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Trend 1

Intelligent Automation: The essential new co-worker for the digital age

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Trend 1

Intelligent Automation: The essential new co-worker for the digital age

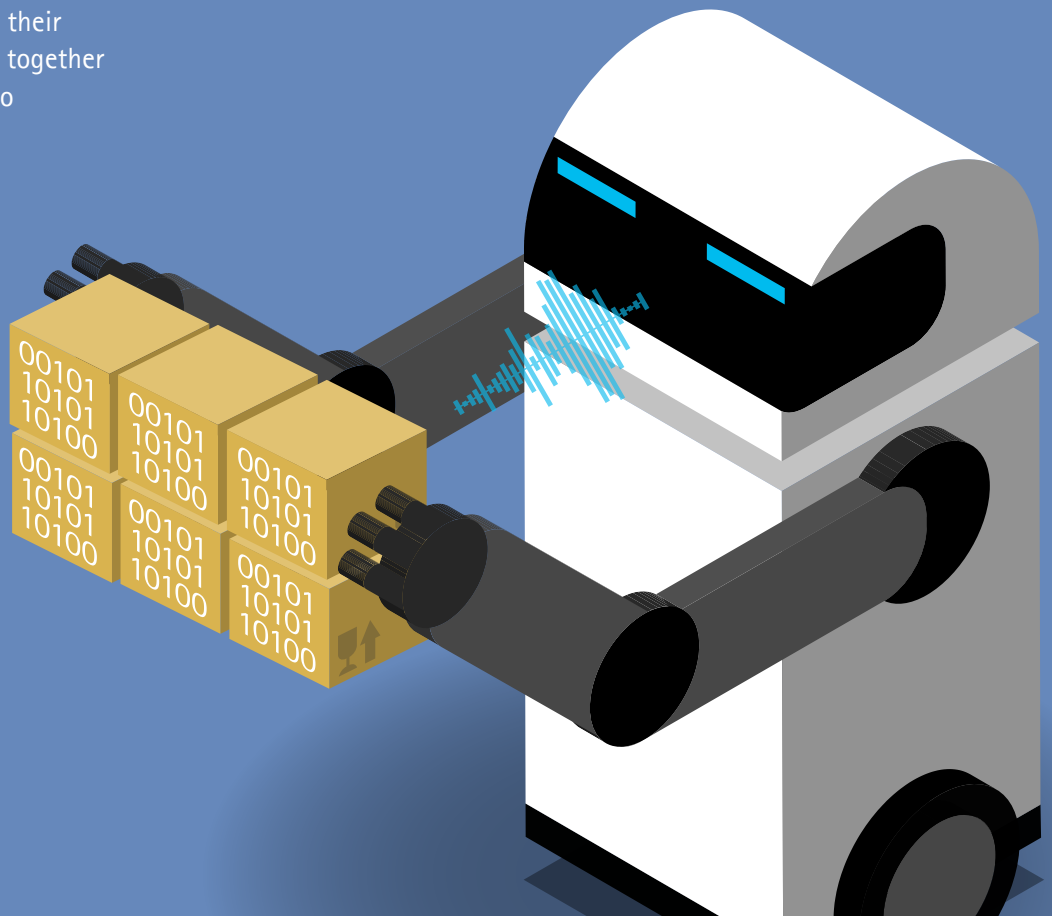
Leaders will embrace automation not just to take advantage of the breakneck pace of digital change, but also to create a new digital world where they hold competitive advantage. Machines and artificial intelligence will be the newest recruits to the workforce, bringing new skills to help people do new jobs, and reinventing what's possible.

Customers at Singapore's Timbre restaurant will notice something is different. Instead of waiters carrying dishes to and from the kitchen, autonomous drones now fly dirty dishes off customer tables.[1] Visitors to Siemens' so-called 'lights out' manufacturing plant will notice a change, too, as Siemens has automated some of its production lines to the point where they can run unsupervised for several weeks.

This is intelligent automation in action today. On the surface it may appear to be a simple transfer of tasks from man to machine. But look a little closer. The real power of intelligent automation lies in its ability to fundamentally change traditional ways of operating, for businesses and individuals. These machines offer strengths and capabilities (scale, speed, and the ability to cut through complexity) that are different from—but crucially complementary to—human skills. And their increasing sophistication is invigorating the workplace, changing the rules of what's possible so that people and their new digital co-workers can together do things differently. And do different things.

Look again at Siemens' lights out manufacturing plant. While it may seem like a transfer of tasks from people to machines, for Siemens it's a step toward a larger goal of creating the fully self-organizing factory (aka Industrie 4.0). Here, machines will largely organize themselves, supply chains will automatically link themselves together, and orders will be directly converted into manufacturing information that is incorporated into the production process. This will make the industrialized manufacture of highly customizable products a reality. Before you assume that people are cut out of this loop, you should recognize that even Siemens' lights out manufacturing plant requires 1,150 employees to support it. They just have different roles than before, as many are now focused on programming, monitoring, and machine maintenance.[2]

Machines and artificial intelligence will be the newest recruits to the workforce, bringing new skills to help people do new jobs, and reinventing what's possible.



Intelligent automation is being used across multiple industries to create new value for businesses and society alike.

Natural Language Processing: Finance companies apply NLP to compliance and fraud prevention by monitoring electronic communications at financial institutions to identify relationships and entities across threads.

Computer Vision: Law enforcement uses computer vision on facial recognition systems to identify or verify a person from a digital image or a video frame from a video source.

Knowledge Representation: Healthcare providers use a system to analyze massive amounts of data to extract useful sections, such as doctor names, costs, and number of complaints, in order to create a clean and easy way to find the root cause of declining clinic performance.

Reasoning and Planning: Automated planning and scheduling, typically for execution by autonomous robots and unmanned vehicles, from warehouse to retail store to household.

Examples like these are popping up everywhere as leading organizations are driving more and more of their processes into smarter machines. Their goal is not restricted to performing the same tasks faster and more efficiently. They've understood that intelligent automation changes the rules by empowering the creation of new products and services on a scale that was previously infeasible. And they're already rethinking what they do across every area of the enterprise—from their business processes right through to the customer experiences they provide.

Far from killing jobs and creating a dehumanized future, pioneering companies are using intelligent automation to drive a new—and much more productive—relationship between people and machines. Leaders are exploiting this potential. For example, luxury retailer Moda Operandi was able to scale and improve its high-touch customer service, where stylists provide personalized recommendations and one-to-one communications with clients. By building a new personalization engine that allows a single stylist to work with up to 300 customers (compared to 50–75 previously), the company is able to offer the same luxury services to its valued clients as it does to its very top customers.[3]

Discussions and projections about the possibilities of automation and artificial intelligence have been swirling around for decades. So why are changes like these starting to take off now? The answer lies in part simply in the increased footprint of digital technology. As more and more business processes and even objects are touched by software, the scope of what can possibly be automated has expanded exponentially. The second part of the answer lies in advances in application of AI technologies.

Fundamental Change in IT

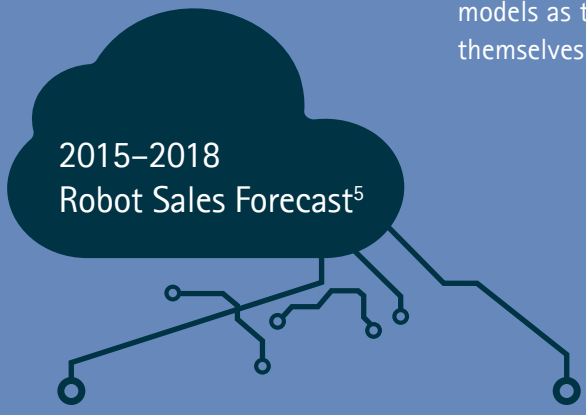
Rather than just being looked at as an add-on, AI now represents a fundamental change in how IT systems are built. As a new foundational layer of IT architecture, an increasing number of tools are being created that allow machines to become more sophisticated in how they learn and make decisions. This means that the process of actually automating these tasks becomes much easier. Examples abound: from Google's now open-sourced image recognition software to IPsoft's AI platform, Amelia, that automates knowledge work and is able to speak to customers in more than 20 languages.

These tools, and many others like them, are making the AI industry a renewed focus of interest for investors and Global 2000 organizations alike. Funded with venture capital, AI startups in the US alone have increased 20-fold in the past four years.[4] And in our Technology Vision survey, 70 percent of corporate executives said they are making significantly more investments in AI-related technologies than two years ago, with 55 percent stating that they plan on using machine learning and embedded AI solutions like Amelia extensively.

70% of executives are making significantly more investments in artificial intelligence technologies than they did in 2013.

For all its focus, it is important to note that incorporating artificial intelligence into the business will not be a trivial task. For a start, enterprises will have to redefine both their business and IT architectures. The use of artificial intelligence at each layer means that firms will be essentially doing things differently, and that includes incorporating AI as a new and important layer in that architecture.

Technology leaders already see the amazing potential of intelligent automation and how it will inevitably pervade every aspect of business, but all enterprise leaders must also now look beyond the potential of automation to simply cut costs. The companies that will grow and dominate their industries will be those that systematically embrace automation across their organizations, using it to drive the changes to their products, services, and even business models as they continue to transform themselves and their industry.

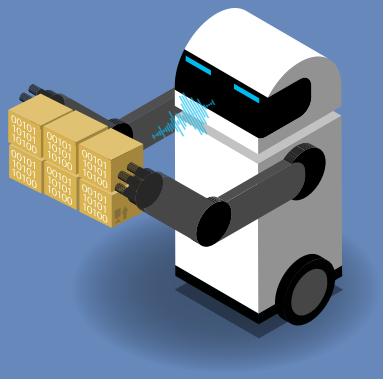


Professional Service Robots:

152,400 units
$19.6 billion

Personal Service Robots:

35 million units
$12.2 billion



Rapid technology advancements are opening up new possibilities for innovation, intelligence, and automation.

- **Unprecedented data volumes:** By 2020, there will be more than 44 zettabytes of data, 35 percent of which will be considered useful for analysis.[6]
- **Decreasing cost of storage:** Over the past 30 years, the cost per gigabyte of hard disk data storage has halved every 14 months, from $3,488,630 in 1980 to $0.03 in 2015.[7]
- **Virtually unlimited computing power:** Public cloud computing was estimated to reach almost $70 billion in 2015 worldwide.[8]
- **Advances in artificial intelligence technologies:** AI startups in the US alone have increased 20-fold in the past four years.[9]
- **Broadening IT scope:** 88 percent of executives agree the IT organization needs to broaden its scope and keep pace with evolving IT needs.[10]

Innovate and Evolve

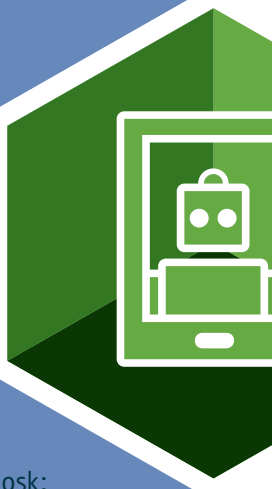
What will that mean in practice? Intelligent automation will enable enterprises to innovate and evolve by increasing their agility, reducing the complexity of systems and operations, accelerating their time to market, and creating the ability to experiment continually with new products and services.

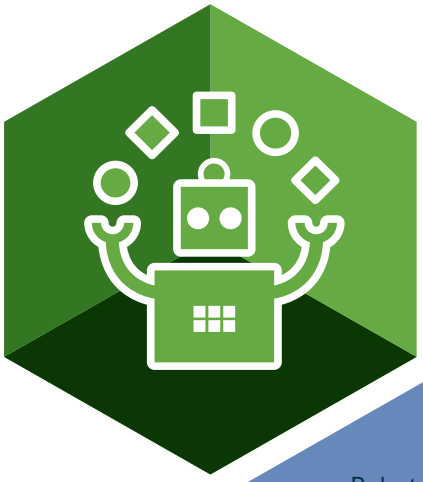
For example, many pioneering companies are now deploying intelligent automation to transform their use of data. Paxata is showing data scientists where to focus their efforts by automatically finding meaningful relationships within vast data lakes. Adobe Target has automated not just the personalization of ad experiences, but the creation of experiments on those experiences to figure what features a consumer will find compelling, thereby enabling marketing executives to test their ideas without involving IT. Pointing the way ahead, Bloomsbury.ai, a London-based startup, has announced plans to release a demo enabling people with no programming skills to carry out complex data analytics.[11] Bloomsbury.ai claims that, with training, its technology could be used for everything from art creation to consumer products.

It's not just in IT systems that automation is driving real change. It's happening out in the physical world too: improving mining safety by letting men and machines work side by side in a way that takes the most dangerous tasks off the shoulders of people (e.g., intelligent 'worms' monitoring hazardous mining operations), changing the rules of e-commerce by driving ever closer to same-day delivery (e.g., 30,000 Kiva robots helping Amazon to meet rising customer demand), easing urbanites' lives with intelligent street lighting and predictive traffic control, and boosting crop yields through precision agriculture (e.g., companies such as AquaSpy and AGCO, which are already using intelligent automation to support 'digital' farming).

Robotic Surgery:

da Vinci enables a surgeon to operate with enhanced vision, precision, and control.





Retail Service Bot:

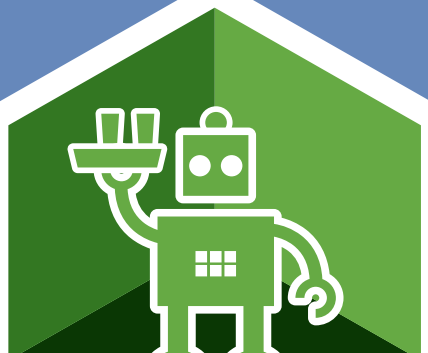
OSHbot can answer simple customer questions, identify items, search inventories, act as a guide, and even summon hardware experts for a video chat.

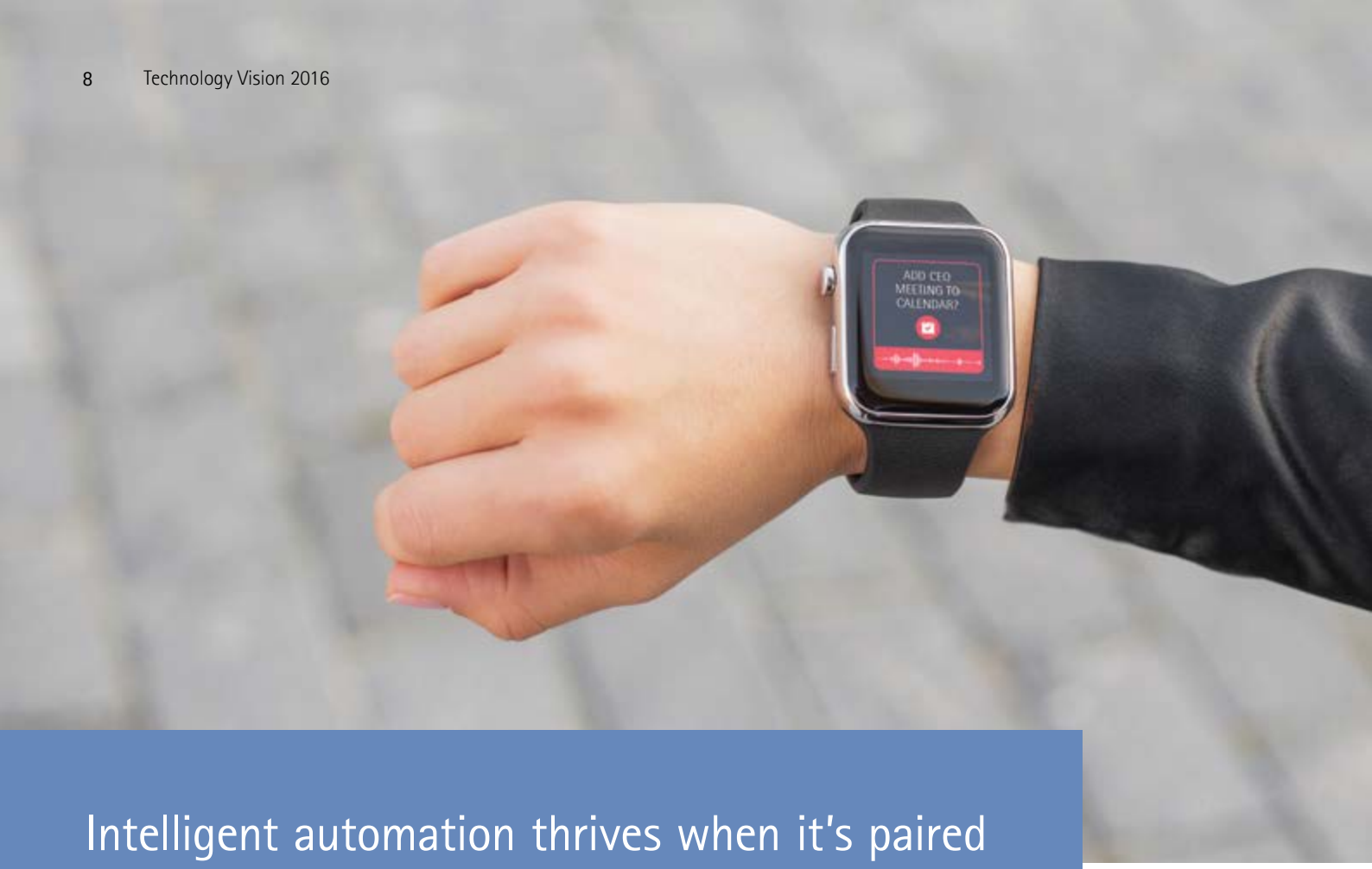
AI Kiosk:

The FURo-S Smart Service Robot can interact with FURo-S to help people buy tickets, ask for directions, and even sit through annoying advertisements.

Robot Butler:

The robotic butler at Aloft hotel delivers amenities to guest rooms.





Intelligent automation thrives when it's paired with people to drive better outcomes.

Consumer experiences, too, across the board are set for automation. Coles Supermarkets is piloting Hiku, a countertop barcode reader, to enable its consumers to automatically order groceries from home.[12] Control4, a home automation company, has created a solution to give home owners an unprecedented amount of control by automating features in the home—from whole-house audio to a secure network of cameras to door-locking mechanisms and light and temperature controls. And when we look a little into the future, we see even more. For example, Panasonic is working on creating the so-called 'Laundroid,' a washing-machine robot that washes, dries, and folds your clothes.[13]

All these examples show not only how the pace of change is accelerating, but also the pressure that all companies are under to reinvent themselves. In fact, 82 percent of executives we surveyed agree that organizations are being increasingly pressed to reinvent themselves and evolve their business before they are disrupted from the outside or by their competitors. Intelligent automation has become a key enabler of the changes they need to make.

Businesses will only be able to manage the enormous wave of complexity that arises from pervasive digital change if they can seamlessly harness and integrate, at scale, everything that's coming their way—new products, new services, new technology tools, new business models, new alliances, new ecosystems and more. Meeting that challenge demands new skillsets and a very different workforce. And that will be made possible by the pervasive introduction of intelligent automation—the essential new co-worker for the digital age.

Predictions

Apps by Me: Consumers will be able to build simple, custom apps through voice commands, gestures and more to their devices. Soon, every person will become a programmer.

Age of Avatars: We'll see widespread use of avatars and robots who we will send to be where we can't be and do things we can't—or don't want to—do.

Key Takeaways

- Intelligent automation will give you new-found power to drive change.
- AI will become a core competence—a pervasive capability for every aspect of your business.
- Take a 'People First' approach by adapting the enterprise's organization, culture, skills, and experience to use AI.

Intelligent automation isn't an option, it's mandatory. The question is whether you have the capabilities to not just use it, but also implement it across every aspect of your organization and maximize the benefits.

Intelligent Automation:

100-Day Plan

Over the next three months, develop a comprehensive understanding of the current state of intelligent automation and artificial intelligence. This should include how it is currently used in your enterprise and its optimal application in your company.

1. Identify the artificial intelligence and analytics capabilities your company uses today to provide a capabilities and gap analysis. Understand the advantages that artificial intelligence provides, from making decisions to self-evolution and discovering opportunities for innovation. How would you build your company differently to take advantage of these?

2. Take an inventory of labor-intensive business processes and identify appropriate opportunities to invest in automation and machine-learning capabilities. These can help to improve operational capabilities and scale analytics.

3. Identify specific applications that require frequent and manual updates, rapid scaling, data extracts, and/or a high degree of personalization. If an application relies on data, classify it as a top candidate for artificial intelligence, such as machine learning for self-evolution.

4. Map these examples/use cases against your current business processes and corporate strategy to prioritize specific opportunities—to catch up or gain new advantages.

5. Cultivate your data talent: develop a plan to build, buy, and/or partner to support your data and your automation know-how.

6. Map the implications of tasks being automated—the changes to roles, organization needs, processes and skills. Determine what needs to be done fundamentally differently once certain automated tasks are removed from the human side of the workforce.

7. Create a 'People First' strategy for transitioning the organization, training on new skills, and implementing the changes.

Intelligent Automation:

365-Day Plan

A year from now, enterprises should begin to infuse automated intelligence throughout their organization to spur change—by providing rule-based automation capabilities, implementing new machine-learning technologies, and evaluating the latest artificial intelligence products.

1. Review your top candidates for automation projects as determined in your 100-day plan. Implement artificial intelligence technologies that address one of these use cases. Quantify its business impact and use those cost savings to justify the next project(s).

2. Create the impact and transition plans required to scale the automation project. Proper planning will enable a smooth transition, so that the workforce and processes can work well alongside the newly automated elements.

3. Develop machine-learning skills internally by implementing a machine-learning software solution that utilizes a defined data set for a very specific use case. This solution should benefit from advanced analytics, such as a personalization application.

4. Pilot a machine-learning solution that discovers new data associations. Review the outcomes with an eye toward identifying new opportunities for growth and innovation, such as a new customer segment or creating a new product.

5. Review your machine-learning use cases with a questioning eye. Set up a quality assurance process to support or refute the conclusions being drawn and subsequent actions taken. Have your data scientists confirm that the datasets are complete and accurate and that the algorithms are appropriate.

6. Create a training program to ensure that your data scientists and software engineers are educated in the latest deep-learning and AI technologies, specifically in natural language processing and image recognition. Give them time to research and develop potential solutions with these new technologies.

7. Establish a top-down strategic commitment to artificial intelligence and data science, including R&D investment, innovation programs, and production development.

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Trend 1

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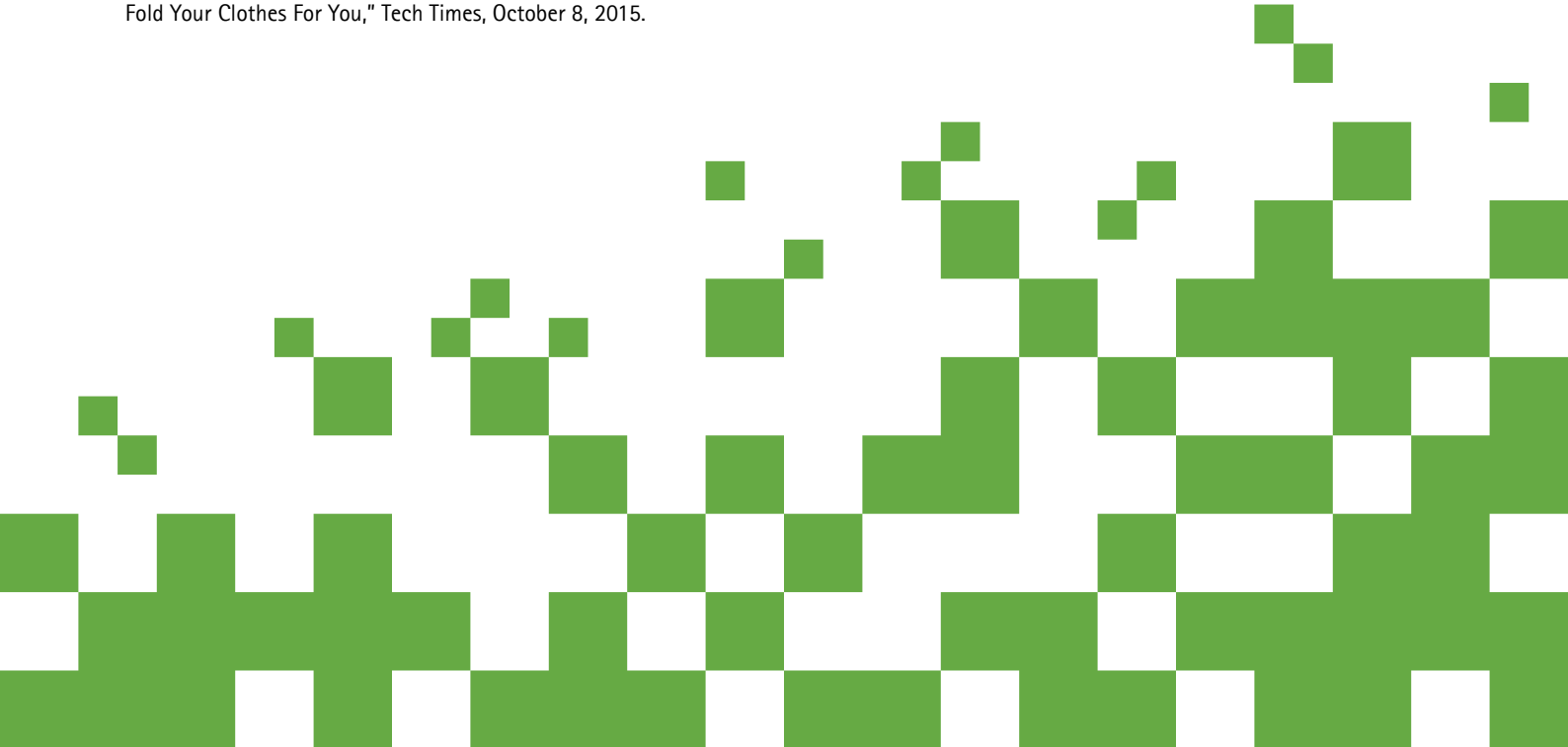

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