Three Macrotrends Impacting the Journey to 2030

Super Humans, Fluid Organizations, and Enlightened Ecosystems




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KALEIDO INSIGHTS

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Introduction

The pace of change driven by technological advancement isn't just accelerating, it's widening. The scope of this change simultaneously defines our age as well as how we manage life and work. In this introductory report from Kaleido Insights, we explore technology's impact on the evolving relationships among humans, businesses, and their ecosystems, crystallizing the innovator's path forward.

The advent of the Internet and digital have changed the world, while organizations struggle more to keep up––nevermind, get ahead. We're surrounded by a proliferation of devices and interfaces; an untold velocity of data generation and networked services; and an ever-shifting tessellation of new capabilities and bright shiny objects. To innovate is no longer a choice, it is imperative.

Meanwhile, businesses are told this technological disruption is both their future and their biggest threat. This report offers clarity amidst the chaos as we provide a three-tiered methodology for analyzing technologies not as fragments, but in patterns of impacts. These impacts affect humans, businesses, and the ecosystem at large, the foundation for three macro trends relevant to every organization:

First, technology is enabling people to evolve into **Super Humans**. Born in the age of social media and accelerated through mobile, consumers' ever-expanding toolkit of capabilities renders individuals more powerful than ever before.

Second, nimble and **Fluid Organizations** are those that survive. Early efforts in digital transformation reveal why shifting competitive forces requires agility and fluidity across systems, internal culture, and within innovation programs themselves.

Third, **Enlightened Ecosystems** are the result of digital convergence with the physical world-- as distributed systems, machines, and supply chains become more integrated, interconnectivity across ecosystems is forging intelligence more powerful than any single human or business.

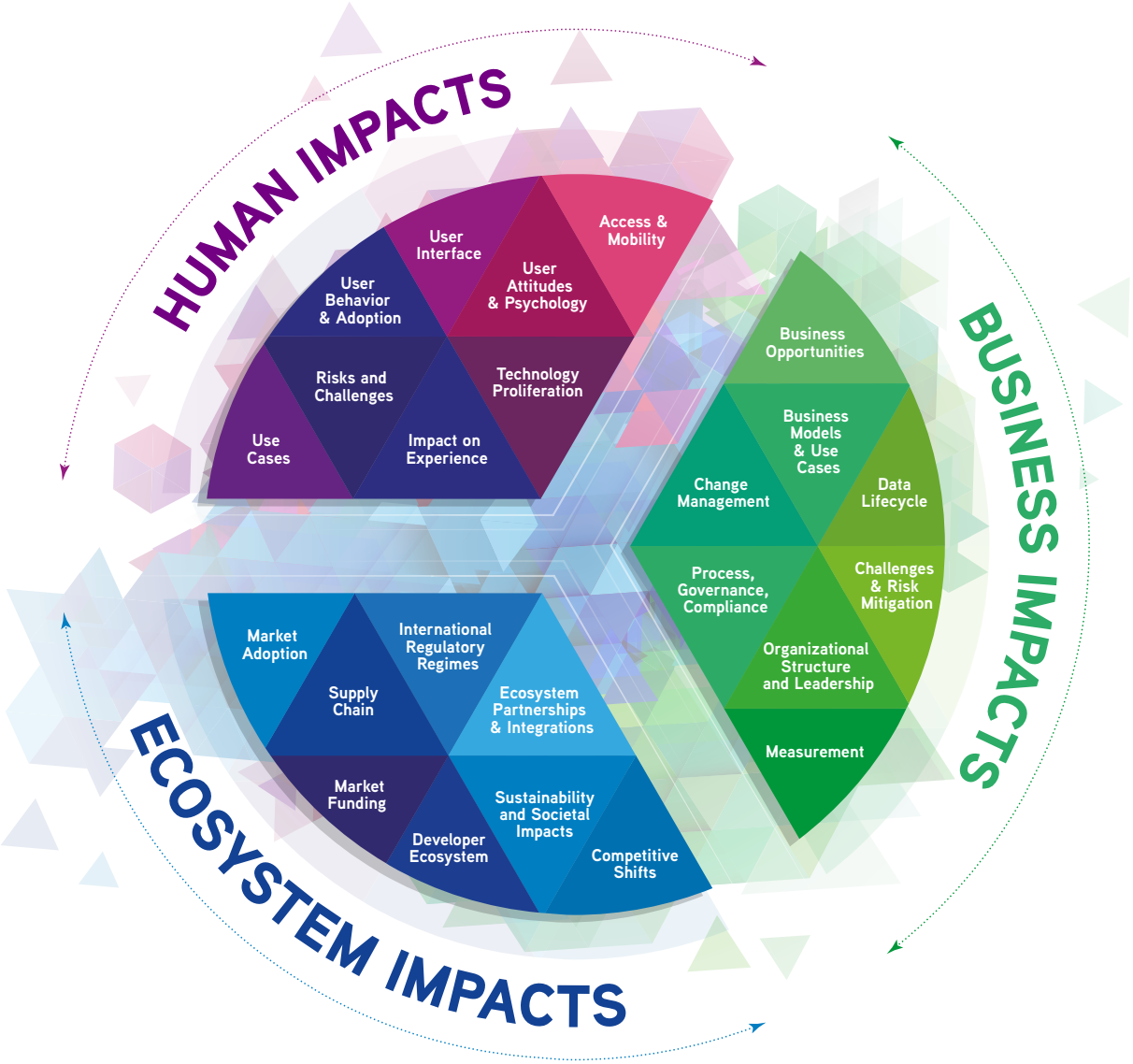
Within each of these trends, Kaleido analysts surface key implications and offer clear direction on how to apply insights to help organizations participate. Our objective is to distill sanity and strategy from the noise, transforming the "kaleidoscope" of technological disruption into a clear vision for innovation.

Our Approach

Kaleido Insights' mission is to help companies foresee, decipher, and act on technological disruption with agility.

Our research methodology defines our approach: amid ongoing technological change, we identify the constants--your users, your business, and your ecosystem--and apply deep impact analyses across each area.

FIGURE 1 KALEIDO INSIGHTS' METHODOLOGY FOR IMPACT ANALYSIS



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Like a kaleidoscope, multiple impacts reflect myriad patterns. Diverse technological advancements, shifting customer expectations, and ever-dynamic external forces constantly create new challenges and new ways for companies to proactively react to these changes. Rotation of the full picture --disruption-- creates motion, and a new way to view norms. Within this methodology lie thousands of combinations for impact assessment, across countless products and services and industry applications, regardless of the technology or disruption du jour.

To bring our methodology to life, what follows is a deep overview of three macrotrends Kaleido Insights has identified that impact everyone.

Trend 1. Super Humans: Empowered Users Feel the (Super) Powers

Today's superheroes don't need capes. They have smartphones, smartwatches, and voice-controlled devices that grant them super-human powers. Armed with virtually unlimited, on-demand information, consumers augment their human abilities, transforming themselves into "Super Humans" with the tap of an app, touch of a screen, or voice command. They're faster than the companies they interact with and expect no less than on-demand everything.

Super Humans access information they need, anywhere, at any time. Mobile devices are now Super Humans' primary tool. Tomorrow's toolkit is filled with virtual robotic assistants, wearables that augment physical environments, even biometric implants that utilize real-time data streams to deliver recommendations and preemptive services.

Super Humans demand a new type of corporation that not only meets their needs but predicts their future state and delivers before need arises. With personalized, on-demand AI agents at their beck and call, Super Humans' expectations rise for companies to deliver equally efficient and individualized products and services. This necessitates a significant corporate shift toward a more nimble internal culture that prioritizes fast-paced innovation.

Incremental Innovation Democratizes User Technology, Creating Super Humans

From call to text, or text to voice, consumers quickly master new technology innovations as their base understanding of interfaces builds over time. As they shape their surroundings, experiences, and interactions with seamless assistance from their technological sidekicks, they feel their intelligence augmented, analogous to a cyborg-human.

The ability to personalize and shape one's experiences comes at a price, paid in data. Corporations have many opportunities to collect and act on customer data in order to craft hyper-personalized interactions, but must

do so with caution, integrity, and consent. Research shows that consumers rarely know how data is sold and shared,[1] and are not comfortable with their data being sold between companies without express consent.[2] Yet as Super Humans develop a taste for power, other studies show they are more comfortable sharing their data in exchange for tangible value,[3] such as improved security, cost reductions, or personalized content.

Artificial intelligence (AI) represents the next frontier for Super Human adoption and offers great opportunity for corporations looking to further augment customer interactions. While today's consumers have very mixed feelings about AI,[4] tomorrow's Super Humans may come to value their technology-enabled superpowers so much, they welcome AI into brand and personal interactions, so long as systems deliver on expectations.

Case in Point: E-commerce retailer Spring offers a shopping concierge bot powered by Facebook Messenger

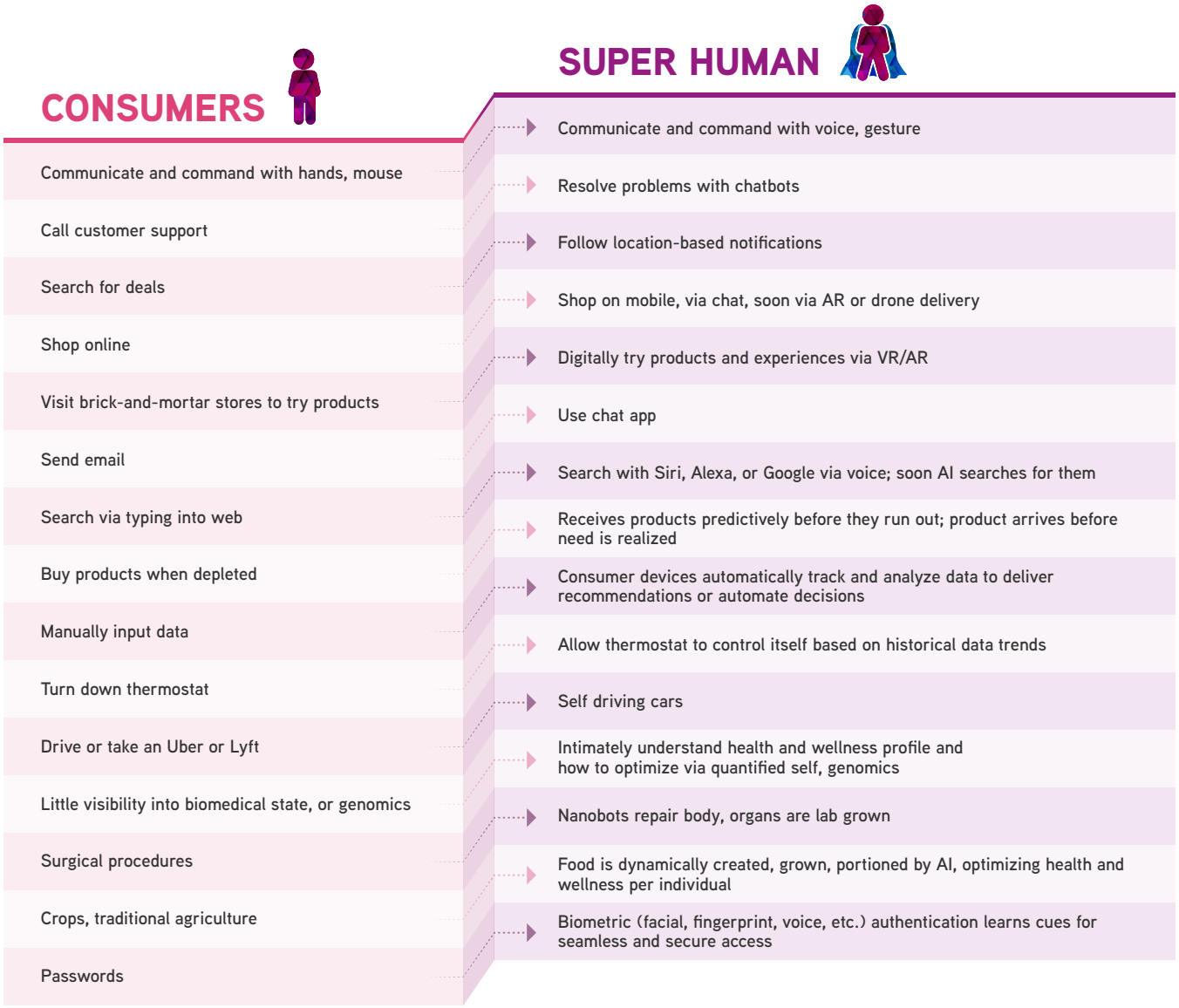
Retailer Spring offers customers an online shopping assistant in Facebook Messenger, powered by the social platform's send/receive API. Customers can cycle through a series of conversation-based questions that take them through product categories, specific product choices, and pre-determined price ranges. Eventually, Spring presents a series of three to five products for purchase and redirects to an e-commerce engine for checkout. The customer's receipt is promptly delivered via Messenger before the bot bids adieu. Future Super Humans won't care if their transaction is led by a robotic sales associate so long as they find what they want, and the experience is efficient, respectful, and enjoyable.

Case in Point: Chinese grocery store Yihaodian built 1,000 virtual shops in public places using augmented reality (AR)

China's largest online grocery store, Yihaodian, built over 1,000 virtual shops in public places, offering augmented reality (AR) shopping experiences on mobile devices. Customers who downloaded Yihaodian's app could browse and shop in these virtual stores. Once goods were purchased they were directly delivered to customer homes. Through its virtual, on-demand storefronts, Yihaodian set a Guinness World record by selling 2 million boxes of milk in less than an hour.[5] Yesterday's customers visit grocery stores for essentials like milk; today's customers shop online; tomorrow's customers pick up milk via an AR store at the bus stop.

We're already witnessing consumers (and employees) transitioning to Super Human state through a range of behavioral shifts enabled by technology:

FIGURE 2 CONSUMER VS. SUPER HUMAN BEHAVIORS



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"Invisible" Interactions Enable Super Human Evolution

As consumers become increasingly connected, sharing data and interactions with devices and networks and also the infrastructure around them, brand services will become so seamless as to effectively become "invisible." Screens eventually disappear from user experiences as AI combined with IoT devices ease controls with natural gesturing, biometric authentication, voice recognition and understanding, and predictive behaviors. Machine learning in conjunction with devices and the Cloud increasingly push friction away from user interface. Data sets driving personalization are also invisible to end users.

When devices communicate and learn from others products and services around them, pulling historical and real-time data to enhance context, Super Humans' powers to act and make decisions dramatically increases.

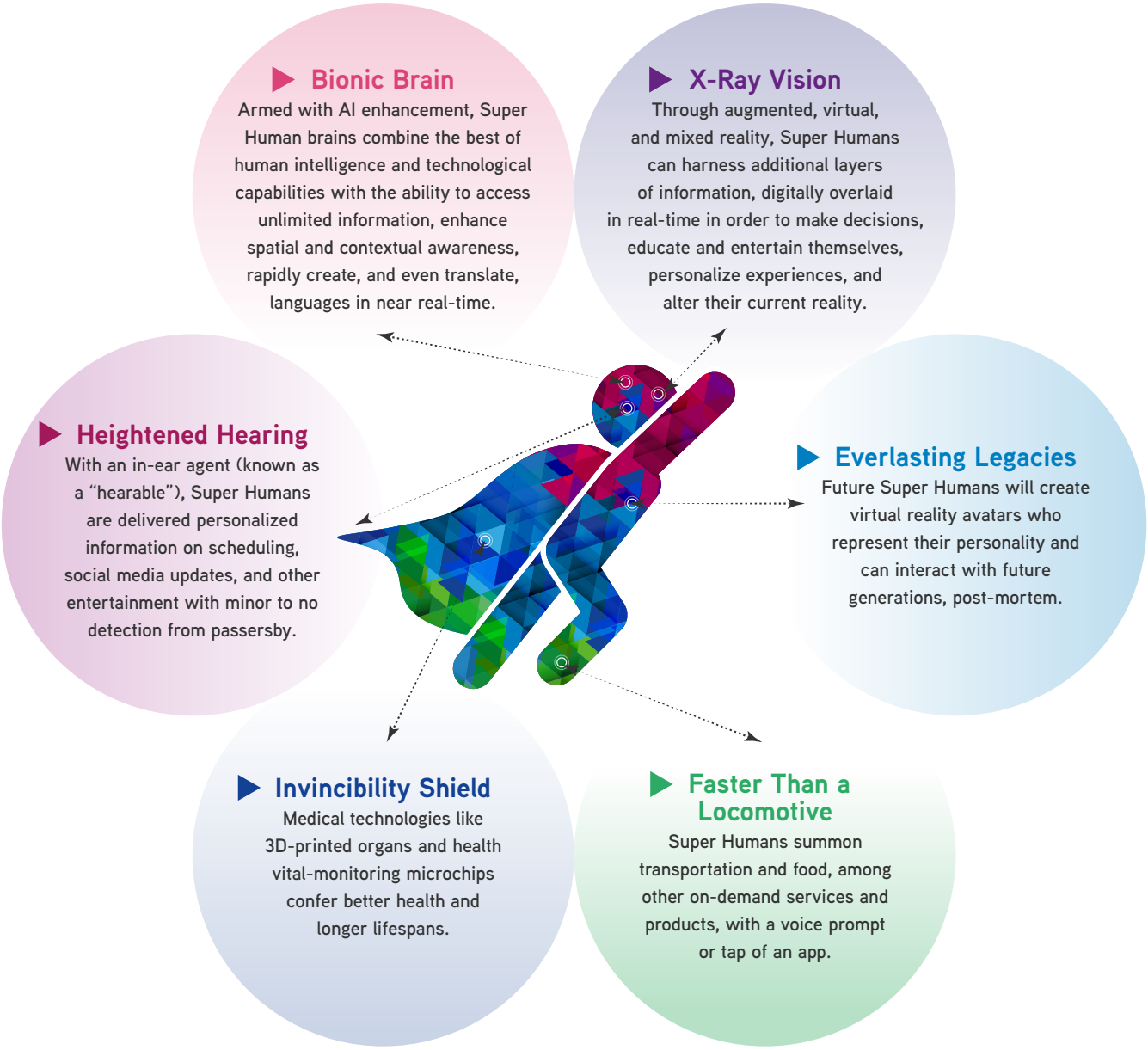
Hyper-personalization becomes table stakes for companies hoping to remain relevant in the individually crafted worlds of Super Humans. This new state of Super User Centricity will permeate not only the brand-consumer interaction economy but also that of employees and employers. "Super Employees" are boosted on the job with AI enhancement and robotic assistance, sometimes called Augmented Intelligence, to become more efficient, smarter, and safer. Human + AI = the strongest employee.

"Today we have data at our fingertips; tomorrow we'll have knowledge at our fingertips."

Case in Point: Quiet Logistics pairs robots and humans for greater warehouse fulfillment efficiencies. Quiet Logistics is deploying Locus Robotics robots to work alongside humans as a way to boost warehouse productivity by as much as 800%. The decision to "employ" robots to augment employee tasks was born from rising consumer expectations of on-demand deliveries and the need for a quicker turnaround on the warehouse floor. Locus bots retrieve online orders from the warehouse at the pace of a "brisk walk," then deliver orders to human workers who box and ship them for delivery.[6]

Today's Super Humans rely on the technology companies that provide infrastructure, platforms, and data foundation. Empowered Super Humans of the future will become so technologically enhanced that they will assemble through the same commodity software and hardware to develop their own distributed infrastructure. What happens when customers (or employees) become more powerful than the organization? They already hold more power than brands that don't innovate. When acting as a unified front, there's greater potential risk to disrupt entire business models and transactional ecosystems. Bitcoin, anyone?

FIGURE 3 ANATOMY OF A SUPER HUMAN



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Trend 2. For Fluid Organizations, Strategy Equals Agility

Fluid Organizations constantly change to adapt to market changes. By contrast, companies of the past-- rigid companies--are like a rock in the river. While they divert water, the water is actually eroding them, a granule at a time. As companies of all types undergo digital transformation, they are forced to shift from analog, fixed, and slow-to-adapt models of the past, to highly adaptable, dynamic models-- models enabled by digital technologies and interfaces. The water represents technology and digital innovation, a constantly moving force that envelops anything in its path.

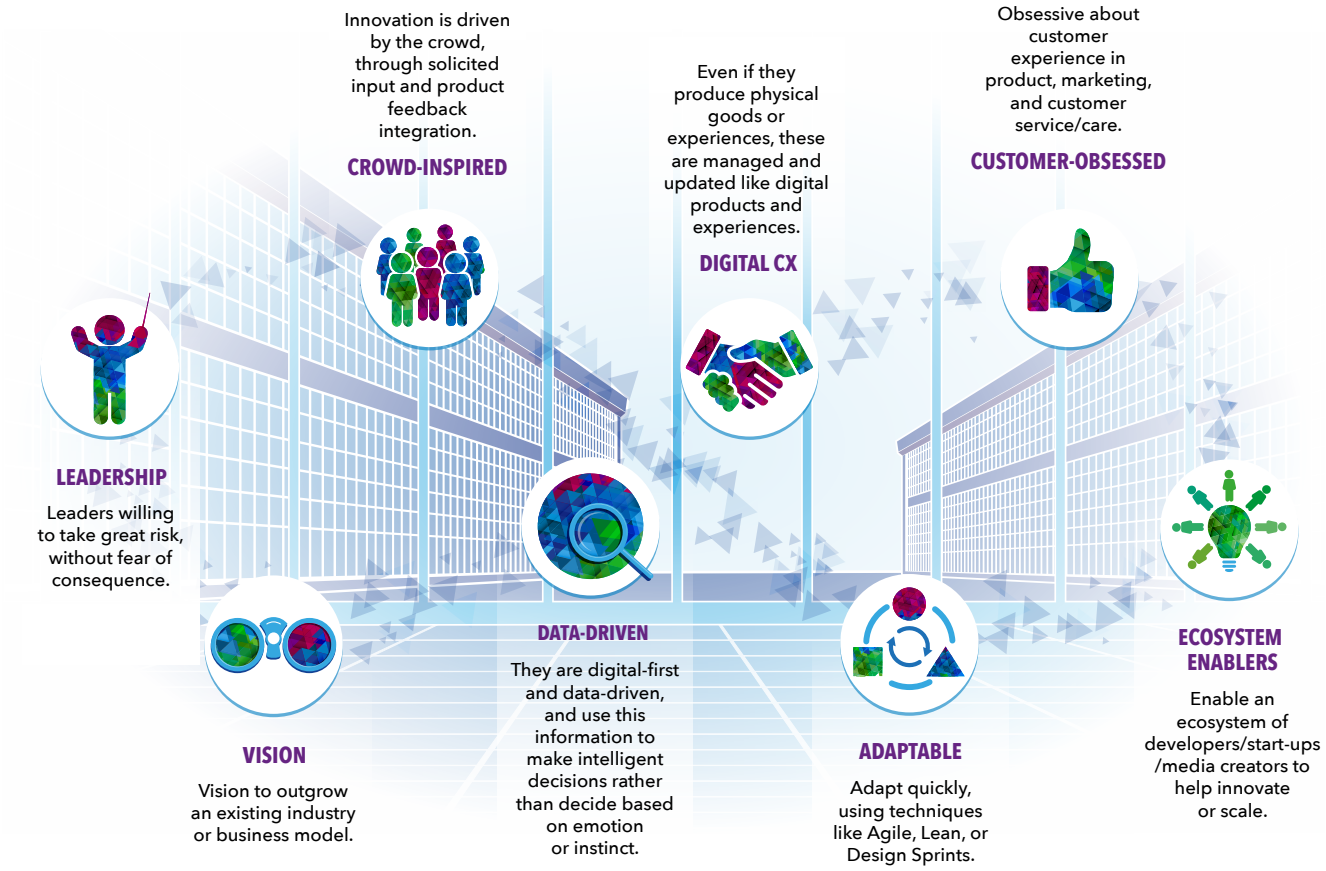
Kaleido analysts look at Fluid Organizations like Amazon, Tesla, Google, GE, and others to identify common traits. These traits encompass the whole of an organization, and infuse cultural and structural areas like leadership and governance, strategic areas such as product and business model innovation, as well as functions and lines of business themselves.

Fluid Organizations go through a three-phase metamorphosis. They must be "digital first,' digitizing processes, products, and services. Next, companies realize digital isn't fluid enough; they must invest in longer term corporate innovation programs to stave off disruption. The third phase is marked by integration of both innovation data strategies across ecosystem partners.

Understand the Architecture of a Fluid Organization

What makes an effective companies so effective is their ability to adapt. In the digital age, adaptation is a function of agility-- in leadership, teams, workflows, customer experiences, and innovation itself. Data strategies underpin secure 'circulatory systems' governing how data are collected, processed, and leveraged, but cultural transformation and innovation strategy are equally, if not more critical for Fluid Organizations' success.

FIGURE 4 ARCHITECTURE OF A FLUID ORGANIZATION



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From Rigid Structures to Digital Fluidity & Agility

Traditional companies were designed in the industrial revolution: a linear manufacturing process designed for a high volume of consistent goods. Traditional companies are changing their DNA by becoming digital organizations, enabling an internal culture of change, then bridging with their direct ecosystem to sustain long-term innovation. Essentially, they're shifting from rigidity to fluidity.

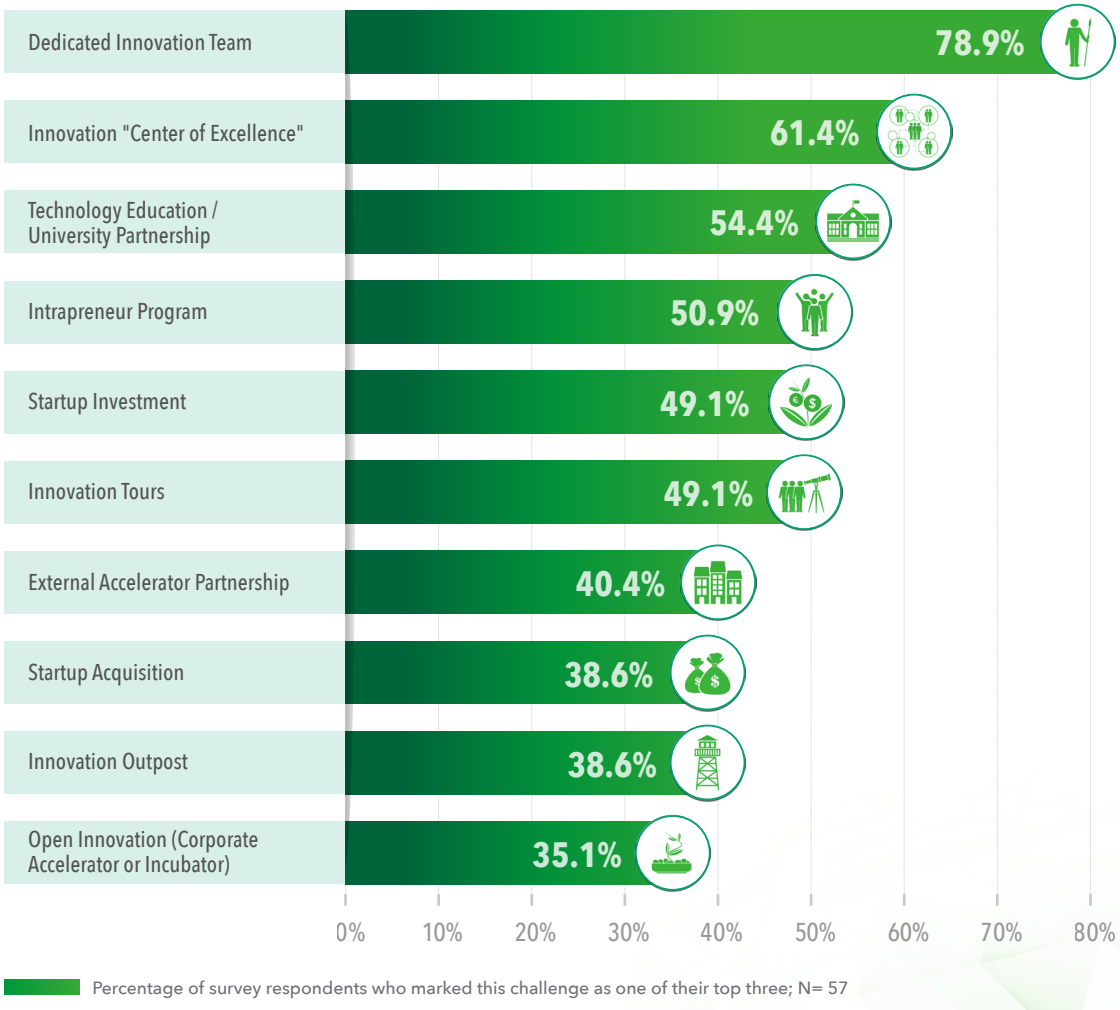
Phase One: Organizations digitally transform, function by function. Companies are shifting analog processes to become digital. Some $1.2 trillion will be spent on digital transformation in 2017, and will only increase in coming years, according to IDC.[7] As companies undergo this transition, they turn use software systems to track and manage processes, and analytics to measure and improve how they operate. Most often, digital transformation of consumer-facing organizations is led by the marketing group: a mid-level leader that often has customer experience background sees important market changes that need to be addressed, proposes a plan, and obtains CMO blessings. In some companies, often in B2B, CIOs or change agents in IT lead digital transformation, typically pertaining to back-of-house systems like data warehouses, dev-ops, or security.

Companies are also realizing the goal-post of what can be digitized is moving as new technologies unlock new ways to digitize interactions, physical assets, and workflows. This makes digital transformation an ongoing effort. Without destination, digital transformation is less about technology and more about people.

Phase Two: Invest in longer term internal innovation programs. As organizations continue to undergo the digital transformation process, the limitations of siloed digitization come into focus. Digital efforts concentrated in a single business function-- marketing, for example-- only underscore these limitations. Even as data from disparate departments help streamline decision-making in those departments, value is limited if insights are not distributed across an organization's own programs. How can new business models and efficiencies emerge when functions, albethey digital, are still disjointed? Companies then realize long-term investments must be made to establish a shared culture of change; the agility to fluidly act on the digital landscape.

This realization often paves the way for 'corporate innovation' programs. These span multiple business units, and typically focus on larger programs, experiences, and products for the company to champion instead of single initiatives or pilots. For example, they set up or cross-functional centers of excellence that work with various business units, dedicated teams that experiment with technologies in a lab setting, or intrapreneurship programs that enable all employees to contribute new product ideas.[8] These programs are often cross-functional, span multiple geographics, and launch innovation programs for products, customer experience, operations, or entirely new business models. This is essential so that innovation program findings aren't limited to single groups.

FIGURE 5 10 TYPES OF CORPORATE INNOVATION PROGRAMS



Adapted from Crowd Companies research, 2016. Kaleido Insights, October 2017.

The most important change to the company isn't technological adoption but the cultural dynamics of adapting and adopting. As champions step up to lead the program, they start to bridge multiple business units, both in terms of multiple data streams and culture. Once companies bridge internal business units functionally and through shared data, reporting, and insights, they're able to move at a faster pace. When networks of people and systems are connected, companies can see (and adapt) the customer experience from a holistic viewpoint, rather than through the fractured lens of business unit silos.

As organizational culture shifts and the C-suite mandates "Digital First," a deeper realization sets in: traditional business models must change to avoid disruption.

Phase Three: Companies connect to their external ecosystem for continued, scalable innovation. In the third phase, companies continually innovate through a pipeline from outside startups, partners, and developers. Some organizations set up 'open innovation' programs that issue challenges for the community to work on. They work with citizens, business partners, and the crowd to solve customer, business, and societal challenges, as exemplified in Visa's and GE's Open Innovation Programs.Others launch labs that enable an ecosystem of startups to continually innovate close to their brand.

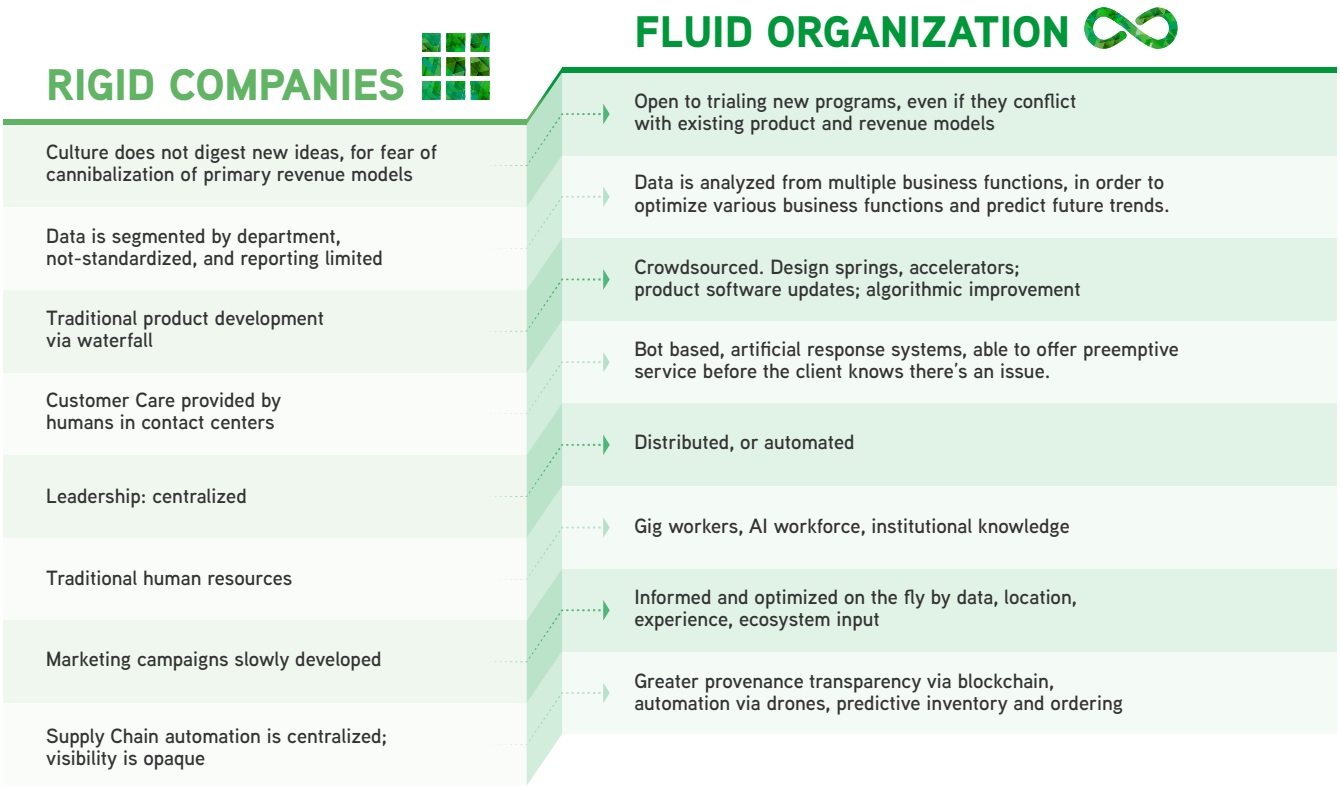
Case in Point: Johnson & Johnson' JLABS provide the resources for others to innovate.
With labs in nearly a dozen cities, they offer (otherwise costly to acquire) facilities, high-end equipment, year-round curriculum, and resources for start-ups to conduct scientific research and experiments for a fixed monthly cost. Companies must complete their work within 2 years, during which time JNJ may choose to invest but are not given to equity.[9] The objective of these labs is simple: to do good science. This common goal extends benefits across the ecosystem: young companies access world-class resources while maintaining entrepreneurial freedom, economic benefit for nearby communities, JNJ gains inspiration, and better pharmaceutical product and techniques benefit us all.

Companies like Nestlé set up 'innovation outposts' in Silicon Valley to connect to startups, sense the latest trends, and conduct proofs of concept. Even Apple, which prides itself on high-quality design from its own internal teams, relies on outside third-party developers and media creators for their app platform and iTunes platforms. Elon Musk has open sourced battery and Hyperloop designs in order to foster an ecosystem of innovation around the brand.[10]

"What is critical is that internal culture is open to a continuous flow of outside ideas."

Data strategy is the technology foundation for Fluid Organizations. Equally important as cultural shifts and innovation program development is the infusion of the organization's data strategy into optimization at each level. Integrating systems across departments is a first step, but this must go beyond integrated reporting and dashboards. Companies must develop products as services that continuously learn from interactions and use insights to improve the algorithms that power those products and services. Fluidity in data strategy is marked by the ability to design products and architectures that automatically learn, triage, self-optimize, self-heal, even self-update. Whether at the product level, functional level, or organizational level, a fluid data strategy effectively automates innovation.

FIGURE 6 RIGID COMPANIES VS. FLUID ORGANIZATIONS



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Interactions, Intelligence, and Innovation Flow Across Organizations

To become fluid, companies must be able to see coming technologies, experiment fast, and implement nearly at the speed of a startup. The reason they can do this is because they're data savvy, and can connect disparate data sources to visualize a single view, a shared reality of all operations. Fluid organizations are equipped to quickly deliver core teams the information they need to act quickly. Over time, the duties of the CDO and CIO will be spread to nearly everyone's job. As machine and deep learning permeate business functions, particularly IT and product, products and systems themselves become self-learning and self optimizing.

In 2-5 years: **The Scramble.** Corporations will try to quickly integrate digital into their programs and business processes. Marketing team will often lead, but unless connected through the entire customer and product lifecycle, it will fail. Sometimes, partners will make the transition and help them to stand up against the Fluid Organizations.

In 5-10 years: **The Die-Off.** Companies that don't make the pivot will fall, as we've seen with retailers. The market will purge these companies as digital and new automated business models quickly rise.

In 10+ years: **The Adapters.** The companies that can survive likely be able to withstand for the long haul. They will sustain over decades as they've digitally converted their companies, fostered a culture and data strategy of innovation, enabled by their ecosystem for continual growth.

As companies approach digital transformation and corporate innovation fluidly, with adaptive data strategies supporting both, the lines between digital or innovation blur. An "innovative" company becomes synonymous with one that opens itself to digital strategies.

Trend 3. Enlightened Ecosystems: The Convergence of Physical & Digital Demands Radical Ecosystem Integration

Enlightened Ecosystems are a future state in which the integration of distributed digital and physical systems forges an intelligence more powerful than any human or business.

In the physical world and nature, interconnectedness is more powerful and adaptable than any single part. Whether physical, digital, or both, distributed systems become more powerful when interconnected. Digital has already pushed companies to open up in numerous ways. Companies look to the crowd for innovation, develop vast partner networks, open up data and devices, shift to services-based business models, lean into new markets, and decentralize dependencies at every level.

Amazon's Alexa products expand in functionality as an ecosystem of brands develop new skills and integrations. The experience of one Tesla is integrated across the entire fleet of Tesla's vehicles.[11] Over 40 smart cities worldwide are adopting open data policies.[12] Early examples abound. Yet, this is only the beginning.

Ecosystem enablement has already become a tenant in digital strategies, but emerging technologies will shift and accelerate what it means for companies to open up. In the first phase, products and services are enhanced through interoperability and app marketplaces, APIs, services-based business models, and open development communities. The second phase will be marked by integration of business intelligence and transaction processing into supply chains and across multiple AI systems, networks of devices, and workflow automations. In the third phase, a global 'general' intelligence could emerge, powered by the autonomous integration of context and shared understanding of the logic that drives the world.

While such a future state may seem remote, the velocity of digitization has already rendered traditional centralized business models obsolete. Participation in ecosystem-defined strategies requires that organizations move from closed models of the past to open, interoperable, ever-evolving models of the future.

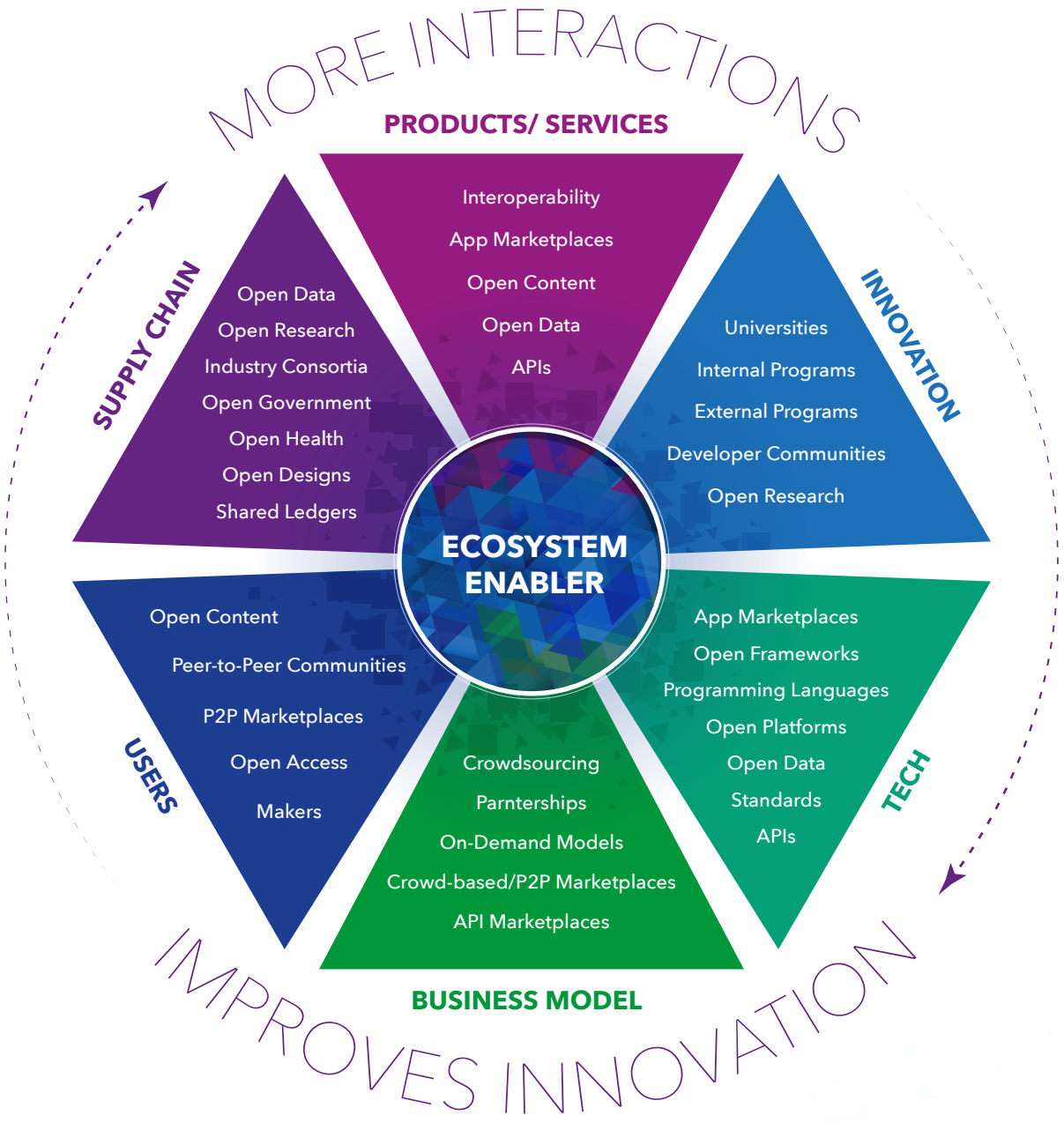
The Rising Digital Tide Lifts Intelligence, Shifts Business Models

We've been building digital layers on top of the physical world for decades. People, objects, and infrastructure are connected, and access is ubiquitous. In the last year alone, more than 2 billion new IoT devices came online, with projections for another 10 billion in less than four years.[13] This hardly scratches the surface of industrial applications, as in energy, aerospace, manufacturing, or transportation. The convergence of physical and digital may be well underway, but we are in the infancy of the information age. Digital now represents the digitization of information. Yet myriad emerging technologies are unlocking new transformational layers: the digitization of intelligence, of perception, of language, of identity, of value exchange, and potentially of trust itself.

Digitization already forces organizations to think open.

Most digital transformation efforts are still dumb: disparate systems, a lack of standards, incomplete context, dark data, redundant workflows, and proprietary limitations. Our research of both leading and legacy companies undergoing digital transformation finds a common theme: to extract actual value from data generated requires organizations open up.

FIGURE 7 ECOSYSTEM ENABLERS LOOK OUTWARD ACROSS SIX KEY AREAS



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The most resilient companies leverage their ecosystems for innovation. Enablement occurs across virtually all business processes and assets. Figure 7 depicts the ways "ecosystem enablers" are both contributing to and extracting value from broader networks. We see this pivot towards the ecosystem interdependency occurring for the following reasons:

"Extracting actual value from data generated requires organizations to open up."

Ecosystems enable interoperability, context, and proactive services.

One of the hallmarks of digital transformation is incorporating mobile, IoT, and cloud into how products and services are consumed. The problem is that basic connectivity, proprietary data and devices--even if useful--aren't enough. Truly intelligent products and services must be interoperable, contextually aware, proactively improving, and constantly evolving--standards no business can achieve alone.

Ecosystems become strategic as digital transformation forces product-based business models to service-based business models.

While companies undergoing "digital transformation" have exponentially increased the data and visibility associated with their product and customer lifecycles, they've struggled with monetization because they haven't shifted business models. Enabling connectivity so long as it is with other products in their proprietary suite (a common shortcoming of "smart home" devices) isn't enough. This approach stifles more than user experience, it (ironically) stifles manufacturers' ability to layer new services on top of the product itself. Value is now defined by how an entire ecosystem of constituents integrates, protects, and leverages product data contextually and in ways that actually improve people's lives.

> ***Case in Point: Amazon Echo Integrates with scores of manufacturers out-of-the-box; developers use open skills APIs to create thousands of new services.*** Echo achieved its success in no small part thanks to its interoperability and scalability alongside any other product or service.[14] Amazon has opened up their Alexa products to brands and developers in two essential ways: first, by allowing manufacturers to integrate with it directly, and, secondly, by opening Echo's 'skills' development to the community. By enabling integration and innovation into other products and other services, the device is more useful to consumers, partners gain share of data, and Amazon places itself more centrally in customers' lives--all of which drive its e-commerce business.

Ecosystems help actualize the wisdom of the crowd into product/service improvement.

The social media revolution was the catalyst that caused companies to systematically tap the crowd for feedback, ideation, and product W. As mobile adoption and machine learning have improved, these feedback loops are becoming more automated and integrated. Not only are companies like Tesla using data from their cars to improve vehicles via software updates, they leverage these [individual and aggregate] insights for both personalization and innovation at the fleet level.[15]

Ecosystems flourish off open-source innovation.

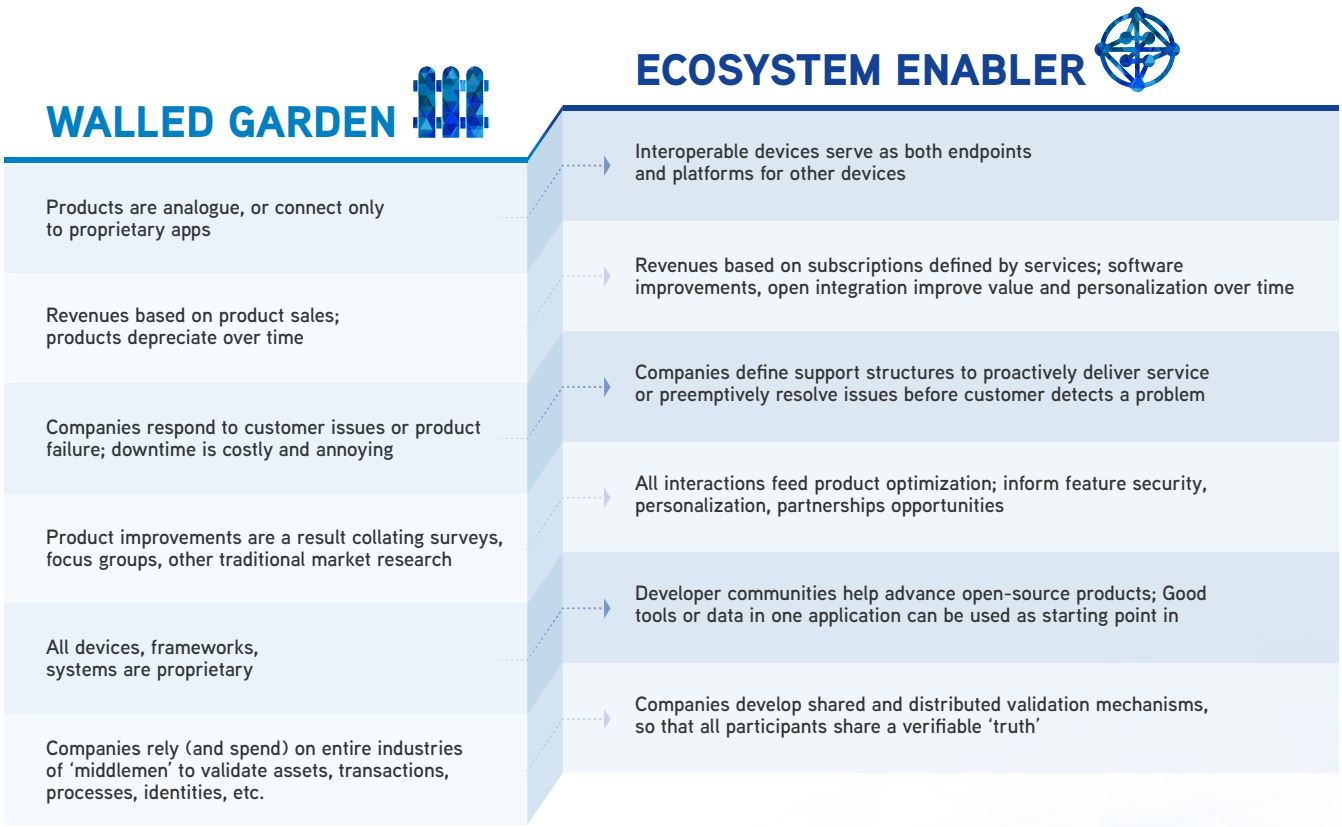
Fluid organizations are marked by the ability to pivot and lean into new markets based on user needs and insights. Increasingly, what's important isn't owning devices or even algorithms, but quickly delivering improved experiences to the market and staying ahead of the competition. While organizations are both justified and obligated to protect data from security, compliance, and competitive standpoints, not all proprietary assets are created equal. Ecosystem-driven business models require they re-imagine the value of data in ways that both attract and fulfill demand, without threatening their viability.

Case in Point: Google's Search, Google Maps. Many apps include a search function, but most app makers don't build search engines themselves; they use Google or Bing. Google Maps both aggregates demand because it can be infinitely replicated for consumers and developers, and also fulfills demand because it can be integrated into services developers build, such as ride-hailing and navigation apps and services. This also exemplifies how new markets can emerge based on existing shared platforms.

Whatever advantage a company might gain with a proprietary solution usually ends up negated by the lost opportunity cost sacrificed during development. Virtually every technology giant is fostering huge developer communities to help drive open-source frameworks, protocol, standards, and other products and services that benefit broader technological advancement. This doesn't mean proprietary goes away, or customization isn't required; rather, when hardware, software, and data become shared tools, the ecosystem exponentially accelerates innovation.

From centralized to decentralized: ecosystem automation places new tensions on old structures. Although centralized structures are the dominant structural paradigm of modern businesses and societies, they can and do engender significant inefficiencies: redundancy, inefficiency, reconciliation, fraud, sunk costs, and low trust. The nature of digital and the Internet: accessible to all, from almost anywhere, and broadly speaking, defiant of geographic boundaries, exacerbates these inefficiencies. Just as the Internet transformed the world in a way many intranets could not, the shift from centralized to decentralized is a natural evolution of meeting both business and user demands in the age of automated, and increasingly autonomous services.

FIGURE 8 WALLED GARDENS VS. ECOSYSTEM ENABLERS



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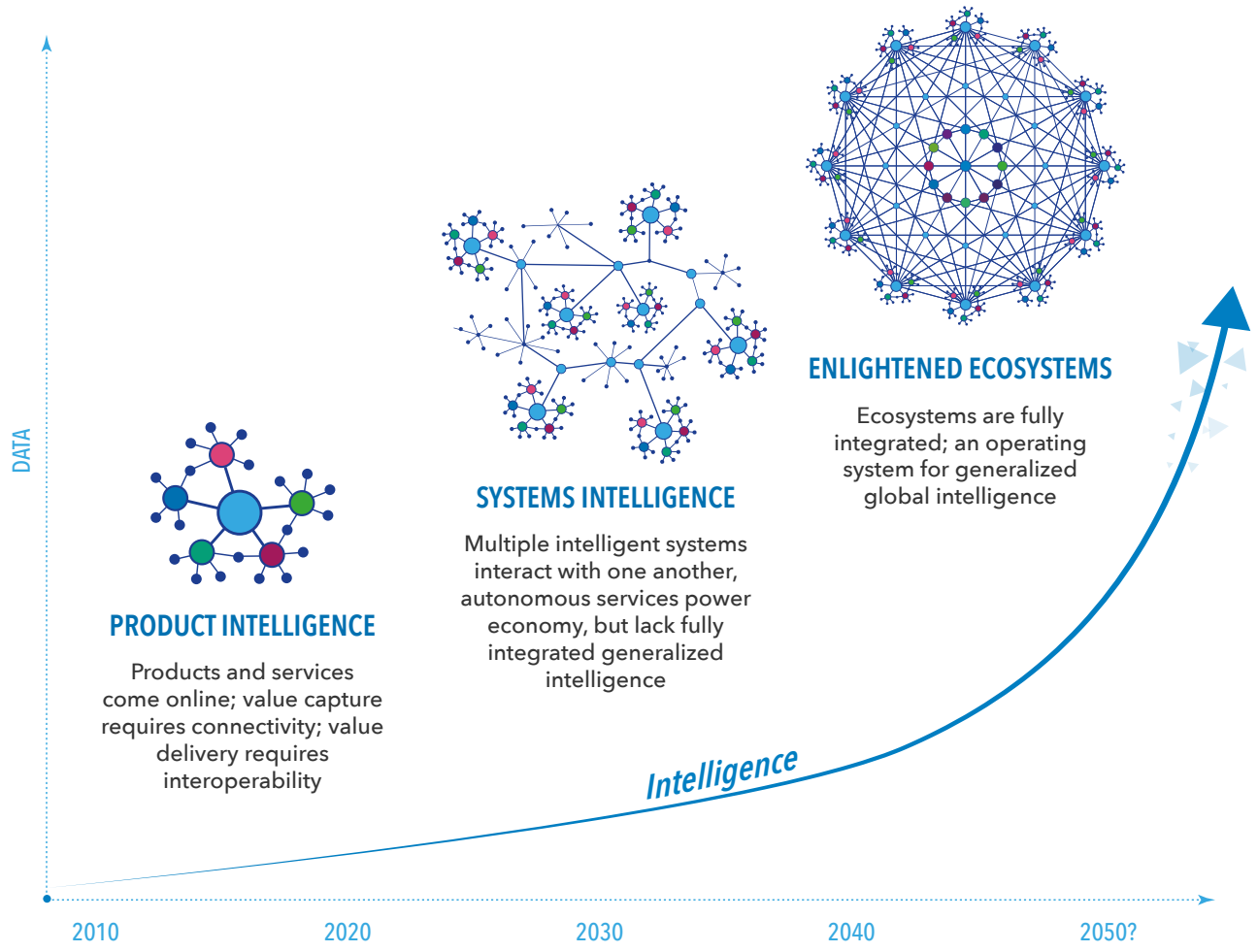
From Product Intelligence to Systems Intelligence to Ecosystem Intelligence

The full convergence of physical with digital will demand radical ecosystem integration. Whether physical, digital, or both, systems become more powerful when interconnected. While early efforts in digital transformation are surfacing the challenges (and opportunities!) of 'opening-up,' this trend will play out over many years. When distributed networks connect, intelligence increases.

FIGURE 9 DISTRIBUTED NETWORK INTELLIGENCE EVOLVES TOWARD ENLIGHTENED ECOSYSTEMS



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In the first phase, product and services come online and companies quickly realize 'digital' isn't enough. Business models shift toward on-demand and service-based models, which foster new and sometimes unlikely partnerships and entrance into new markets. Product iterations become more software than hardware-based and users expect products grow smarter over time. In the near term, Kaleido expects companies will continue to develop new partnerships integral to both scale and product innovation. Developer communities are already becoming essential, if disparate, business functions. Advancement in and access to widely applicable data, frameworks, and standards will be driven by these communities. Value chains grow wider, but deep integration is still limited.

The second phase will be marked by integration of business intelligence and transaction processing into supply chains and across multiple AI systems, networks of devices, and industry automations. Industries will become flatter, as ecosystems associated with any single industry will contribute data, technology, frameworks, and best practices across others. Super Humans rise as consumers become more active agents of their data. Autonomous services will increasingly power the economy, but lack fully integrated "generalized" intelligence.

Later, in the third phase, a global intelligence could emerge, powered by the autonomous integration of context and shared understanding of the logic that drives the world. Fully integrated and autonomous ecosystems may act as a global operating system. Looking decades out, Kaleido expects data will becomes interchangeable with currency; constant interactions across people, devices, infrastructure, and organizations inform sentient design (of products, services, processes, business structures, even strategy) in real time. Businesses could flatten entirely, relying on easily configurable teams and machines, sourced through decentralized marketplaces, to accomplish work.

Super-powered humans will always have a role in preserving the integrity of systems, defining and augmenting quality of life, and ensuring both we, and our tools, wield all this intelligence for good. That's plenty of work, no matter the technology.

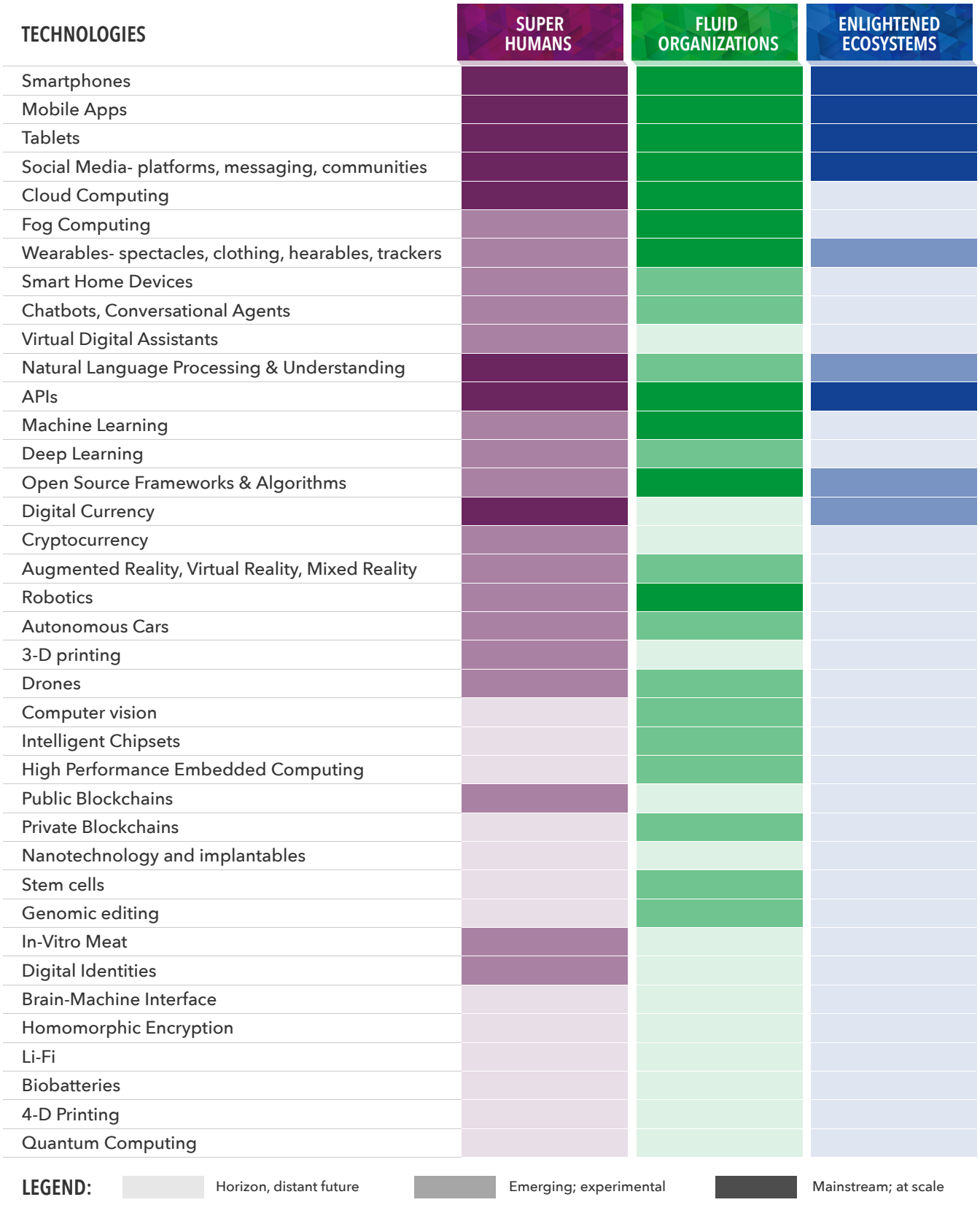
Enabling Technologies

Each Kaleido analyst has conducted research on a wide range of existing and emerging technologies across numerous industry applications and business programs. Combining this expertise unearthed a distinct finding unto its own: the quickening pace and widening scope of technological advancements means virtually every technology can be relevant to every organization.

Pockets of technological adoption in one part of the market quickly influence or catalyze another. For example, while consumers led adoption of smartphones, subsequent shifts in behavior and expectations forced businesses to implement internal mobile-first strategies for employee workflows, recalibrate enterprise security, and deploy B2B app marketplaces. Conversely, enterprise adoption leads augmented reality deployments,[16] given the cost, power, and aesthetic barriers are easier to overcome there than in consumer markets.

While clearly some technologies are far more 'real' and commercialized than others, Kaleido expects these categories will shift, as adoption fragments from market to market. The most powerful disruptions are rarely single technologies, but well-timed convergence of multiple existing technologies to foster something altogether unprecedented.

FIGURE 10 FIGURE 10 EMERGING TECHNOLOGIES IMPACTING CONSUMERS, ORGANIZATIONS, AND ECOSYSTEMS



Kaleido Insights: *Three Macrotrends Impacting the Journey to 2030*

Develop a Clear Vision for Innovation

Businesses are struggling to keep up, much less stay ahead. The Internet, web, social, mobile, devices are only the beginning. Companies must develop clarity and stability to see beyond the bright and shiny and innovate strategically. To help organizations manage daunting complexity, Kaleido analysts apply impact lenses based on our four coverage areas, applicable to every business.

Media:

"How do we effectively communicate and convey brand value across physical, digital, virtual realms?"

Customer Experience:

"How do we reach our customers on their digital terms in order to remain relevant and profitable?"

Automation:

"How can we move from reactive models of the past to proactive> predictive> preemptive models of the future?"

Business Models:

"How do we innovate and shift our current business model?"

Below we apply these lenses to distil the critical impacts these three macrotrends have on existing organizational structures and programs. Next we collate thematic recommendations based on these implications.

As digitization forces companies to do more with data, both faster, and more preemptively, competitive differentiation comes down to how organizations design for, act on, and monetize intelligence for their customers, themselves, and for broader ecosystems. Below are thematic recommendations to help apply the above insights.

FIGURE 11 IMPLICATIONS ACROSS MACROTRENDS

IMPLICATIONS	MONETIZATION STRATEGY	AUTOMATION STRATEGY	CUSTOMER STRATEGY	MARKETING STRATEGY
SUPER HUMANS	Super Humans demand access to goods without necessarily having to own or manage them.	Data integrations and prediction 'free us' from being system admins of life, enabling users to accomplish/remember/conduct more, with less effort/time/money/pain.	Hyper-personalization is expected. If they don't feel like a Super Human when interacting with one brand, consumers will turn to another that makes them feel powerful and respected.	No matter the channel or medium, content is the kernel of communication between the enterprise, the consumer, and within the ecosystem.
FLUID ORGANIZATIONS	Business models themselves must become more agile, using data to detect new opportunities or strategic partners as well as areas of inefficiency.	Over time, innovation itself becomes automated as integrated systems, networks of users and devices, machine and deep learning streamline optimization of products and services in real-time.	Fluidity is marked by the organization's ability to listen, analyze, act, and predict areas of improving the customers' experience across each touchpoint.	Content comes from all corners of the organization, it's not "just" a marketing function.
ENLIGHTENED ECOSYSTEMS	Organizations must contribute to and leverage vast ecosystems of partners to enhance all phases of customer journey and product lifecycles.	The essential element of automation is good data. But data alone are rarely valuable. Value is a blend of context, perception, wisdom, prediction, and proactive services.	Customer experience is driven by ecosystems, not lone organizations. Users aren't loyal to single brands, but rather to seamless, desirable product, service, and experience delivery.	Informed by data, situations, conditions, and history across ecosystem partners, messaging and communication are generated instantaneously and heavily informed by externalities.

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Prioritize data integrity.

The axiom 'garbage in, garbage out' is never more true than in the context of building digital customer experiences and automating workflows. Data integrity, including data sourcing, authenticity, cleansing, storage, stewardship, and security are foundational for any successful digital program.

Define value for both customers and ecosystem.

Data alone are not valuable. Value is a combination of context, perception, security, prediction, and proactive services. Every company has a unique ability to configure value that applies to other parts of the ecosystem. Success is defined by how organizations contribute this value to customers as well as across broader integrated systems, information ecologies, and networks of people and devices.

Design for personalization across each phase of the customer journey.

Reconsider the existing digital customer journey in all channels, and how current experiences can be augmented with a better understanding of data. Focus on delivering individualized yet cohesive product offerings, promotions, and sensory experiences through connected interfaces at all touch points.

Customer strategies must be ever-evolving to accommodate new modes of communication in real-time.

Hyper personalized and contextual situations must take into account not just "the right message to the right person at the right time," but more "rights" including, for example, situation, conditions, location, and historical data. Innovative organizations spot consumer needs quickly through continuous feedback loops, savvy data management and integration, and internal processes that allow them to act nimbly.

Craft on-demand experiences.

Companies must offer on-demand models able to anticipate customer needs and proactively deliver services. Craft for seamlessness through new or no interface so that summoning experiences requires zero clicks. Delivering on customer needs in real-time and (eventually) predictively is essential for building trust and driving more interactions.

Empower customers; they're innovators.

Brands play an important role in developing the tools, understanding, and value propositions for Super Humans. Digitally mature companies innovate with customers, not for customers. Involve customers through open innovation programs as well as integrated product feedback loops, in which interactions are form the customer's voice to speak to companies about what they desire and expect.

How Kaleido Can Help

The onslaught of disruptive technologies impacting your customers, organization, and ecosystem are increasing exponentially. Kaleido analysts work in concert to decipher actionable insights from the noise, helping you to envision the clear impacts on your future business models, customer experience design, marketing, content, and automation roadmap. As a team, we can create an action plan for innovation that helps you plan for future growth and respond to current threats to your business viability.

By constantly keeping pulse on how your customers, partners, competitors, startups, and cross-industry technology leaders are evolving, we're able to advise our clients on the right path forward. Kaleido advisory relationships, webinars, speeches, and workshops are grounded in research rigor, impact analysis, and decades of combined expertise. Expect us to raise and ask the tough questions as we vet your level of disruption in order to guide your adaptation in a future filled with super humans, fluid organizations, and enlightened ecosystems.

Our tools are many, and include quantitative survey panels, investment analysis, use case analysis, ethnography, qualitative research interviews, and secondary research approaches. If you're interested in building a relationship with our analysts, we'd love to hear from you. Please email info@kaleidoinsights.com to start a conversation, or visit www.kaleidoinsights.com to learn more about our offerings.

Contact Us: We are happy to respond to your questions, receive comments, or possibly collaborate with your organization. You can reach us at info@kaleidoinsights.com

About Us

Jessica Groopman specializes in automation technologies impacting organizations including IoT, AI, and blockchain. She concentrates on the application of sensors and machine learning with a focus on user experience, data integrity, and convergence with blockchain. Past clients range from start-ups to media agencies to large brands including Technicolor, Microsoft, Cisco, Qualcomm, Dell, Intel, DuPont, Pandora, and numerous vendors to develop research, content, and digital strategies.

Jessica is a frequent speaker at IoT industry events. She is also a frequent contributor to numerous blogs and/media outlets. She has been principal analyst with Tractica where she contributed to their automation and robotics practice. She has also served as contributing member of the International IoT Council, the IEEE's Internet of Things Group, IoT Guru Network, and FC Business Intelligence's IoT Nexus Advisory Board. Jessica was also included in Onalytica's list of the 100 Most Influential Thought Leaders in IoT.

Jessica served as research director and principal analyst with Harbor Research and as an industry analyst with Altimeter Group. Earlier, she lead research at Focus Research and was a research analyst at Tippit Research.

Rebecca Lieb's is focused on Marketing, Content, Media, and the relationship between organizations and their market. Her areas of specialization are digital marketing and media, with a concentration in content strategy, content marketing and converged media. She has published more research on content strategy than anyone else in the field.

Rebecca works with many of the world's leading brands on digital marketing innovation. Clients range from start-ups to non-profits to Fortune 100 brands and regulated industries, including Facebook, Home Depot, Nestlé, Anthem, Adobe, Honeywell, DuPont, Fidelity, Gannett, IBM, New York Life, Oracle, Save the Children, Pinterest, LinkedIn, Cisco, ad and PR agencies, and The Federal Reserve Bank of New York.

She's a frequent speaker on topics related to digital marketing, advertising, and media. Earlier, she was Altimeter Group's digital advertising and media analyst.. Prior to that, she was vice president at Econsultancy, where she launched the company's U.S. operations. Rebecca was VP and editor-in-chief of The ClickZ Network for over seven years, and for part of that time also ran the redoubtable SearchEngineWatch.com.

Jeremiah Owyang focuses on how new technologies impact business models and how corporates must innovate. He focuses on how disruptive technologies—such as social media, collaborative economy, autonomous world, blockchain and more—and how they impact the relevance to corporations. He is well recognized by both the tech industry and the media for his grounded approach to deriving insights through rigorous research.

Jeremiah is frequently quoted in top-tier publication and cited in books and press and media. He was featured in the "Who's Who" in the Silicon Valley Business Journal, and his Twitter feed was named one of the top feeds by Time.

He is also the Founder of Crowd Companies, an innovation club for Fortune 500 companies, which he also manages independently from Kaleido Insights. Jeremiah was an Industry Analyst at Forrester Research, a founding partner at Altimeter Group, and a web marketing leader at Hitachi.

Jaimy Szymanski focuses on the impact of technology on customer experience (CX) and digital transformation. Jaimy advises digital leaders and change agents in managing digital transformation and innovation efforts to reach evolving consumers and employees.

She has worked in strategic advisory and planning capacities with organizations including: Bristol Myers-Squibb; Enterprise Holdings; Facebook; Google; Hallmark; HBO; Intel; LinkedIn; Nestle; Ogilvy & Mather; and Save the Children International. Her research has been covered by USA Today, Mashable, Forbes, Inc., Huffington Post, and more.

Jaimy's experience derives from her recent work as an independent analyst and previously Altimeter Group, where she focused on digital transformation and social business strategy. Her career path has led to a deep body of research on technology disruption, covering topics that include digital and mobile CX, retail innovation, digital culture, the collaborative economy, autonomous technologies, blockchain, and more.

ENDNOTES

[1] Morey, Timothy, Theodore "Theo" Forbath, and Allison Schoop. Harvard Business Review, "Customer Data: Designing for Transparency and Trust." 2015 May. Accessed 2017 August 31. https://hbr.org/2015/05/customer-data-designing-for-transparency-and-trust.

[2] Rainie, Lee, and Maeve Duggan. Pew Internet, "Privacy and Information Sharing." 2016 January 14. Accessed 2017 August 31. http://www.pewinternet.org/2016/01/14/privacy-and-information-sharing/.

[3] Ibid.

[4] PwC, "Bot.me: A revolutionary partnership." 2017. Accessed 2017 August 31. https://www.pwc.com/us/en/industry/entertainment-media/publications/consumer-intelligence-series/assets/pwc-botme-booklet.pdf

[5] Millward, Steven. Tech in Asia. "China's Yihaodian Plans 1,000 Virtual AR Supermarkets Where You'll Shop With Your Smartphone's Camera." 2012, October 15. Accessed 2017 August 31. https://www.techinasia.com/china-yihaodian-virtual-supermarkets-qr-codes

[6] Garfield, Leanna. Business Insider, "These four-foot-tall robots could change the way warehouse workers do their jobs." 2016 February 2. Accessed 2017, August 31. http://www.businessinsider.com/robots-in-warehouses-for-online-shopping-2016-1.

[7] IDC. IDC Forecasts $1.2 trillion in spending on digital transformation technologies in 2017. 2017, February 23. Accessed 2017, August 20. http://www.idc.com/getdoc.jsp?containerId=prUS42327517

[8] Owyang, Jeremiah. Web Strategist Blog. 2017, July 26. Accessed 2017, August 26. http://www.web-strategist.com/blog/2016/07/26/the-ten-types-of-corporate-innovation-programs/

[9] Johnson & Johnson Innovation. Accessed 2017, August 30. https://jlabs.jnjinnovation.com/

[10] Cosgrove, John. "A Look at Elon Musks' Hyperloop Competition" Opensource.com. 2015, July 25. Accessed 2017, August 31. https://opensource.com/life/15/7/hyperloop-competition

[11] Fahrenbacher, Katie. "How Tesla is Ushering In the Age of the Learning Car" Fortune. 2015, October 16. Accessed 2017 August 30. http://fortune.com/2015/10/16/how-tesla-autopilot-learns/

[12] Murray, Peter. "40 Brilliant Open Data Projects and How They're Redefining Smart Cities" Carto.com. 2017, March 4. Accessed 2017 September 3. https://carto.com/blog/forty-brilliant-open-data-projects/

[13] Tung, Liam. "IoT devices will outnumber the world's population this year for the first time" ZDNet. February 7, 2017. Accessed August 20, 2017. http://www.zdnet.com/article/iot-devices-will-outnumber-the-worlds-population-this-year-for-the-first-time/

[14] Wroclawski, Daniel. "Everything That Works with Amazon Echo and Alexa: The List Just Keeps on Growing" Reviewed.com. 2017, May 4. Accessed 2017, August 15. http://smarthome.reviewed.com/features/everything-that-works-with-amazon-echo-alexa

[15] Udy, Jason. "Tesla Model S Software Update Increases Personalization" MotorTrend. 2014, September 22. Accessed 2017, August 15. http://www.motortrend.com/news/tesla-model-s-software-update-increases-personalization/

[16] Hebblethwaite, Colm. "Will Enterprise Rather Than Consumer Drive AI Adoption?" VR360. 2017, June 16. Accessed 2017, August 28. https://www.virtualreality-news.net/news/2017/jun/16/will-enterprise-rather-consumers-drive-vrar-adoption/

RESEARCH METHODOLOGY

This research was developed by collating insights derived from each analyst's extensive primary research conducted across more than two dozen reports in aggregate. We also conducted additional secondary qualitative research and case study analysis. In addition, we hold ongoing briefings and discussions with industry innovators and technology leaders in a variety of markets. Mention in this document does not represent a complete endorsement of the report by the companies listed herein.

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