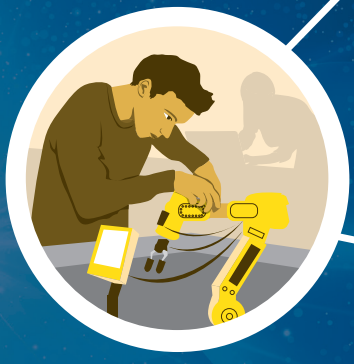
MIT Technology Review
Insights / Research

Asia's AI agenda

AI and human capital



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Preface

Asia's AI agenda is an MIT Technology Review Insights research program sponsored by ADP, IMDA, Genesys, Splunk, and the Asia School of Business. It is designed to comprehensively examine the development of artificial intelligence (AI) in Asia Pacific from four distinct angles: Asia's AI ecosystem, the leading use cases and business applications across the region, the evolving talent landscape, and the emerging discussions around AI and ethics. To produce this series, MIT Technology Review Insights conducted a survey of almost 900 executives across 13 markets, and a series of interviews with leading authorities from academia and industry. The research is editorially independent and the views expressed are those of MIT Technology Review Insights.

The survey

- In September and October 2018, MIT Technology Review Insights surveyed 871 senior business leaders. Twenty-nine percent are CIOs, CTOs, or heads of AI or analytics. More than half (53%) are C-suite and director-level executives. Almost 60% are from large companies with more than $1 billion in revenue.
- Survey respondents are based in 13 Asia-Pacific markets: Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, the Philippines, Singapore, South Korea, Thailand, and Vietnam. A minimum of 50 people from each country responded.
- Respondents are drawn from a wide range of industries, including more than 50 from each of the following sectors: consumer goods and retail, financial services, information technology and communications, manufacturing, pharmaceuticals and healthcare, professional services, property, construction and engineering, and transport and logistics.

Expert interviews

We would like to thank the following experts for contributing their time and insights towards this research program:

Joanna Bryson, Associate Professor, Department of Computing, **University of Bath**

Jeffrey Ding, D.Phil Researcher, Future of Humanity Institute, **University of Oxford**

Greg Miller, Executive Director, **Faethm**

Scott Park, President and CEO, **Doosan Bobcat**

Michael Priddis, Chief Executive Officer, **Faethm**

Viriya Upatising, Chief Information Officer, **True Corporation**

Ken Wong, Head of AI Lab, **OCBC Bank**

Zee Kin Yeong, Assistant Chief Executive, Data Innovation and Protection Group, **Infocomm Media Development Authority, Singapore**

Contents

1. Executive summary

The impact of AI on work, jobs, and people is one of the most controversial aspects of today's technological wave that will undoubtedly transform companies, industries, and societies in the years ahead. In this report, "*AI and human capital*," part of our research program Asia's AI agenda, we explore the degree to which executives in Asia Pacific are expecting and preparing for the automation of job roles. We also look at how staff working in companies across the region are responding to the increasing need to work "shoulder to software."

The report also explores a new data set provided by Faethm, a future of work software-as-a-service company. It shows, by country and industry, the proportion of formal sector jobs that will become redundant through automation. It also shows the proportion that will be supported and augmented by AI, making those jobs more productive and highly skilled. The key findings of the report are as follows:

- **AI will be a major growth driver for Asia in the coming decade.** The company priorities for AI are to enhance customer satisfaction, speed up decision making, and reduce inefficiencies. The loss of some roles to automation, and the restructuring of others to take advantage of technology-created capacity, are likely. Yet reducing headcount is not a top priority in and of itself. Just one-third of survey respondents listed the need to reduce labor costs as a top-three driver for AI.

- **The large majority of companies are expecting headcount to increase.** Some 77% of survey respondents expect total headcount to increase over the next five years, including in functions where AI is already being deployed. One fifth of respondents overall indicated that they expect five-year increases of more than 15%. Very few (just 3%) are predicting any headcount contraction.

- **Yet AI will affect one in every five jobs in Asia—eliminating one in eight.** Faethm data show that across 11 Asian markets, 12% of current jobs are at high risk of being automated in the next five years. By analyzing ILO employment data with each job categorized in up to 218 specific job-related tasks, the data show that the effect of AI on job automation will be greater in Asia's wealthier economies than in poorer ones (14% as opposed to 10%). However, many more jobs in those developed markets will actually benefit and be augmented by AI (11% of the total) than in less-developed markets (just 6%). The data were measured against country and industry forecasts for the adoption of 17 emerging technology categories.

- **AI will produce winners and losers.** The introduction of AI in high-income countries will result in a high degree of job augmentation and added capacity, mostly in knowledge-intensive industries. In developing Asian countries, fewer jobs are augmented by technology and little capacity is added. The degree to which jobs are enhanced is determined by the structure of each country's economy, its technology-readiness in each category, and other economic and social drivers. Labor-constrained markets such as Singapore, Australia and Japan will be among the fastest to seize the opportunities created by AI.

- **Talent and technology agendas must align to sustain long term growth.** Survey respondents believe that jobs are being enhanced by AI, and that employee satisfaction overall is increasing as a result. But is there a false sense of security? Corporate expectations for growth and the belief that AI will have a net positive effect on jobs may prevent the necessary preparations for disruption and reskilling from taking place. Across the region, governments are also unprepared for how fast technology will outpace human capabilities in some areas. Business leaders and policymakers must urgently align technology and talent agendas to build career pathways for those displaced, and to ensure that critical skills gaps do not open up and restrict growth in the long term.

2. Asia's AI opportunity

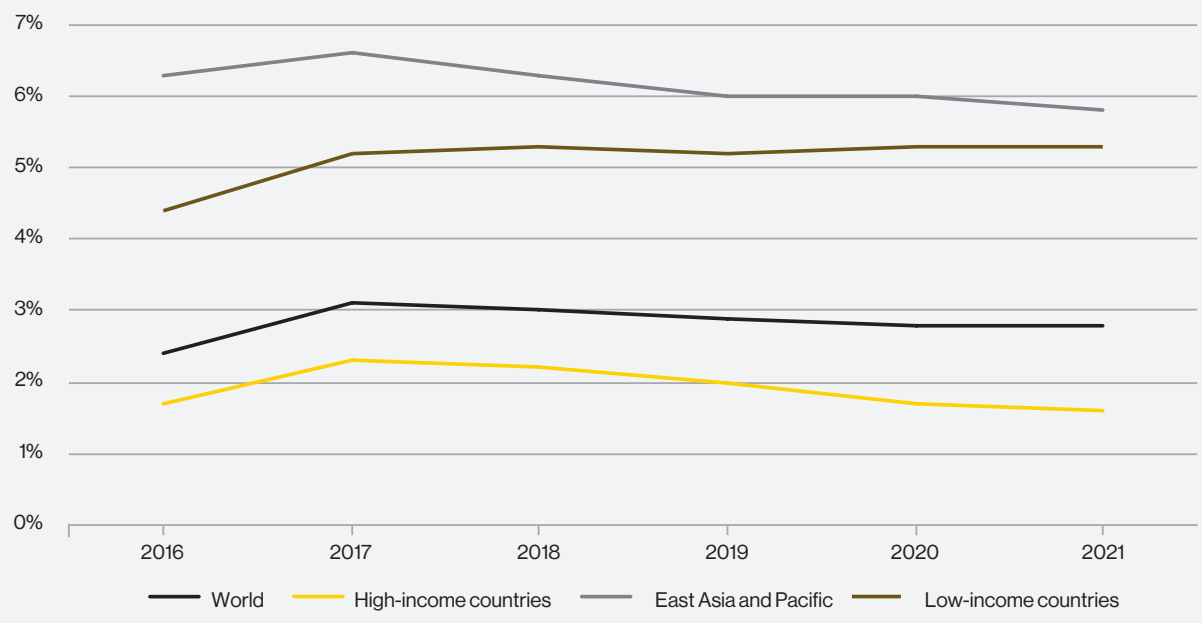
Asia is recognized by senior decision makers as an emerging AI leader, both for its research and development of AI tools and applications as well as deployment of AI solutions to improve enterprise performance. AI will, as a result, have a disruptive impact on employment across the region. It will also enhance job efficacy, performance, and ultimately job satisfaction. These are the findings of a survey of almost 900 senior executives in Asia Pacific, conducted by MIT Technology Review Insights.

Self-reliance and the tech imperative

The criticality of AI for Asian businesses today is easy to assess against the current backdrop of the region's economic and social transitions. Asia as an economic whole continues to grow at twice the global average. The World Bank estimates that Asia's GDP grew 6.3% in 2018, compared to worldwide economic expansion of 3%. Yet the Bank predicts that 2019 growth will be lower for all as international trade and investment activity slows, partially informed by trade conflicts. As a result, export-reliant Asia will not only find global trade—its primary growth lever—diminished. Geopolitical tensions will amplify the need for economies around the region to become increasingly self-reliant. To sustain the growth that Asia needs to continue its social and developmental transformation—including improving income levels and quality of life—the region must turn to technology-enabled solutions.

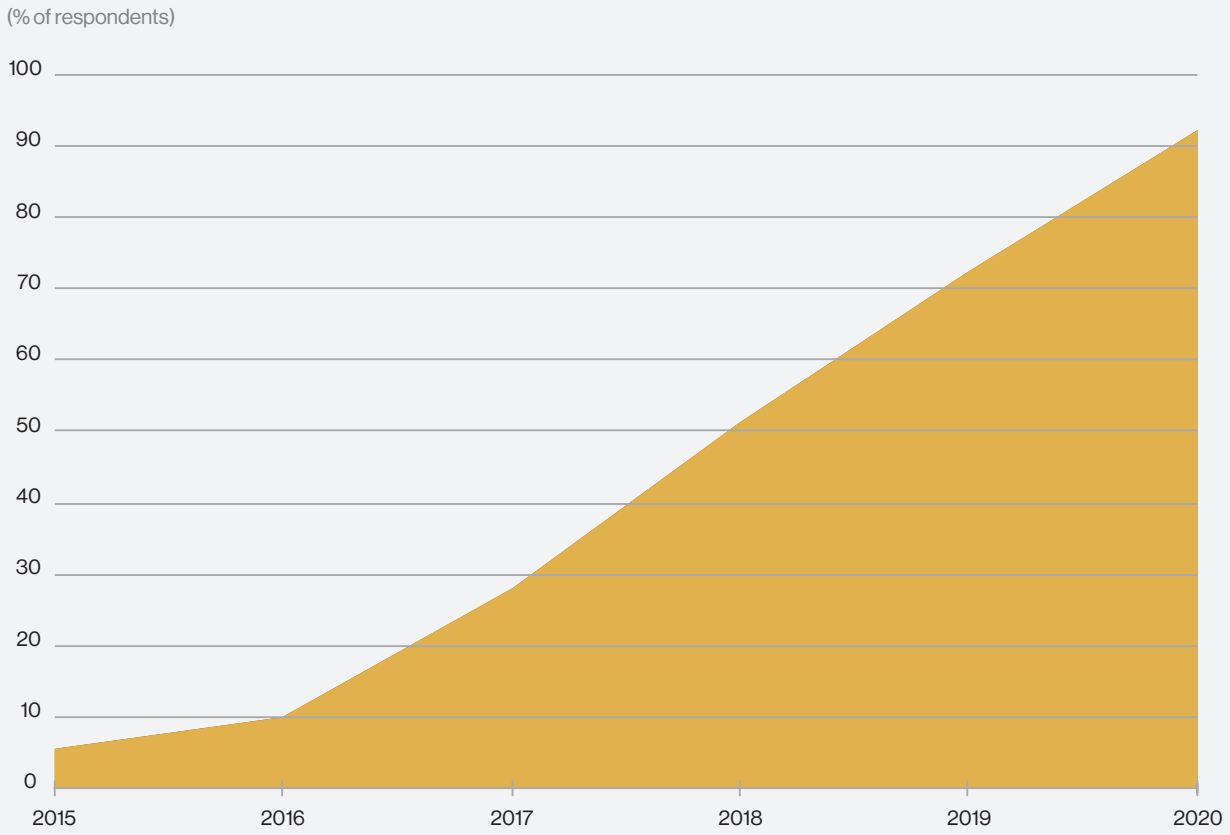
Many of these solutions will positively impact economic output for Asia and its workers. Asia has already proven to be a receptive platform for AI innovation. In the report "Asia's AI Ecosystem," MIT Technology Review Insights found that in rich and poor countries alike, leveraging the region's growing AI competency and technologies across all industries and public services has become an urgent priority. And, because Asia has both tremendous pools of AI "natural resources" (data,

Figure 1: Real GDP growth, 2016-2021



Source: World Bank forecasts, 2019

Figure 2: Proportion of companies using AI in Asia



Source: MIT Technology Review Insights survey, 2018

plugged-in digital consumers, and public and private AI R&D investments), it is possible that many of the world's key innovations will be developed and scaled up first in Asia.

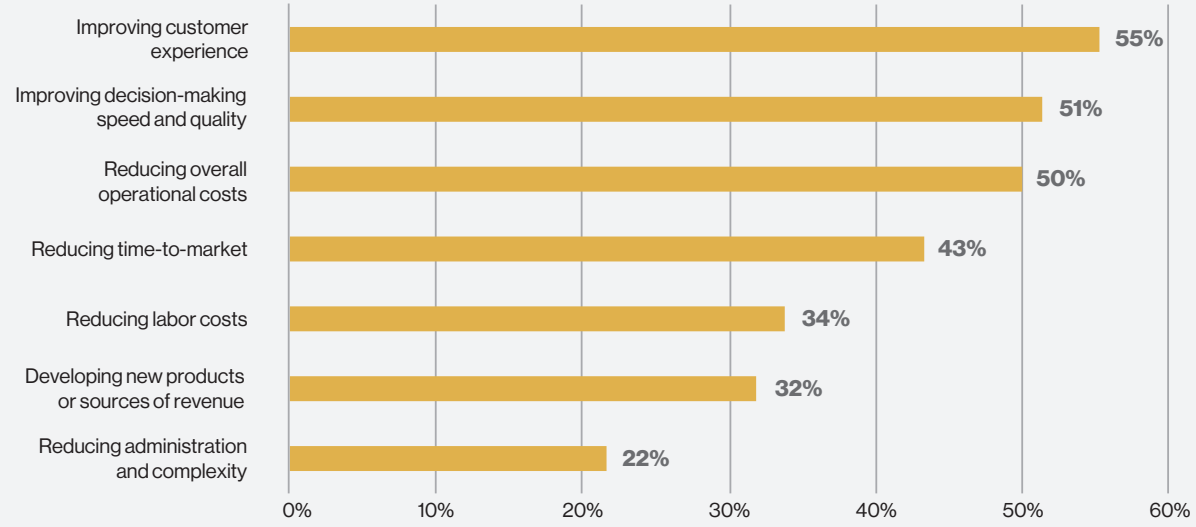
Given this urgency, and Asian businesses' increasing familiarity with the effect of AI on their operations, Asian decision-makers feel confident that these technologies will be of tremendous value. As of 2018, nearly half of survey respondents had already deployed AI tools and technologies within their organization. By 2020, more than 90% are expected to have done so.

The survey also found that the most important drivers for AI adoption are those which help firms be more agile and responsive in high-growth, competitive markets. More than half of respondents cited the need to improve customer experience as the most important driver (see Figure 3), followed closely by those who said they used AI to improve the speed and quality of decision-making. Overall operational cost reduction was the third-most-cited driver. However, other reasons more traditionally associated with an automation strategy—such as reducing labor costs, administration, and overall complexity—were lower priorities for respondents.

The most important drivers for AI adoption are those which help firms be more responsive in high-growth, competitive markets.

Figure 3: Business drivers for deploying AI

What are your company's top three business drivers for deploying AI?
(% of respondents)



Source: MIT Technology Review Insights survey, 2018

Shoulder to software

While reducing labor costs was not identified as a top priority for companies in the region, it is certain that increasing the speed of business is absolutely key to competitiveness. The result is that any process involving repetitive work where human interaction or decision-making adds little value is likely to be considered for automation. As we explore in the next chapter, businesses in the region do not see headcount reductions as part of their immediate plans. However, employees will increasingly notice AI technology creeping in. They will need to develop, train, and manage the quality of workplace AI tools, and the evolving nature of their own jobs over time.

While businesses in the region do not see headcount reductions as part of their immediate plans, employees will increasingly notice AI technology creeping in.

Key takeaway

AI addition—not talent subtraction. In order to sustain their growth momentum, Asian business leaders are using AI to extend their human workforce capabilities, and accelerate their performance—not to trim headcount. However, Asian businesses need to invest in training and development so that AI-enabled jobs and skills evolve and grow at pace with the technology.

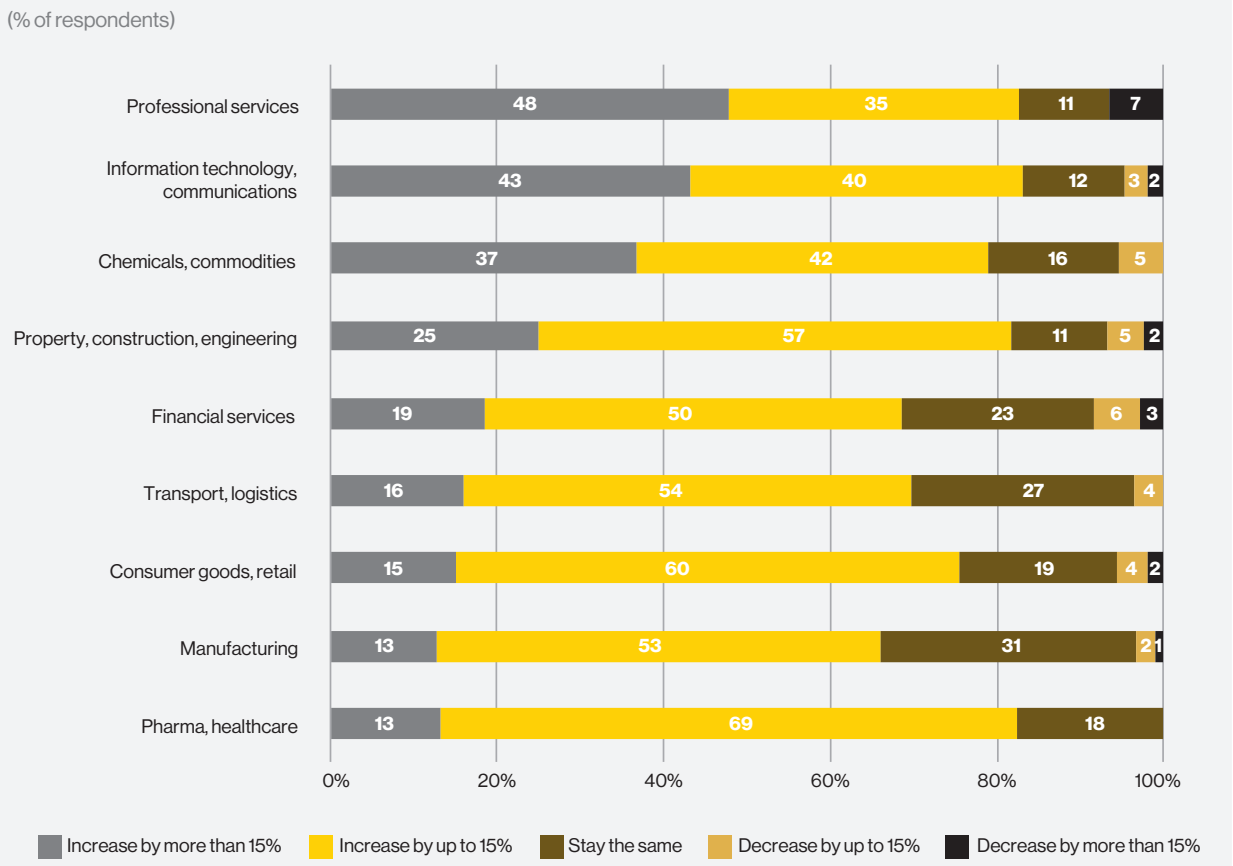
3. Growth stories

When asked in the abstract, do you believe that AI will destroy or disintermediate more jobs than it creates over the next five years, 42% of respondents agree, compared to only 24% who disagree.

This shows that when considering the region as a whole, they consider AI to be a destructive force in employment markets. Yet when asked about headcount in their own organizations, the story is one of growth. Some 77% of respondents expect headcount to increase over the next five years as Asia continues to lead the world in economic expansion. Overall, less than three percent of respondents expect to see any headcount contraction.

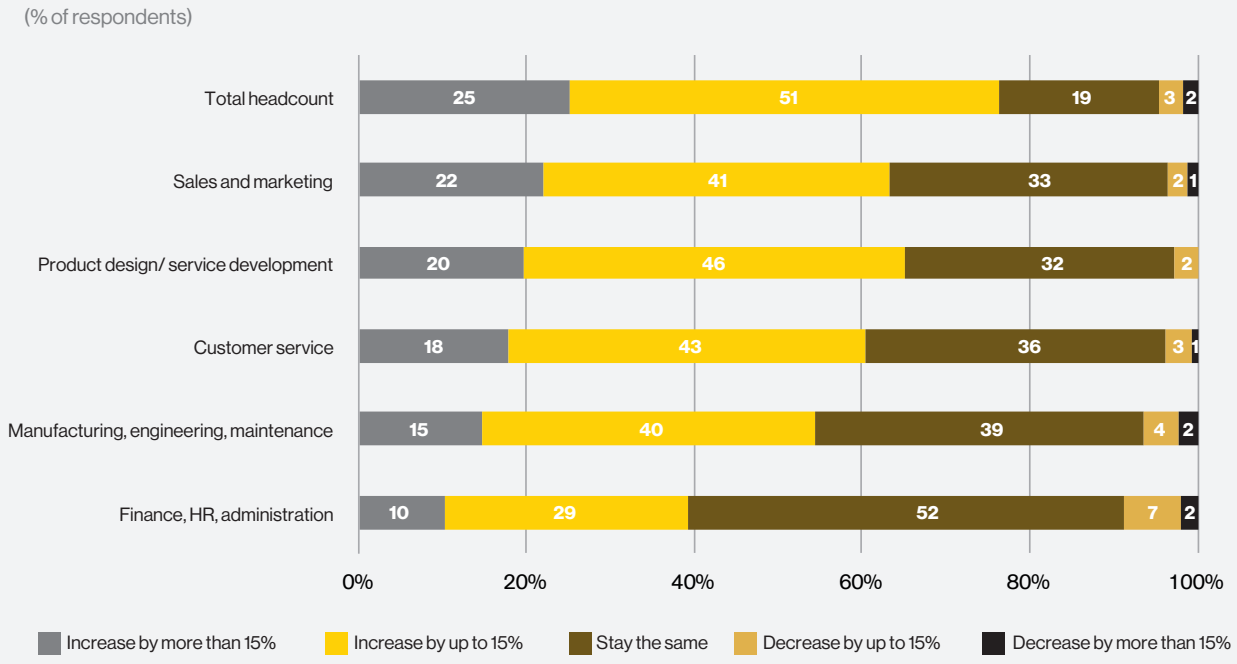
One fifth of all respondents indicated that they expect five-year headcount increases of more than 15%. Many industries report even higher expected overall increases, including labor-intensive sectors such as commodities and construction, and knowledge-intensive sectors such as information and communications technology (ICT) and professional services. About 80% of respondents in the ICT and professional services categories reported that headcounts would grow. While few respondents reported headcount contraction (the highest number was in financial services, yet only 9%), those in manufacturing and transportation were the most likely to say that their headcount would remain the same in five years' time.

Figure 4: Expectations for headcount changes in the next five years, by sector



Source: MIT Technology Review Insights survey, 2018

Figure 5: Expectations for headcount changes in the next five years, by function



Source: MIT Technology Review Insights survey, 2018

Headcounts are increasing

When asked how staffing levels will change across various functions over the next five years, survey respondents indicated significant headcount growth in "customer-facing" activities. More than 60% of respondents reported that sales and marketing, customer service, and product development functions will grow. Respondents from more knowledge- and technology-intensive industries reported even higher growth. Over a quarter of ICT respondents expect customer service hiring to increase by more than 15% over the next five years.

Headcount increases are expected to be lower in back office functions such as finance, HR, manufacturing, and maintenance. Still, just 9% of respondents anticipate headcounts in finance, HR, and administration to decrease.

First front office, then back

The pressure for companies in Asia to grow rapidly and compete on service explains why executives are ploughing both human and technology resources into the customer-facing areas of the business. Viriya Upatising, chief information officer at Thai communications conglomerate **True Corporation**, is overseeing the launch of a large effort to overhaul its online and voice-based customer experience channels using AI tools. This involves using natural language and image recognition to achieve a target of reducing call center staff by 1,000 people.

"As our tools improve, technology magnifies our leverage and increases the importance of our expertise, our judgement, and our creativity."

David Autor
Professor of economics
MIT

However, Upatising believes that True's use of AI will enhance overall job quality and satisfaction. "The goal is actually [to] increase productivity while providing better service," he says. "Right now, we have a lot of customer query backlogs, which [natural language-enabled] chatbots can help us clear." Upatising points out that employing AI-enabled image recognition to vet identification documents from new customers also helps customer experience teams process orders more efficiently, and comply with government regulations.

Increasingly, industry observers are finding that deploying AI and automation does not result in a zero-sum game in which headcount is reduced in lockstep with new AI software. Instead, AI creates efficiencies that allow employees to become even more effective and productive. "As our tools improve, technology magnifies our leverage and increases the importance of our expertise, our judgement, and our creativity," explains economist David Autor in a 2016 TED talk about the impact of automation on jobs.[1]

The finding that only one-third of Asia-based respondents are using AI within their finance and human resources functions presents an odd contradiction, as the region's decision-makers often describe back-office functions being among the most "AI ready." But perhaps economic realities offer an explanation. High growth, agile competition, and fast-rising consumer expectations of digital sophistication push businesses towards aggressive, expansive go-to-market strategies. The higher penetration of AI in customer-facing operations is likely a response to these pressures.

While it may be considered "easier" to load AI capabilities into the back office, increasing efficiency there is a currently a lower priority. However, concerns about economic headwinds cooling global growth in the coming years may prompt technology leaders to look more closely for back-office use cases that enable quicker fixes for operational efficiency.

Key takeaway

Front and center. AI deployment is not a zero-sum game where headcount is reduced in lockstep with new AI software. For Asian businesses, this is doubly so, for not only are businesses in the region increasing their headcount to capitalize on market growth, the departments which are growing their staff the most—front-line, customer-facing talent—are also where most AI investments are going.

[1] *www.ted.com/talks/david_autor_why_are_there_still_so_many_jobs*

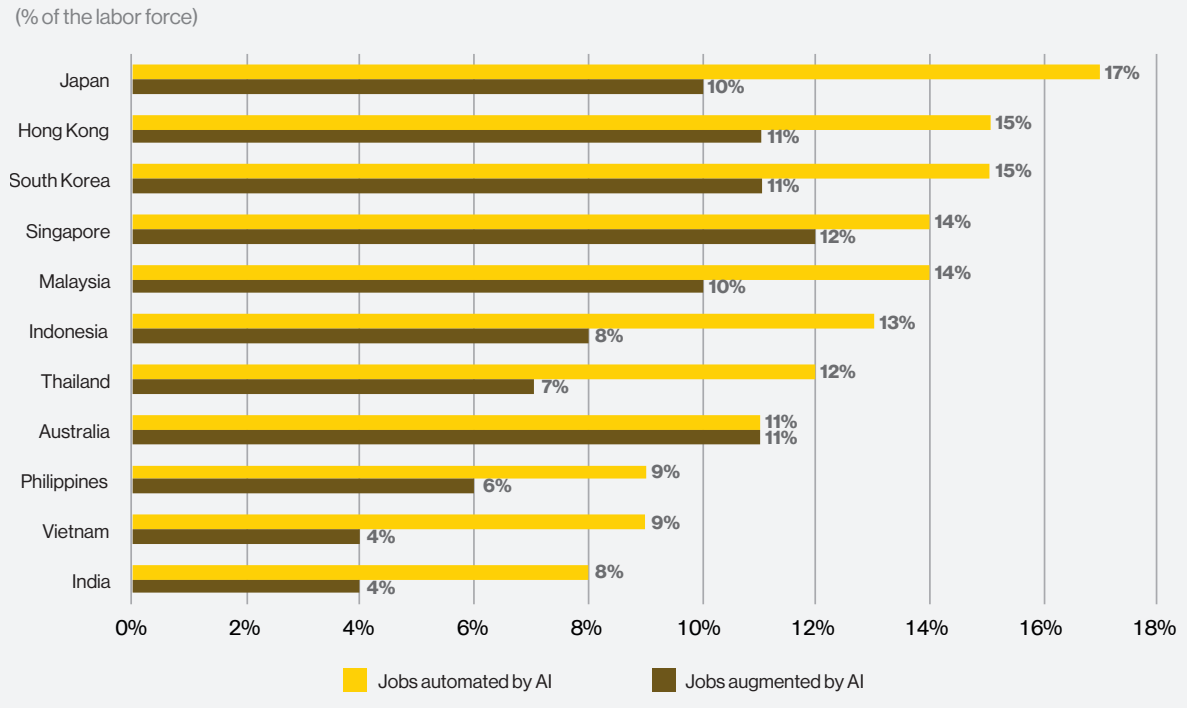
4. Automation, augmentation, and the future of work

Much has been written about technology's disruptive effect on employment markets, with the world's research houses making wildly-varying predictions about the numbers of jobs that AI could destroy or create. The World Economic Forum, in a study of 15 countries, estimates that AI will destroy 75m jobs and create 133m new ones by 2020. Management consulting firm McKinsey & Company predicts that by 2030, 400-800m jobs will be eliminated. One University of Oxford study estimates that there will be 67.7m job losses within the US alone over the next 20 years.

The trouble with the varying estimates, says Michael Priddis, chief executive officer at **Faethm**, is that "divergence masks the truth, which prevents action." Faethm is a software-as-a-service analytics platform that combines proprietary and public data sets with its customers' workforce databases, which delivers detailed scenario modeling about the talent- and finance-related implications of a wide variety of technology deployments.

Analysis of 11 Asia Pacific markets shows that AI will impact one in five jobs—removing some but enhancing others.

Figure 6: Job roles automated or augmented by AI within five years



Source: MIT Technology Review Insights based on data provided by Faethm, 2019

The company's customers include governments, companies, and universities seeking to understand the impact of emerging technology on industries and job roles, develop informed strategies, and make technology investment decisions.

The outlook for Asia

Faethm's platform can analyze any workforce data set to create a deconstructed, task-level view of specific roles. It uses information about the technological, sociopolitical, and demographic environment to predict how that job will be affected once specific AI capabilities are introduced. The platform enables policymakers and technology executives to understand the degree to which the job will be completely automated (making the human redundant), enhanced or "augmented" with AI (the human is supported with AI), and how much capacity is created for full-time-equivalent tasks that free up people to pursue other activities.

Analysis of 11 Asia Pacific markets shows that AI will impact one in five jobs—removing some but enhancing others. On average, 12% of current jobs in Asia will be removed by automation within five years' time. Eight percent of Asia's current jobs will benefit from, and be augmented by, AI capabilities. In all but one of the economies, the number of jobs AI will eliminate will exceed the number of jobs it enhances. In countries that have large process-driven sectors such as manufacturing, twice as many roles are eliminated as enhanced. These include emerging markets such as Vietnam and Indonesia, but also Japan, which already has an advanced and automation-driven manufacturing industry. In Australia, AI will augment as many jobs as it will eliminate (11%). This shows that the economy is both mature and diversified with large employment pools in knowledge-intensive and labor-intensive sectors.

"If you work in manufacturing in Bangladesh, if you work in the call centers in Manila, if you work in a BPO in India—you're in real trouble."

Michael Priddis
Chief Executive Officer
Faethm

Developed, middle income, and emerging markets

Priddis is sanguine about the impact of AI on developed Asia. "I'm broadly optimistic about the way that developed countries will emerge from the fourth industrial revolution," he says, "because most share a half-dozen supporting attributes: benevolent governments that collaborate with industry to promote economic growth, capital to invest in new growth, an education culture, and social contracts that allow for [citizens'] provision of care." Notwithstanding the stress and inconvenience of finding new employment for those displaced, he argues there will be new jobs: "You have skills, and because of that there'll be more work in other areas for which you can retrain." Automation will also be an opportunity to manage the growing shortage of manpower. South Korea and Japan (the latter has seen its population shrink by an average of 200,000 people each year since 2010[2]) will see more than 20% of job roles in industries such as manufacturing and logistics automated within five years.

AI will automate a higher percentage of roles in developed Asia (14%) than in the region's emerging markets (10%). However, many more jobs (11% of the total) in mature Asian economies will also benefit from augmentation than their less-developed peers (6%). In Priddis' view, it is this combination of automation and augmentation that will drive AI to become a net positive for workers in higher income countries, where knowledge-intensive sectors make a greater economic contribution and generally constitute a higher percentage of overall employment than in developing markets. Knowledge jobs, creativity, problem-solving, and interaction with other people are not skills easily replaced by AI, but they can be well-supported and enhanced with technology.

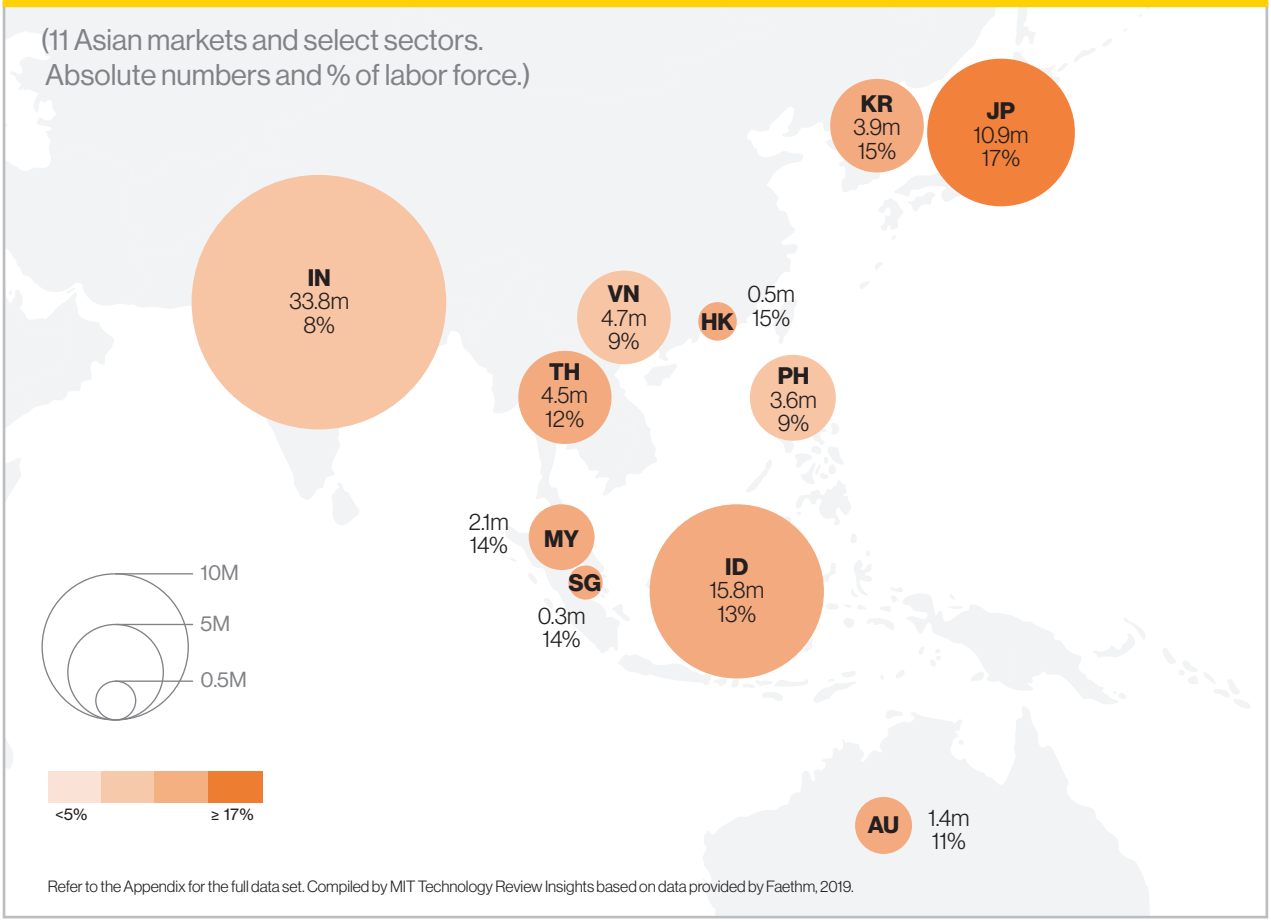
[2] *www.tradingeconomics.com/japan/population*

In contrast, policymakers in Asia's emerging and middle-income economies will be facing a more-worrying reality. Having benefited from Western companies' past offshoring and outsourcing strategies, these jobs will be readily replaced wholesale by AI and other forms of automation. "If you work in manufacturing in Bangladesh, if you work in the call centers in Manila, if you work in a BPO in India—you're in real trouble," says Priddis. The speed and scale at which these transitions are happening is also likely to take governments by surprise, potentially causing economic and social shocks leading to new patterns of migration.

The Philippines, India, and Vietnam, for instance, each will experience a workforce automation rate of between 8% and 9% considering their large, automation-susceptible labor pools. All three countries will see 14% of their manufacturing jobs disappear, but manufacturing is a much greater employer proportionally in Vietnam and India than in the Philippines. Yet the Philippines has a large population of workers in the business process outsourcing (BPO) industry, with equally as many jobs at risk there.

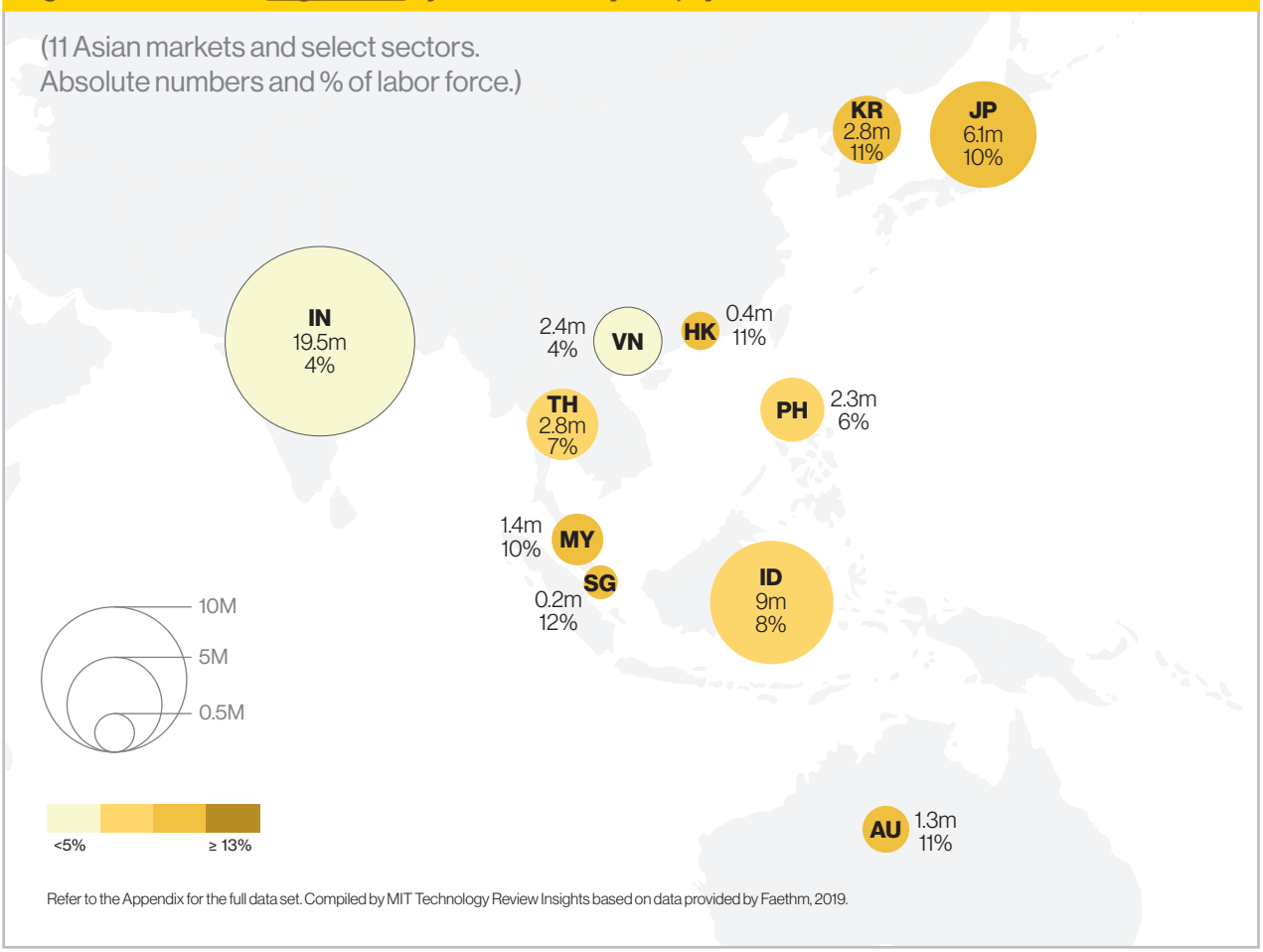
Is this different from previous waves of automation? Yes, says Priddis, in that "the speed of change is greater, the extent of globalization is greater. The geographic implications are different." In previous waves of automation, the relative capital costs were high. "What we're talking about now," he says, "is very, very capital-light—anybody can be involved in RPA [robotic process automation] work. The accessibility, the speed, the low cost mean that it is different this time around." In preparing for the next wave, many Asian governments remain "systematically unprepared."

Figure 7: Jobs to be automated by AI within five years, by market



Refer to the Appendix for the full data set. Compiled by MIT Technology Review Insights based on data provided by Faethm, 2019.

Figure 8: Jobs to be augmented by AI within five years, by market



Refer to the Appendix for the full data set. Compiled by MIT Technology Review Insights based on data provided by Faethm, 2019.

The augmentation advantage

The level to which an economy is "AI ready" is a key factor in the speed at which technology will be deployed and the nature of jobs changed. Indonesia, with 13% of formal sector jobs at risk, will feel the impact of AI much faster than neighboring Thailand, the Philippines, or Vietnam. Indonesia's export economy is largely driven by manufacturing and natural resources, which are both vulnerable to AI-enabled job automation. However, domestic consumer consumption is Indonesia's primary growth driver, and the country's retail, logistics, and consumer services have been undergoing a digital revolution. More than $3 billion was poured into e-commerce and other technology ventures last year— far more than any other Southeast Asian economy including Singapore. Indonesia is also the emerging Asian market with the most jobs likely to benefit from AI augmentation (8%).

"Positive outcomes will first accrue to countries with the ability to harness the potential of AI," says **Faethm** executive director Greg Miller, "and emerging Asia is more at risk from not being able to do so." He points to several policy levers that can be rapidly and simultaneously applied, including "tax incentives for AI-enabled industry development, content creation, infrastructure development, and lifelong learning programs." These require collaboration and leveraging the strength of the

regional ecosystem. Asia's policymakers, says Miller, "can identify and assess relevant competencies at home [and those] of their neighbors, to determine what policy and tax incentives can be used to create opportunity for both their own country and the region."

A research study by the Asian Development Bank (ADB) suggests that these types of policy initiatives can pay off for Asian governments. Despite many jobs in export-oriented sectors such as manufacturing being automated away, for most Asian economies the core driver of economic and employment growth is domestic consumer demand.[3] In other words, the higher incomes generated in technologically advanced societies will result in greater job creation for all.

Even if Asia's technology-enhanced future creates more growth, there is still a larger question as to whether it will be the right kind of growth—that is, whether the jobs will be of equal or greater value and skill level than before. Also unclear is whether economic growth powered by AI will lead to a boom in part-time, "gig economy" service jobs that require fewer skills and offer limited opportunities for advancement and social mobility.

"Asia's policymakers can identify and assess relevant competencies at home [and those] of their neighbors, to determine what policy and tax incentives can be used to create opportunity for both their own country and the region."

Greg Miller
Executive Director
Faethm

Key takeaway

Emerging Asia AI pain before gains. Less developed Asian economies are at greater risk of seeing more jobs automated out of existence by AI than their richer peers, which have larger knowledge worker sectors that can be 'augmented' by AI and have greater resources to invest in reskilling affected workers. That said, over time workers in rich and poor Asian economies alike should see greater employment opportunities arise as AI and automation technology long-term productivity boosts are realized. The challenge for policy-makers is to ensure that new jobs will be of equal or greater value and skill level than before.

[3] *www.adb.org/publications/asian-development-outlook-2018-how-technology-affects-jobs*

5. Needle in a h(AI)stack

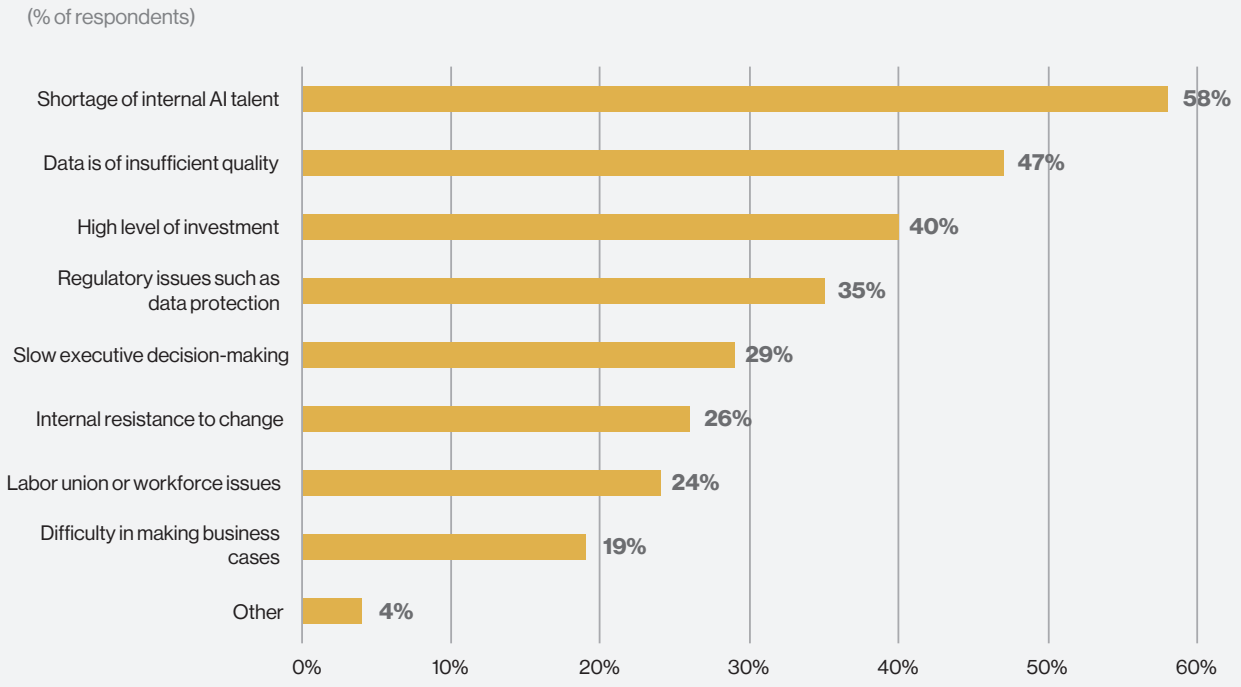
Limited advancement and lack of social mobility are not challenges faced by today's breed of AI developers. The headlong rush into AI by organizations in Asia has generated high demand for data scientists, algorithm developers, and programmers. Business leaders surveyed by MIT Technology Review Insights see AI talent as the greatest hurdle for successful deployment, which more than half of respondents have experienced. At the same time, they also feel that being based in Asia gives them advantages in sourcing this talent. One-third believe that Asia's AI talent availability is higher than anywhere else globally, and only 14% feel it lags other markets.

Some AI industry observers, however, are less assured about talent availability. Jeffrey Ding, D.Phil researcher at **Oxford University's Future of Humanity Institute**, believes China still has an AI talent gap despite its growing global lead.

"China has many structural advantages for AI development, particularly in terms of data on a consistent population of people, including language recognition and facial recognition, but on other measures, the U.S. is in front."

Jeffrey Ding
D.Phil Researcher
Oxford University

Figure 9: Top challenges in deploying AI



Source: MIT Technology Review Insights survey, 2018

"China has many structural advantages for AI development," he says, "particularly in terms of data on a consistent population of people, including language recognition and facial recognition, or other data pulled from different Ministry of Public Security bureaus." But the U.S. leads in other areas. "The clearest measure is talent. People will find where the best places to live are, and they are attracted to good companies. And in that respect, the U.S. still has the best of the best AI talent."

Ding argues it's not that China doesn't have a broad base of talent, but that the talent is being snapped up by a small group of powerful businesses. In their hunger for AI skills, China's "BAT" companies (Baidu, Alibaba, Tencent) are in a war for talent that is reflected in rapidly rising wages. Online recruiting firm Zhaopin estimated in 2017 that entry-level salaries in AI-related fields are nearly twice China's average monthly wages.[4] China's education sector is striving to increase the supply: Since 2014, the Ministry of Education has overseen a collaboration initiative between China's leading universities and the tech giants that has resulted in some 600 AI R&D projects. The Ministry reports that in 2018, 489 universities offered majors in AI—nearly double the number in 2017.

Plugging the gap

If China is locked in a battle for global AI leadership, Asian businesses elsewhere are having a tough fight for talent. "It's really hard today, and not just for the banks—everybody's after the AI talent in the market," says Ken Wong, head of the AI Lab at Singapore-headquartered **OCBC Bank**. Yet absorbing existing talent into the banks might be the more pernicious challenge. "Many come from academic fields, so they may not have the right cultural fit when they migrate to a commercial organization," he says, adding that OCBC Bank's strategy has been balancing "trying to bring in people with the right skills while trying to train up those already in the bank."

"It's really hard today, and not just for the banks—everybody's after the AI talent in the market."

Ken Wong
Head of AI Lab
OCBC Bank

True Corporation's Viriya Upatising describes talent as the greatest constraint on its AI strategy. "Our biggest challenge is getting programmers—we just don't have enough," he says. The company has launched a number of internal training initiatives, including hiring university professors to teach classes and developing blended work teams of experienced programmers and high-potential hires.

True is also looking to increase AI skills in the workforce at large. "We hold monthly training sessions on subjects like data analytics and machine learning which are open to all," says Upatising. These are mandatory for all project team leaders, with bonuses for high scores on the post-course tests. The aim is greater self-sufficiency in AI application development. True uses vendor-developed solutions for its image recognition today, but "in six or seven months we're probably going to be able to develop it ourselves," he adds.

AI-specific talent will continue to constrain growth for all firms in Asia as its application becomes more pervasively embedded in their processes and workflows. Moreover, as AI constantly evolves, the impact on tasks and working structures will require continuous reskilling and training for even the most technology-literate team members. This will mean that AI's ultimate impact on Asia's firms will not be on its operations, but rather its organization and culture as jobs, workflows, and organizational structures are continually reinvented.

[4] *www.yicaiglobal.com/news/china-first-tier-cities-have-most-demand-for-ai-talent-offering-them-up-to-usd7500-per-month-says-career-platform-zhaopin*

Bringing up the base

Across Asia, governments must focus on building up tech skills in the local workforce as an urgent priority to guard against the risk that more jobs are automated than are augmented or created. When it comes to developing workforce readiness, Singapore's policymakers are on the front foot, complementing their efforts to attract AI talent and investment globally. AI Singapore, a collaboration framework between several government bodies aimed at raising the nation's overall AI capability, is beginning with a series of programs designed to enhance relevant skills at all employment levels. One of those is 100 Experiments, a government-supported incubation program allowing Singaporean companies to access AI R&D resources for addressing their immediate business challenges. The goal, according to Zee Kin Yeong, assistant chief executive, data innovation and protection at Singapore's information technology developer and regulator **Infocomm Media Development Authority** is "unlocking research talent and unleashing this talent into the industry."

Singapore is actively building up its AI ecosystem. Yeong sees the presence of the global tech giants as presenting an opportunity for the nation to learn. "They have the muscle, they have the know-how," he says referring to Facebook, Google, Amazon and other tech players that have their regional headquarters domiciled in Singapore. "When they come here, we try to make use of the opportunity to expose our citizens and residents by giving them an opportunity to work with the best. In 2017, we introduced an AI Apprenticeship Program precisely intended to create that opportunity for big multinationals who are doing some work with data analytics or AI in Singapore to take in apprentices so that the apprentices will have opportunities to work on real-world problems with the best, not just here but globally, and gain a real-world experience. That's one way of building a capability."

Key takeaway

Got talent? AI-specific talent will continue to be a constraint on growth for all firms in Asia. The MIT Technology Review Insight survey reveals that Asian business leaders see scarce AI talent as their greatest deployment hurdle—but they also feel that Asia is among the best regions globally to source it. AI will place pressure on Asian organizations to invest in continuous reskilling and training, meaning cultural change will also be a constant, as jobs, workflows, and organizational structures are reinvented, again and again.

6. Better careers, for some

Executives interviewed as a part of this research are optimistic that employees will benefit from the change coming to their daily work. "In the next five years, roles will definitely change, and some jobs consisting of purely manual repetitive tasks will definitely go away," says Wong at OCBC Bank. "But while AI today is very good at automating specific tasks within roles, it can't replace them entirely. Most jobs will still stay, and AI will play a part in helping humans do them better, taking away some of the more, smaller, repetitive tasks and leaving humans to focus on the higher-value, higher-order tasks and giving them more time to serve and interact with other humans."

Wong describes the bank's plans for deploying smart ATMs, which replace human tasks within branches. "We have been telling the tellers 'We need to retrain you, and the bank is going to put you through training so that you could fit into a new job in three years' time.'" The response has been really positive, and ultimately we should be able to place them into roles where they feel more fulfilled, and with better [long-term] career options."

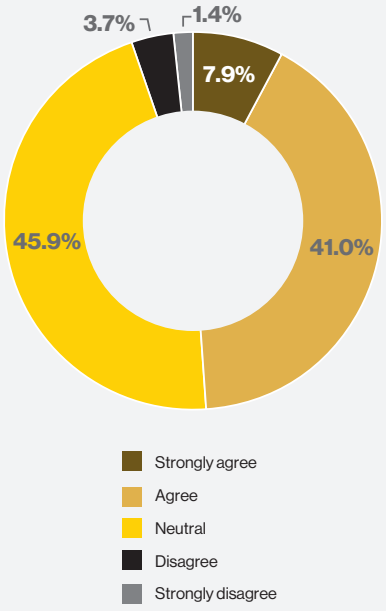
This view supports the findings of the MIT Technology Review Insights survey. Almost 60% of survey respondents believe that job roles have been enhanced since the introduction of AI. Just 4% hold the view that job roles are diminished by AI. Similarly, AI does not seem to be noticeably dampening morale at organizations surveyed for this report. Indeed, almost half note that overall employee satisfaction has increased.

What about the others?

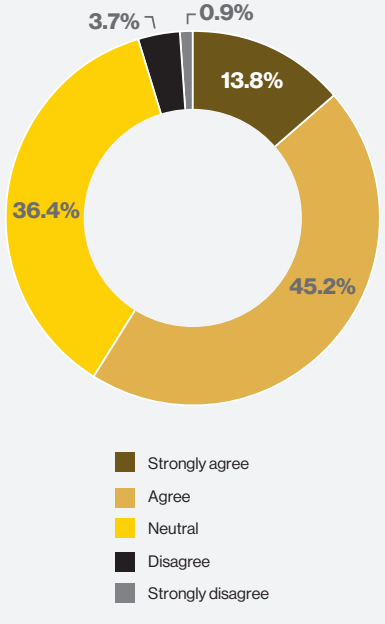
While the survey data presents a positive overall picture, the academic world is paying considerable attention to the downside scenarios. According to AI scientist and **University of Bath** associate professor Joanna Bryson, the disintermediation question is

Figure 10: Attitudes towards the impact of AI on work

Overall employee satisfaction has increased since the introduction of AI
(% of respondents)



Our employees' job roles have been enhanced since the introduction of AI
(% of respondents)



Source: MIT Technology Review Insights survey, 2018

"The disintermediation question is really interesting: people usually think of it as a negative because it implies reducing wages paid to laborer—but technology-enabled disintermediation actually means getting rid of middle people, and connecting the people who provide a service directly to their customers."

Joanna Bryson
Associate Professor, Computer Science
University of Bath

interesting. "People usually think of it as a negative because it implies disintermediating capital from the means of production," she says—in other words, reducing wages paid to laborers. "But technology-enabled disintermediation actually means getting rid of middle people, and connecting the people who provide a service directly to their customers." This could make the quality of services better, and their costs cheaper.[5]

Yet, Bryson notes, the differentiation created by AI and automation technologies "also can lead to a net loss of wage differentiation, and the hollowing out of the middle class." In the short term, this could create "redistribution benefits" such as allowing companies to implement a higher minimum wage. However, in the long term, it could amount to the flattening of wages across the board. She points to a general trend within retail banks. ATMs reduce the headcount per branch, which makes it more cost effective to open branches provided that they require lower-level frontline staff. This allows banks to reduce their more expensive staff—the branch managers. "There are now fewer of them, and those that remain are making lower wages because they have fewer people to manage," she says."This matters because these people were leaders in their communities, who were able to make, for example, philanthropic local contributions."

But in a world where, as Bryson says, machines are becoming good at "replicating every aspect of human intelligence at superhuman levels," might organizations become less tolerant of humans' foibles? "In the quest for efficiency, this might have unintended and severe economic and social consequences," she says. "Are we going to micromanage populations and extract messy and difficult people from teams?" In other words, could resource managers begin to view humans as fungible as machine inputs?

Scott Park, president and CEO of **Doosan Bobcat**, a global market leader in compact construction equipment, doesn't think so. "AI is just another tool in the innovation bucket," he says. "Throughout the centuries, technology has destroyed jobs and created them. There will be more jobs in the future than there are today due to AI, and more than half of them do not yet exist." Park sees AI as an opportunity to reshape jobs for the benefit of employees. "How ethical is it to have people doing menial tasks, such as three-way matches on invoices, when we have computers to do that more easily?" he asks.

Key takeaway

Asia's business leaders feel strongly that employees will benefit from the change AI will bring to their daily work—and most believe that job roles have already been enhanced since the introduction of AI, and many note that overall employee satisfaction has increased. At the same time, business managers must be mindful that, as they remove or scale back roles that are not directly enhanced by AI, that they are not hollowing out their organization charts—'flattening' them, limiting wage growth and advancement prospects—in the process.

[5] *Bryson references Tim O'Reilly's book "WTF? What's the Future and Why It's Up to Us", 2017*

7. Conclusion

This report is the third part of the research series *Asia's AI agenda*, and reviews the implications that AI will have on the organizational structures and talent management practices in Asian businesses, using insights drawn from a survey of nearly 900 senior executives across the region, and a series of in-depth expert interviews. The main conclusions of this report are as follows:

1. **AI is beginning to augment human talent in Asia, without extensive headcount cuts.** AI technologies allow Asian firms to capitalize on the region's world-beating economic expansion while increasing their competitiveness and customer focus in the process. The survey data show that AI is complementary to the capabilities and productivity of human resources, and not a substitute. Thus far, AI is being deployed largely without laying off staff. Where AI removes tasks, it either enhances existing roles or gives managers the opportunity to retrain and redeploy team members in places where they can add more value.

2. **The speed of AI adoption has provided little time for deeply considering the consequences.** Economic growth, strong technology and data assets, and motivated government and business actors. Asia's rapid growth has meant that business decision-makers have not yet had to make any hard decisions about organizational structure, cultural changes, or significant retooling of their workforces. It also means they have had little time to contemplate the tough choices that lie ahead.

3. **With much of Asia systematically unprepared, this bright future could quickly darken.** These choices will indeed be tough, as Asia's growth continues to slow while AI's technology maturity steadily rises. These contrasting economic and technology shifts will mean that jobs will be eliminated in the years ahead across Asia, and in great numbers—a disintermediation effect on regional employment which will, as our data show, exceed the number of existing jobs that AI will enhance. This view is tempered by optimistic longer-term views of Asia's future that the economic impact of technology will flow through to increased incomes and consumer demand. This bright future could quickly darken if most of these new jobs are low-income, service economy jobs. This could leave Asia's employment landscape increasingly polarized, with more and more people excluded from the value-creation side of AI.

4. **Organizations need to plan for substantial disruptive effects of technology on people and careers.** To avoid this trap, Asia's policymakers and business leaders must begin to rethink what employment means for their societies and their economies, recognizing that AI's ultimate economic impacts are not yet known and will constantly evolve. So too will the number and types of jobs that will emerge in the new world of work—even if it is becoming rapidly clearer which jobs will be eradicated due to AI's impact. Thus, decision-makers in Asia must assume that technology will continually evolve, making the need for continuous reskilling and training critical. Jobs for life will cease to exist, just as lifelong learning becomes a permanent fixture of education systems in Asia.

5. **Safeguarding future economic and social prosperity will require a 'great rewiring' of the region's institutions.** The real moment of truth for Asia's AI agenda will not be whether its institutions and corporations will successfully increase productivity and efficiency—they already are and will continue to do so. Nor will it be whether Asia can grow bountiful AI talent and skills; this, too, seems inevitable. It will be when Asia rewires its institutions—government services, places of learning and employment—to allow for all its people to have their efforts contribute positively, and dynamically, to its economies and civil society.

Appendix

AUTOMATION

Proportion of roles to be automated by AI within five years, by market and industry
(% of the labor force)

	Australia	Hong Kong	India	Indonesia	Japan	Malaysia	Philippines	Singapore	South Korea	Thailand	Vietnam
Total industry	11%	15%	8%	13%	17%	14%	9%	14%	15%	12%	9%
Accommodation, food	13%	17%	8%	16%	16%	15%	10%	19%	22%	14%	9%
Admin services	16%		12%	17%	20%	17%	14%	18%	19%	15%	10%
Agriculture	12%		6%	8%	8%	12%	7%		8%	7%	7%
Construction	12%	14%	9%	14%	16%	13%	9%	13%	13%	11%	7%
Education	4%		3%	3%	9%	3%	2%		3%	3%	2%
FSI	15%	13%	13%	22%	23%	16%	16%	12%	16%	15%	9%
Healthcare	5%		4%	7%	8%	5%	4%	7%	7%	5%	2%
ICT	8%		9%	15%	17%	10%	9%	10%	8%	10%	8%
Manufacturing	17%	19%	14%	22%	24%	21%	14%	15%	20%	20%	14%
Mining	13%		11%	16%	20%	13%	12%		15%	14%	9%
Professional	11%	18%	8%	15%	20%	13%	11%	12%	10%	11%	8%
Public admin.	9%	13%	9%	15%	17%	11%	7%	8%	13%	9%	5%
Real estate	8%		5%	16%	15%	9%	6%	11%	11%	12%	8%
Transportation	18%	17%	11%	20%	23%	20%	8%	20%	20%	17%	10%
Utilities	13%		11%	18%	21%	17%	12%		16%	14%	10%
Wholesale & retail	15%	17%	9%	17%	20%	17%	8%	16%	16%	15%	11%

Blank cells: data N/A. "Total industry": weighted average. Data was not available for Mainland China.
Compiled by MIT Technology Review Insights based on data provided by Faethm, 2019.

AUGMENTATION

Proportion of roles to be augmented by AI within five years, by market and industry
(% of the labor force)

	Australia	Hong Kong	India	Indonesia	Japan	Malaysia	Philippines	Singapore	South Korea	Thailand	Vietnam
Total industry	11%	11%	4%	8%	10%	10%	6%	12%	11%	7%	4%
Accommodation, food	10%	11%	7%	9%	11%	11%	7%	10%	9%	10%	6%
Admin services	8%		7%	9%	8%	10%	9%	11%	8%	10%	8%
Agriculture	5%		3%	5%	5%	5%	3%		5%	4%	2%
Construction	10%	11%	5%	8%	9%	10%	5%	11%	11%	8%	5%
Education	12%		9%	11%	13%	12%	8%		12%	11%	8%
FSI	12%	13%	8%	8%	10%	12%	7%	14%	14%	10%	10%
Healthcare	13%		9%	13%	12%	13%	9%	15%	14%	12%	8%
ICT	13%		10%	12%	14%	14%	10%	14%	15%	12%	10%
Manufacturing	8%	10%	5%	6%	7%	7%	5%	12%	8%	6%	4%
Mining	9%		5%	8%	7%	10%	5%		9%	8%	5%
Professional	13%	10%	10%	11%	10%	12%	9%	13%	14%	11%	9%
Public admin.	14%	13%	9%	9%	13%	14%	9%	16%	12%	11%	9%
Real estate	10%		7%	8%	9%	10%	7%	11%	12%	8%	7%
Transportation	7%	8%	4%	6%	5%	7%	4%	9%	7%	6%	3%
Utilities	10%		7%	8%	7%	9%	6%		10%	9%	6%
Wholesale & retail	11%	13%	8%	12%	11%	12%	7%	12%	14%	11%	9%

Blank cells: data N/A. "Total industry": weighted average. Data was not available for Mainland China.
Compiled by MIT Technology Review Insights based on data provided by Faethm, 2019.

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