion songs only 18 months later). Facebook followed a similar pattern by taking several years to get to 100 million users in 2008, but then adding another 100 million users on average every 167 days until it reached 1 billion users late in 2012.

Apple and Facebook started by getting smart and building user communities. The value of the Code Halo was ultimately proved (by so many voting with their fingers), but in the early days of Enrichment, the business results were not yet obvious.

Even with a great idea for capturing Code Halo value, the cost of skipping the Enrichment phase can be high. Not convinced? Consider the many failed start-ups, companies stagnating in the market or even Blockbuster, which certainly had enough data to understand that its business was in a period of ionization. Decision-makers did not – or could not – derive meaning from their data and catalyze change through Code Halos. Equally important, by skipping the Enrichment phase, they failed to understand the nuances of new business models. Blockbuster missed the shift in how people wanted to consume media, did not enrich its customer interactions, failed to fully understand the new commercial models and paid a heavy price.
During the Enrichment stage, a Crossroads comes into view. As illustrated in the Crossroads Model, the valuations of Code Halo-powered companies begin a rapid and significant market ascent, often within 12 to 36 months of the Enrichment phase.

Companies that miss the key elements of the process are left to struggle with closing the gap. After all, when markets flip (as described in the next step), customers and investors begin to place disproportionate value on experiences created by information — in some cases relegating the value of physical assets to near zero.

**Stage 4**

The Crossroads: Where Code Halo Business Models Win and Markets Flip

*“There are decades where nothing happens; and then there are weeks where decades happen.”*

— Vladimir Lenin

Once a Code Halo reaches critical mass — in its numbers, data and resulting meaning — it drives significant and rapid shifts in business results and enterprise value. In very abbreviated periods of time (usually between one and three years) well-established industry leaders permanently cede their positions to upstart competitors. This is the Crossroads, the stage where corporate fates are determined.

The Crossroads is a time of massive transition. Even though the industry may essentially look the same — selling books still involves pitching some form of “book” — the basis of competition changes rapidly. Customer expectations — about their relationship with the company and their interactions with its products or services — shift. The valuation placed on your company, and how investors reward performance, changes. In many cases, even the basics of financial performance — from revenue per employee, gross margins and return on capital — change radically.

The Crossroads is a compressed period of time of intense and rapid disruption in which market leadership flips dramatically. Innovators differentiate and ascend rapidly, gaining in market relevance and value, while those stuck in yesterday’s business model head dramatically and painfully toward stagnation or perhaps go out of business, instigating an Extinction Event (see Figure 7, page 25).

Several key events occur at the Crossroads of an industry, company or process.

- **Code becomes the offer.** At the Crossroads, enriched Code Halos are now central to winning or losing in the market. Products continually become smarter and can give and receive more data as they become more efficient in enhancing and managing Code Halos. The “give-to-get” equation makes sense for external customers, and algorithms are now essential to the customer experience. Internal employees and partners at companies and organizations see the value of collaboration and knowledge-sharing. At the Crossroads, success and failure in the market, or on missions, is based on wisdom and insight derived from Code Halos.

- **Customer and employee halo-based expectations go mainstream.** Once customers and employees experience the value of Code Halos, their definition of a company in the industry is forever changed. These experiences have raised all our expectations for many more interactions with companies, products or colleagues. At the Crossroads, the distinction between a “smart” product or process and a “dumb” one becomes glaring, and customers and employees rapidly shift their allegiance accordingly.
• **Business processes “melt.”** As Code Halos go mainstream, the value of the virtual interaction begins to outweigh the physical interaction. This allows for a merging or melding of processes. In essence, they appear to melt, as it becomes difficult to determine where one organization ends and the other begins in these virtual interactions. Connections among customers, ecosystem partners, products (or devices) and employees are re-formed. At the Crossroads, business processes melt from the heat of new insights and understanding and re-form as digitally enabled work. For example, new product development has historically been handled by people within the enterprise, but companies such as P&G and Statoil are opening up to ideas from external sources. Sales work changes from waiting for customers to walk into the physical store, to interacting with a technology enhanced, personalized customer experience based on Code Halos.

• **The algorithm links the chain.** Netflix, Pandora, Hulu, LinkedIn, Facebook – and all the intimacy and familiarity we feel when engaging with these platforms – are driven by how well their algorithms “know” us. At the Crossroads, complex algorithms that turn data into meaning and insight are inseparable from the process and connections among people, technology and organizations. When these connections are enriched by data and algorithms, and business value is generated from emerging insights, you know you are at the Crossroads.

• **Software eats the process.** Marc Andreessen, the father of the modern Web browser, was right: Applications and algorithms are becoming ever more critical to business decision-makers. At the Crossroads, insight and meaning from process data streams change how core work is performed and unlocks new business value. This is already happening in life sciences, banking, retail, insurance and other industries – and the trend is exploding. As mentioned previously, Progressive Insurance, for example, uses SMAC Stack technologies and algorithms to compare rates, file claims, track driving behavior, etc. The company also uses social systems – Google Plus, Facebook, YouTube, Twitter, etc. – to create a community around all things insurance. You know you are near the Crossroads when software and customer expectations drive significant process change.

• **Your toothbrush talks.** We are headlong into the “Internet of Things” era. As earlier noted, technology-mediated communities of interaction grow around physical objects like GE aircraft engines, UPS packages, Beam Technology toothbrushes and Garmin fitness devices. Linking people, processes and devices with data and meaning-making are changing our expectations of everyday devices. When your internal or external process work can be reshaped by new devices, your company or business unit is at the Crossroads.

• **Value goes virtual:** Most importantly, the six factors above combine to shift the source of value from hard assets to soft assets, from the physical to the virtual. When the movie rental business hit the Crossroads, customers exited the Blockbuster store and walked into Netflix’s virtual space. In mobile phones, the basis of competition went from hardware (e.g., the Motorola flip phone) to software (with the thousands of apps available on iPhones and Android devices). And the Crossroads is why Barnes & Noble’s physical retail stores are currently valued at half of its virtual Nook division.

**Stage 5**

**Winning the Code Rush and Avoiding an Extinction Event**

When Code Halos shift mainstream expectations of products and ways of doing business, the transition is brutally efficient. If your company is not prepared for this rapid market shift, it may well be on the path toward an Extinction Event.
The Crossroads Model — Ionization, Spark, Enrichment and the Crossroads — has played out in a dozen-plus major industries, and we believe it will play out in many others in the coming years. For those organizations that want to capture the value of Code Halos, the time has come to re-code business models, technologies, knowledge processes and ideas about how work is done.

Code meeting code is at the center of many winning businesses and transformative business models. It’s so powerful that it often becomes the true north for these companies. They understand that Code Halos — and analysis by powerful algorithms — are worth much more than traditional means of production.

Determining Where Your Company Stands in the Five-Stage Crossroads Model

So, do you know your own company’s Code Halo? Do you know the code of your best customers? And do you have a mechanism that allows these code bases to easily connect and integrate? If this is an institutionalized capability at scale, you can profoundly change your business for the better.

Where are the best places to start to understand how to apply “Code Halo” thinking to your organization? Based on our industry-wide travels and client work, we have concluded that savvy business leaders can take practical steps to derive value in this new age of business and technology.

- **Analyze your company at the process level**. The road is littered with failed initiatives attempting to *<Reboot>* an entire organization or business unit. You know better. Take a hard look at your real business process anatomy (management, new product and service development, sales and customer relationship management, operations, etc.) and find the most squeaky wheels. Look for processes that shape more than
20% of cost or revenue, then pick two. Work to apply Code Halo thinking to those processes. Target tangible process metrics meaningful to your industry – cost per claim, clinical trial yield, healthcare unit cost, fraud prevention rates, etc. Find the Spark where code meets code, and work to re-code moments of engagement with clients, internal workers and partners.32

- **See people, products and organizations as code.** Many of the near-term targets will be internal business process, but many will be aligned with customer interaction. “You had me at ‘hello’” is now more like, “You had me at ‘0100100001000101010010110001001111.’”33 Think of customers as essential because of their data, not just because they are near-term sales prospects. It may seem counterintuitive, but Code Halos can create more authentic experiences by building affinity and communicating your company’s value.

- **Don’t hide under your “security blanket.”** It would be naïve to think that issues of security, privacy and the ethics of data management and exchange are simple to resolve. But it would be similarly naïve to conclude that these issues are impossible to overcome or that Code Halo sharing is not worth doing. The U.S. Department of Defense is crowdsourcing design and implementing BYOD (bring your own device) strategies. Google Apps is FISMA accredited (an information security management certification).34 There are bad people out there, but there always have been. During the Renaissance, bandits on trade routes didn’t stop the explosion of trade. In the Wild West, bank robbers didn’t slow a nation’s expansion. And more recently, phishers have not slowed e-commerce. As with any form of commerce, there are risks associated with Code Halos; in some places of the world, sharing your code is a good way to get hurt, and there are many for whom the idea of offering up their Code Halo is unsettling and paralyzing, bringing as it does both the specter of Anonymous (the infamous hacking group) and “Big Brother.” But we see this shift as a song of hope. Supreme Court Justice Louis D. Brandeis put it best: “Sunlight is said to be the best of disinfectants.” We are convinced that smart deployment of Code-Halo thinking – driving transparency and agility – will ultimately help your organization and your customers.

- **Don’t get SMACked!** In many sectors and processes, SMAC Stack technologies are already impacting the fundamental nature of business (see our recent white paper, “Don’t Get SMACked”). Most cases cited in this white paper simply would not work without this technology foundation. The SMAC Stack is enabling new organizational models, economic value and the foundation of competitive advantage. Very plainly, if you are not building key portions of your business on the principles and realities of an emerging SMAC-powered model, then you are at risk of being usurped by competitors that have.

- **Learn the new language of Code Halos.** Making business meaning out of code is already changing how companies – both those that are “born digital” and “digital immigrants” – create value. S&P 500 outliers of the past five years have won based on knowledge and meaning, not just assets and capital. Some decision-makers may categorize this opportunity as “the CIO’s problem.” Others might focus on the more immediate demands of the current quarter. Keep in mind that people – inside and outside your company’s walls – want to engage with you and each other in dramatically different ways. They have emerging expectations for how they want to interact, buy, sell, communicate and collaborate. Business leaders should pick a few key spots and create a reasonable and feasible plan to embrace this shift. The opportunity is vast, and the punishment for missing this trend will be swift and harsh.
Afterword

Words to the Wise – and Wary

In 1849, a gold rush consumed many Americans. Individuals nationwide flocked to California to mine and pull value from the earth and surrounding river beds. We expect the coming years to deliver a “code rush,” as innovators seek new processes, tools and business models derived from Code Halos. Indeed, SMAC Stack technologies are the new power grid, and data has become the new oil.

The model may be simple, but the implications for business decision-makers could not be more significant. At the risk of sounding melodramatic, we believe we are living in a special time in economic history. We are in a period where innovations in technology – combined with elevated customer expectations – are increasingly creating dramatic industry transformations. Banks, insurers, healthcare providers, manufacturers, retailers, education, government and other sectors are now facing this tremendous opportunity.

The good news is that a clear pattern – the Crossroads Model – has emerged as a roadmap for companies to reimagine their work. This phased model also provides a practical roadmap for companies seeking to win in the near and long term, by fostering improved ways of working, relating with customers and generating value.

A powerful shift in business, technology and commerce has only just begun, and the time to act – to re-code your enterprise – is now.

This white paper is intended to be a quick introduction to the complex and powerful trends we’re observing in the market. It’s our take on how to most effectively discuss some major shifts in business, technology and commerce. We’ll be publishing new analysis and insight about these trends throughout 2013 via a forthcoming book and app. We’d also be honored if you would participate in practical conversations around these themes at our Center for the Future of Work community site www.unevenlydistributed.com.
Footnotes
1 Code Halo™ and Information Halo™ are pending trademarks of Cognizant Technology Solutions.
2 Our ideas about the meaning of code have been informed by the work of Juan Enriquez, founding director of the Life Sciences Project at Harvard Business School and a fellow at Harvard’s Center for International Affairs. Enriquez is a great thinker and speaker, and no minute spent reading and listening to him is wasted. Some good starting points include http://www.youtube.com/watch?v=GcPvvBgdItE and http://www.ted.com/speakers/juan_enriquez.html.
10 Industrial work models have run their course, and businesses across most industries are at a profound shift point. From the ashes of lost opportunity, inflexible organizational structures and vertically integrated processes, a new social enterprise is emerging, one that leverages social collaboration tools to seize the high ground in emerging digital value chains. See http://www.cognizant.com/InsightsWhitepapers/Build-a-Modern-Social-Enterprise-to-Win-in-the-21st-Century.pdf.
11 2010 figure from PricewaterhouseCoopers/iDate.
14 For information on UPS, see http://www.bizjournals.com/sacramento/print-edition/2010/12/10/a-tech-company-with-trucks.html?page=all.
15 See http://pressroom.ups.com/Fact+Sheets/The+Evolution+of+the+UPS+Delivery+Information+Acquisition+Device+(DIAD).
17 In looking at the impact of Amazon, the firm has already forced a significant value shift in two industries — books and technology — and is currently poised to do the same in several other sectors, including technology services. Such has been the power of Amazon in transforming the customer interface as well as the partner and supply chain.
20 Companies such as Progressive (http://rbcis.com/web/comm/20130220-Perspectives-2-en.htm) and Allstate (http://www.allstate.com/drive-wise.aspx) are working to mature usage-based insurance models that connect prices to actual driving behavior tracked by proprietary devices.
About the Authors

Malcolm Frank is Executive Vice President of Strategy and Marketing at Cognizant. In this role, he focuses on Cognizant’s brand, driving business through the company’s business units and overseeing Cognizant’s corporate strategy, including its cloud initiative. Malcolm has authored articles in several leading industry publications, is the subject of a Harvard Business School case study on management and leadership, and was named one of the 100 Most Influential People in Finance in 2005 by Treasury & Risk magazine. He earned a B.A. in Economics from Yale University. Malcolm can be reached at Malcolm.Frank@cognizant.com.

Paul Roehrig, Ph.D., leads Cognizant’s Center for the Future of Work and drives strategy and market outreach for the Business Process Services Practice. Prior to joining Cognizant, Paul was a Principal Analyst at Forrester Research, where he researched and advised senior IT leadership on a broad range of topics, including sourcing strategy, trends and best practices. Paul also held key positions in planning, negotiation and successful global program implementation for customers from a variety of industries, including financial services, technology, federal government and telecommunications for Hewlett-Packard and Compaq Computer Corp. He holds a degree in journalism from the University of Florida and graduate degrees from Syracuse University. Paul can be reached at Paul.Roehrig@cognizant.com.

Ben Pring co-leads Cognizant’s Center for the Future of Work. He joined Cognizant after spending 15 years with Gartner as a senior industry analyst researching and advising on areas such as cloud computing and global sourcing. Prior to Gartner, Ben worked for a number of consulting companies including Coopers & Lybrand. His expertise in helping clients see around corners, think the unthinkable and calculate the compound annual growth rate of unintended consequences has brought him to Cognizant, where his charter is to research and analyze how organizations can leverage the incredibly powerful new opportunities that are being created as new technologies make computing power more pervasive, more affordable and more important than ever before. Ben graduated with a degree in philosophy from Manchester University in the UK. He can be reached at Ben.Pring@cognizant.com.