Disruptive competencies for a Cognitive Internet of Things world

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Introduction

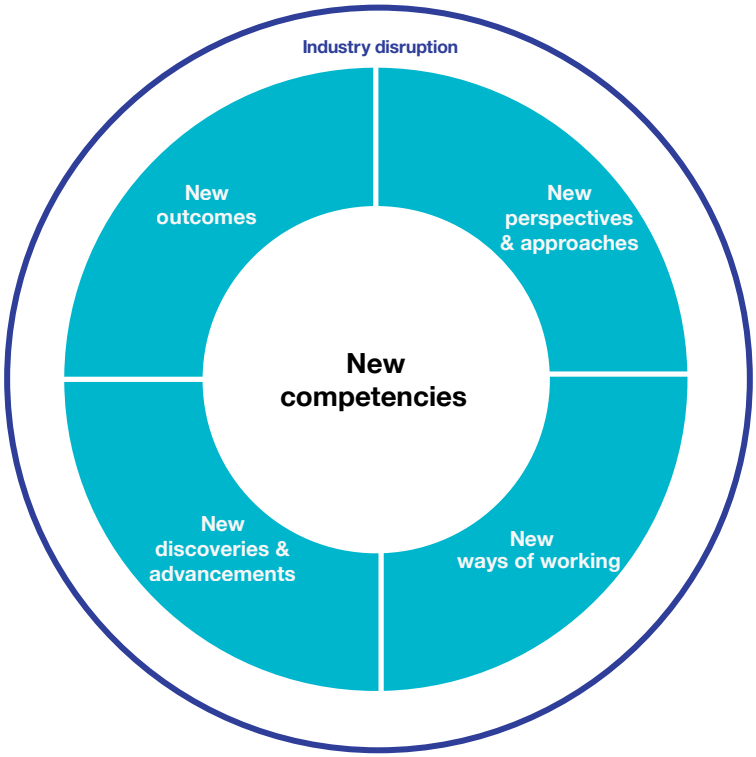
The proliferation of connected devices and related emerging technologies is enabling disruption across industries. From industrial products to insurance, industries are facing disruption from all angles—driven by the race to stay market relevant, to differentiate, and to assimilate consumer data. As technology changes industries, it's also disrupting operations and jobs. 65% of children now in primary school will work in job types that don't exist today, and there may be less of them, with every 3 of 10 jobs expected to be done by software, robots, and smart machines by 2025.[1] There is an intense demand for new competencies—a set of capabilities that represent organizational strategic values which influence decisions and actions across the enterprise.

The competencies required in this new world are differentiated from the past and need to be acquired and nurtured. Today, companies have not fully invested in establishing an environment that fosters and promotes these new competencies. By prioritizing these new competencies, companies will transform themselves and become disruptive.

To transform in this Cognitive Internet of Things (CIoT) world[2], a company's perspectives and approaches must change to enable new ways of working. As the company works in this different way, they unleash the opportunity for new discoveries and advancements leading to new, transformational outcomes. These new outcomes are only possible through these new competencies. Exhibit 1 illustrates this continuous cycle of disruption.

Organizations must question their readiness for these competencies and the enterprise-wide changes required for transformation or be swiftly disrupted and surpassed in the market. Success or failure will be determined by their ability to adapt to the cycle of disruption. Companies must assimilate these competencies into their culture to realize their full potential and vision.

Exhibit 1: The cycle of disruption



Industry disruption

Companies across industries are in a race to stay market relevant and gain customer intimacy via technology and data. This is evidenced by the emerging technology market passing $350 billion, the 2.6x increase in technology acquisitions by non-technology companies since 2012, and the constant competition amongst companies to become data providers.[3] For example, Microsoft acquired LinkedIn for $26 billion to capture its one-of-a-kind dataset mined from its 450M+ member network.[4] Technology and data make disruption the new reality. 90% of global managers and executives surveyed by MIT Sloan Management Review and Deloitte "anticipate their industries will be disrupted by digital trends to a great or moderate extent," but only 44% believe they are adequately prepared for that disruption.[5]

Industry disruption can occur in three ways:

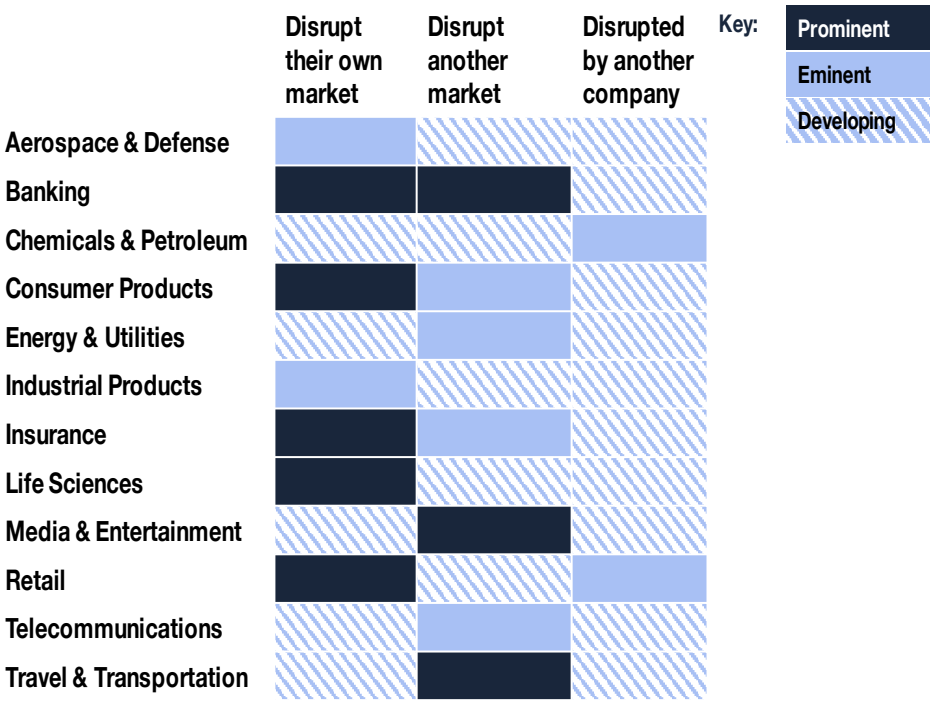
1) **Disrupting their own market** by forcing other players in the market to plan, buy, make, or sell in a radically different way than it does now.

2) **Disrupting another market** by finding an extension of their product or service such that it becomes applicable to another market where they realize more favorable economic optimums.

3) **Disrupted by another company** that provides a cost to serve that is materially less than what is currently in the market, and/or with a better experience that makes the product or service more easily consumable. The disruptive company can reside in an existing market or an entirely unrelated market.

Within these three ways, the four dimensions of the cycle of disruption are present. Exhibit 2 is a snapshot of the concentration of disruption across industries. Following the exhibit are a series of examples of industry disruption.

Exhibit 2: Snapshot of industry disruption



Aerospace & Defense[6]

Airbus has the potential to disrupt their own market—the airplane manufacturing industry—through new ways of working by establishing an innovation center, launching commercial drone technology efforts, using drones for inspections, and exploring 3D printing applications. They have a venture fund and patent efforts to invest in emerging technology.

Banking[7]

SoFi is one of several fintech companies tackling the $1.2 trillion in student debt by offering loan refinancing through its online lending space, and disrupting traditional bank offerings in the process. It competes by offering a simple online application, investment, networking, and entrepreneurship programs to its members.

BBVA is aiming to disrupt their market as a bank acting as the "software company of the future," with a huge emphasis on digital enablement and a perception that it is unreachable among its competitors in Spain. It runs an innovation center and invests in an API ecosystem.

Chemicals & Petroleum[8]

Toray Industries is disrupting another market—the automotive industry—with a new carbon fiber reinforced plastic. The material is lower cost and offers higher shock resistance than current materials. It's set to be the primary structural material in automobile applications by 2020.

Consumer Products[9]

Purple could be disrupting the mattress industry by offering a direct to consumer model different from the traditional mattress retail market. By retaining their mattress technology, they remove wholesale, distributor, and manufacturer markups to offer the mattress at a competitive price.

Dominos is disrupting its own market by establishing a "digital everywhere" and customer experience approach. They have positioned themselves as a technology company that delivers pizza by experimenting with digital ordering platforms, drones, and automation.

Energy & Utilities[10]

Automotive company Tesla has an opportunity to disrupt the $19 billion energy storage market. The Tesla Powerwall, originally developed for their cars, can store excess energy and be made available for residential and commercial use.

Industrial Products[11]

Rio Tinto is building a mine of the future using emerging technology such as wearables to improve management and workforce safety. It incorporates control centers as well as autonomous trains and drilling operations.

Building materials company CEMEX is undertaking a customer-centric digital transformation for a real-time, mobile-led approach to customer experience. In partnership with IBM iX, CEMEX will launch a series of "speed-to-market" custom apps that will differentiate the company from others in its market.

Insurance[12]

DataWing Global, a drone provider, has partnered with Donan investigation firm to provide drone inspection for underwriting and claims. Drones provide faster and cheaper claims turnarounds through visual inspections and machine learning.

Embark has disrupted the small business insurance (SBI) industry by offering insurance options directly to consumers digitally. By 2020, e-brokers and similar digital disruptors stand to gain a 30% market share of SBI policy purchases. Larger insurers, as a result, now offer policies directly online.

Life Sciences[13]

Life Sciences CRM provider Veeva disrupted the industry by moving away from 3rd-party data purchasing to a data sharing model with the product OpenData. With OpenData, companies can share data with other subscribers rather than paying for specific datasets.

Pfizer has the potential to disrupt their industry by partnering with IBM Watson for Drug Discovery for cancer treatment research. Pfizer will be one of the first worldwide to use machine learning and other cognitive reasoning technologies to identify new drug targets and combination therapies.

Media & Entertainment[14]

Netflix disrupted the media and television markets by developing original content for their streaming entertainment platform. Netflix develops shows and movies, and suggests content, by using algorithms and its users' streaming data for insights to inform content creation and selection.

Retail[15]

Amazon has disrupted multiple retail segments, including with Amazon Pantry which fills and refills more than 2000 products, and its Dash Button, which connects to devices and refills and ships deliveries with one touch. With its Go Store opening in 2017, Amazon is driving a cashier-less and cashless retail and grocery shopping future.

Amazon is also capable of disrupting other markets in logistics and distribution, with its use of adaptive robots that fulfill orders 70% faster than non-automated warehouses, its plans to use drones for expedited and last-mile deliveries, and an app that matches truck drivers with shippers.

Telecommunications[16]

Verizon bought Fleetmatics and Telogis, telematics companies, to build out its enterprise logistics, workforce mobility, and fleet management offerings. This will disrupt traditional fleet management providers with the combination of technology and basic network connectivity. AT&T has similar business developments.

Travel & Transportation[17]

Airbnb, a sharing economy start-up, disrupted the hospitality industry with their design-centered approach by offering home-stays through their online platform, at prices and experiences competitive with hotels. Its valuation is higher than many hotels, without owning the real estate that it books, and it offers more rooms than some of the largest hotel groups.

With the CIoT world leaving few companies immune to disruption, companies need to take a course of action starting with adopting new competencies that can propel them into the future.

New competencies

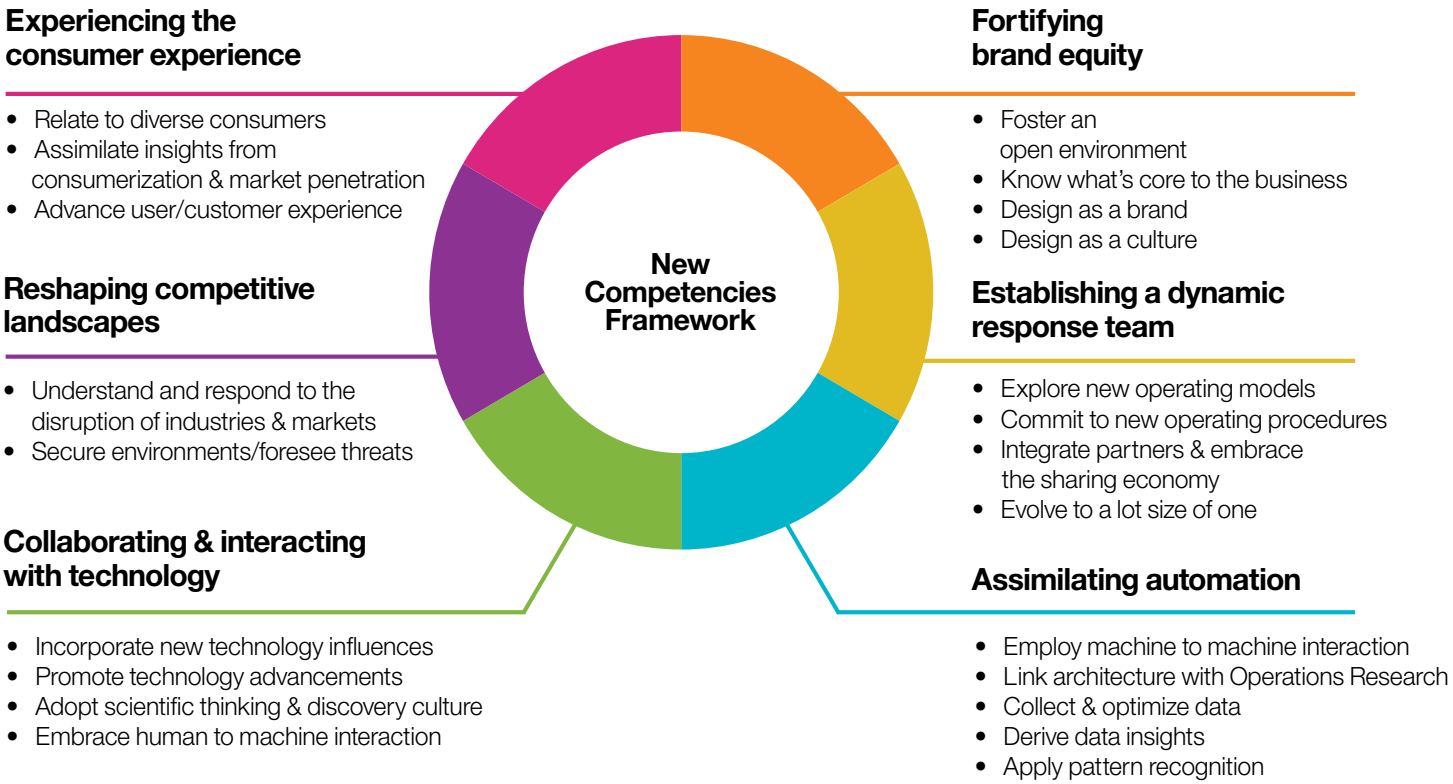
60% of IoT projects are internally driven.[18] The success of these projects rests with the adoption of new competencies. However, companies aren't prepared to tackle the IoT projects on their agenda. In a recent study, 77% of the business leaders surveyed indicated that the missing digital skills within their company is a hurdle to transformation.[19]

To address this necessity, we've defined a New Competencies Framework proven to enable a company to realize their goals. The new competencies and associated attributes fall into six categories outlined in Exhibit 3. These competencies will help companies disrupt traditional business models and allow early adopters of the framework to capture market share or enter new markets.

Each category has a number of competencies which organizations should acquire and foster. Tied to each competency are key attributes that help businesses identify opportunities, establish new operating disciplines, and measure performance. Notably, these competencies are not aligned to job roles or skills, but to capabilities that should be distributed across the enterprise.

The competencies and attributes for each category are outlined below.

Exhibit 3: New Competencies Framework



Experiencing the consumer experience

The competency category for experiencing the consumer experience highlights the need for intense focus on consumers' experience to remain competitive.

Relate to diverse consumers	Assimilate insights from consumerization & market penetration	Advance user/customer experience
• Establish communities and consortiums • Instrument and interconnect sensor data on products to monitor consumption and application • Establish social eminence/ relevance • Apply behavioral science	• Integrate technology for interactive experiences • Utilize IoT with other data (i.e. weather or location) to baseline environmental norms and prescribe actions • Build partnerships to embed product or service in other products' markets to gain insight and take advantage of their competencies	• Design and develop a consumable user interface • Establish visualization techniques to digest outputs from advanced algorithms • Create interactive capabilities to capture user sentiment in real time

Fortifying brand equity

The fortifying brand equity category builds on the power of reputation fueled by design to run and grow a disruptive business.

Foster an open environment	Know what's core to the business
• Engage with universities and development communities • Establish a collaboration platform that encourages swarm thinking • Recognize the value of crowdfunding, crowdsourcing, and hackathon sponsorships	• Articulate what the external world views as differentiating about the company • Align pricing strategies and commercial structures to differentiated product or service offerings • Utilize CIoT data to understand the radically changing environment
Design as a brand	**Design as a culture**
• Establish an intuitive product strategy focused on product end-use • Reimagine the consumer segment and reach of the product • Establish simplicity in the sophistication of the technology	• Establish design thinking capability throughout the enterprise • Utilize consumer data to drive higher margins via design • Use technology to enable a more agile and collaborative design culture

Establishing a dynamic response team

The competency category for establishing a dynamic response team requires an agile mindset and team culture to drive new ways of working.

Explore new operating models

- Redefine the value chain with new areas for value-added services
- Evolve make-to-stock to assemble-to-order or make-to-order constructs
- Infuse machine learning and cognition throughout execution and decision-making

Commit to new operating procedures

- Build or establish work teams with diverse backgrounds
- View technology as an extension of a co-worker
- Embrace business activity monitoring and automation
- Prioritize speed to market, including iterative design, development, and deployment strategies

Integrate partners & embrace the sharing economy

- Have a clear determination of insource, outsource, co-source
- Establish complimentary business models with third parties
- Build a symbiotic network with shared goals

Evolve to a lot size of one

- Develop flexibility within a structured supply chain
- Utilize ecosystem partners and technologies to develop value-added hubs closer to consumer
- Develop more real-time commerce for custom experiences

Assimilating automation

The assimilating automation category utilizes technological advancements to enable automation and data-driven approaches across the enterprise.

Employ machine to machine interaction

- Understand and build semantic models to facilitate communication
- Create dark API strategies
- Apply CIoT insights to optimize S&OP plans

Link architecture with Operations Research

- Understand the marriage between IT, OT, and supply chain execution
- Evaluate the need for customized and/or fabricated CIoT devices
- Establish CIoT command/control centers to derive greater operational insights
- Develop digital records for retrieval and integration with other data

Collect and optimize data

- Build data curation guidelines and standards
- Utilize cognitive APIs in conjunction with advanced analytics and semantic data models to solve complex business issues
- Interpret and integrate voice and facial recognition data
- Identify data monetization opportunities that optimize cost and drive revenue

Derive data insights

- Understand, develop, and apply machine learning concepts
- Incorporate unstructured and contextual data
- Build advanced algorithms via multiple numerical methods
- Translate outputs into business priorities and actions

Apply pattern recognition

- Examine and apply parametric analysis
- Develop simulation models
- Examine and analyze degradation and tolerances
- Model consumer behavior and demand signals

Collaborating and interacting with technology

The competency category of collaborating and interacting with technology promotes using technology to create new perspectives and new discoveries.

Incorporate new technology influences	Promote technology advancements
• Utilize IoT and emerging technology to augment human work • Identify dynamics where technology can address arduous or hazardous tasks that are more safely done by a machine • Search for value-added capability of technologies to enhance processes • Identify where the addition of technology creates new market opportunity	• Explore emerging technology patents and potential applications • Execute pilots for prototypes within existing operations • Tie emerging technology value with business outcomes
Adopt scientific thinking & discovery culture	**Embrace human to machine interaction**
• Prototype emerging technologies within operations versus only in a lab • Develop using: big data, IoT data collection and analysis, what if simulations, and predictive/prescriptive capabilities	• Redefine human engagements within traditional management systems to include machine recommendations • Build performance management systems inclusive of emerging technology contributions • Evolve culture to view technology as extension of self and as a coworker

Reshaping the competitive landscape

The reshaping the competitive landscape competency category focuses on constantly searching for new ways to utilize data and technology for differentiation, while maintaining a secure environment.

Understand and respond to the disruption of industries & markets	Secure environments/foresee threats
• Examine data monetization opportunities • Establish engagement vehicles that promotes bi-directional collaboration with consumers • Capture and process new customer sentiment and behaviors • Study market dynamics for potential oligopolies, for tangential product or service offerings, or new market penetration via differentiated data services • Utilize new technologies and existing industry expertise to explore opportunities for business model expansion	• Apply blockchain technology to CIoT architectures • Incorporate security protocols within communication, cloud, and edge architectures • Prevent, manage, and eliminate vulnerabilities within the business model • Apply organizational-level securities to elements of semantic data structures • Be aware of market dynamics and trends around security risks

Not every organization will need the same competencies in the same concentration. An organization's competency framework will be unique, and based on their markets and geographies served, their products/services end use, and their strategy and differentiation. Some degree of each competency will be required by most organizations. Half of organizations surveyed by MIT recognize they need to develop their talent base to take full advantage of IoT.[20] 56% of organizations surveyed are interested in taking advantage of IoT by hiring talent, 43% partner with another organizations' talent, 39% engage with consultants, and 23% outsource their IoT.[21] Within the cycle of disruption, new competencies are at the core of a company's success. As new competencies are mastered, new perspectives and approaches will emerge.

New perspectives and approaches

New perspectives and approaches abound as new competencies proliferate throughout the enterprise.

Throughout the cycle of disruption, these perspectives and approaches will fuel a new reality and drive greater adoption of New Collar jobs*, as shown in Exhibit 4.

*The term "New Collar" has recently been introduced to describe a new type of job.[22] New Collar workers are born out of the evolving nature of work made possible by CIoT. New Collar describes workers who don't have traditional experiences or education and don't necessarily have four-year degrees, but have the technical skills and practical experience needed to innovate and create new solutions using the latest technology. At some IBM centers, as many as one-third of the employees do not have four-year degrees. These workers may come out of high schools or vocational training, but most importantly, they can be employed in largely unfilled new roles in cybersecurity, mobile application development, and cognitive business.

Exhibit 4: Prominent, eminent, and developing new perspectives and approaches practices

		Prominent practices	Eminent and/or developing practices
Perspectives	**Employee-based**	• Four-year degree, university-sourced • Traditional recruiting methods • Training in emerging markets	• Tech-savvy veterans • New Collar* and P-Tech hires • Acquiring boutique firms for highly specific markets • Investing in future employment markets
	Crowd-based	• Proprietary operations and facilities • Acquiring capital from investors/ banks • Sharing economy for hospitality, transportation, employment, real-estate	• Manufacturing and supply chain as-a-service • Acquiring capital through enterprise-level crowdfunding • Sharing economy for operations, product development, sales and marketing
	Culture	• Job-role families • Knowledge developed locally (by geo or BU) and transferred • Performance aligned to internal objectives • Work and lifestyle co-exist	• Project-based teams • Knowledge is developed collaboratively and shared • Performance aligned to the external experience • Work integrated into lifestyle
Approaches	**Data-sourcing**	• Data historians • Data warehouses • Data lakes	• Data harvesting • Data as-a-service as a means of acquiring and utilizing data (ex. CrowdFlower, LinkedIn)
	Role of technology	• Technology as a utility • Technology as an enabler	• Technology as a co-worker • Technology that learns and recognizes (ex. IBM Watson)
	Methods of work	• Agile • Six Sigma • Waterfall • Kanban	• Digital replicas (ex. Trimble and Microsoft Hololens) • Mixed reality for learning and executing
	Hyper-local fulfilment	• Global sourcing • Expedited shipping of make-to-stock products • Co-location and co-development based on location of facility	• Network of microfactories, enabled by 3D printing, injection molding, and automation • Co-location and co-development based on consumer proximity
	Command & control centers	• IT/OT integration for operations	• System of systems within the technology stack (i.e. CIoT)

As new perspectives and approaches emerge, new competencies will begin driving new ways of working.

New ways of working

Cyber-physical systems, Industrie 4.0, and the affordability and advancements in instrumentation and mobility have reshaped how work is performed within operations, supply chains, and commerce. Consequently, consumer data and insights have had a greater influence in the making and selling of goods and services. Organizations must discover new ways to satisfy consumer demand and respond to consumer sentiment. These new competencies are required to respond to this challenge. Emerging technologies must be employed in concert with these new competencies to realize economic optimums.

Emerging technologies are the enabler behind the new ways of working. Patents related to emerging technologies have increased 12x since 2010.[23] Adaptive robots, wearables, cognitive, digital manufacturing, and drones are a reality changing every business. Adaptive robots are emerging as low-cost, flexible solutions that can safely work alongside humans while changing how work is performed and increasing productivity. Wearable technology such as smart watches, smart clothing, and head-mounted displays contribute to new data sources and interfaces, and drive new business processes and operating models. CIoT provides a competitive advantage with richer experiences and insights, offsetting constantly changing market dynamics.[24] Digital manufacturing techniques such as 3D printing has made it possible to manufacture customized products, enabling breakthroughs in industries from healthcare to aerospace. Drones are changing the way business is done by automating processes and providing real-time visual feedback. Industries are quickly applying emerging technologies in a variety of ways. For example, according to a KPMG study, in the construction industry alone, 42% of construction businesses use drones to monitor sites, 30% use robotics or automated technology, 65% use remote monitoring, and 17% use smart sensors on employees.[25]

The combination of new competencies and emerging technologies creates opportunities to disrupt and fundamentally change how traditional processes are executed. Exhibit 5 illustrates how pervasive the new ways of working will be.

Exhibit 5: New ways of working—processes of the traditional supply chain likely impacted by emerging technologies*

Shipping & Receiving
- Picking
- Delivery processing from distribution centers
- Trailer processing
- 3PL to 6PL integrations
- Packaging
- Container track & trace

Inventory Management
- Obsolete inventory
- Inventory monitoring
- Threat protection
- Inventory turns
- Consignment inventory

Manufacturing
- Energy management
- Assemble to order
- Availability checks – raw/semi
- Repetitive manufacturing
- Route determination

Quality Management
- Field testing/samples
- Dispensing hazardous/dangerous goods to manufacturing areas
- Flame retardant testing
- Laboratory information management system (LIMS) integration
- Root cause analysis

Environmental Health & Safety
- Employee health monitoring
- Waste management
- Corrective/preventative actions
- Employee location
- Hazardous substance management

Order/Invoicing
- Returns processing
- Customer specific instructions
- Rebate/discount programs
- Campaigns
- Transportation planning & management

Warehouse Management
- Tank farm management
- Returnable containers
- Container loading
- Inspection process
- Put-away strategies

Maintenance & Reliability
- Maintenance notifications
- Predictive maintenance
- Capacity planning and leveling
- Warranty management
- Overall equipment efficiency

Business Finance
- Inventory reconciliation
- Utility costs
- Fixed asset accounting

Demand, Supply, & Production Planning
- Campaign sequencing
- Safety stock planning
- Service level management

*These are a selection of operations impacted by emerging technologies such as: drones, CIoT, wearables, digital manufacturing (3D printing, injection molding, CNC machining), adaptive robotics, etc.

In the CIoT world, working in a new way implies executing processes at a lower cost with a higher return. To operate at this level, the swift application of new discoveries and advancements is critical.

New discoveries and advancements

The application of new discoveries and advancements offers many potential near-term benefits. They include:

1) Increasing the quality, value, performance, and utilization of a product or service, as well as reducing the risk of a product or service.

2) Uncovering opportunities to enter new markets by developing new applications and/or new ways of consuming a product or service.

3) Creating new value and new returns for a company and its consumers.

Exhibit 6: The three benefits of new discoveries and advancements[26]

New quality, performance, and value	3D printing has made it possible to manufacture products in new ways, enabling breakthroughs and personalization in industries from healthcare to aerospace. For example, Ford manufactures parts for Mustangs in a cost and time effective way, and at a higher quality than traditional methods allow.
New markets, product derivatives, end uses	Genome sequencing for data and insights is being used to forecast and mitigate health risks. As the use cases proliferate beyond their original intent, there will be use cases from fetal screenings to job applications. Genetic information will also impact insurance and data security.
New ROI	The automotive industry is finding new ways to enable connected vehicles. For example, Toyota and Kymeta Corp have tested a satellite antenna system of modules on the car's roof that send data at broadband speeds, providing secure links and access for vehicles in remote locations.

To realize the full impact of new discoveries and advancements, a company must commit to many of the competencies within the New Competencies Framework. Only through employing many of these competencies collectively can a company increase quality and performance, penetrate new markets, or develop new end uses and achieve new returns. There are companies that have fully committed and embarked on this transformational journey, strategically positioning themselves to realize new outcomes.

New outcomes

Across industries, companies have leveraged new competencies to create new outcomes. They have repositioned themselves in their respective markets, and, in some instances, in new markets as well. These companies are now positioned in one of three categories.

1) **Making markets** to create new markets of untapped demand.

2) **Making their competitors irrelevant** to become the company to beat in their market.

3) Becoming the **keystone of their ecosystem** to provide platforms and services that make their company and customers more valuable as their ecosystem grows. Their competitors may even need to use their data and services to compete.

Exhibit 7 highlights examples of such companies and their transformations.

Exhibit 7: New outcomes from new competency-enabled transformations[27]

Market Maker

Rent the Runway: This fashion on-demand start-up created a new offering in the fashion industry by renting designer apparel and accessories in a vertically integrated system that maximizes the lifetime of fashion items. They use data to improve purchasing recommendations and decisions, and share that data with their suppliers. It has leveraged competencies in new operating models, the sharing economy, disruption, and data by developing a warehouse management system, an analytics model supported by New Relic, and sharing economy options for deliveries.[27]

SpaceX: This rocket company, founded in 2002, became the first privately-funded company to put a payload in Earth's orbit. While other rocket, national, and military contractor companies compete with SpaceX, this smaller company continues to lead the market it created with its lower, fixed-price launch costs and its plans to reuse and re-launch its rockets. It makes changes to rockets on the margins, not the core technology, by making modular rockets primarily on the factory floor, reducing outsourcing costs. SpaceX leverages its founder's entrepreneurial and bold agenda and technological competencies.[28]

Venmo: This financial transaction company, now owned by PayPal, created an untapped market for peer-to-peer payments enhanced by social media and mobile. They tapped a market of younger users who prefer digital financial accounts and transactions, registering over $1 billion in transactions in January 2016. Venmo, by leveraging competencies in integrating technology into the consumer experience, designing a consumable UI, and understanding the benefits of partnerships, has integrated third-party apps, and its app is opened by users frequently to view a newsfeed of their friends' interactions.[29]

Making Competitors Irrelevant

OPower: This start-up, founded in 2007 and recently acquired by Oracle, has created the world's largest residential energy data set with 60 million utility customers for over 100 utilities clients. OPower offers a full-suite of customer-centric applications with automated data checks and personalization. OPower leveraged strengths in user experience design and behavioral science to interact with customers.[30]

Precision Hawk: Precision Hawk provides drones and information systems used to conduct aerial surveys in support of the mining, agriculture and real estate development industries. The use of drones is displacing more traditional surveying mechanisms in favor of lower cost, lower risk procedures. Precision Hawk leverages advanced and user friendly data analysis tools to engage their customers with the drone imagery. It is the chosen company to develop and test an air traffic control system for the U.S. airspace in partnership with NASA, Verizon, the U.S. Federal Aviation Administration, and others.[31]

DocuSign: This cloud-based document and eSignature company has dominated its market by starting in real estate and expanding across industries. By enabling remote document signing, DocuSign expedites processes and convenience for its clients and 100 million users on its network. DocuSign has focused on its SaaS and API offerings to enable growth, and is planning a payments offering. The company's competencies in disrupting its competitive landscape has served it well as a digital transformation partner.[32]

Keystone of the Ecosystem

John Deere: This agriculture leader has built an industry cloud platform, SageInsights, for precision farming analytics capable of gathering and analyzing machine-to-machine and sensor data, among other data sources. John Deere focused on data collection and analytics, and customer productivity and experience to become transformational in their market and essential in their ecosystem, including having competitor farming companies using their data.[33]

Freelancer: Freelancer.com is the world's largest freelancing, outsourcing, and crowdsourcing marketplace by number of users and projects. They connect over 22 million employers and freelancers globally from over 247 countries, regions, and territories. Through the marketplace, employers can hire freelancers to do work in areas such as software development, writing, data entry and design right through to engineering, the sciences, sales and marketing, accounting, and legal services. Freelancer increases the value of its customers as they gain talent, and their business benefits in the process.[34]

Square: Square has become a key partner for small businesses in payment processing, inventory management, and other offerings in a traditionally under-served market. This company has taken a comprehensive approach to serving its clients, and leveraged competencies in user experience and data extraction and insights to better serve them. For example, Square can offer loans to small businesses, which it already has rich insights on from its payment processing tool. It also acquired food delivery apps Caviar and Main Line Delivery to offer delivery management and payment processing to its restaurant clients.[35]

While 69% of CEOs are actively pursuing opportunities to play a new or different role in their ecosystems, most aren't doing what it takes to be transformational.[36] As companies adopt new competencies for the CIoT world, they can achieve the outcomes desired.

Conclusion

The connected age is impacting every industry. Disruption and transformation will continue to occur at an ever-increasing pace. Adoption of the New Competency Framework unleashes new perspectives and approaches, new ways of working, and new discoveries and advancements to ultimately achieve new outcomes. The companies causing disruption in today's industries rely on the confluence of their competencies paired with emerging technologies to achieve greater ROI. As companies incorporate these new competencies, they can expect transformational changes and new outcomes.

Are you and your organization ready for your future? Exhibit 8 contains questions regarding your company's readiness for disruption. As you read each question, use the New Competency Framework to determine which competencies you should add to strengthen your market position.

Exhibit 8: Are you ready for disruption?

- Do your current competencies embrace an outside-in perspective?
- Are you confident in how effective your design is in sustaining your customer engagement?
- How does your vision, strategy, and standard operating procedures equate to market perceptions of your brand?
- What are the five ways that your machine data can be leveraged for market disruption and how does your workforce enable that differentiation?
- Do you have a strategy to make your competitors your customers using data?
- Do you know how your vulnerability management strategy drives differentiation in your market segment?
- Do you have the requisite skill and capability to utilize emerging technologies to develop a highly flexible supply chain?
- How do you dynamically adjust business rules (ex. pricing, partial pallet shipments) in response to real-time consumer interaction?
- How does your CIoT architecture foster collaboration and discovery across internal and external channels?
- How are science and CIoT combined to reinvent how performance is measured and benchmarked?

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