



DevOps Institute

↑pskilling IT

APAC REGIONAL REPORT | 2022



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Upskilling is a Professional and Organizational Imperative

Welcome by DevOps Institute CEO Jayne Groll

DevOps Institute's mission is to advance the Humans of DevOps by equipping them with Skills, Knowledge, Ideas and Learning (SKIL). Each year, we conduct an important community research project to help identify which human, process, functional and automation skills are considered must-have, nice-to-have and not as important. Now in its fourth year, I am pleased to welcome you to the data for Upskilling IT 2022.

With over 2,500 responses, the response to the Upskilling IT 2022 survey was overwhelming. Thank you to all who took the time to share their input. As a result, we produced four distinct reports this year – three for specific regions and one for a global perspective. We hope that you find these reports meaningful and relevant.

Now more than ever, professional development is an essential factor in both an individual's and organization's ability to meet the rapidly changing demands of a technology-driven world stage. The shelf life of existing skills is short. Starting an upskilling journey can be daunting for the professional and the enterprise. Year over year, we have seen subtle changes in the rise (or fall) of specific practices, functional areas, and automation considerations. We believe these changes reflect the times (such as the pandemic) and the increasing adoption of Agile, DevOps, Site Reliability Engineering (SRE), Cloud Native and Cybersecurity. One area has remained consistent – the need to focus on human skills with the same intent as technical skills.

Interestingly, the three key challenges to achieving digital transformation are virtually the same across the regions:

- Insufficient skilled resources (talent and skills gaps)
- Budget constraints
- Excessive manual work (known as toil)

It is clear from the data that the availability and retention of skilled, passionate, happy humans will be the deciding factor in adaptability and competitive advantage.

Last year, we had over 6,000 downloads of the 2021 Upskilling Report. I sincerely hope that the insights contained in this year's reports provide ongoing value to its readers.



4 things to do with this report

Understand the skill gaps within
IT organizations today.

Review the top must-have
skill categories.

Assess each skill category
and see how you compare.

Take some action around
your skill development.

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Executive Summary

Currently, we see a variety of transformational challenges and changes such as skill gaps within organizations, labor shortages, the impact of automation on job roles, remote and hybrid working conditions, and continuous innovations in technology – to name a few. The question for IT leaders and individuals is: what can be done to help IT organizations, their teams and individuals survive and thrive? We argue that to thrive and remain competitive against this backdrop of changes and challenges requires fostering a culture of continuous learning and making upskilling and reskilling a top strategic priority. However, implementing a successful upskilling strategy requires a thorough understanding of what skills are needed today and what will be needed tomorrow in the near, middle, and long term.

A key part of an upskilling and reskilling strategy must be understanding the must-have skills. That is what we have set out to do here in this study for the fourth time with our research, but that is only half the battle. The second part is knowing how to develop the skills. This year, we found that fifty-two percent (52%) of our global respondents said that their organization has a formal upskilling (training) program. In comparison, only thirty-two percent (32%) indicated that they had one in our last year's research. Congratulations to [those](#)¹ who have initiated and are offering upskilling programs.

An upskilling strategy and making continuous learning part of the job helps organizations have the skills they need. In addition, an upskilling approach encourages individuals to grow and learn, and also enables organizations to leverage existing staff by reskilling to move into future-facing roles.

There are some excellent examples to learn from, such as companies like PwC and Salesforce. These organizations have successfully developed upskilling programs. For instance, PwC has created the [Digital Fitness app](#)² with training tools for various in-demand topics such as artificial intelligence, machine learning, and augmented reality. Employees and others can earn micro-degrees and certifications through the app, which is now available to the public. Another example is Salesforce and their [Trailhead](#)³ digital upskilling program that allows learners to develop in-demand skills and earn credentials. To begin, participants select a career path (such as developer or data analyst) and then complete the "trail" for that career. These are some ideas for putting upskilling into practice, but first, it is essential to understand the key must-have skill capabilities and must-have skills. We are excited to share our research and findings with you.

Key Takeaways

1

Insufficient IT resource skills are a huge challenge across the globe. Forty percent (40%) of survey respondents said that the resource and skill shortage is one of their top three challenges today. Additional research shows dramatic skill shortages within the technology and IT area globally.

2

Addressing technical debt must be paired with addressing talent debt. While technical skills are a must-have skill priority, technology without human skills, will not accelerate innovation and transformation.

3

Upskilling is a professional and organizational imperative. Continuous learning must be foundational for leaders and individuals and requires a mind-shift across leaders and individuals.

IT Transformation 2022 and Beyond

Demographics

359

APAC Respondents

(Out of 2,476 Global Repondents)

Over
14,700

Data Points

26

Countries from APAC

4

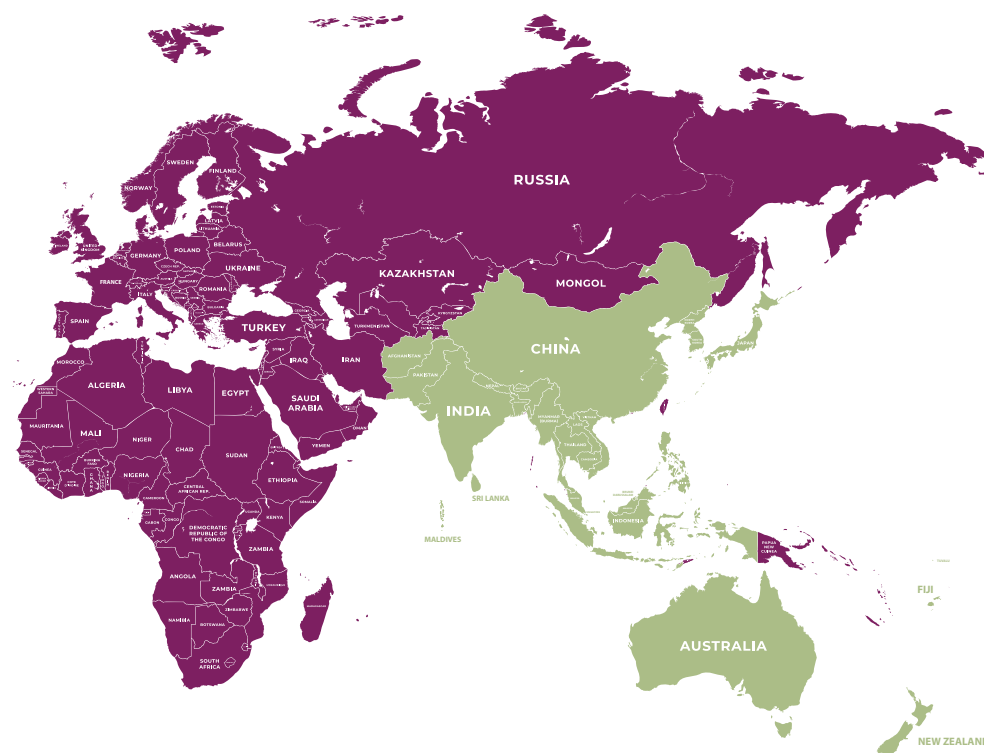
Years Running

This year we have created four reports. In our global research report titled Global Upskilling IT 2022, we analyzed the findings of the 2022 Upskilling IT⁴ survey on a global basis.

The following report is focused on the Asia Pacific geographic location. We also have created additional reports for the Americas⁵ and EMEA⁶ regions.

In what country do you work?

ANSWER CHOICES	RESPONSES	ANSWER CHOICES	RESPONSES
Afghanistan	4.18% 15	Malaysia	2.51% 9
Australia	8.36% 30	Maldives	0.28% 1
Bangladesh	4.74% 17	Myanmar	0.56% 2
Bhutan	0.28% 1	Nepal	0.56% 2
Brunei Darussalam	0.28% 1	New Zealand	0.28% 1
Cambodia	0.56% 2	Pakistan	0.28% 1
China	8.36% 30	Philippines	4.18% 15
Democratic People's Republic of Korea	1.67% 6	Republic of Korea	0.28% 1
Fiji	0.84% 3	Singapore	7.24% 26
India	49.03% 176	Sri Lanka	0.28% 1
Indonesia	3.06% 11	Thailand	1.11% 4
Japan	0.28% 1	Tuvalu	0.28% 1
Lao People's Democratic Republic	0.28% 1	Vietnam	0.28% 1



IT's Fast-Paced Cycle During the Pandemic is the New Normal

Digital transformation might be too broad to understand, but when described as 'rethinking old operating models, to experiment more, and to become more agile in your ability to respond to customers and rivals' it hits home. Digital transformative changes in internal working practices and business interactions with suppliers, partners and customers exploded during the global pandemic.

The pandemic had three key impacts on IT enterprise organizations:

- 1** It triggered a variety of employment shifts and a mass exodus which did not help in the already existing talent and staffing challenges.
- 2** IT teams needed to recalibrate operations in support of remote work and new contactless digital customer and employee experiences.
- 3** As IT played a pivotal role in ensuring the continuity of business operations, its archetype shifted from cost center to enabler as the crisis has convinced all executives that IT and technology are essential ingredients that fuel the growth and profitability of their companies.

There is no going back to the old ways of working. CIOs will spend their time and money in 2022 refining their operating model to be more agile. After analyzing the responses from the APAC region, we found the following challenges (see Figure 1).

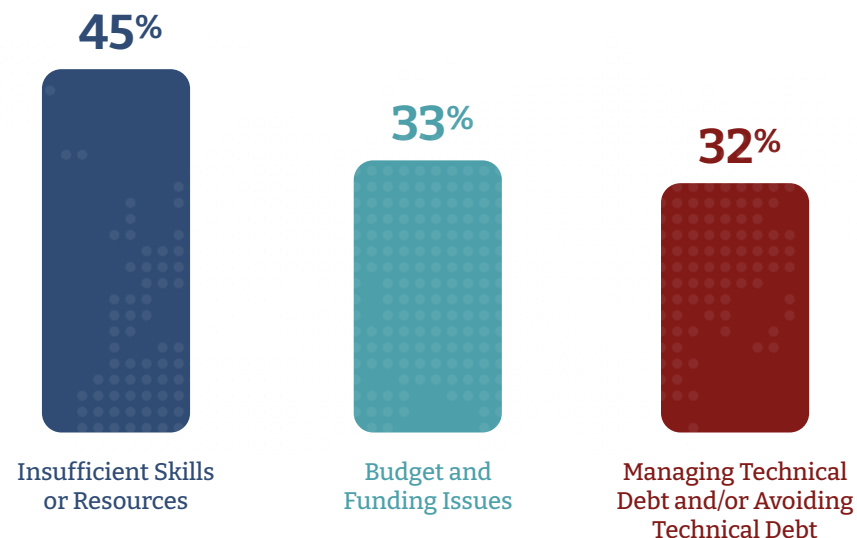
FIGURE 1

The Top Three Challenges In Asia Pacific IT Organizations

QUESTION

What are the TOP THREE challenges your enterprise IT organization is currently facing?

N=359



Insufficient skills and resources remain a top challenge and the gap keeps growing. The skill gap keeps growing and 45% of our survey respondents say that this is a challenge. From the [2022 State of the CIO⁷](#), we know that 38% of respondents confirmed current socioeconomic factors have escalated the need to improve talent acquisition and retention strategies.

Budget and funding issues rank as the biggest challenge, but there is hope. Our survey respondents (33%) state that budget and funding issues were one of the top three challenges for them in 2021. However, according to a study conducted by CIO Magazine, 59% of global CIOs are saying that tech budgets will increase in 2022 and will be back at pre pandemic levels.

Managing technical debt and avoiding technical debt is a balancing act. Unfortunately, technical debt is a reality for all software teams, and nobody is able to avoid it. For 32% of our survey respondents, this was a challenge in 2021. The main thing for 2022 and beyond will be to keep technical debt from spiraling out of control. For further details on how to classify technical debt, we recommend leveraging the [TechnicalDebtQuadrant⁸](#).

IT Transformation is an Essential Prerequisite for Digital Transformation

The power of technology has or will change how a company operates, differentiates, or gets ahead. In 2016, global overall IT spending was at \$3.6 trillion, while predictions for 2022 are that global IT spending will be at \$4.5 trillion according to [Gartner⁹](#). All levels of company executives realize that continuous technology innovation is key to their company's survival and success. When it comes to creating a digital business, technology is one of the key pillars that must be addressed to bring desired changes and achieve a digital business. IT transformation and digital transformation are sometimes used interchangeably. Figure 2 describes the similarities and differences between the two.

FIGURE 2

Culture, Automation, Lean, Metrics and Skills are Connecting IT and Digital Transformation

IT Transformation

What is it?

IT transformation is the overhauling of IT system and infrastructure of an organization to improve overall efficiency and delivery capabilities.

What is the Approach?

IT transformation is the modernizing of its information systems, infrastructure and operating models to improve productivity, decrease technical debt, increase velocity, flow, and the quality of what is developed and delivered.

Who are the People Involved?

Mainly IT and some lines of business.

Scope

Infrastructure, operating model, software, data management, processes, frameworks, way of working, automation.

Metrics

IT KPIs
(including organization and technology)

Essential for Success

Culture, Automation, Lean, Metrics, Skills
(CALMS)

Digital Transformation

Digital transformation is the process of using digital technology in all business areas, across human interactions and within processes and services to continually improve how organizations deliver value to their customers.

Digital transformation involves people, processes, products, and the culture of an organization.

Entire organization.

Applies all of the digital transformation aspects towards a digital business.

Business KPIs
(including organization and technology)

Culture, Automation, Lean, Metrics, Skills
(CALMS)

Source: DevOps Institute

Many IT organizations need to introduce new capabilities while refreshing their legacy capabilities to enable digital transformation. Unfortunately, the larger the company and its technology debt the more difficult it is to introduce changes. The overall goal for many change initiatives is to improve efficiency, velocity, security and quality of services and products for sustaining competitiveness in the digital economy. Digital transformation can drive IT transformation, but it can also be the other way around.

“In many enterprises there is an ongoing push-pull phenomenon that occurs between IT and the business. Sometimes IT experiments with new technical capabilities that are leveraged to achieve true business transformation. In other instances, the business has clear operational objectives and business leaders place demands on IT leaders to go find technical solutions that will enable those objectives to be achieved.”

Mark Settle, CIO

IT Transformation Requires Human Talent and Continuous Learning

Transformations do not happen without people. Humans shape culture, initiate and implement processes, adopt frameworks, implement, plan, design and manage technology, applications and services. The following are a variety of trends and facts we found during our survey after analyzing the responses across the APAC region (see Figure 3):

Lack of time and budget hinders upskilling. Our survey respondents shared with us that their current barriers to skill development range from lack of offerings (54%) to lack of budget (42%) to lack of content and offerings (36%).

Training and upskilling exist with three favorite ways to learn. Fifty-two percent (52%) of survey respondents indicated that they already have an upskilling program in place and 27% are currently developing one. The top three preferences for learning are in person, virtual and peer learning.

IT operation professionals are in demand. In 2022, the demand for IT operations engineers and developers will be high. Sixty-two percent (62%) of our survey respondents said that they are recruiting for an IT operations engineering and 53% are looking for a developer.

DevOps Engineer is still the top title being hired. We have had this conversation since the inception of DevOps, and many argue that DevOps Engineer is not a title. Despite this debate, we are happy to share that in APAC respondents indicated that DevOps Engineer (48%) is still the most popular job title hired. The next title is that of Software Engineer (36%) and Site Reliability Engineer (31%).

Tool training takes a significant amount of time. Individuals spent more than 57% of their time in tool training during onboarding and ongoing training.

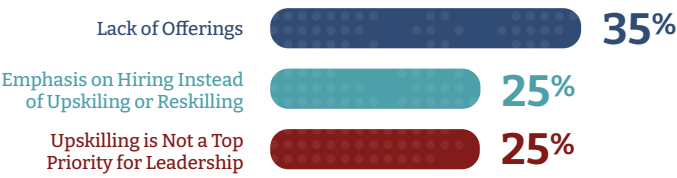
Certifications are very valuable. The majority of survey respondents (67%) perceive certifications as very valuable and 31% as somewhat valuable.

Application of new skills learned is mediocre. While over 96% of respondents said that they have learned a skill in the past 12 months, only 28% of respondents said that they actually applied the new skill.

Happiness is relative. When asked if individuals are happy with their job, 38% of APAC respondents said they are very happy, whereas six percent said that they are very unhappy. Financial and technical factors followed by personal factors would increase happiness for APAC respondents. Of course, much of this depends on industry, age, actual job and other factors. For more details on happiness within Asia Pacific region, see this [report](#)¹⁰.

FIGURE 3

Lack of Offerings, Emphasis And Priorities Hinder Upskilling In Asia Pacific



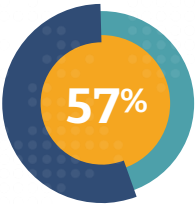
QUESTION

What would you say are the current barriers to skill development within your organization?

(Select all that apply)

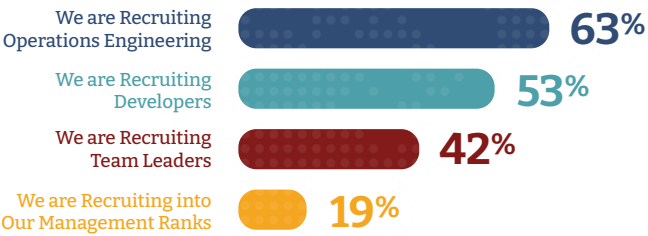
N=288

More Than 57% of Staff Time Goes Towards Tool Training



How much of your time or your team's time is currently spent on tool-related upskilling or training across dev, sec, and IT, considering both onboarding and ongoing training? (On a Scale of 0-100%)

IT Operations Engineering and Developers are in High Demand

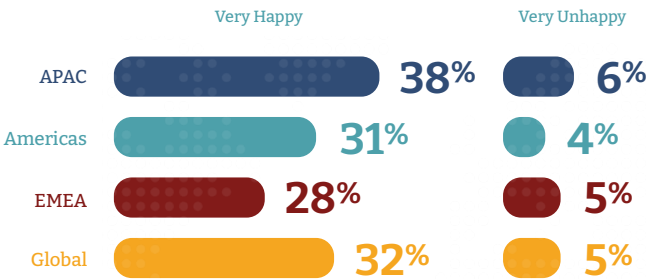


QUESTION

What is your (or your IT enterprise organization) recruiting plan for the next 12-months relative to the following roles? (Select all that apply)

N=359

Are You Satisfied With Your Career?



QUESTION

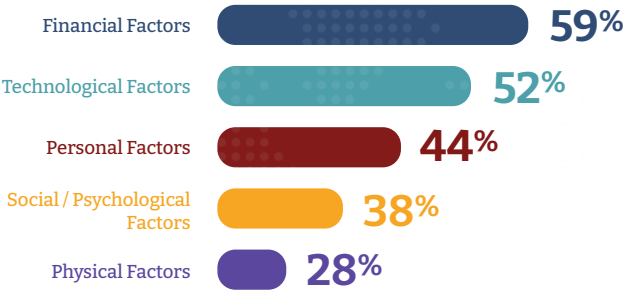
Are you satisfied with your career?

N=359

38% of People are Happy With Their Career



Financial Factors Would Change Satisfaction in Career



QUESTION

What changes would improve your career satisfaction? (Select all that apply)

N=359

Key Skill Gaps in Asia Pacific

While we know that IT transformation includes replacement of infrastructure and technology, it is also about people and culture. IT and business leaders agree that their top three priorities for 2022 are improving operational experience, improving customer experience, and developing new services and products. Our research shows that IT organizations in Asia Pacific are experiencing a significant amount of skill gaps to make progress on these priorities (see Figure 4).

New IT operational models are not just implementable through tools...frameworks and best practices are essential. An operational model defines how an IT organization develops and maintains the capabilities that are required to deliver its strategy and how it fulfills its business partner's expectations. As external requirements, leadership, and new best practices evolved, IT operational models have adapted as well. Some IT organizations, specifically those that are born digital, have adopted DevOps and Agile from the start. For others, evolutions are more complex and require more time and effort. To ensure that the IT operational model remains effective, companies need to systematically assess it and make possible adjustments. This requires people who have the skills around key processes and frameworks such as DevOps, ITIL, SRE, and Agile to name a few. In APAC, 53% of survey respondents listed this as one of their skill categories where they experience skill gaps.

Advanced cognitive work ranks as the second-largest skill gap. Within this skill capability we had listed a variety of semi-new emerging topics such as ModelOps, DataOps, Artificial Intelligence, Machine Learning, Augmented and Virtual Reality. While there might be significant differences in how these topics are applied within the industry verticals, they are all used for innovation. According to Forrester, up to 93% of companies agree that innovative technologies are necessary to reach their [digital transformation](#)¹¹ goals. Within APAC, 48% of respondents said that they experienced a skill gap within this capability.

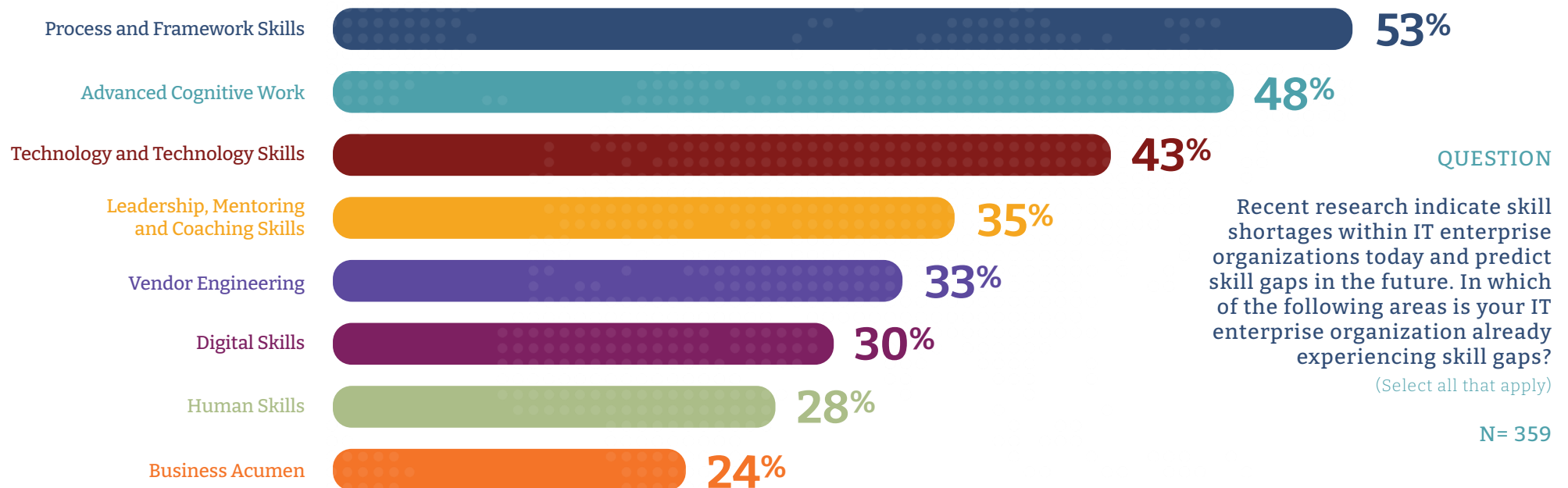
Asian Pacific organizations are making technology investments but might not have the matching technical skills. The priorities for technology investments range from security/risk management, data/business analysis, application/legacy modernization, customer experience technologies to cloud migrations and more. Technology alone, without the humans who can implement them, won't cut it. Forty three percent (43%) of APAC survey respondents said that this is one of their key skill gaps.

Without critical leadership, there is no one to shape the learning culture. While there are many leadership skills, or the lack thereof, one key skill is that of shaping a learning organization. A learning organization is composed of individuals and leaders all interested in increasing their capabilities and improving their skills to achieve the results they care about. Learning a new skill is extremely rewarding, and, at the same time, achieves specific organizational goals if the learning is aligned to the needed capabilities. Thirty five percent (35%) of Asia Pacific survey respondents indicated that they have a skill gap within leadership.

The gap within human, social and emotional skills is not going away. Literature has argued the benefits and need for human skills. Today, employers seek interpersonal skills, communication, and collaboration skills to augment creating value from technological advancements and to introduce automation. Research has shown that employees acquire more proactive attitudes, better work engagement, and increased receptiveness to transformational leadership when they have a [growth mindset](#)²¹. For twenty five percent (25%) of respondents within Asia Pacific, this is a current skill gap.

FIGURE 4

Asia Pacific Skill Gaps Which Impact IT Transformation Success



Welcome to the 2022 Asia Pacific IT Transformation Skill Capabilities

There are always unknowns in business, and right now those include how exactly the pandemic will play out, what the outlook for the political climate will be and when supply chain disruptions will ease. But there's one thing technology and business leaders are pretty certain about: there are a key set of must-have skill categories that are essential for a modern IT enterprise organization in the future.

A Deep Dive Into the Top Five Must-Have IT Skill Capabilities

The IT skill capabilities are powerful categories essential for developing the skills, knowledge, and abilities of individuals and teams. They are the starting point for developing an organization or individual upskilling roadmap to enable the greatest chance of success within your organization or anywhere else in leading and evolving IT organizations. While we have used these same skill capabilities of human skills, process and framework skills, automation skills, and technical skills over the past four years (see Figure 5), this year we added leadership skills, business skills, cognitive skills and digital skills (see Figure 6).

FIGURE 5

IT Skill Capabilities

SOURCE

DevOps Institute



Human Skills

This skill capability includes emotional intelligence, psychological safety, dynamic learning, transformational leadership, The Three Ways, happiness at work and diversity and inclusion.



Process and Framework Skills

This skill capability includes a variety of different frameworks and processes applied within IT organizations.



Automation Skills

This skill capability includes software engineering and support automation, the ability to understand process flow and the reengineering of tasks, processes and procedures with the goal to replace manual processes, tasks or events with automation.

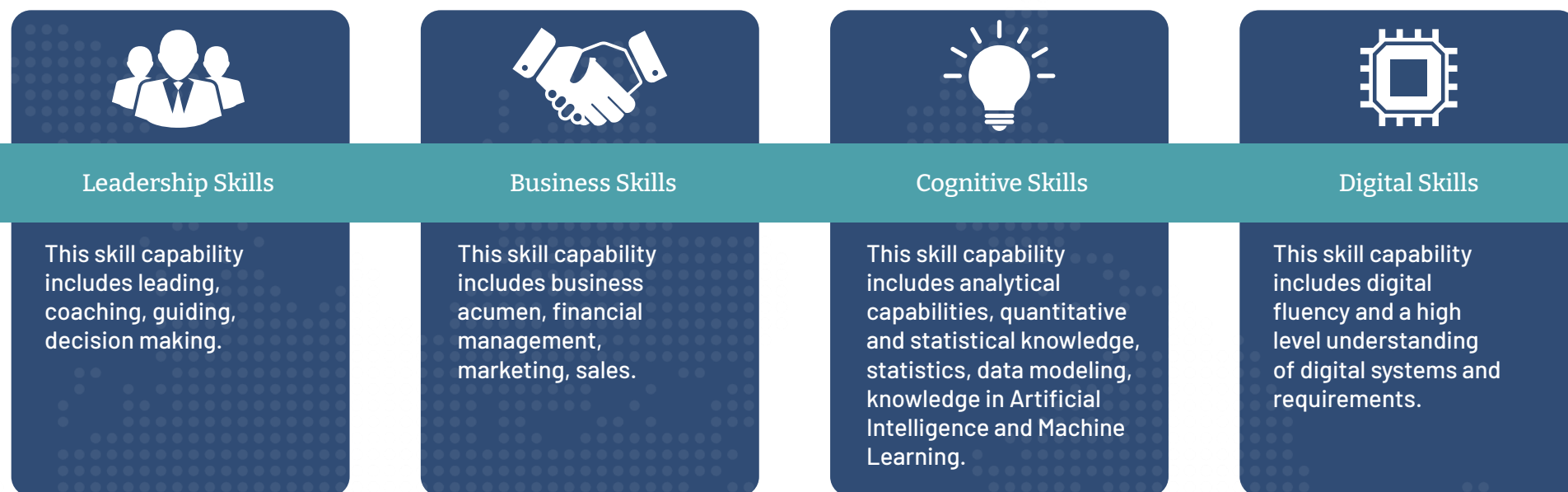


Technical Skills

This skill capability includes a variety of technical skills in topics such as elastic infrastructure, containers, microservices, APIs, serverless, DevOps toolchains, open source and security management.

FIGURE 6

Additional IT Skill Capabilities



SOURCE

DevOps Institute

The Upskilling IT 2022 survey received more than 359 respondents within APAC, including 16 chief information and chief technology officers. The response shows that the essential combination of skill capabilities for a successful IT transformation in 2022 are (see Figure 7):

The Top Five Skill Capabilities in the Asia Pacific Region

- 1 Process and Framework Skills
- 2 Technical Skills
- 3 Leadership Skills
- 4 Human Skills
- 5 Automation Skills

FIGURE 7
APAC Top Five Must-Have Skill Capabilities



QUESTION

How would you rate the importance of the following major skill categories for modern IT enterprise organizations in the future? (Select less important, important, critical)

N=359

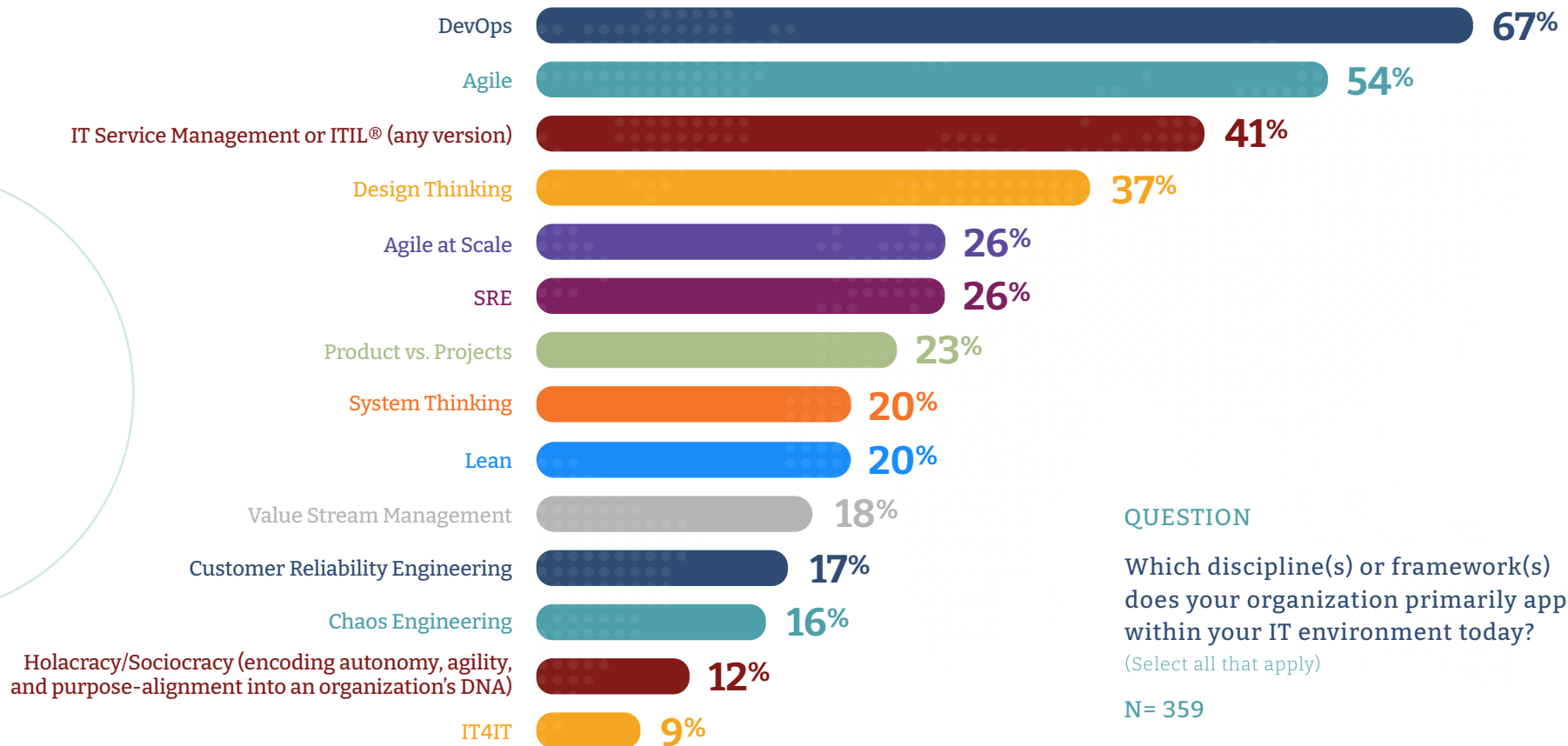
In the following sections, we take a deep dive into the different skill domains.

Process and Framework Skills Capability

According to [Gartner](#)¹², an “information and technology (I&T) operating model represents how an organization orchestrates its I&T capabilities to achieve its strategic objectives”. The continuous drive to accelerate, improve, and introduce new products and services to the market forces traditional IT organizations to update their operating model. While modern organizations such as Netflix started with modern operating models like DevOps and Agile, traditional IT organizations are also changing their operating models. Different operational frameworks are adopted (e.g., Agile, DevOps, ITIL) in various ways and at different levels within the IT organization (or beyond). This combination leads to a fused IT operating model leveraging various processes and frameworks (see Figure 8).

FIGURE 8

APAC IT Operational Model Leveraging Different Process and Framework Models



QUESTION

Which discipline(s) or framework(s) does your organization primarily apply within your IT environment today?

(Select all that apply)

N= 359

DevOps and Agile Remain the Cornerstones of IT Operating Models

Sixty-two percent (62%) of Asia Pacific survey respondents selected process and framework skills as the most important must-have skill capability.

Almost all these different processes and frameworks focus on aiding IT teams with improvements on velocity, quality and security within their products and solutions. There is not one perfect operational framework but rather the combination of them all which together form a fused IT operating model of the future. Here are some key highlights:

DevOps and Agile are the top two operational frameworks. When asked which operational frameworks organizations leverage, DevOps and Agile are the two most dominant models. According to a [study](#)¹³ conducted by Grand View Research, Inc., the global DevOps market size is expected to reach USD 12.85 billion by 2025. The desire to digitize business processes across the enterprise results in the need to shift towards a DevOps operating model. DevOps is adopted by 67% and Agile is adopted by 54% of survey respondents in APAC.

IT Service Management (ITSM) is part of the realm of operating models. Forty-one percent (41%) of our survey respondents also leverage ITSM as their operating model.

Chaos Engineering and Site Reliability Engineering are here to stay. Pioneered by Netflix and other organizations, Chaos Engineering (adopted by 16% of our APAC survey respondents) is aimed at increasing a team's confidence in a system's ability to withstand a variety of unpredictable failure modes that are otherwise difficult to prove through traditional testing methodologies. DevOps engineers should acquire these skills as these operational models are on its way to become mainstream practices in IT enterprise organizations. SRE (adopted by 26% of our APAC survey respondents) leverages Chaos Engineering as a best practice model.

Value Stream Management (VSM) aligns leadership and teams and provides clear direction. VSM is adopted by 18% of our survey APAC respondents today. Failure to deliver value happens when companies don't take the time to align goals and direction. Alignment can only happen if there is a vision for transforming an end-to-end value stream of a product or solution. The value stream includes how value is created, how people do their work, how resources are utilized, how processes operate, how the technology works, and how management manages. To achieve alignment, key things to uncover are: what are our priorities? Where do we start? What are the key use cases? Which priorities are short term? Medium term? Long term? And what does success look like? What are the outcomes we want to achieve? What does that mean in terms of operational KPIs? Once we identify these aspects, alignment is more easily achieved.

Tight collaboration between DevOps and security shapes DevSecOps. We asked to describe the relationship between DevOps and security and 47% of the APAC survey respondents said that they had a tight collaboration between the two teams, with regular joint meetings and well-used channels, 27% said there was some collaboration, but DevOps and security are still two separate teams and 22% said security was already completely embedded into DevOps and one team supporting both DevOps and security.

“In a world of escalating threats and increasingly ramped up compliance requirements, transparency collaboration and context among development, operations, and security teams is absolutely critical.”

David DeSanto, GitLab VP of Product

The Must-Have Process and Framework Skills

To understand how our APAC survey respondents rate the importance of the process and framework skills within their IT enterprise organizations of the future, we leveraged the same list of frameworks and process models from our 2021 research and figure 9 shows the survey results. This year, we concluded the following:

DevOps and DevSecOps will become one. The rise of cybercrime causes tremendous challenges, and application security rises to the top of the agenda of many technology and business leaders. Security management, according to [The 2022 State of CIO report¹⁴](#), states that 51% of CIOs are currently focusing on security management.

DataOps and ModelOps are new, but have received lots of must-have votes. DevOps brings together development (Dev) and IT operations (Ops) into a set of organizational practices intended to shorten the application development lifecycle while resulting in improved quality, reduced risk/downtime, and increased feature set. DataOps and ModelOps are focused on getting the data ready, expediting model development from lab to production, and deploying decision frameworks leveraging the models underneath. The overall goal is to reduce development, prototyping, testing, and deployment cycles while ensuring quality results and to ensure that outcomes can be achieved in a timely manner.

Design thinking for faster innovation: The most important factor for a digital transformation is to focus on the innovation rather than the technology. To achieve innovation, one must explore the problems which should be solved or opportunities to exploit. This is about ideation, generating sometimes revolutionary or evolutionary ideas which might cause a breakthrough. Design thinking is just that, which 49% of our APAC survey respondents indicated this to be a must-have skill.

FIGURE 9

APAC Top Five Must-Have Framework and Process Skills



QUESTION

How would you rate the importance of the following operating models within the IT enterprise organization in the future?
(Select less important, important, critical)

N= 359

SRE and VSM are the New Dynamic Must-Have Skill Duo

While Agile, DevOps and DevSecOps are the top three must-have process and framework skills, SRE and VSM have moved ahead in their must-have standing.

SRE has risen to the third must-have skill. IT operations members realize that the pure reactive management and monitoring of available applications and services is not enough to sustain happy customers and employees. SRE as an operating model enables IT operations to be part of design, focus on reducing toil and continuously improving applications and services towards reliability and availability. In our survey, 46% realize the advantage of this powerful operating model.

More business value with fewer resources requires managing value streams. While the demands from any digital enterprise vary depending on the industry, all verticals are eager to improve the way they deliver software. Improving velocity is a good thing, but it should not be the only focus. Ensuring software quality, security, and meeting business expectations are essential to achieve happy customers and employees and avoid disasters. Too often, valuable resources across both IT and the business are wasted due to myopic focus on speed. More and more organizations are adopting VSM, which drives the need for such skills.

Technical Skills Capability

Balancing the Must-Have Disruptive Technical Skills with Other Technical Skills

Sixty-two percent (62%) of Asia Pacific survey respondents selected technical skills as the second most important, must-have skill capability.

There are certain technologies that are disruptive and relatively new. [Burning Glass Technologies](#)¹⁵ analyzed 17,000 unique skills demanded across their database of over one billion historical job listings in the United States. Among them are software development methodologies, AI and machine learning, cloud technologies, and IT automation. Technical talent and expertise are finite resources, and without the right technical skills, transformation projects slow or even come to a standstill. Here are some key things to remember:

The competition for technical skills continues. The “war for talent” was coined by Steven Hankin of McKinsey & Company in 1997 to refer to the relentless competition involved in attracting and retaining exceptional, talented employees. Nearly 25 years later, organizations are still fighting this war and the battle is as intense as ever. Technology projects are frequent casualties; often projects slowdown or can even fail outright due to a lack of talent. With many companies accelerating their digital transformation efforts, organizations need a new strategy to address the talent gap.

Disruptive technical skills pay more. Disruptive as defined by Burning Glass means that these skills are of high value and not everyone has them. To the delight of those who possess these skills, it puts upward pressure on salaries. While employers are needing people with such skills, they also need to pay premiums for individuals possessing them. According to the same [research](#)¹⁶ from Burning Glass, individuals with IT automation skills can demand an average of additional \$24,969 as a salary premium. The following are additional premiums listed in the research: Artificial Intelligence and Machine Learning additional premium of \$14,175, software development methodologies additional premium of \$13,762, and cloud technologies additional premium of \$10,588.

When companies in Asia Pacific hire, they first look for technology skills. Possessing strong tech skills is a guaranteed path into the IT industry or a way to advance within it. While we differentiate between disruptive and regular technology skills, we found that 51% of our APAC survey respondents first look at technical skills when they hire externally.

Technology without skills is meaningless: Technologies and automation are critical success factors for any successful transformation. But imagine the technology without the required skills to leverage them—meaningless! Leading organizations are evolving their workforce development strategies based on the strategic goals of the business. Our APAC survey respondents confirm this since 73% say that they match the skill needs to the business outcome they want to achieve, or they predict which skills are needed by understanding the current skill level within a team (see Figure 9). Twenty-one percent (21%) of APAC respondents indicated that they are reactively identifying skill gaps.

Don't get overwhelmed by the vast amount of technical skills. From our members, we know that many of them are overwhelmed by which technical skills they should expand on. Are you one of these people? Does the very thought of which skills to develop, e.g., data analytics, coding, software development, and cloud computing make you nervous? If so, you're not alone. Additionally, the technology [predictions](#)¹⁷ from different market research vendors show continuous growth around cloud, containers, smart infrastructure, security, hyperautomation, and Artificial Intelligence and Machine Learning, just to name a few. When we asked and analyzed our APAC survey responses which are the must-have skills around technology, we found a few of those trends and more (see Figure 10).

FIGURE 10

APAC Top Five Must-Have Technical Skills



QUESTION

How would you rate the importance of the following technical skills within the IT enterprise organization in the future?
(Select less important, important, critical)

N= 359

Leadership Skills Capability

Autonomous Teams Require Leaders That Lead - Not Manage

For the first time in our research, we have introduced the category of leadership skills.

Fifty-six percent (56%) of our APAC survey takers rated the leadership skill category as a must have skill capability. Here are a few things to consider:

Modern organizations are enabling autonomous teams. Autonomous teams are several staff members who typically self-organize to accomplish various tasks. These teams have complete independence over what they do, including decision-making around who, what, when, where and why. They typically govern and control themselves, allocate resources, hire, train, and terminate. They have complete responsibility for a product or service.

Autonomous teams must have some rules. Typically, there are a variety of guardrails set by the autonomous team and in conjunction with its human leader. These guardrails or rules enable the team members' safety and guard some critical items.

Autonomous teams need leaders instead of managers. While these teams manage themselves, the more distributed and self-managed a team is, the more important it is that all the members enhance their leadership skills. When we asked what are the critical must-have skills for a leader, we found that diplomacy, trust-building and influencing people and culture are must-have skills (see Figure 11).

FIGURE 11
APAC Leadership Skills



QUESTION

How would you rate the importance of the following leadership skills within the IT enterprise organization in the future?
(Select less important, important, critical)

N= 288

Human Skills Capability

The Power of Human Skills are Essential to Sustain Growth and Change

Fifty-six percent (56%) of Asia Pacific survey respondents selected human skills as the fourth must-have skill capability.

Human skills are how we think and who we are and how we interact with and navigate through situations with others. The recruitment market is on fire for individuals with technical skills. Technology changes are happening at an accelerating pace. But what is essential to remember is that it takes humans with high learnability and curiosity to leverage new technologies, operating models, or whatever comes next. Here is what we know:

Human skills and emotional intelligence (EQ) are not the same. According to the [National Soft Skills Association](#)¹⁸, “Emotional intelligence is a learned ability to identify, experience, understand, and express human emotions in healthy and productive ways. Emotional intelligence skills form the base of competencies that all soft skills are built upon.” To understand more about how to teach soft skills go [here](#)²⁹.

“I recently heard [Dom Price, Work Futurist](#)¹⁹ at Atlassian, at [The DEVOPS Conference](#)²⁰, say that no-one’s ever died trying to be emotionally intelligence. How right he is! Changing ways of working means people need to unlearn old practices and adopt new ones, and human skills are no different. The good news is, as the NSSA points out, it’s a learned ability and, thanks to the inherent neuroplasticity of our brains, we all have the capacity to learn. To start, learn about yourself with some mindful introspection and then share what you learn with your colleagues. Encourage them to do the same. And focus on being an active listener. Anyone can have a high EQ—it just may take some work if you don’t think it’s a skill you were born with.”

[Helen Beal](#), Chief Ambassador DevOps Institute

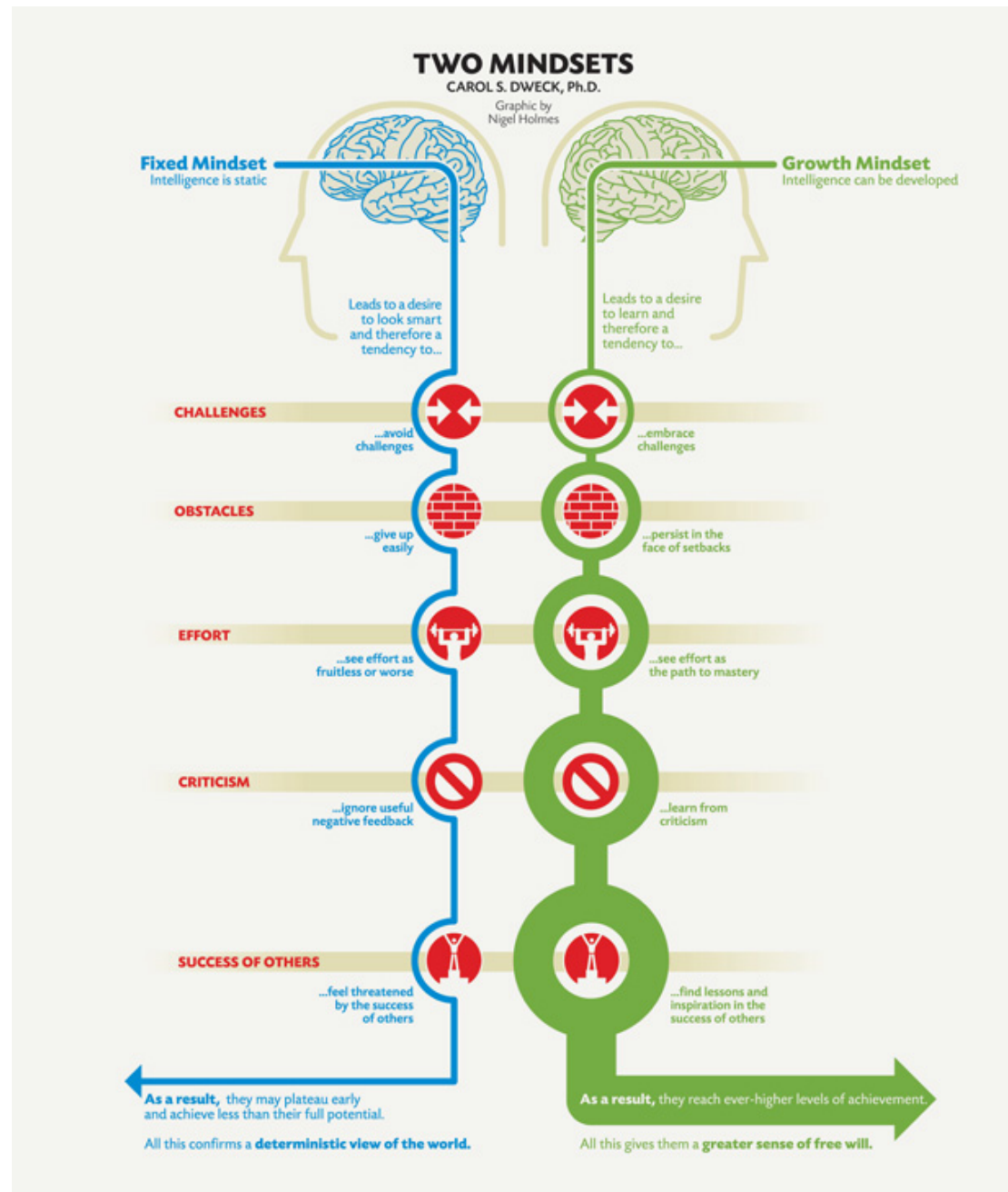
How you learn depends on your mindset. [Research](#)²¹ by American Psychologist Dr. Dweck has shown that the different mindsets—a growth mindset and fixed mindset—influence how we learn. Dr. Dweck says “the growth mindset is based on the belief that your basic qualities are things you can cultivate through your efforts.” A growth mindset leads to the desire to learn and brings a variety of positive developments (see Figure 12).

Human skill gaps have remained a challenge. The lack of human skills is not new for many employers. In 1918, a [study](#)²² of Engineering Education found that soft skills are missing from curriculums in engineering schools. To understand where in relation to other skill capabilities, we asked our survey respondents to share with us in which skill categories their IT enterprise organization is already experiencing skill gaps. See figure 13 for what we found.

Awareness that human skills are critical is not enough, we must teach and learn them. While awareness of the need for employees to possess human skills such as positive attitude, communication, critical thinking, and professionalism, to name a few, has begun to reach a fever pitch, we cannot stop there. Many institutions are teaching the concepts of human skills, but even that is not good enough. We must go deeper. First we must understand the different human skills. Figure 14 shows a heat map capturing the must-have human skills from our Asia Pacific survey respondents.

FIGURE 12

Dr. Carol Dweck's Fixed Mindset vs Growth Mindset

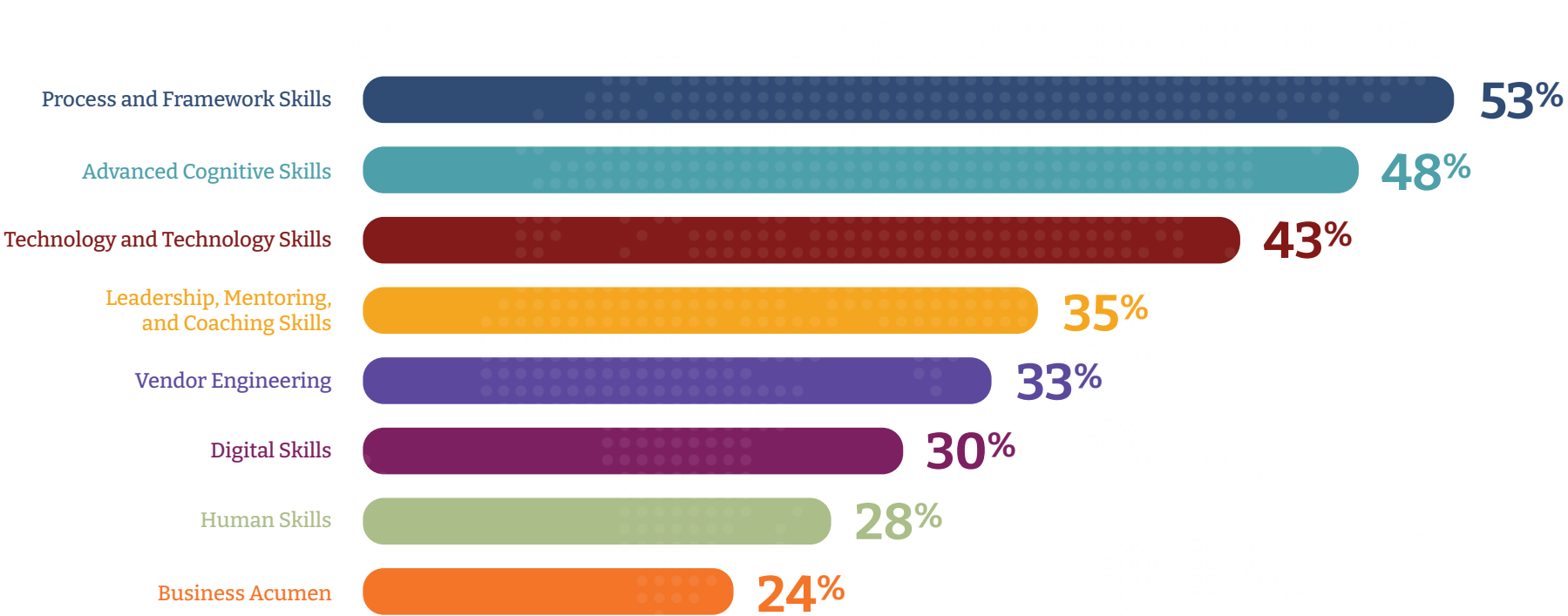


SOURCE

[Dr. Carol Dweck's Fixed Mindset vs Growth Mindset](#)²¹

FIGURE 13

APAC Ranks Human Skill Gaps 7th Highest Gap Within All Skill Categories

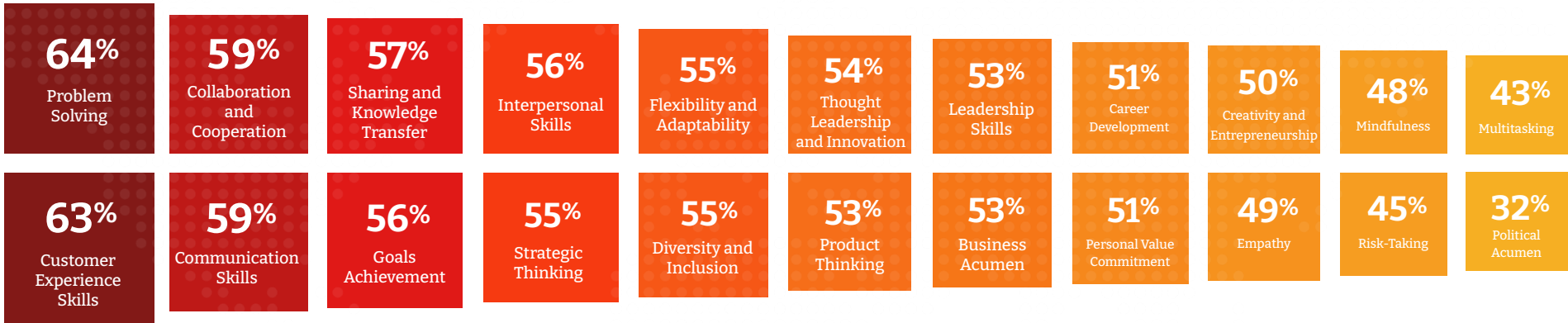


QUESTION

Recent research indicate skill shortages within IT enterprise organizations today and predict skill gaps in the future. In which of the following areas is your IT enterprise organization already experiencing skill gaps? (Select all that apply)

N=359

FIGURE 14
APAC Must-Have Human Skills Heat Map



QUESTION
How would you rate the importance of the following human skills within the IT enterprise organization in the future?
(Select less important, important, critical)
N= 359

Automation Skills Capability

Automation to Reduce Manual Work Frees up Resources for Innovation

Fifty-six percent (56%) of APAC survey respondents selected automation skills as the fifth must-have skill capability.

IT operational excellence defines the “what” of IT transformations, while the technologies define “how” you will get there. But that is only half of the story as there are many tasks, events and processes within IT and the business that can be automated. As we move into this category, we are only focusing on automation within IT. Other automation topics such as hyper-automation or business process automation are out of scope.

APAC Top Ten Must-Have Automation Tool Skills That Eliminate Manual Work

IT automation is the process of creating software and systems to replace repeatable processes and reduce manual intervention. It accelerates the delivery of IT infrastructure and applications by automating manual processes that previously required humans. The potential applications of automation are nearly infinite. We have selected a total of 25 automation technologies and asked our survey respondents to rate the importance of individuals being familiar with each automation tools within the IT enterprise organization. Figure 15 shows the top must-have IT automation tool skills.

FIGURE 15
APAC Top Ten Must-Have Automation Tool Skills



QUESTION

How would you rate the importance of being familiar with the following IT Automation tools within the IT enterprise organization in the future? (Select less important, important, critical)

N= 359

Upskilling is a Professional and Organizational Imperative



Make Every Day at Work an Upskilling Experience:

- ✓ **Make your upskilling journey intentional.** Many think about upskilling narrowly to enhance or expand their technical skills. The breadth and depth of skills range beyond technical, and individuals should think more broadly and intentionally about the breadth of the APAC IT Skill Wheel presented in Figure 16.
- ✓ **Be more thoughtful and holistic about the training you receive via your jobs.** Formal instructional training is not the only form of training. In many instances, it's the least effective because students rarely return to their jobs and immediately employ all the knowledge/skills they've just received.
- ✓ **Invite feedback on your job performance to target development needs.** Don't wait for your supervisor, team member or business customer to provide feedback on how you are doing. Invite others to give you feedback. Once others know that you welcome feedback, you will receive more of it. Feedback is a key mechanism for measuring skill development and targeting development needs.
- ✓ **Don't just think about now, think beyond now.** From your current perspective as an employee, upskilling is imperative not just to keep your current job or receive additional compensation, but to prepare and position yourself for the next job you want.
- ✓ **Technical skills may get you to the shortlist, but may not get you the job.** Survey respondents indicated that their number one hiring criteria are technical skills, but in many instances, those are just 'table stakes' – they might get individuals to a second interview or on a shortlist. Still, they don't get you the job. The other skills are the determining factor in who gets the job offer in many instances.

A [study](#)²³ conducted by Salesforce in April 2021 found 72% of workers claim they'd be more engaged with work if their company increased investments in training, while 69% believe they would be happier with their work. But there is more to an upskilling imperative beyond keeping employees happy about the amount of training they receive.



Leaders Must Extend Their Mindset from Training Towards Continuous Learning:



Leadership experience and business knowledge will expand your career opportunities. Individuals who extend their business and leadership accomplishments might have a better ability to progress in their careers. While people may want technical skills today, business knowledge and leadership experiences may be more important for the job you will be seeking five years from now.



Leaders must adopt a continuous learning frame of mind and not just allocate a budget for training activities. While there is importance in establishing a budget to ensure key training is happening, continuous learning should be part of an individual's job. On-the-job work experience is one of the best forms of training. This on-the-job work experience requires that work assignments are presented to employees as learning opportunities. For example, being asked to lead a distributed project is a tremendous opportunity to uplevel an individual leadership skill if presented and perceived as an upskilling opportunity.



Leaders must provide powerful learning experiences through continuous feedback. If management can identify, monitor, and provide feedback upon the developmental opportunities associated with a particular assignment or activity, then that assignment can be a powerful learning experience. It's largely a matter of how a leader or supervisor frames and presents the assignment and the attitude of the employee receiving it. Continuous feedback should be given and not just a one-time communication every year during the annual performance review.

The Upskilling IT Skill Wheel

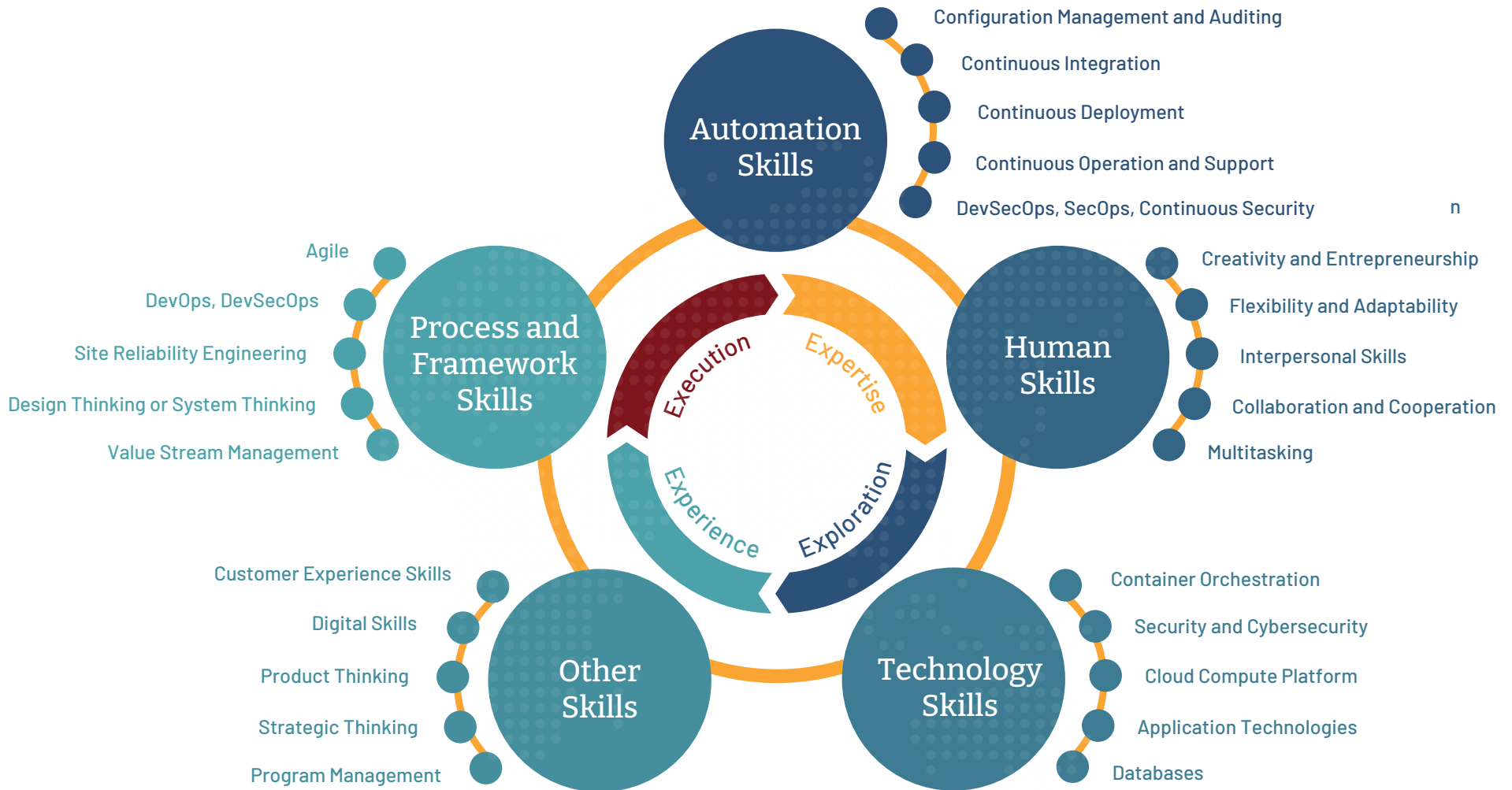
To foster broad and intentional upskilling, DevOps Institute created the Upskilling IT Skill Wheel. Recognizing your (or your teams') unique experience, expertise, examples of execution, and various tolerances for exploration should be complemented with the different must-have skill capabilities within our APAC IT Skill Wheel (see Figure 16). Use this skill wheel to:

- 1 Reflect on your current experience and expertise.** Think about your experiences (breadth), expertise (depth), and the tangible execution examples you have gained throughout your current or previous positions or during past product journeys and engagements. Take this inventory and compare it to the skill capabilities and must-have skills to examine where you already have sufficient experience and expertise or where you could improve.
- 2 Understand where you have made an impact through your ability to execute.** List some key tangible achievements and contributions you have made throughout your upskilling journey. These could be specific results, improvements, or other achievements. Include where you influenced results or outcomes, as these are also important.
- 3 Understand your willingness to explore and change.** Now reflect on your motivations and where you see yourself today and in the future. Are you comfortable with the current experience, expertise, and contributions you have made to your team and your organization? Are there opportunities where you could add additional value or take on a different role? Try to capture and understand your tolerance for exploration and ability to change, which will make it easier if you want to explore other opportunities or roles. Your willingness and ability to be flexible in expanding, learning, and acquiring new skills are essential in the current and future transformation of IT and the business.

We also have created two additional regional reports around the different skill capabilities. The other two regions covered are the Americas and EMEA.

FIGURE 16

APAC IT Skill Wheel:
Top 5 Skill Capabilities and Top 5 Skills



SOURCE

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- Baseline your DevOps skills, upskill your teams, and accelerate your DevOps Journey – learn more about [SKILup Assessments](#)²⁴ today
- Advance your Skills, Knowledge, Ideas, and Learning with our library of [SKILbooks](#)²⁵

Research Methodology

The Global Upskilling IT 2022 Report is the fourth report capturing the perspectives of individuals that are involved in recruiting, hiring, or working within IT enterprise organizations. We set out to understand the must-have, nice-to-have, and optional skills within key skill categories. After extensive research around skill capabilities, we determined the following skill categories from the previous years. Still, we added a few additional capabilities due to advances in digital transformations: automation, human skills, technical skills, process skills, framework knowledge, business skills, leadership skills, digital skills, and cognitive skills. The target population for this survey was the community of IT practitioners, hiring managers, team leaders, consultants, human resources, and other individuals who are familiar with the different frameworks such as DevOps, SRE, and Agile. We targeted all industry verticals and all company sizes. We promoted the survey via online promotions, short research webinars, social media, presentations during major events, press releases, and our networks. We designed our survey questions with input from various team members and industry experts. We tested our survey questions extensively to ensure good constructs, and we leveraged SurveyMonkey Enterprise as our survey and design instrument. We collected primary data from our survey respondents. Our goal was to achieve a sample size of 2,500 individual responses targeting key geographic areas such as the Americas, EMEA, and the Asia Pacific region. The survey was open from July 2021 until December 2022. We received 2,476 responses.

Interviews

We also leveraged personal interviews as a complementary research method to provide additional in-depth details. The interview scripts consist of brief but open questions. The results from the interviews are not generalizable because of the subjectivity of the data obtained. On the other hand, their flexible format contributed to a deeper explanation and understanding and allowed us to augment our report with interesting details.

Instrument Design

For this research, the writer designed one questionnaire script and one brief interview script. The questionnaire for the survey takers from the companies consisted of 29 closed questions related to DevOps skill priorities and importance within their teams or jobs. The first part of the survey focused on the key skill domains and detailed skills within the domains—the second part of the questions focused on DevOps topologies, hiring situations, and challenges. The last part of the questionnaire consisted of demographic questions related to company size, region, the professional role of the participants, and the IT environment. If you have questions on our survey methodology, please contact: customerservice@devopsinstitute.com.

Sponsors

The DevOps Institute extends a special thank you to the following partners for helping make this year's survey possible: Platinum Sponsors GitLab, Palo Alto Networks, Gold Sponsor Rancher, and Supporters Cycloid, The Linux Foundation, LLPA, LPI, Service Desk Institute, Taub Solutions, NTUC Learning Hub, DDLS, and Narada Code.

Acknowledgments

DevOps Institute would like to thank the many people who have provided their thoughts, ideas, inputs, and guidance on this year's report. This work is not possible without including and connecting with subject-matter experts, partners, and friends worldwide. We are incredibly grateful to them for their willingness to share, collaborate, discuss, critique, and contribute to this report. We also want to thank a few individuals who went above and beyond to help us with the survey and the publication of the report: Julia Pape, Jaida Olvera, Mark Settle, Karen Skiles, Ingrid Sides, Luke Sneddon, and Christina Majic. And finally, a huge thank you to all the people who have completed our survey, which is the foundation of our work.

Demographics

We had a total of 2,476 global survey respondents with good distribution across the globe, across verticals and enterprises. We also had a good representation of organizations with a hybrid infrastructure environment and modern infrastructures. Our survey respondents came from the key roles within IT organizations.

APPENDIX A

Collaboration and Cooperation	Includes working with others to achieve common goals
Problem Solving	Includes showing good judgment, focus on the right thing, high quality decision making, accept feedback to strengthen further improvement
Communication	Includes the effective communication across functional and leadership stakeholders
Sharing and Knowledge Transfer	Includes effective transfer of acquired knowledge to others
Diversity and Inclusion	Includes the accommodation and inclusion of multiple lifestyles and needs, and to accept the viewpoints and expertise of others
Flexibility and Adaptability	Includes adapting easily to change, remaining flexible and open to change
Interpersonal Skills	Includes communication, relationship building, listening
Personal Value Commitment	Includes trustworthiness, respect of others, ethics, integrity
Thought Leadership and Innovation	Includes knowledge on industry innovation, trends and practices, ability to accelerate adoption of best practices
Creativity and Entrepreneurship	Includes taking responsibility of new ideas and solutions to solve problems, energy, passion
Empathy	Includes understanding and taking different backgrounds, ideas and styles into consideration when working
Mindfulness	Includes attention and awareness of self and others, non-judgmental, curios and kindness

APPENDIX A (continued)

Risk-Taking	Includes making decisions taking risks into consideration, possibly without supervision
Multitasking	Includes the ability to focus resources and activities on multiple tasks while achieving key goals and/or desired results
Customer Experience Skills	Includes an understanding of how customers interact with the business
Product	Is defined as the thinking of “building the right thing, the right way”
Strategic Thinking	Includes comprehensive and holistic thinking, developing a bigger paradigm
Leadership Skills	Includes capability to lead and motivate others
Goals	Include ownership, self-development, achievement orientation
Business Acumen	Includes seeking and working for and with the business to solve business problems

APPENDIX B

Top 5 Global Human Skills



QUESTION

How would you rate the importance of the following additional human skills within the IT enterprise organization in the future? (Select less important, important, critical)

N= 1,547

Top 5 Global Technical Skills



QUESTION

How would you rate the importance of the following technical skills within the IT enterprise organization in the future? (Select less important, important, critical)

N= 1,580

Top 5 Global Leadership Skills



QUESTION

How would you rate the importance of the following leadership skills within the IT enterprise organization in the future? (Select less important, important, critical)

N= 1,141

Top 5 Global Automation Tools Must-Have Skills



QUESTION

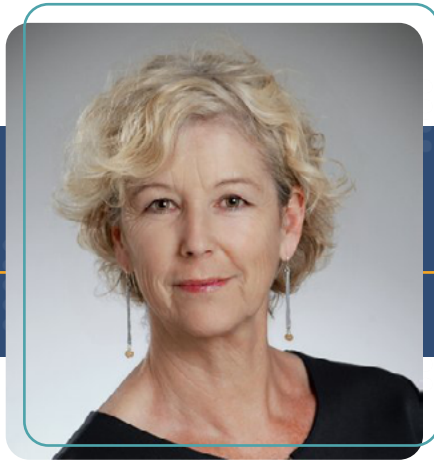
How would you rate the importance of being familiar with the following IT Automation tools within the IT enterprise organization in the future? (Select less important, important, critical)

N= 1498

APPENDIX C

Similar Skill Gaps Among the Regions, Except APAC
Does Not Perceive a Skill Gap in Human Skills

REGION	TOP 5 SKILL CAPABILITY GAPS
Global	Cognitive Skills Technical Skills Process and Framework Skills Leadership Skills Human Skills
EMEA	Technical Skills Cognitive Skills Process and Framework Skills Leadership Skills Human Skills
Americas	Cognitive Skills Technical Skills Process and Framework Skills Human Skills Leadership Skills
APAC	Process and Framework Skills Cognitive Skills Technical Skills Leadership Skills Automation Skills



Eveline Oehrlich

Chief Research Officer,
DevOps Institute



Mark Settle

CIO

Author and Biographies

Eveline Oehrlich is Chief Research Officer at the DevOps Institute. As former VP and Research Director at Forrester Research, Eveline led and conducted research around a variety of topics including DevOps, Digital Operational Excellence, Cognitive Intelligence and Application Performance Management for 12 years. She is the author of many research papers and thought leadership pieces and a well-known presenter and speaker. She has more than 25 years of experience in IT. Her passion is to help companies transform their IT organization, processes and tools towards high performing teams, enabling their business partners to achieve better business results. She has helped some of the largest enterprises across the world to adopt new strategies, workflows and automation within their journey towards a digital business.

Mark Settle is a seven-time CIO, three-time CIO 100 award winner and two-time book author. His most recent book is *"Truth from the Valley, A Practical Primer on IT Management for the Next Decade."*

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