

# AUTOMATION FOR GOOD:

Can automation and artificial intelligence  
benefit the workforce?

JULY 2018

# What we heard from investors, business leaders, and sector experts who attended our June 12 forum with Autodesk Foundation:

“Work is changing. As that happens, context and assumptions about work will also change. And that’s exactly the kind of thing that computers are not good at adjusting to. It’s important that AI work *with* people, rather than against them. We really have to think about taking these dichotomies and turning them into synergies.”

- Dr. Ken Haase: Co-Founder and Chief AI Officer  
(keynote speaker)

“A common narrative about AI and automation is that it’s taking away jobs. The companies that we’ve gathered in the program are taking a totally different approach. They’re leveraging these technologies to have a positive impact on the workforce.”

- Jean Shia: Head of Portfolio & Investment,  
Autodesk Foundation

“AI won’t replace humans. Humans that effectively use AI will replace humans that don’t.”

- Forum Attendee

“People are talking a lot about this topic, and there are not a lot of solutions proffered. Everybody knows that it’s a big existential problem that we’re going to have to deal with as a society. But this gathering today is helping us focus on solutions to the problem. We want to tip the scale in favor of those organizations and initiatives that are actually investing in humans.”

- Joe Speicher: Executive Director, Autodesk Foundation

“While AI is not a must have, it can immensely increase the value of a business and its stickiness with customers. The key step in evaluating AI is to see how the tool builds a compounding lead over competition.”

- Trent Sisson, Vice President, Mountaingate Capital

“LinkedIn’s mission is to connect every member of the global workforce to economic opportunity. There are a lot of ways that AI can help with that. I was excited to see companies that use information retrieval and machine learning to assist in hiring and offer adaptive, step-by-step training for workers. I plan to stay in touch with one of the startups I met as a mentor.”

- Sami Ghoche: Senior Machine Learning Engineer, LinkedIn

## AUTOMATION IS INEVITABLE.

We're about to undergo the biggest transition in the global workforce since the industrial revolution. Robots and machines will replace humans in a lot of jobs - as many as 375 million by 2030, according to McKinsey.<sup>1</sup> However, that doesn't mean that these people will necessarily be put out of work. If automation and AI are harnessed in the right way, these technologies may actually create as many jobs as they replace.

The problem is that right now, the economy is not equipped to handle the other side of the equation: finding qualified workers to fill all those new jobs.

We believe in the power of entrepreneurs to think creatively about the future. That's why Village Capital and Autodesk Foundation put out a call for **startups harnessing automation as a positive force for workers**, especially in fields where automation will have a significant impact on jobs.

In the coming pages, we'll share some emerging trends we're seeing across 50+ startups, broken down into a few categories:

- Platforms that use big data to get past hiring biases and improve the quality of matches
- Smarter HR and training tools that use AI and machine learning for personalized learning
- Predictive analytics tools that allow workers to focus less on rote tasks and more on the creative "people aspects" of work

We focused on startups rather than initiatives within large corporations for a reason. Startups are often more nimble than large corporations, and they typically excel at testing new ideas, failing fast, and iterating to fine tune a solution - an important quality in the field of AI and automation. They are the tip of the spear when it comes to innovation.

The subsequent pages provide insight into how entrepreneurs are innovating in the age of automation – allowing anyone, anywhere to imagine, design, and build a better world.

According to AI expert Dr. Ken Haase, there is one school of thought that AI is here to replace people, and there's another school of thought that AI is here to augment and support people. The important thing is that we get to choose, and we need to choose fast.



A handwritten signature in black ink, appearing to read 'Allie Burns'.

**Allie Burns**  
Managing Director, Village Capital



Village Capital is a global venture capital firm that helps entrepreneurs bring big ideas from vision to scale. Our mission is to reinvent the system to back the entrepreneurs of the future. Our vision is a future where business creates equity and long-term prosperity. Since 2009, we have supported more than 1,000 early-stage entrepreneurs through our investment readiness programs. Our affiliated fund, ViCap Investments, has provided seed funding to more than 90 program graduates.

Contributors to this report:

Marissa Lowman: Head of Education Practice, Village Capital  
Allie Burns: Managing Director, Village Capital  
Inder Takhar: Investment Analyst, Village Capital  
Victoria Fram: Managing Director, ViCap Investments  
Ben Wrobel: Marketing Manager, Village Capital

# SELECTED COMPANIES



Balloonr is a platform that allows teams and companies to solicit anonymous ideas or feedback. (San Francisco, CA)



NexusEdge is a career services platform for community college students. (Los Angeles, CA)



Blendoor is a hiring platform that uses augmented intelligence and people analytics to reduce unconscious bias through merit-based job matching. (San Francisco, CA)



Presentr is a personalized coaching app that provides real-time feedback on presentation skills. (New York, NY)



SELECTED FOR JUDGES' VOTE

Green Badger is a cloud-based automation and compliance solution for the green construction industry. (Savannah, GA)



SELECTED FOR AUDIENCE VOTE

Quartolio is a knowledge management platform for research that utilizes insights from millions of scientific documents and datasets. (New York, NY)



Holobuilder is a construction site software that utilizes 360° photos for the entire development process. (San Francisco, CA)



SELECTED FOR PEER VOTE

RoadBotics is a road assessment and monitoring platform. (Pittsburgh, PA)



MakuSafe is a workforce safety platform that provides insights to improve worker health, safety, and productivity. (Des Moines, IA)



Sorcerero is a platform that improves employee engagement, retention, and training. (Washington, DC)

# EMERGING SECTOR TRENDS

On June 12, 2018 in San Francisco, we convened startups, investors, business leaders, and AI experts to discuss how automation and AI can be used to benefit the workforce of the future.

The following pages provide an overview of how entrepreneurs are building solutions for the workforce of the future.



# INCLUSIVE HIRING AND JOB MATCHING: USING DATA TO GET PAST HIRING BIASES

## THE UPSHOT

---

**The sector:** one report by a well-known recruiter stated that the cost of recruiting, hiring, and onboarding a new employee is \$240,000, and the cost rises substantially if the person turns out to be a bad fit.<sup>2</sup>

Hiring remains a large pain point for many companies, with millions of jobs in the United States currently unfilled.<sup>3</sup> Not surprisingly, HR tech is a \$5 billion industry.<sup>4</sup>

One aspect of hiring that has drawn more scrutiny in recent years is the lack of diversity in tech and business more generally. Google's lackluster diversity report in 2014 led to a new level of attention and accountability around representation in tech. Executives are also increasingly recognizing the business case for diversity: for instance, a Deloitte study found that inclusive teams outperform their peers by 80% in team-based assessments.<sup>5</sup>

All of this is driving demand for tools that remove bias from the recruiting and hiring processes. Google recently pledged \$150 million to diversity initiatives, while Intel and Apple have pledged \$300 million and \$50 million, respectively.<sup>6</sup> Some initial trials have been successful. Hilton implemented an AI tool in pre-hire assessments to fill call center and customer support positions. Within three years, they were able to reduce the length of time between initial interviews and offers from 42 days to five days.

**What it means for startups:** automation and AI will play an increasingly large role in how organizations source, recruit, hire, and onboard employees in the future. A cross-industry survey last year found that approximately 62% of recruiters planned to spend more on AI-based human resource solutions in 2018. Out of those surveyed, 86% said they intend to tap into AI software that helps with sourcing.

One area in which automation can help is removing unconscious bias in hiring. As one participant at our forum said: "The best possible uses of AI include the opportunity to remove bias, but it will take cooperation among corporate partners." Several startups are looking to assist with this. Blendoor helps recruiters reduce unconscious bias during the hiring process. The company's algorithm analyzes data from the employer and candidate to find matches between the two. The automated process helps hide resume data that is not relevant (i.e. names and addresses) and highlights data that matters. The app then tracks how candidates progress through the hiring process and provides recruiters with tailored feedback on how to make better, more inclusive decisions.

Automation tools can also make the labor market more efficient by simplifying the process for jobseekers and eliminating time-consuming tasks for recruiters (i.e. interview screening), freeing them up to focus on higher-level tasks. For instance, Mya Systems sends automated text messages to candidates asking about their salary requirements and hiring timeframes. Of the candidates surveyed by Mya, 73% believed they were interacting with an actual recruiter. Another example is writing enhancement service Textio, which uses AI and a proprietary data set of over 350 million job posts to tailor company job descriptions to a more inclusive talent pool. Johnson & Johnson reported an additional 90,000 female candidates in its talent pipeline after using Textio's services.

Investors are taking notice. In 2016, Village Capital worked with Kapor Capital to host a People Ops pitch competition for entrepreneurs focused on recruiting, hiring, evaluation, complaint handling, and training and Kapor has remained an active investor in this sector.

## AT THE FORUM

---



Blendoor is a hiring platform that uses augmented intelligence and people analytics to reduce unconscious bias through merit-based job matching. (San Francisco, CA)



NexusEdge is a career services platform for community college students. (Los Angeles, CA)

## COMPANIES TO WATCH

We found several companies offering AI-enabled platforms and technologies to improve gender, racial, cultural, and neuro-diversity in the workplace. They fell into two categories:

**Job Matching Platforms and Marketplaces:** these companies provide two-sided platforms that connect employers with candidates or help employers find more diverse candidates and mitigate bias in the hiring process.

- **Jopwell:** career advancement for Black, Latino, and Native American professionals
- **PowerToFly:** streamlined job placement for women in tech
- **Handshake:** democratizing career opportunities for university students
- **WayUp:** finding jobs and internships for underserved college students and recent grads
- **Entelo:** recruiting automation that goes beyond the resume to find top talent
- **Textio:** taking the subjectivity out of writing job descriptions

**Recruiting and Hiring Tools:** these companies offer technologies that help employers recruit and engage with potential employees.

- **Interviewing.io:** facilitating anonymous, bias-free interviews for tech companies
- **GapJumpers:** inclusive job ads and blind hiring tools designed for diversity
- **Quantize Analytics:** predictive analytics to maximize the quality of hires
- **Qualified:** prescreens software engineering candidates before on-site interviews
- **Mya Systems:** automates the pre-screen process to better engage great candidates
- **HireVue:** an all-in-one video interview and pre-hire assessment solution
- **Humanyze:** people analytics that uncover patterns in employee productivity
- **Glassbreakers:** software for inclusive talent development as a core business function
- **Pymetrics:** building cognitive and emotional profiles to help source and screen talent

### AI's Role In Perpetuating Biases

Given that AI-powered platforms are driven by human-produced algorithms that are fed massive amounts of data, some platforms risk perpetuating and strengthening existing societal biases. As forum attendee Ivy Nguyen from Zetta Venture Partners said, “an algorithm is only as unbiased as the people who make it. You can end up calcifying injustices more than if you let humans run the show.”

In 2016, Microsoft released an AI chatbot on Twitter that engaged with Twitter users to develop casual and playful conversation skills, which it then recycled into future tweets. Within 24 hours, the chatbot began tweeting racist and sexist sentiments – a reflection of the data it was being fed.

In the same vein, a 2016 ProPublica investigation found that analytics-based software used to make court recommendations had inherent biases and led to perverse outcomes. Black defendants evaluated through the software, for instance, were found to be twice as likely to be incorrectly labeled as higher risk to society than white defendants and thus received longer sentences.<sup>7</sup>

If proper measures are not taken in monitoring and evaluating AI-driven job matching platforms, these biases may strengthen discrimination in hiring practices and thus impede rather than strengthen diversity in the workplace. The potential and risk that these technologies carry to influence systematic decisions makes it even more important that the entrepreneurs and developers who build these tools are thoughtful, ethical, and representative of society at large.



# UPSKILLING & HUMAN CAPITAL MANAGEMENT: SMARTER TRAINING TOOLS FOR A NEW GENERATION OF WORKERS

## THE UPSHOT

---

**The sector:** corporate spending on training and upskilling in the United States is on the rise, partly due to an increasing need for job-specific STEM skills. A 2017 industry report by Training Magazine found that total US training expenditures rose by 32.5% last year, to \$90.6 billion.<sup>8</sup> A separate survey, conducted by LinkedIn, found that 25% of companies plan to spend more on learning in 2018.<sup>9</sup>

This training budget boom coincides with several other major shifts in the workforce, including:

- **The rise of traditional workers:** although the 2008 recession resulted in companies hiring fewer full-time employees, and many companies are still outsourcing jobs like computer programming and social media, there are more workers in traditional jobs now than a decade ago.<sup>10</sup>
- **A growing market of freelance workers in certain industries:** while the number of independent contractors in the US has actually declined since 2005, there has been a 50% increase in independent contractors who work in the transportation sector.<sup>11</sup> Furthermore, there has been a significant growth in business and professional services freelancers. One likely cause for this shift is that while more workers are employed in traditional jobs, wages have not kept up with inflation, and as a result, many people are taking on side gigs in addition to their full-time jobs to make ends meet.
- **Online learning:** in 2006, 33% of learning and development was done by in-person instructors. By 2016, it had fallen to 16%.<sup>12</sup> As more employees work from home and use their phones for different job functions, content will continue to shift from in-person delivery to personalized digital classes.

**What it means for startups:** recent shifts in the workforce – including outsourcing, the rise of freelance workers and online learning – continue to drive demand for AI-driven tools that increase employee engagement, learning, and

productivity at an individualized level.<sup>13</sup>

The rise of online training opens the door for tools that are personalized, have multiple touch points throughout the day, and have on/off sync functionality. AI is well positioned to meet these needs. The incorporation of deep learning, for instance, has created customized learning paths for individuals, crafted based on expertise, interests, and personalized learning objectives while adapting to the data resulting from user engagement.

Sorcero is just one example. The company integrates human capital management systems with existing learning management systems (LMSs). It uses AI to analyze human learning behavior through end-user activity (i.e. chat tools and content engagement). It then maps out learner progress against industry competency models and delivers customized trainings. For employees, this makes learning more relevant and helps increase productivity and efficiency.<sup>14</sup> For employers, this can lead to a higher-performing workforce and cost savings.

Secondly, the rise of new talent structures has spurred demand for ways to reach and upskill workers who do not work in traditional office environments. Workers can benefit from AI products that collect and leverage data, such as course completion rates, online learner progress, learner surveys, e-learning assessment scores, peer-based feedback, and audio capture. Managers can also benefit from AI-driven solutions, such as vendor management systems and cross-border engagement tools that interact with these newer labor segments.<sup>15</sup>

Presentr, for example, is a personalized mobile coaching app that helps users improve their public speaking and presentation skills. Users record themselves during a presentation and receive a formal analysis of their speaking skills, including attributes like volume and word choice. Users then receive tailored feedback and custom modules to fill in any skills gaps.

## AT THE FORUM

---



Balloonr is a platform that allows teams and companies to solicit anonymous ideas or feedback. (San Francisco, CA)



Presentr is a personalized coaching app that provides real-time feedback on presentation skills. (New York, NY)



Sorcero is a platform that improves employee engagement, retention, and training. (Washington, DC)

## COMPANIES TO WATCH

We found several companies in this sector, both emerging and established, in the following categories:

**Training Programs:** these companies offer (primarily digital) content-based training for workforce development. These trainings tend to be focused on technology skill building, language, soft skill, and leadership development.

### *Skill Development:*

- **Pairin:** personalizing career development through soft skills assessments

### *Coding Bootcamps:*

- **Thinkful:** coding bootcamp and career accelerator that prepares students for jobs in tech
- **App Academy:** 12-week course to train the next generation of developers

### *E-learning:*

- **Udacity:** offering massive online open courses to democratize education
- **Udemy:** online learning and teaching marketplace for 15 million adult learners
- **Everfi:** providing scalable learning through community-driven e-learning solutions

**Human Capital Management:** these companies improve the management, productivity, relationships, inclusivity, and well-being of employees.

### *Startups:*

- **BetterUp:** cultivating collaboration by connecting workers with mentors through video
- **SyncHR:** cloud-based technology automating benefits and payroll processing
- **TINYpulse:** measuring and shaping company culture through anonymized feedback
- **Zugata:** mobile software provider enabling continuous peer-to-peer feedback

### *Corporations:*

- **ADP Vantage:** diversified HR platform offering payroll, benefits, and compliance services
- **Kronos:** powerful human capital solutions to help engage and manage the workforce
- **Oracle HCM Cloud:** an AI tool that helps companies manage employees and improve learning
- **Paylocity:** providing innovative payroll and HR services to enterprises

**Learning Systems:** applications for the delivery, management, monitoring, and distribution of learning and training programs for employees.

- **Credly:** end-to-end solution for creating, issuing, and managing digital credentials
- **Degreed:** a lifelong learning platform that individuals and organizations use to discover learning content, build skills, and certify expertise
- **Moodle:** free, open-source software that helps educators, administrators, and learners create personalized learning environments
- **Smart Sparrow:** adaptive, e-learning platform that enables anyone to create interactive learning experiences

### **We see three specific challenges for AI-driven training and upskilling solutions:**

#### **Cultural Diversity & Linguistic Differences**

For global corporations, the cultural nuances of training programs require degrees of variation based on end user origins and educational systems. Building in variance for language, cultural preferences, and learning styles is complex and consumes resources.<sup>16</sup>

#### **Security & Data Standards Regulations**

Privacy regulations vary by country, and LMS companies have to differentiate how learners in different countries interact with and store data. Failure to do so can have major legal consequences. As a result, LMS vendors have to make the deliberate choice to deploy their technology through the cloud or on premise. This choice largely depends on data privacy laws. Thus, achieving economies of scale internationally is a difficult proposition.<sup>17</sup>

#### **Lack of Reporting & Integration**

Integrating a product into different parts of an organization is challenging, given that there are multiple points of integration and reporting, including various business units, regions, specialized teams, and HR groups. This also has financial implications both because longer integrations cost more and cross-border integrations carry different currency, tax, and time zone burdens. Southern New Hampshire University and University of Maryland University College, for instance, are adopting system architectures that enable multiple systems to be integrated into one core platform. This makes it more difficult for LMS companies to achieve full penetration.<sup>18</sup>

# PRODUCTIVITY & PREDICTIVE ANALYTICS:

## A NEW FOCUS ON THE “PEOPLE ASPECTS” OF WORK

### THE UPSHOT

---

**The sector:** as cloud computing continues to advance and become more affordable, companies are more easily able to access the underlying architecture for AI tools that can help them cut down on time-intensive tasks for both employees and their managers. For example, in 2016 General Electric invested over \$1 million in sensors to capture and analyze data on equipment performance.<sup>19</sup> (Predictive analytics was a \$4.56 billion market in 2017 and is expected to grow at a 22.1% CAGR to \$12.41 billion by 2022.)<sup>20</sup>

Increased productivity will give workers more time to focus on activities uniquely suited to human cognition and execution. As a Deloitte report stated, “today there is a new focus on the ‘people aspects’ of work...While tasks are being automated, the ‘essentially human’ parts of work are becoming more important.”<sup>21</sup>

One company that exemplifies this idea is Quartolio, an AI-powered knowledge management platform that analyzes millions of open access articles, datasets, and patents to provide researchers with intelligible insights. Researchers will be able to spend less time on this rote work (akin to a search engine) and more time on analytical work. In Quartolio’s words, “machines can never replace human curiosity, but Quartolio gives you more time to put your knowledge to work.”

Sami Ghoche, a LinkedIn engineer who participated in the forum, said: “I don’t think AI has displaced people as much as it has augmented their abilities. Over time, this allows workers to focus their energy in a more creative way.”

**What it means for startups:** there are several ways AI can augment the workforce without causing job losses.

**Industrial IoT:** as AI becomes more integrated in industrial IoT, startups are developing products that help predict discrepancies and free up employees to focus on other aspects of their jobs.<sup>22</sup> Data from factory sensors, wearables, and connected devices can be leveraged to predict systemic issues before they occur. For instance, Alluvium leverages AI and industrial data from connected equipment to deliver a real-time “stability score” that enables factory operators to find anomalies in production systems down to a single piece of equipment. This helps them make informed decisions and prevent future outages.

**Safety:** AI can keep workers safe, reducing a major management and insurance burden and preventing accidents from occurring on the job. MakuSafe, for example, uses both IoT sensors that workers wear on their arms and adaptive software to collect data on safety conditions in a workplace. This data includes information on where accidents happen, when air quality declines, when temperatures escalate, and where dangerous equipment is located. The data is then fed into a machine learning algorithm that can predict where and when worker accidents will occur, with the goal of preventing and avoiding them.

**Compliance:** AI tools help companies automate all types of compliance, especially in regulated industries like healthcare, law, and real estate. These tools are often used to digitize paper recordkeeping systems that have not been updated in decades. For instance, Green Badger describes itself as the “TurboTax for LEED compliance.” The company compiles everything a construction developer needs to fill out to earn LEED certification for a building. The company claims to reduce labor hours by 60%, as well as reduce regulatory risk.

### AT THE FORUM

---



Green Badger is a cloud-based automation and compliance solution for the green construction industry. (Savannah, GA)



Holobuilder is a construction site software that utilizes 360° photos for the entire development process. (San Francisco, CA)



MakuSafe is a workforce safety platform that provides insights to improve worker health, safety, and productivity. (Des Moines, IA)



Quartolio is a knowledge management platform for research that utilizes insights from millions of scientific documents and datasets. (New York, NY)



RoadBotics is a road assessment and monitoring platform. (Pittsburgh, PA)

## COMPANIES TO WATCH

We found several companies in this sector, both emerging and established, in the following categories:

**Predictive Analytics:** these tools track real-time data to offer valuable insights and catch unexpected fluctuations (e.g. when a water pipe is nearing its end life).

- **C3 IoT:** an enterprise platform as a service for AI, predictive analytics, and IoT software
- **KONUX:** an end-to-end IoT solution combining smart sensors and AI-based analytics to enable predictive maintenance for industrial and rail companies
- **6sense:** B2B predictive intelligence engine for marketing and sales
- **Maana:** a platform that accelerates knowledge discovery to increase profitability for industrial oil and gas companies
- **Uptake:** an industrial analytics platform that improves productivity, security, safety, and reliability

**Workplace IoT:** these companies use surveillance-based technologies (i.e. armband sensors) to track worker movements and productivity.

- **Alluvium:** leverages factory data to deliver real-time operational insights to complex industrial operations
- **RoboCV:** an electrical forklift and cloud-based service that optimizes task distribution among robots in real time
- **Augmedix:** digital documentation service for health systems and doctors
- **Theatro:** mobile communications platform that allows hourly employees to communicate hands free
- **DorsaVi:** wearable sensors that measure human movement and muscle activity
- **SmartCap Technologies:** fatigue monitoring solution that provides real-time feedback to help operators manage their alertness
- **Altizon:** fully managed IoT platform that helps companies connect and process IoT data at scale

**Digital Assistants:** integrated tools that enable employees to streamline workflow and focus on relevant, high-priority tasks while increasing efficiency.

- **IBM Watson:** AI platform for businesses that provides data analysis and insights
- **Amazon Alexa for Business:** an intelligent voice assistant that improves worker productivity
- **Microsoft Cortana:** a virtual assistant compatible with Windows products
- **SAP CoPilot:** a digital assistant for enterprises
- **Google Assistant:** a virtual assistant compatible with Google devices

### Cybersecurity Threats

The expansion of information flows between machines and humans, spurred by AI, directly increase the threat of cybercrime. A 2017 Better Business Bureau survey found that roughly 20% of all businesses have been victim to a cybersecurity attack, often traced back to personal employee data.<sup>23</sup>

This will become a growing concern as the increased sophistication of natural language processing and voice recognition in the workplace further incentivizes cybercriminals to track and attack AI-driven workforces. The recent WannaCry ransomware attack, which caused Renault-Nissan auto plants in Europe to shut down, is one high-profile example.<sup>24</sup> As adoption of IoT increases, so does the growth of cybercrime touchpoints: for example, a North American casino was recently subject to data theft through a wi-fi-connected fish tank.<sup>25</sup>

Companies that incorporate AI will need to be particularly conscious about preventing cybercrime and dealing with its consequences. These high-profile hacks raise the possibility of legislation or regulation that could severely curtail industry innovation.

On the other hand, increased security threats have already led to some innovations. For instance, MIT has developed chips that do not require web connections to process AI-driven tasks. Startups like Rubicon Labs and Mocana also offer solutions to improve secure communication at the device and IP level. According to Accenture's Cost of Cyber Crime Study (2017), automation and machine learning have produced some of the strongest cost savings for dealing with cybercrime, but only 28% of companies have implemented these solutions enterprise-wide.<sup>26</sup>

## DISCLAIMER

- This document was prepared by analysts at Village Capital for general information purposes only and is not necessarily definitive, current, or authoritative. Data used in this document was gathered from reliable sources, but the analysts and the publishers of this document do not hold themselves responsible for the accuracy or completeness of data used. The document provides the opinions, analyses and conclusions of Village Capital analysts only and is provided without warranties of any kind. Village Capital and its partners do not in any way endorse the findings, views, and conclusions in this document. We do not accept any liability for any direct or remote loss or damage arising out of the use of all or any part of the information contained in this document.

## USE OF THIS PUBLICATION FOR THE PURPOSE OF MAKING INVESTMENT DECISIONS EXPOSES YOU TO SIGNIFICANT RISK OF LOSS.

- Receipt of this publication does not make you a client or provide you with the protections afforded to clients of Village Capital. When distributing this document, Village Capital is not acting on behalf of the recipient of this document and will not be liable for providing investment advice to any recipient in relation to this document. Accordingly, Village Capital will not be held accountable to any recipient for providing the protections afforded to its clients.
- This document is published for informational purposes only and is not an offer to solicit, buy, or sell any security or other similar instruments or investments of any kind. This document does not provide customised investment advice and should not be used as such under any circumstances. It has been prepared without regard to the individual financial circumstances and risk and return objectives of individuals who receive it. The appropriateness of a particular investment will depend on an investor's individual circumstances, risk tolerance, and return objectives. The investments referred to in this document may not be suitable for all or certain categories of investors.
- The opinions presented in this report may be changed without prior notice or cannot be depended upon if used in place of an investor's independent judgment.

© Village Capital 2018. All Rights Reserved. This disclaimer has been prepared by Apoorv Karmakar and the Village Capital communications department.

For any question, please contact: Ben Wrobel, Village Capital, 1101 K St NW, Suite 920, Washington, DC 20005

## DISCLOSURES

Research analyst certification: the research analysts primarily responsible for the preparation and content of all or any identified portion of this research report hereby certify that all of the views expressed herein accurately reflect their personal views. Each research analyst also certifies that no part of their compensation was, is, or will be directly or indirectly related to the views expressed by that research analyst in this research report.



## ENDNOTES

- 1 <https://www.mckinsey.com/featured-insights/future-of-organizations-and-work/jobs-lost-jobs-gained-what-the-future-of-work-will-mean-for-jobs-skills-and-wages>
- 2 [shrm.org/resourcesandtools/hr-topics/employee-relations/pages/cost-of-bad-hires.aspx](http://shrm.org/resourcesandtools/hr-topics/employee-relations/pages/cost-of-bad-hires.aspx)
- 3 [money.cnn.com/2017/06/06/news/economy/us-job-openings-6-million/index.html](http://money.cnn.com/2017/06/06/news/economy/us-job-openings-6-million/index.html)
- 4 [businesswire.com/news/home/20170719005619/en/Top-5-Vendors-Global-Cross-cultural-Training-Market](http://businesswire.com/news/home/20170719005619/en/Top-5-Vendors-Global-Cross-cultural-Training-Market)
- 5 [2.deloitte.com/content/dam/Deloitte/au/Documents/human-capital/deloitte-au-hc-diversity-inclusion-soup-0513.pdf](http://2.deloitte.com/content/dam/Deloitte/au/Documents/human-capital/deloitte-au-hc-diversity-inclusion-soup-0513.pdf)
- 6 [fastcompany.com/3061457/how-silicon-valleys-diversity-problem-created-a-new-industry](http://fastcompany.com/3061457/how-silicon-valleys-diversity-problem-created-a-new-industry)
- 7 [propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing](http://propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing)
- 8 [trainingmag.com/trgmag-article/2017-training-industry-report/](http://trainingmag.com/trgmag-article/2017-training-industry-report/)
- 9 <https://learning.linkedin.com/elearning-solutions-guides/workplace-learning-report-2018>
- 10 [https://www.washingtonpost.com/news/wonk/wp/2018/06/07/there-are-fewer-workers-in-the-gig-economy-today-than-before-uber-existed-official-data-show/?noredirect=on&utm\\_term=.2228c04116d6](https://www.washingtonpost.com/news/wonk/wp/2018/06/07/there-are-fewer-workers-in-the-gig-economy-today-than-before-uber-existed-official-data-show/?noredirect=on&utm_term=.2228c04116d6)
- 11 [Ibid.](#)
- 12 [evollution.com/revenue-streams/corporate\\_partnerships/four-key-trends-driving-the-corporate-learning-and-development-market/](http://evollution.com/revenue-streams/corporate_partnerships/four-key-trends-driving-the-corporate-learning-and-development-market/)
- 13 [hcamag.com/hr-news/top-six-talent-management-trends-for-2018-and-beyond-245121.aspx](http://hcamag.com/hr-news/top-six-talent-management-trends-for-2018-and-beyond-245121.aspx)
- 14 [elearningindustry.com/learning-management-system-trends-for-2018-7-corporate](http://elearningindustry.com/learning-management-system-trends-for-2018-7-corporate)
- 15 [planetexpat.org/2018/04/24/5-workplace-trends-youll-see-future/](http://planetexpat.org/2018/04/24/5-workplace-trends-youll-see-future/)
- 16 [hrpayrollsystems.net/5-challenges-to-overcome-when-training-a-global-workforce/](http://hrpayrollsystems.net/5-challenges-to-overcome-when-training-a-global-workforce/)
- 17 [talentedlearning.com/global-learning-platforms-top-10-lms-buying-challenges/](http://talentedlearning.com/global-learning-platforms-top-10-lms-buying-challenges/)
- 18 [techcrunch.com/2016/09/02/the-lms-market-glacier-is-melting/](http://techcrunch.com/2016/09/02/the-lms-market-glacier-is-melting/)
- 19 [theatlantic.com/sponsored/vmware-2017/human-ai-collaboration/1721/](http://theatlantic.com/sponsored/vmware-2017/human-ai-collaboration/1721/)
- 20 [marketsandmarkets.com/PressReleases/predictive-analytics.asp](http://marketsandmarkets.com/PressReleases/predictive-analytics.asp)
- 21 [2.deloitte.com/insights/us/en/focus/human-capital-trends/2017/future-workforce-changing-nature-of-work.html](http://2.deloitte.com/insights/us/en/focus/human-capital-trends/2017/future-workforce-changing-nature-of-work.html)
- 22 [information-management.com/news/ai-may-hold-the-key-to-success-with-predictive-analytics](http://information-management.com/news/ai-may-hold-the-key-to-success-with-predictive-analytics)
- 23 [bbb.org/globalassets/shared/media/state-of-cybersecurity/updates/cybersecurity\\_final-lowres.pdf](http://bbb.org/globalassets/shared/media/state-of-cybersecurity/updates/cybersecurity_final-lowres.pdf)
- 24 [cnet.com/news/wannacry-wannacrypt-uiwix-ransomware-everything-you-need-to-know/](http://cnet.com/news/wannacry-wannacrypt-uiwix-ransomware-everything-you-need-to-know/)
- 25 [washingtonpost.com/news/innovations/wp/2017/07/21/how-a-fish-tank-helped-hack-a-casino/](http://washingtonpost.com/news/innovations/wp/2017/07/21/how-a-fish-tank-helped-hack-a-casino/)
- 26 [accenture.com/t20170926T072837Z\\_\\_w\\_\\_/\\_us-en/\\_acnmedia/PDF-61/Accenture-2017-CostCyberCrimeStudy.pdf](http://accenture.com/t20170926T072837Z__w__/_us-en/_acnmedia/PDF-61/Accenture-2017-CostCyberCrimeStudy.pdf)