

Advancing MSMEs' Digital Transformation for Balanced, Sustainable, and Inclusive Growth in APEC Economies

APEC Policy Partnership on Science, Technology and Innovation

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**Asia-Pacific
Economic Cooperation**



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APEC Policy Partnership on Science, Technology and Innovation

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Glossary

Abbreviation	Definition
AI	Artificial Intelligence
APEC	Asia-Pacific Economic Cooperation
APRU	Association of Pacific Rim Universities
CRM	Customer Relationship Management
DESG	Digital Economy Steering Group
ERP	Enterprise Resource Planning
EW4All	Early Warnings for All
GDP	Gross Domestic Product
ICT	Information and Communications Technology
IMD	International Institute for Management Development
IoT	Internet of Things
IPOs	Initial Public Offerings
IT	Information Technology
MIS	Management Information Systems
MSMEs	Micro, Small, and Medium-Sized Enterprises
MYPE	Micro y Pequeña Empresa
PPSTI	Policy Partnership on Science, Technology and Innovation
R&D	Research and Development
RMB	Renminbi (Chinese yuan currency)
SDGs	Sustainable Development Goals
SMEs	Small and Medium Enterprises
SMEWG	Small and Medium Enterprises Working Group
SMU	Singapore Management University
SOM1	APEC First Senior Officials' Meeting and Related Meetings (SOM1)
UN	United Nations
WMO	World Meteorological Organization
ZGC	Zhongguancun

Executive Summary

Micro, small, and medium-sized enterprises (MSMEs) represent the backbone of the global economy. Within the Asia-Pacific Economic Cooperation (APEC) region, MSMEs account for over 97 percent of all businesses, most private-sector employment, and about half of private sector output.

The digital transformation of MSMEs is pivotal to achieving the inclusive, sustainable, and balanced growth envisioned in the Asia-Pacific Economic Cooperation (APEC) Putrajaya Vision 2040. Recognizing this, APEC's Policy Partnership on Science, Technology, and Innovation (PPSTI) initiated this project to assess the current landscape and develop actionable guidance for the region.

The project combined two complementary approaches. First, a survey was conducted across APEC's 21 member economies. These nine economies achieved an average holistic digital maturity score of 617 out of 1,000, which corresponds to Level 4, or "Performer," on a five-level scale covering six dimensions: 1) Digital Strategy, 2) Digital Value, 3) Digital Processes, 4) Digital Technology and Data, 5) Digital Work, and 6) Digital Governance. The strongest performance was observed in Digital Governance as well as Digital Technology and Data, reflecting effective leadership, policy frameworks, and a growing adoption of technology tools. Conversely, Digital Processes emerged as the weakest dimension, indicating persistent challenges in operational streamlining and workflow integration. Key barriers to advancing digital maturity include limited financial and human resources, hardware and software constraints, technical skill deficits among staff, and limited access to technical support.

Second, the APEC Public-Private Dialogue, held on 3 and 4 February 2026 in Guangzhou, China, brought together policymakers, industry leaders, and academic experts to share best practices, examine barriers, and develop coordinated strategies. Presentations from across the region highlighted diverse and proven models—from unified government platforms and structured transformation pathways to full-stack technology ecosystems and university-industry partnerships—offering a rich repository of approaches APEC economies can adapt and replicate.

Drawing on these insights, this report identifies eight priority areas to accelerate MSME digital transformation in the region: strengthening digital infrastructure and connectivity; addressing financial barriers through innovative mechanisms; building human capital and digital skills at scale; enhancing digital processes and operational integration; creating an enabling policy and regulatory environment; leveraging ecosystem partnerships and platform models; measuring progress and sharing knowledge; and mainstreaming gender equality. Together, these priorities reinforce the call for inclusive and quality growth outlined in the Putrajaya Vision 2040.

Continued progress will depend on member economies sharing knowledge generously, aligning policies deliberately, and mobilizing resources equitably. This is a collective effort that APEC, through PPSTI and its broader institutional architecture, is uniquely placed to coordinate and sustain.

1. Background Research on MSME Digital Transformation

1.1 The Importance of MSMEs

Micro, small, and medium-sized enterprises (MSMEs) represent the backbone of the global economy. They account for 90% of businesses worldwide, generate 60 to 70% of employment, and contribute 50% of gross domestic product (GDP) globally (United Nations, 2025). Within the Asia-Pacific Economic Cooperation (APEC) region specifically, MSMEs account for over 97 percent of all businesses, most private-sector employment, and about half of private sector output (APEC, 2025b). Beyond numbers, MSMEs sustain livelihoods, foster inclusive growth, and drive social development across diverse communities (United Nations, 2025).

The importance of MSMEs in the APEC region is reflected in the Putrajaya Vision 2040, which emphasizes “quality growth that brings palpable benefits and greater health and wellbeing to all, including MSMEs” (APEC, 2020). Strengthening MSME participation in the digital economy is central to realizing this vision. However, despite ongoing efforts across the region, digital integration among MSMEs has not progressed at the pace and scale required.

1.2 Women in MSMEs and Digital Transformation

Women play an instrumental role in driving MSME growth and innovation across the APEC region. However, they frequently encounter greater barriers in accessing digital tools and resources than their male counterparts (APEC, 2025a).

Financial constraints represent a major challenge. In particular, female entrepreneurs often struggle to secure loans or investment, which undermines their ability to adopt digital technologies, expand operations, or enter new markets (World Economic Forum, 2023). Globally, the MSME finance gap for women is estimated at USD 1.7 trillion despite women owning 22% of micro-enterprises and 32% of small and medium enterprises (Estrada & Schuber, 2022). Cultural biases further stymie access to essential business networks and mentorship opportunities. This reduces not only the perceived credibility of female entrepreneurs, but also their ability to navigate complex business development processes (Suseno & Abbott, 2021).

1.3 Understanding Digital Transformation

Discourse on digital transformation suffers from major semantic confusion, with terms such as “digitization,” “digitalization,” and “digital transformation” often used interchangeably despite being analytically different (Gong & Ribiere, 2021; Savić, 2020).

Digitization denotes the most basic level of digital adoption—the transition from analog to digital services involving a direct 1:1 change in delivery mode through the addition of a technological channel (Mergel et al., 2019). Digitalization involves

leveraging digital technologies and data to generate revenue, improve business operations, replace traditional business processes, and establish an environment conducive to digital business activities (i-SCOOP, 2016). Digital transformation is “a fundamental change process, enabled by the innovative use of digital technologies accompanied by the strategic leverage of key resources and capabilities, aiming to radically improve an entity and redefine its value proposition for its stakeholders (Gong & Ribiere, 2021).”

1.4 Barriers to MSME Digital Transformation

MSMEs face three primary barriers to digital transformation (Hendrawan et al., 2024). Resource limitations represent the first barrier, particularly in financial and human capital (Hendrawan et al., 2024). High upfront and ongoing costs of digital tools, alongside limited access to skilled labor, hinder adoption (Hendrawan et al., 2024; Marolt et al., 2025; Maroufkhani et al., 2020).

Inadequate infrastructure poses another barrier. Poor connectivity, outdated hardware and software, and limited technical support reduce MSMEs’ ability to adopt digital technologies effectively, especially in rural areas (Hendrawan et al., 2024; Kumar et al., 2024; Morris et al., 2022; Priyono et al., 2020).

Knowledge gaps constitute the third barrier. Limited awareness of digital benefits, insufficient technical skills, and difficulty accessing relevant information reduce readiness for digital transformation and heighten resistance to change (Chidukwani et al., 2024; Hendrawan et al., 2024; Kumar et al., 2024; Rupeika-Apoga & Petrovska, 2022).

1.5 Holistic Digital Maturity Model

Digital maturity models are widely used to assess organizational progress in digital transformation (Hajoary, 2020; Hizam-Hanafiah et al., 2020; Soomro et al., 2020; Teichert, 2019; Williams et al., 2019). At present, however, most models are either too sector- or dimension-specific, limiting their generalizability for broader policy or cross-economy analysis. To address this, Aras and Büyüközkan (2023) introduced a holistic, organization-oriented digital framework spanning the entire digital transformation journey. It comprises the following six dimensions, with corresponding subdimensions detailed in Annex 1:

- The first, Digital Strategy, measures the extent to which corporate vision, strategic direction, and goals for digital transformation create value.
- The second, Digital Value, evaluates the impact of digital transformation on customer value proposition and product portfolio, as well as the degree of differentiation in customer value processes.
- The third, Digital Processes, assesses the scope and depth of digital transformation across organizational processes.
- The fourth, Digital Technology and Data, examines the technologies and solutions that enable the sustainable implementation of digital transformation.

- The fifth, Digital Work, explores how digital transformation reshapes work patterns and the skills employees must acquire.
- The sixth, Digital Governance, addresses how managerial and cultural factors are handled to ensure the success and long-term sustainability of digital transformation.

The digital maturity of an organization can be evaluated on a five-level progression (Figure 1):

- Level 1 (Intention): Organizations that undertake ad-hoc efforts without a structured approach.
- Level 2 (Beginner): Organizations that have initiated or planned digital improvement initiatives but have not yet achieved tangible results.
- Level 3 (Adopter): Organizations that have established foundational structures and practices, with early signs of value creation emerging.
- Level 4 (Performer): Organizations that consistently generate value through mature and widespread digital initiatives.
- Level 5 (Transformer): Organizations that have fully integrated digital initiatives across the enterprise, driving innovation, new products, optimized business models, and measurable growth.

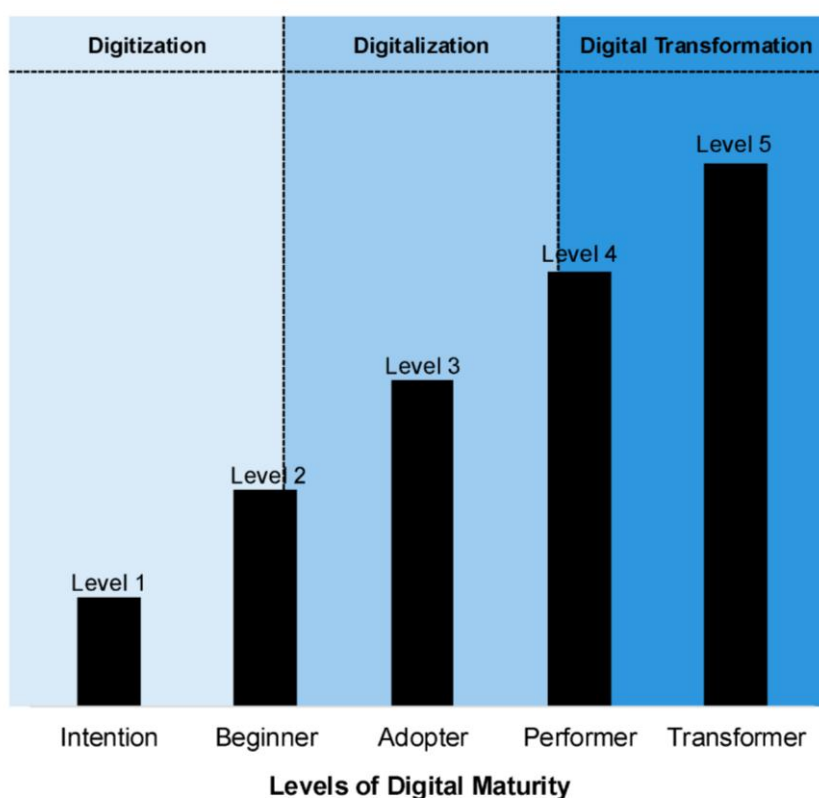


Figure 1. Five levels of digital maturity according to the holistic digital maturity model

2. Survey on MSME Digital Transformation in APEC

As part of this study, a survey was conducted from 24 October 2025 to 17 November 2025 among APEC's 21 member economies: Australia; Brunei Darussalam; Canada; Chile; People's Republic of China; Hong Kong, China; Indonesia; Japan; Republic of Korea; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; The Republic of the Philippines; Russia; Singapore; Chinese Taipei; Thailand; United States; Viet Nam. The objective of the survey was to measure the state of digital transformation among MSMEs in APEC's member economies.

The survey was disseminated through three networks. The first was the PPSTI focal points network in each APEC economy. The PPSTI is a subgroup under APEC, and its focal points are mainly government officers from ICT ministries in charge of coordinating ICT affairs in APEC. The second channel was the APEC Small and Medium Enterprises Working Group (SMEWG), which champions the inclusive development of innovative, sustainable, and digitally empowered MSMEs. The third channel was the APEC Digital Economy Steering Group (DESG), which aims to facilitate the development of the internet and digital economy.

2.1 Demographic and Organizational Overview

A total of 34 responses were received from nine member economies: Canada; Chile; People's Republic of China; Hong Kong, China; Malaysia; Mexico; The Republic of the Philippines; Singapore; Thailand. Among the participants, 59% ($N=20$) identified as women and 41% ($N=14$) as men. The largest age group was 45 to 54 (35.3%; $N=12$), followed by 55 to 64 (20.6%; $N=7$), 35 to 44 (20.6%; $N=7$), 25 to 34 (14.7%; $N=5$), 15 to 24 (5.9%; $N=2$), and 65 and above (2.9%; $N=1$).

In terms of professional level, more than half (58.8%; $N=20$) were executives, directors, or managers. Professionals accounted for 26.5% ($N=9$). Each of the following categories was represented by 2.9% ($N=1$) of participants: elementary workers, service/sales workers, and craft/production workers. The remaining 5.9% reported other professional levels.

Participants worked across a variety of departments such as executive/leadership (23.5%; $N=8$), operations (14.7%; $N=5$), human resources (11.8%; $N=4$), sales/business development (11.8%; $N=4$), R&D (8.8%; $N=3$), IT (5.9%; $N=2$), product management (5.9%; $N=2$), and others.

Participants represented a wide range of industries, including professional/business service (23.5%; $N=8$), manufacturing (17.6%; $N=6$), public administration (8.8%; $N=3$), information/media/telecommunications (8.8%; $N=3$), construction (5.9%; $N=2$), import/export trade/wholesale (5.9%; $N=2$), accommodation/food and beverage service (5.9%; $N=2$), and others.

Annex 2 provides additional detail on the demographic and organizational background of the participants.

2.2 State of Gender Equality

Male-owned organizations comprised the majority of the sample (55.9%; $N=19$), while female-owned organizations accounted for 35.3% ($N=12$). A small share of participants (8.8%; $N=3$) were unsure of ownership status. Regarding gender-equal composition, the largest share of participants came from organizations with a balanced male-female workforce (32.4%; $N=11$), followed by male-dominated organizations (26.5%; $N=9$). In terms of women's representation in leadership, most respondents indicated that some leadership positions were held by women (32.4%; $N=11$), followed by organizations where many leadership roles were held by women (29.4%; $N=10$), and those where few leadership positions were held by women (20.6%; $N=7$).

Participants most commonly reported that digital roles in their organizations were filled by somewhat inclusive representation, slightly skewed toward one sex (35.3%; $N=12$), followed closely by organizations with balanced sex representation in digital roles (32.4%; $N=11$). When asked about organizational policies to promote gender equality in digital roles, the largest share reported no formal policies in place (26.5%; $N=9$). Meanwhile, 20.6% ($N=7$) came from organizations with informal efforts, and another 20.6% ($N=7$) from organizations with comprehensive, organization-wide policies that were actively enforced. Regarding support programs, 32.4% ($N=11$) of participants reported that their organizations had some formal mentorship or development programs for women in digital roles, while another 32.4% ($N=11$) indicated no such programs exist.

Further details on the state of gender equality of responding organizations are in Annex 2.

2.3 Key Barriers to Digital Transformation

Limited financial resources were the most frequently cited barrier to digital transformation (23.9%; $N=17$). This was followed by human resource constraints (15.5%; $N=11$) and hardware/software limitations (15.5%; $N=11$). Other key barriers included technical skill deficits among staff (14.7%; $N=10$), limited access to technical support (12.7%; $N=9$), limited awareness of technology (8.5%; $N=6$), connectivity challenges (7%; $N=5$), and difficulty accessing relevant information (2.8%; $N=2$).

2.4 Holistic Digital Maturity Scores

Using the holistic digital maturity model developed by Aras and Büyüközkan (2023), digital maturity levels were categorized according to the following score ranges:

- Level 1 (Intention): 0–200
- Level 2 (Beginner): 201–400
- Level 3 (Adopter): 401–600
- Level 4 (Performer): 601–800
- Level 5 (Transformer): 801–1000

The member economies were ranked from the most to least digitally mature (Figure 2). It should be noted that the low response rate across all economies limits the representativeness of these findings. The results are therefore not necessarily reflective of the broader MSME digital landscape in these economies and should be interpreted with caution.

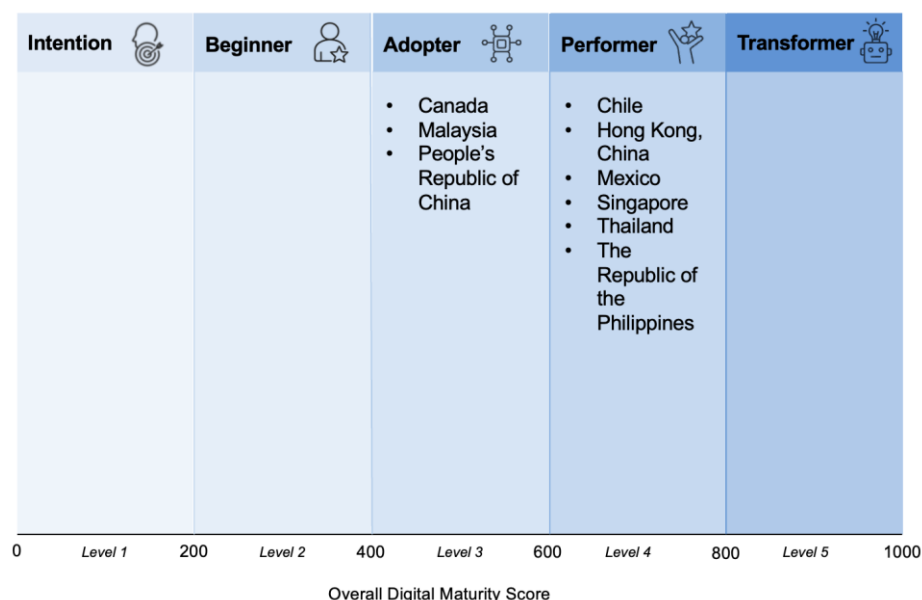


Figure 2. Grouping of member economies based on the holistic digital maturity model

Across the six dimensions, average scores ranged from 2.98 to 3.41. Digital Governance recorded the highest average (3.41), followed by Digital Technology and Data (3.29), Digital Strategy (3.20), Digital Work (3.21), Digital Value (3.15), and Digital Processes (2.98). Overall, six economies were categorized at Level 4 (Performer) and three at Level 3 (Adopter). On average, the member economies attained a digital maturity score of 617, positioning them collectively at Level 4 (Performer).

2.5 Insights by Member Economy

Key insights for each member economy are summarized below. Annex 3 contains a breakdown of scores for every subdimension for all nine economies.

2.5.1 Canada

Canada scored 568, placing it at Level 3 (Adopter). It demonstrated solid capabilities in Digital Strategy (3.20), Digital Work (3.25), and Digital Governance (3.20), reflecting clear vision, workforce readiness, and competent governance structures. Its score in Digital Value (3.00) indicates moderate value creation, while its scores in Digital Processes (2.25) as well as Digital Technology and Data (2.67) reveal gaps in process integration and technology adoption.

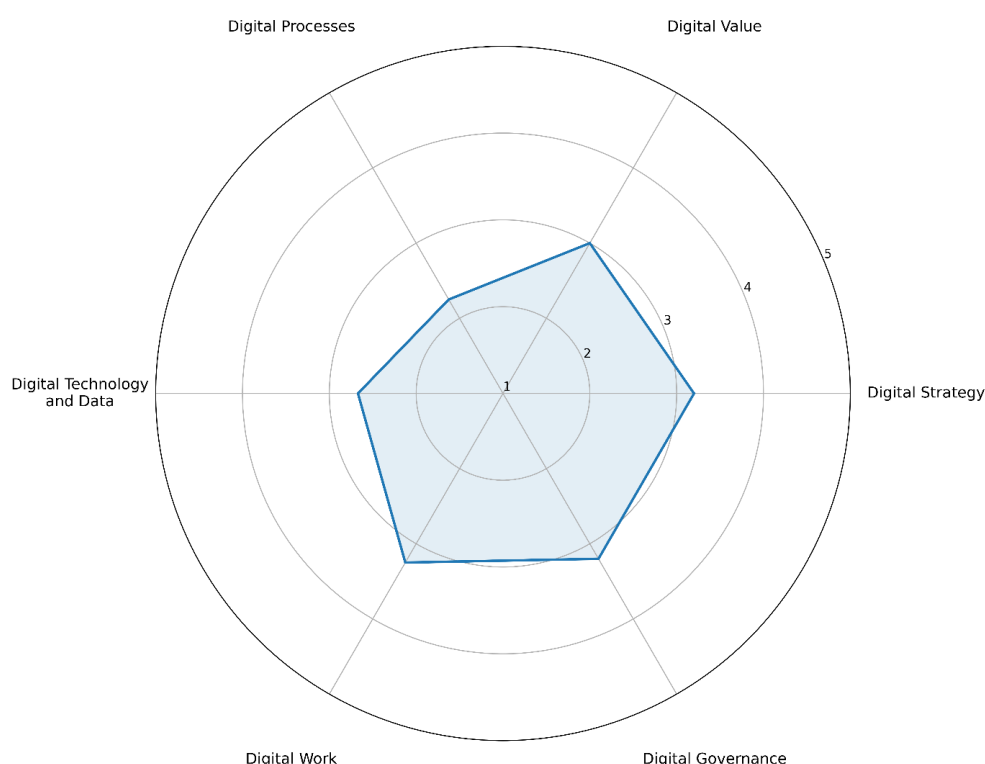


Figure 3. Canada's performance across the six digital maturity dimensions

2.5.2 Chile

With an overall score of 665 (Level 4, Performer), Chile shows strong digital maturity. Its highest scores were in Digital Governance (3.83), Digital Work (3.58), and Digital Strategy (3.47), highlighting effective leadership, workforce capability, and strategic planning. Its scores in Digital Value (3.44) and Digital Processes (3.25) indicate good value creation and process structures, though its score for Digital Technology and Data (3.00) suggests room for improvement in technology adoption and data utilization.

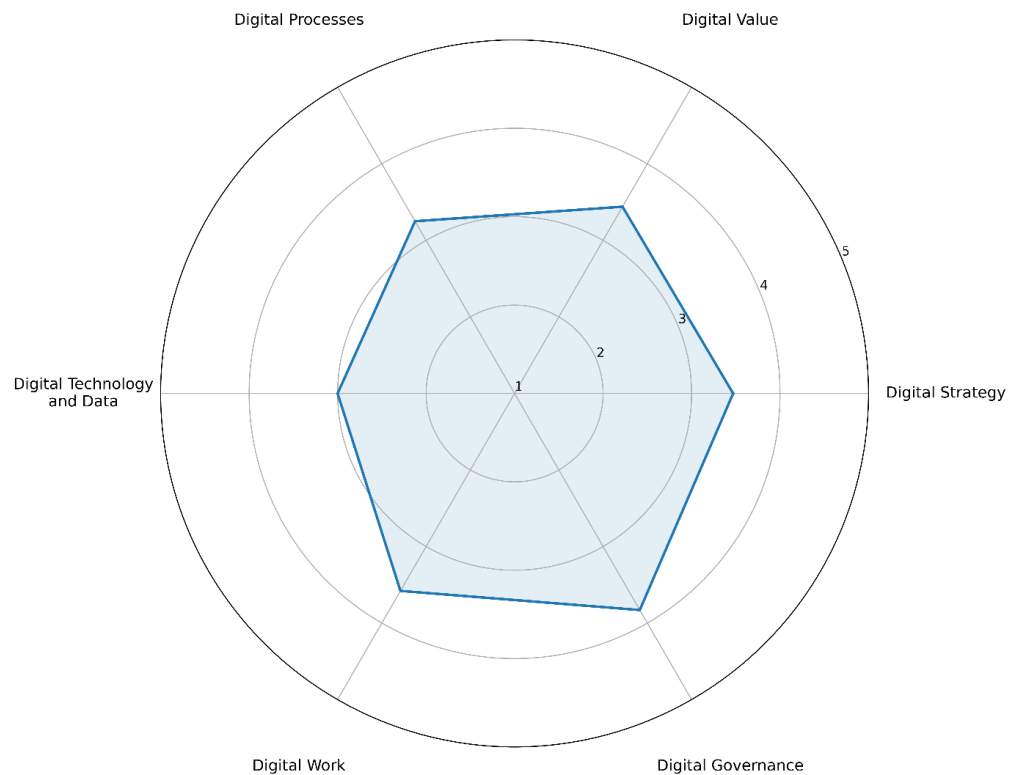


Figure 4. Chile's performance across the six digital maturity dimensions

2.5.3 People's Republic of China

With an overall score of 3.08 (Level 3, Adopter), the People's Republic of China is at an early stage of digital transformation. Its highest score was in Digital Work (3.00), reflecting a degree of workforce readiness. However, lower scores in Digital Processes (2.63), Digital Technology and Data (2.67), and Digital Governance (2.90) suggest limited process integration, technology use, and oversight capacity. Scores in Digital Strategy (2.40) and Digital Value (2.17) point to more significant gaps in strategic planning and value creation.

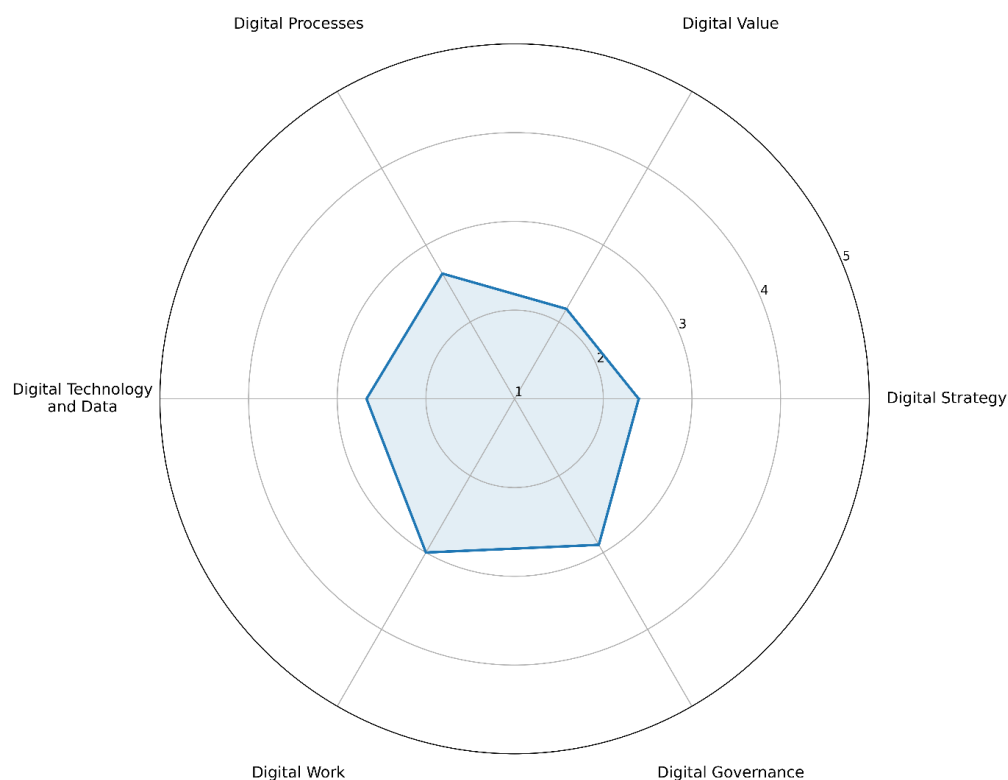


Figure 5. People's Republic of China's performance across the six digital maturity dimensions

2.5.4 Hong Kong, China

Hong Kong, China achieved an overall score of 656, placing it at Level 4 (Performer). Digital Value (3.67), Digital Strategy (3.60), and Digital Governance (3.60) are its strongest dimensions, showing strategic vision, value creation, and governance effectiveness. Its scores in Digital Technology and Data (3.33) as well as Digital Processes (3.25) indicate moderate technology adoption and process management, while its score in Digital Work (3.00) indicates workforce capacity and collaboration could be further developed.

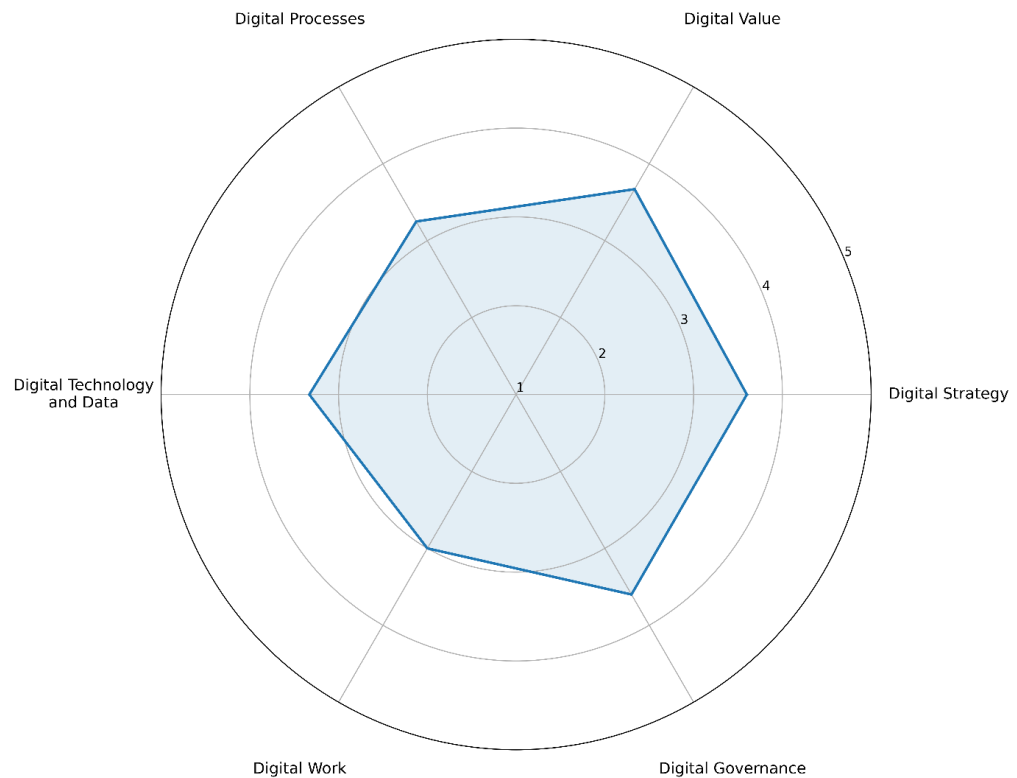


Figure 6. Hong Kong, China's performance across the six digital maturity dimensions

2.5.5 Malaysia

Malaysia had an overall score of 540 (Level 3, Adopter). Its highest scores were in Digital Technology and Data (3.17) and Digital Processes (2.93), showing reasonable technology adoption and process structure. Its scores in Digital Strategy (2.90), Digital Value (2.50), Digital Work (2.58), and Digital Governance (2.80) indicate moderate strategic planning, value creation, workforce capabilities, and governance practices, signaling the need for holistic improvements across dimensions.

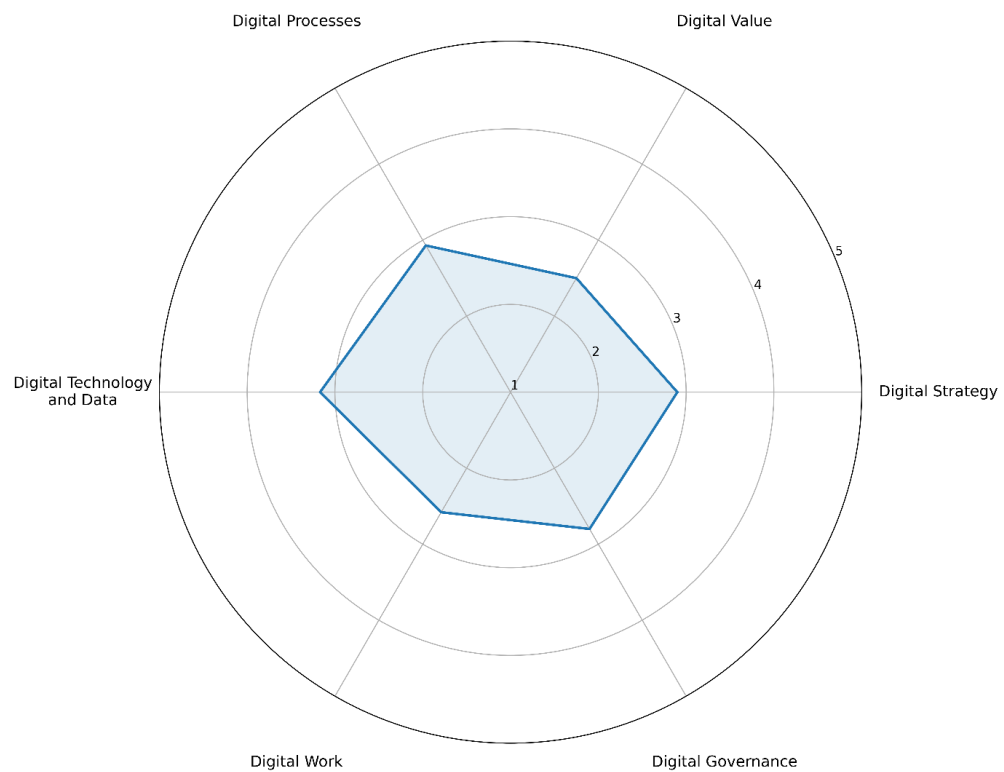


Figure 7. Malaysia's performance across the six digital maturity dimensions

2.5.6 Mexico

Mexico scored 624, placing it at Level 4 (Performer). Digital Technology and Data (3.78) is its strongest dimension, followed by Digital Governance (3.37) and Digital Processes (3.33), reflecting good technology adoption, governance structures, and process management. Its scores in Digital Strategy (3.07), Digital Work (3.25), and Digital Value (2.72) point to a need to strengthen strategic alignment, workforce skills, and value generation.

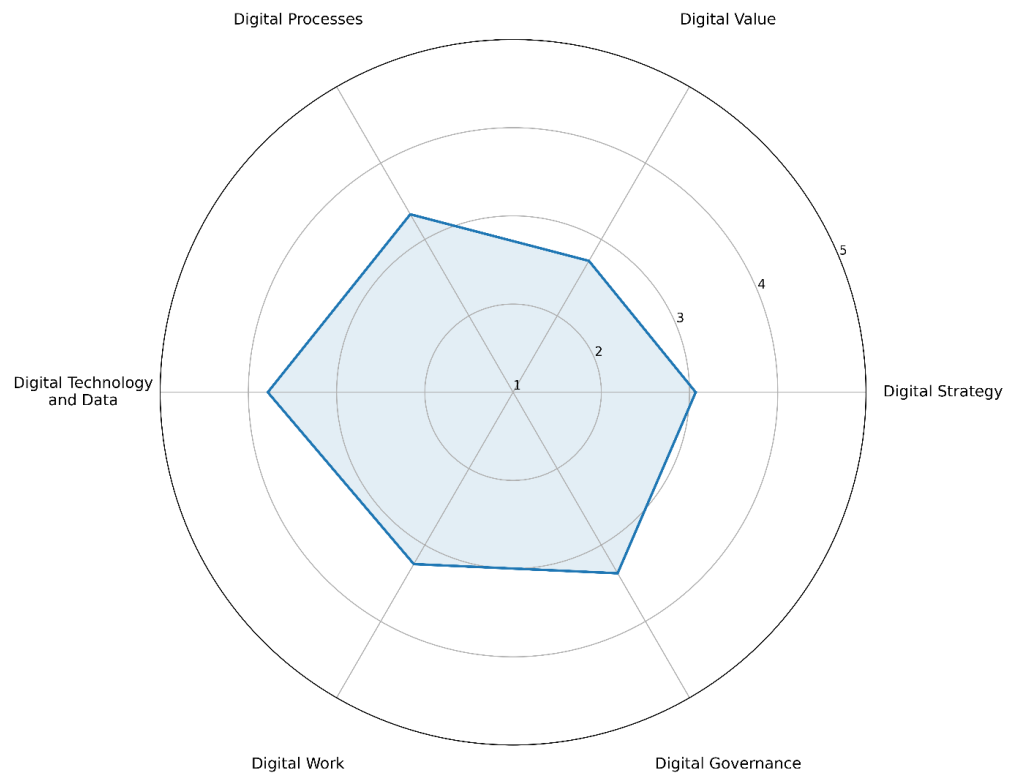


Figure 8. Mexico's performance across the six digital maturity dimensions

2.5.7 The Republic of the Philippines

The Republic of the Philippines attained a score of 643 (Level 4, Performer), showing balanced digital maturity. Its best-performing dimensions are Digital Governance (3.56) as well as Digital Technology and Data (3.37), reflecting effective oversight, decision-making, and technology adoption. Its score in Digital Value (3.37) indicates solid value creation, and its score in Digital Work (3.36) highlights workforce readiness and collaboration. Its scores in Digital Strategy (3.31) and Digital Processes (3.08) reveal a good strategic foundation and process management, though there is room to further optimize process efficiency and fully align strategy with operational execution.

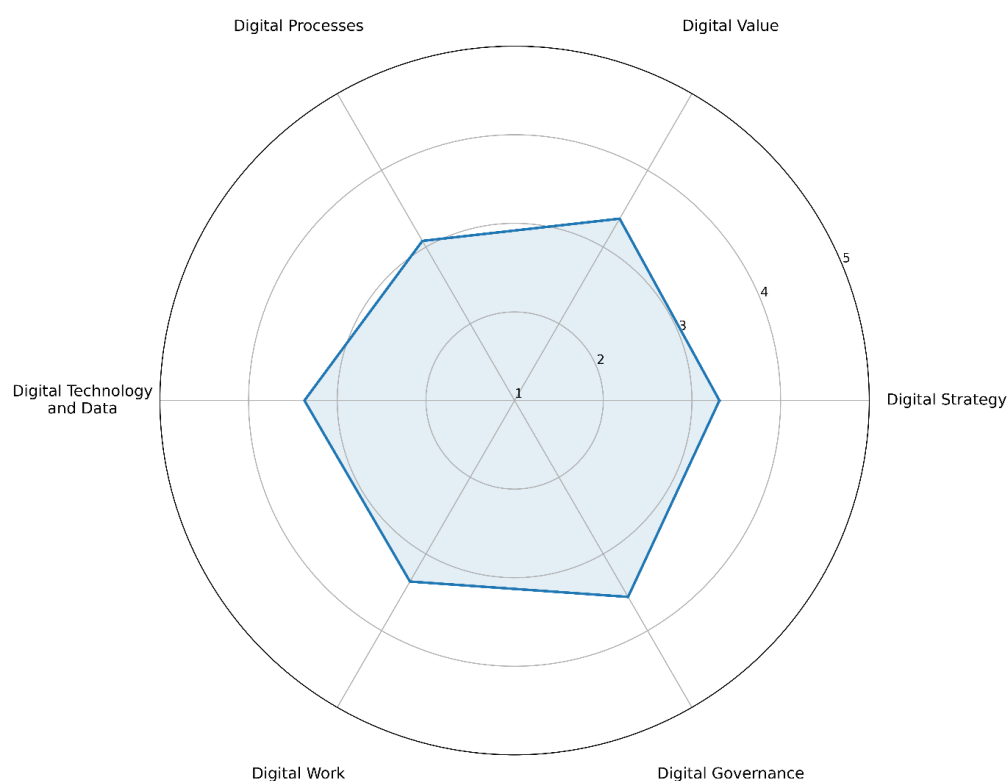


Figure 9. The Republic of the Philippines' performance across the six digital maturity dimensions

2.5.8 Singapore

Singapore achieved a score of 696 (Level 4, Performer). Digital Value (4.00) and Digital Technology and Data (4.00) are the economy's top strengths, reflecting advanced value creation and technology adoption. Its scores in Digital Work (3.75), Digital Governance (3.80), Digital Strategy (3.20), and Digital Processes (3.25) indicate strong workforce capabilities, governance, strategic planning, and process integration.

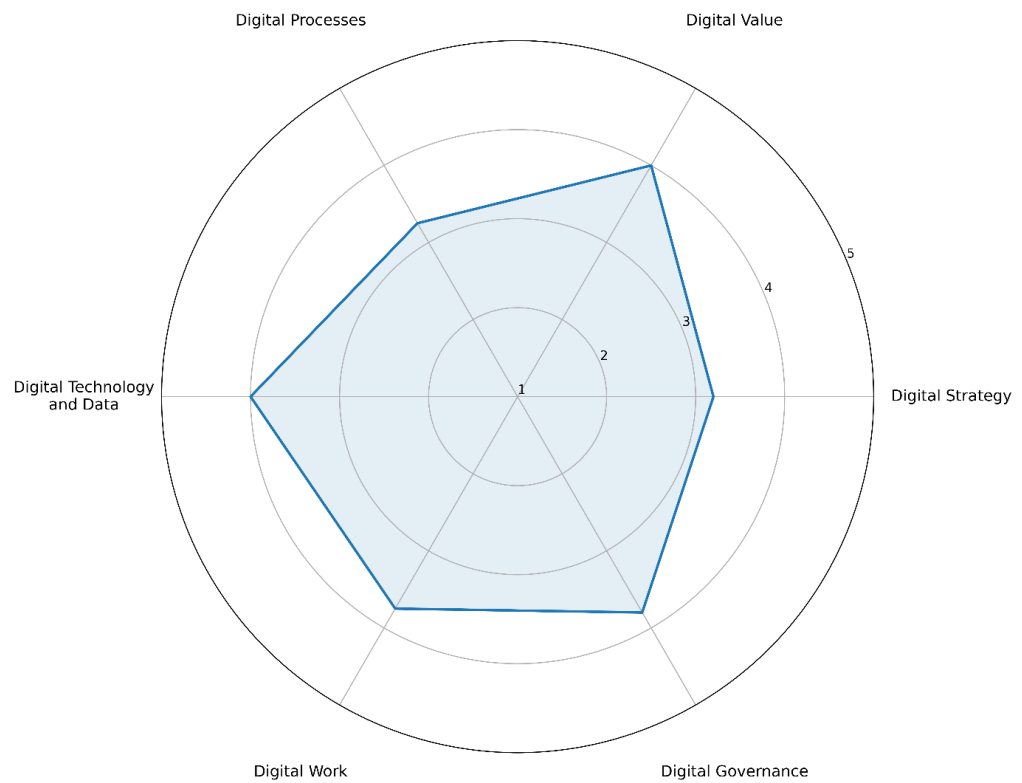


Figure 10. Singapore's performance across the six digital maturity dimensions

2.5.9 Thailand

Thailand scored 656 (Level 4, Performer), showing strong digital maturity. Its highest scores were in Digital Strategy (3.70) as well as Digital Technology and Data (3.67), indicating clear strategic direction and effective technology adoption. Its scores in Digital Value (3.50) and Digital Governance (3.60) highlight value creation and strong governance, while its scores in Digital Processes (2.88) and Digital Work (3.13) suggest further improvements are needed in process efficiency and workforce development.

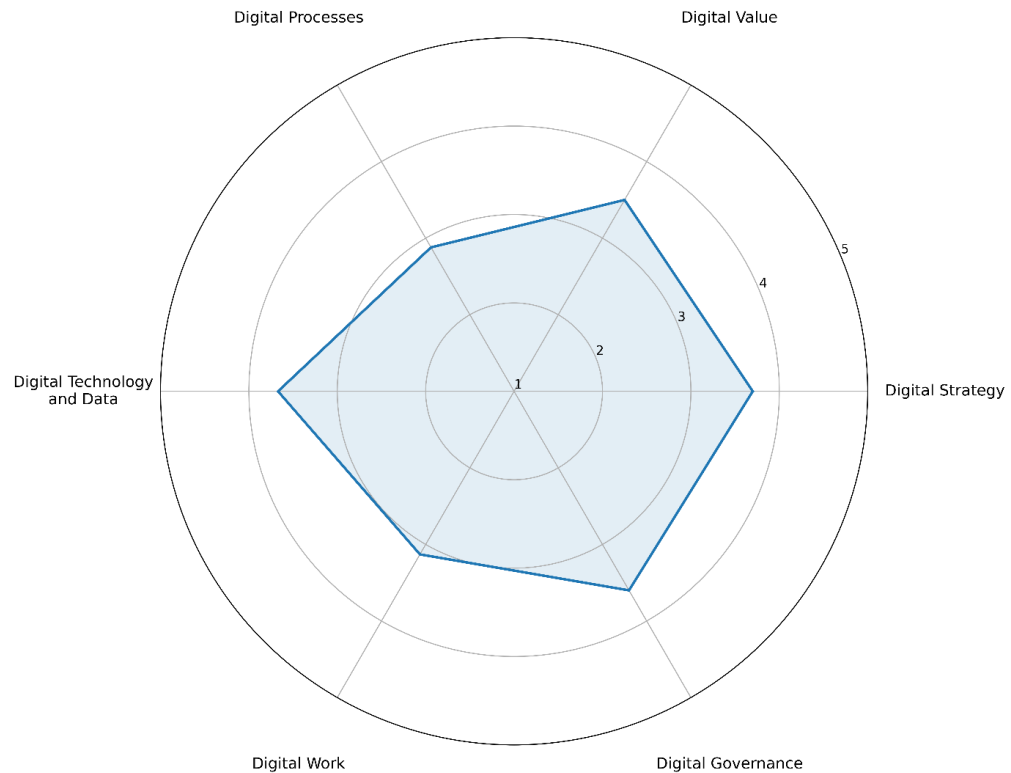


Figure 11. Thailand's performance across the six digital maturity dimensions

2.6 Limitations of Survey

A couple of limitations should be considered when interpreting the findings of the survey. First, the survey responses may not be fully representative of the broader MSME population in each economy. Second, the results are based on self-assessment, which may introduce bias as participants could have overestimated the digital capabilities of their organizations or underreported challenges.

2.7 Key Takeaways

Findings from the survey highlight that digital transformation among MSMEs in APEC economies is progressing but remains uneven across regions and dimensions. Overall, based on the holistic digital maturity model, six of the nine responding economies achieved Level 4 out of 5, demonstrating strong capabilities in certain areas, while three economies remained at Level 3, reflecting early-stage digital transformation. On average, member economies scored 617 out of 1,000, indicating moderate to high readiness for digital initiatives.

Across all six dimensions, Digital Governance (3.41) as well as Digital Technology and Data (3.29) emerged as the strongest areas. High scores in Digital Governance suggest that oversight mechanisms, leadership commitment, and policy frameworks are relatively well established across the nine economies. Likewise, strong performance in Digital Technology and Data reflects growing adoption of digital tools, platforms, and analytics capabilities.

The nine member economies performed moderately well in the dimensions of Digital Strategy (3.20), Digital Work (3.21), and Digital Value (3.15). These scores indicate that many MSMEs have articulated digital priorities, possess competent workforces, and recognize the benefits of digital transformation. However, gaps remain in translating strategy into measurable value. Workforce capabilities could also be further strengthened through targeted training and upskilling.

Digital Processes (2.98) emerged as the lowest-performing dimension across the nine economies. This points to limited process integration and inefficiencies in operational workflows. Weakness in this dimension suggests that even when technology and governance foundations are in place, many MSMEs struggle to embed digital tools into daily operations or redesign processes to fully leverage digital solutions.

The results also highlight persistent gaps in gender equality in the digital workforce. While some organizations reported gender-equal representation, targeted initiatives to support women in digital roles remain limited. Strengthening inclusion is vital for enhancing innovation and broadening talent pipelines.

Key barriers to digital transformation continue to be financial and human resource constraints, limitations in hardware and software, along with limited access to technology and gaps in technical skills. Even economies that are digitally advanced

confront these practical, operational challenges at the MSME level, underscoring the need for targeted support, funding, and advisory programs.

In sum, the survey indicates that while some APEC economies are progressing well in digital maturity, gaps remain in technology adoption, process optimization, workforce capacity, and inclusivity. Addressing these gaps will be essential to driving sustained digital transformation across the region.

2.8 Implications for the APEC Public-Private Dialogue

Findings from the survey informed the design of the APEC Public-Private Dialogue.

First, since Digital Governance as well as Digital Technology and Data were the strongest performing dimensions, organizations with advanced governance structures and technology adoption practices were invited to share practical examples of what has worked well.

Second, the relatively low scores in the Digital Processes dimension underscore the need to focus on how MSMEs can translate strategy and governance frameworks into operational improvements. Sessions that examined workflow redesign and change management were therefore included. This ensured the Dialogue addressed not only high-level policy considerations, but also the practical realities of implementation.

Third, given that participation in digital roles remains uneven between men and women, deliberate effort was made to invite female leaders in digital fields. Their perspectives helped surface practical approaches to foster more balanced participation in digital transformation.

3. APEC Public-Private Dialogue: MSME Digital Transformation Best Practice Analysis

The APEC Public-Private Dialogue on “Advancing MSMEs’ Digital Transformation for Balanced, Sustainable, and Inclusive Growth” took place in Guangzhou, the People’s Republic of China, on 3 and 4 February 2026. Held on the margins of the APEC First Senior Officials’ Meeting and Related Meetings (SOM1), the event convened policymakers, industry leaders, and academic experts from across the APEC region. The objectives of the dialogue were to examine current challenges, share proven practices, and develop actionable strategies for accelerating digital transformation among MSMEs. Annex 4 contains a summary of all the presentations.

Among speakers, 69% were male and 31% female. Among moderators, 67% were male and 33% female. All other participants were female. Overall, the attendee profile was nearly evenly distributed between women (48%) and men (52%).

The presentations at the APEC Public-Private Dialogue highlighted a range of best practices and emerging models for advancing MSME digital transformation across the APEC

region. Even as the approaches varied by economy and sector, several common design patterns emerged. This section synthesizes these cross-cutting insights into six themes. Each subsection first illustrates the theme with examples from specific economies or enterprises, and then distills a set of design principles to guide replication and adaptation across APEC economies.

3.1 Platform-Driven Economies

Several member economies demonstrated the effectiveness of integrated digital platforms that provide MSMEs with comprehensive support. Russia's MSP.RF platform exemplifies this approach, offering registration, finance, training, advisory services, and market-linking opportunities through a unified Digital Entrepreneur Profile. This model reduces administrative burden by aggregating over 1,000 automated data points and transforming interactions from reactive "search and apply" to proactive "receive relevant offers."

Similarly, private-sector platforms such as DiDi illustrated how mobility and food delivery ecosystems can embed capacity-building directly into commercial relationships. The DiDigitalize program in Mexico and Colombia provides free digital training to restaurant SMEs, directly addressing the knowledge gaps that prevent effective platform participation. JD's "Ten Knots of Sugarcane" supply chain integration enables MSMEs to plug into sophisticated value chains at different nodes, thus providing the infrastructure for small players to scale within a global logistics framework.

These examples show that the most effective platforms go beyond transaction facilitation to actively build the capabilities of participating enterprises. In particular, they suggest that effective platform ecosystems share several design features:

- Simplified access through unified interfaces
- Automated data aggregation to mitigate compliance burden
- Embedded capacity-building and advisory services
- Direct market linkages that turn digitalization into revenue

3.2 Structured Digital Transformation Pathways

Peru's MYPE Digital Line provides MSMEs with a clear, structured pathway to digital transformation. The five-phase approach—sensitization, diagnosis, advisory, adoption, and scaling—recognizes that MSMEs require different types of support at different stages of maturity. The Transformation Center Network, composed of both advanced sector-specific centers and basic digitalization service centers, ensures support is appropriately calibrated to the needs of the enterprise.

This structured approach tackles a common shortcoming in digital transformation programs: attempting to apply uniform solutions to heterogeneous populations. By explicitly mapping stages of readiness and tailoring interventions accordingly, Peru's model increases the likelihood that MSMEs will progress successfully rather than become overwhelmed or disengaged.

Key design features of effective structured transformation pathways include:

- Explicit recognition of different levels of maturity
- Graduated support intensities matching readiness of the enterprise
- Clear progression criteria and milestones
- A complementary mix of basic and advanced service providers

3.3 Full-Stack Technology and Open Innovation Models

The People's Republic of China's ZGC Science City, along with enterprise examples such as NIO and JD Technology, showcases the impact of combining comprehensive technology stacks with open partnership models. ZGC Science City's "1+X+1" framework strengthens core industries while integrating complementary sectors and embedding innovation across the value chain.

Similarly, NIO's battery-swapping partnership model and JD Technology's supply chain integration approach show how large enterprises can generate ecosystem-wide benefits for smaller firms. By standardizing key technologies and creating structured collaboration channels, these anchor firms enable MSMEs to access advanced capabilities and infrastructure that would otherwise require substantial capital or R&D investment. This approach is especially relevant in capital-intensive sectors, where barriers to entry would typically exclude smaller enterprises.

Several design features emerge as critical to effective full-stack and open innovation ecosystems:

- The willingness of large enterprises to maintain open, collaborative ecosystems
- Technology standardization that lowers integration and coordination costs
- Clear and mutually beneficial value propositions for both anchor firms and MSMEs
- Governance frameworks that ensure transparency and fair participation

3.4 Collaborative Innovation and University Partnerships

The APRU Tech Policy Hackathon exemplifies how academic networks can facilitate policy-relevant innovation through student engagement. By mobilizing 299 students from 40 universities across 15 economies to develop AI and data science solutions for MSME challenges, the initiative creates a pipeline of both innovative solutions and future-ready talent.

This model addresses two needs simultaneously: MSMEs gain access to cutting-edge technical expertise they cannot afford, while students develop practical skills in real-world problem-solving. Singapore's research-to-implementation partnerships—where universities collaborate with implementation partners to convert research into practical innovations—serve as a complementary approach.

Effective and replicable university-industry collaboration models require a number of elements:

- Problem definitions that reflect actual MSME challenges
- Translation mechanisms converting research into deployable tools
- Funding support for prototype-to-scale transitions
- Incentive structures that reward applied research

3.5 Financial Mechanisms and Risk-Sharing Arrangements

Papua New Guinea's SME Agriculture Financing Project underscores the effectiveness of public-private risk-sharing mechanisms in expanding MSME access to capital. Through coordinating a risk-share facility that mobilized approximately USD 220 million annually and reached over 4,000 MSMEs, the program demonstrates how well-structured partnerships can substantially ease financial constraints.

Hong Kong, China's comprehensive suite of funding schemes—including the Enterprise Support Scheme, R&D Cash Rebate Scheme, and Patent Application Grant—shows how diverse financial instruments can address different aspects of the digital transformation journey, from initial experimentation through to commercialization and scaling.

Together, these cases highlight several key features of effective financial mechanisms for MSME digital transformation:

- Risk-sharing between public and private sectors
- Reduced collateral requirements recognizing intangible digital assets
- Flexible repayment terms aligned with digital investment timelines
- Targeted instruments for different transformation stages
- Explicit provisions addressing gender equality and geographic inclusion

3.6 Sector-Specific Digital Solutions

Several presenters foregrounded the importance of tailoring digital solutions to sector-specific operational realities. Dr Yang's presentation on agricultural machinery highlighted how precision farming technologies must respond to distinct challenges such as labor shortages and environmental sustainability. Likewise, Dr Zhang's case study on eFishery indicated that aquaculture MSMEs benefit most from integrated solutions that combine hardware, data analytics, financing, and market access, which suggests that farmers require end-to-end support rather than isolated digital tools.

The DiDigitalize program further illustrates effective sector customization by addressing the unique digital needs of food service enterprises, which differ markedly from those of manufacturing or retail businesses. By aligning support with sector-specific workflows and constraints, such initiatives enhance relevance and adoption as compared to generic digital transformation programs.

Collectively, these cases suggest that sector-specific digital strategies are most effective when they:

- Reflect a deep understanding of sectoral operational workflows
- Incorporate complementary services into cohesive solutions
- Address sector-specific constraints (e.g., aging workforces, seasonality, fragmented supply chains)
- Balance customization with scalability to ensure wider impact

4. Policy Recommendations to Accelerate MSME Digital Transformation in APEC

Drawing on survey findings and insights from the APEC Public-Private Dialogue, the following policy recommendations are proposed to accelerate MSME digital transformation in the region. These recommendations are organized into eight priority areas, with each section accompanied by a set of actionable short- and long-term measures for APEC and PPSTI to advance implementation.



Figure 12. Overview of policy recommendations

4.1 Priority Area 1: Strengthen Digital Infrastructure and Connectivity

Connectivity challenges and inadequate infrastructure remain fundamental barriers to MSME digital transformation, particularly in rural and remote areas. The survey highlighted persistent limitations in hardware and software, gaps in technical support, and unreliable connectivity, even in relatively advanced economies. Addressing these barriers requires investments in both physical infrastructure and digital public goods, as well as mechanisms to help MSMEs access and adopt technology.

Action	Recommended Approach
Expand universal broadband initiatives	Prioritize last-mile connectivity investments in underserved areas through coordinated public-private partnerships. Economies should consider innovative solutions such as community networks, satellite connectivity, and shared infrastructure models to reduce costs while expanding coverage.
Establish digital public infrastructure	Beyond physical connectivity, governments should develop shared digital platforms—such as digital identity systems and data exchange frameworks—that reduce both the cost and complexity of digital adoption for individual MSMEs. These platforms should be designed as public goods that enable private sector innovation rather than compete with it.
Create regional technology centers	Establish physical and virtual technology centers that provide MSMEs with access to advanced technologies such as cloud computing and AI-enabled analytics. These centers can function as testbeds where enterprises experiment with new digital solutions under guidance, allowing them to evaluate return on investment and build in-house capabilities before making major technology commitments. Centers should also provide training and advisory support tailored to the specific needs of MSMEs across different sectors.
Support technical assistance networks	Fund regional networks of technical support providers to assist MSMEs with system maintenance, cybersecurity, troubleshooting, and the adoption of new digital tools. Consider flexible models such as traveling technical teams for remote areas, multilingual virtual help desks, and subscription-based advisory services.

Table 1 Strengthening Digital Infrastructure and Connectivity (Priority Area 1)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
- Commission a connectivity gap mapping study across all 21 APEC economies to identify the most underserved MSME clusters. - Convene a working group within PPSTI to draft a shared framework for digital public infrastructure interoperability. - Publish a call for expressions of interest from economies willing to pilot a regional technology center model. - Develop a resource kit to help economies launch technical assistance networks rapidly.	- Establish a voluntary APEC Broadband Commitment tracker with annual progress reporting by member economies. - Co-fund at least three cross-border regional technology centers demonstrating the shared-infrastructure model. - Integrate infrastructure readiness indicators into a standardized APEC MSME Digital Maturity measurement framework. - Advocate for digital infrastructure investment to be included in APEC investment facilitation agendas.

Table 2. Actionable Measures for APEC/PPSTI (Priority Area 1)

4.2 Priority Area 2: Address Financial Barriers Through Innovative Mechanisms

In the survey, limited financial resources stood out as the most frequently reported barrier to digital transformation. Traditional lending mechanisms typically fail to meet the needs of MSMEs owing to high collateral requirements, elevated interest rates, and perceptions of risk associated with digital investments. To overcome these barriers, there is a need for dedicated financing solutions and targeted support for groups with untapped economic potential, including women-owned MSMEs.

Action	Recommended Approach
Develop digital transformation financing facilities	Develop dedicated financing mechanisms specifically for MSME digital investments. These facilities should incorporate risk-sharing arrangements between government and private lenders. Such facilities should feature longer repayment periods aligned with digital transformation timelines, recognizing that returns on digital investments often materialize gradually rather than immediately.
Create voucher and grant programs	Provide MSMEs with vouchers or matching grants for specific digital investments, including software subscriptions, training programs, and consulting services. These programs can be especially effective when they require MSMEs to contribute a portion of costs, ensuring commitment and an appropriate selection of services.
Incentivize private investment	Offer tax incentives for venture capital and private equity investment in digitally transforming MSMEs. Consider expanding R&D tax credits to cover digital process improvements, recognizing that process innovation can be as impactful as product innovation for enterprise competitiveness.
Support alternative financing models	Enable and regulate solutions driven by financial technology that provide flexible options beyond traditional debt instruments, such as revenue-based financing and crowdfunding platforms.

Table 3. Addressing Financial Barriers Through Innovative Mechanisms (Priority Area 2)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
• Compile a cross-economy inventory of existing MSME digital financing schemes and identify funding gaps. • Facilitate a workshop among APEC finance ministries and development banks to design a model risk-sharing facility. • Develop standardized voucher program guidelines adaptable by member economies. • Issue an APEC policy brief on alternative financing models for MSME digital transformation.	• Advocate for inclusion of MSME digital transformation financing in multilateral development bank programming. • Establish an APEC MSME Digital Finance Facility with pooled guarantees from interested member economies. • Publish biennial data on MSME access to digital transformation finance, disaggregated by economy, size, sector, and sex. • Work toward a regional fintech regulatory recognition framework to ease cross-border alternative financing.

Table 4. Actionable Measures for APEC/PPSTI (Priority Area 2)

4.3 Priority Area 3: Build Human Capital and Digital Skills at Scale

Human resource constraints and technical skill deficits were among the top barriers to MSME digital transformation. Even when training is provided, traditional theory-based instruction often fails to translate into changed business practices. To address these challenges, it is vital to adopt more practical and contextually relevant approaches to building digital capabilities, as well as targeted interventions to boost participation of women and other groups with untapped economic potential in digital roles.

Action	Recommended Approach
Establish collaborative innovation labs	Replace conventional theory-based instruction with collaborative innovation labs. These labs should provide access to actual technologies and expert facilitators who can guide real-world implementation, ensuring learning occurs through doing rather than through passive instruction.
Develop micro-credentials and stackable certifications	Introduce bite-sized credentials that allow learning to occur progressively alongside work. These credentials must be industry-recognized and portable across APEC economies to enable regional labor mobility and to signal genuine competency to employers. Stackable architectures mean that individuals can accumulate credentials over time, working toward more comprehensive qualifications without needing to commit to extended periods away from work.
Facilitate peer learning networks	Connect digitally mature MSMEs with enterprises beginning their transformation journeys through sector-specific or cross-sector networks. As peer enterprises understand the practical constraints and operational realities confronted by similar businesses, they are well-positioned to offer advice both technically sound and contextually appropriate.
Integrate digital competencies into education	Work with educational institutions to embed foundational digital literacy and data analysis into standard curricula. University-industry partnerships create dual benefits by generating practical solutions for current MSME challenges while sharpening students' applied skills. These partnerships should be structured so that academic research addresses real-world problems defined by MSMEs, even as students gain experience working on projects with immediate practical relevance.
Provide subsidies and performance-based support	Provide subsidies or vouchers MSMEs can use to access accredited training providers. To ensure accountability and genuine skill development, these subsidies should be tied to completion and implementation milestones rather than merely to enrolment. Concerted effort must be made to increase women's participation in digital roles.

Table 5. Building Human Capital and Digital Skills at Scale (Priority Area 3)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
- Identify economies where innovation labs are most urgently needed. - Launch a pilot micro-credential framework with three to five lead economies; document occupational standards and cross-recognition protocols. - Strengthen MSME–academic–policy linkages by convening structured partnerships in at least two economies per year. - Publish toolkit providing practical guidance on converting training into implementation. - Initiate peer learning pilots by establishing cross-border or cross-sector MSME mentorship networks linking digitally advanced firms with early-stage adopters in priority industries.	- Develop an APEC Digital Skills Qualifications Framework enabling mutual recognition of micro-credentials across all 21 economies. - Establish a sustainable APEC Innovation Lab Network with shared resources, curricula, and best-practice repositories. - Commission longitudinal impact studies measuring the effect of collaborative labs on MSME productivity and digital maturity scores. - Integrate digital skills targets and participation metrics related to gender equality into the APEC Education Strategy.

Table 6. Actionable Measures for APEC/PPSTI (Priority Area 3)

4.4 Priority Area 4: Enhance Digital Processes and Operational Integration

The survey found that Digital Processes was the weakest of the six dimensions under the Holistic Digital Maturity Model. This means many MSMEs struggle to incorporate digital tools into daily operations and redesign workflows effectively. Even when technology is available, enterprises may lack the expertise to adapt processes and integrate systems for operational improvement. Interventions that support process redesign and promote the adoption of standards are therefore essential, in addition to providing MSMEs with examples of successful digital workflows.

Action	Recommended Approach
Fund advisory services for process redesign	Support MSMEs in mapping existing processes and implementing redesigned workflows. Many MSMEs lack the expertise to conduct effective process analysis or to envision how operations could be restructured to leverage digital capabilities. External consultants with process expertise can spearhead this transformation.
Develop industry-specific process templates	Build templates and reference architectures for common operations such as inventory management, CRM, and financial reporting. These templates should be developed collaboratively with industry associations and technology providers to ensure they reflect actual

	operational requirements and can be implemented using accessible tools.
Promote interoperability standards	Establish and encourage adoption of standards that enable different digital tools to communicate seamlessly. Industry-wide standards that enable different tools to interoperate reduce these integration costs and increase the value MSMEs derive from each tool they adopt. Governments can accelerate standards adoption by mandating interoperability in procurement specifications and by funding standards development.
Establish process digitalization showcases	Create demonstration sites where MSMEs can observe how digital processes are applied in practice. These showcases should be designed to accommodate visitors and to explain not only what technologies are in use, but also how processes were redesigned, what challenges were encountered, and what benefits have been realized. Ideally, showcases should cover various scales and sectors so that visiting MSMEs can locate examples applicable to their own situations.

Table 7. Enhancing Digital Processes and Operational Integration (Priority Area 4)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
- Commission a rapid diagnostic across member economies to identify the top five sector-specific process digitalization pain points for MSMEs. - Develop and freely distribute a starter library of five sector-specific process templates (e.g., food services, manufacturing, retail). - Identify and promote 10 MSME process digitalization showcase sites across at least five economies.	- Establish an APEC Process Digitalization Advisory Service matching MSMEs with accredited process redesign consultants. - Develop a comprehensive APEC MSME Interoperability Standards Roadmap with a five-year adoption timeline. - Expand the showcase network into every member economy with government co-funding for facility development.

Table 8. Actionable Measures for APEC/PPSTI (Priority Area 4)

4.5 Priority Area 5: Create an Enabling Policy and Regulatory Environment

Regulatory frameworks often lag behind technological change, which induces uncertainty for MSMEs considering digital investments. Policies designed for larger enterprises may create barriers for smaller firms, imposing compliance costs and administrative burdens that disproportionately affect MSMEs. Inconsistent data governance across borders, gaps in cybersecurity support, and a lack of regulatory flexibility for experimentation further hamper digital adoption. Fostering an enabling policy environment necessitates measures that both ease compliance burdens and support innovation.

Action	Recommended Approach
Conduct MSME regulatory impact assessments	Implement “MSME tests” to explicitly consider differential impacts to ensure new regulations do not disadvantage smaller firms. These assessments should examine not just the direct costs of compliance, but also the opportunity costs. If the assessment reveals disproportionate burdens, appropriate exemptions or graduated compliance requirements should be designed to maintain regulatory objectives while recognizing capacity constraints.
Develop digital compliance tools	Create unified digital profiles that pre-populate forms and eliminate duplicate data entry. When enterprises can fulfil tax filing, safety reporting, employment documentation, and other obligations through streamlined digital interfaces, compliance shifts from being a barrier to a routine administrative task. These systems also help governments improve data quality and enable more effective monitoring and enforcement.
Establish regulatory sandboxes	Provide safe environments where MSMEs can test digital business models under supervision without bearing full compliance costs. This approach recognizes that innovation usually entails trial and error, and that mandating full compliance before concepts are proven only stifles experimentation. These sandboxes must have clear entry and exit criteria for transitioning successful experiments into full regulatory compliance.
Promote cross-border data and privacy alignment	Work toward regional alignment of data protection and privacy standards to reduce compliance complexity for MSMEs operating across jurisdictions. Although full harmonization may be neither feasible nor desirable given different legal traditions and social preferences, mutual recognition arrangements and coordinated minimum standards can lessen friction.
Support cybersecurity readiness	Provide subsidized cybersecurity assessments and insurance mechanisms to help enterprises manage risks. Consider establishing mandatory baseline security standards for businesses handling sensitive data, paired with technical and financial support to fulfil these standards. Industry-specific guidance that addresses the threats and appropriate protections for different sectors makes cybersecurity advice more actionable.

Table 9. Creating an Enabling Policy and Regulatory Environment (Priority Area 5)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
• Develop a model “MSME Regulatory Impact Test” template member economies can adapt into their domestic rule-making processes. • Pilot a cross-economy regulatory sandbox program with three to five volunteer economies and publish lessons within 12 months. • Initiate negotiations on a minimum data privacy standards mutual recognition arrangement. • Commission a cybersecurity baseline standards study for MSMEs and distribute subsidized assessment tools to PPSTI focal points.	• Pursue formal APEC endorsement of MSME regulatory impact assessment requirements as part of APEC’s trade and investment agenda. • Develop a region-wide APEC Digital Compliance Platform as a shared backend governments can deploy to reduce MSME administrative burden. • Reach a binding or voluntary APEC agreement on cross-border data flows with specific MSME-friendly provisions. • Establish an APEC Cybersecurity Capacity-Building Fund providing co-financing to economies developing MSME security support programs.

Table 10. Actionable Measures for APEC/PPSTI (Priority Area 5)

4.6 Priority Area 6: Leverage Ecosystem Partnerships and Platform Models

The dialogue highlighted that successful digital transformation for MSMEs calls for coordinated action across multiple stakeholders. Without coordination, MSMEs often receive fragmented or inconsistent support. Enabling ecosystem partnerships and inclusive platform models can help MSMEs access resources and accelerate digital adoption.

Action	Recommended Approach
Encourage inclusive platform partnerships	Governments can set up frameworks that incentivize large enterprises to build inclusive ecosystems. These incentives can include preferential treatment in public procurement for companies that demonstrate MSME integration, recognition programs that highlight ecosystem leadership, or regulatory flexibility for platforms that meet inclusion criteria.
Establish multi-stakeholder digital transformation platforms	Convene government agencies, financial institutions, technology providers, training organizations, and business associations to coordinate interventions and identify gaps. Regional platforms can also facilitate knowledge exchange between economies, enabling quicker diffusion of successful approaches and helping economies learn from each other’s experiences.
Implement governance	Develop rules that balance platform innovation with MSME interests. Key issues include algorithmic transparency, fair pricing,

frameworks for commercial platforms	data ownership, and dispute resolution. Frameworks should be developed collaboratively with MSMEs and platform operators to address real concerns without constraining business models unduly.
Strengthen industry association capacity	Support associations can act as intermediaries between MSMEs and other ecosystem actors. Associations can aggregate needs, negotiate collective solutions, provide peer networks, and advocate for policies reflecting operational realities. Government support for staff, technology, or program development will aid in enhancing their reach and effectiveness.
Expand university-industry collaboration	Foster university-industry partnerships structured in a way that allows research agendas to be informed by problems identified by MSMEs instead of being driven solely by academic interests. Mechanisms such as translational research grants, industry-sponsored graduate research, and joint laboratories can align academic and industry incentives.

Table 11. Leveraging Ecosystem Partnerships and Platform Models (Priority Area 6)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
• Publish an APEC inventory of MSME-inclusive platform and ecosystem models across member economies to enable learning and replication. • Establish a working group to develop governance principles for commercial platforms serving MSMEs. • Launch an APEC Platform-MSME Inclusion Award to recognize private sector leaders building accessible ecosystems.	• Negotiate an APEC Framework for Inclusive Platform Ecosystems, establishing minimum standards for MSME data rights and dispute resolution. • Hold an APEC Multi-Stakeholder MSME Digital Transformation Council meeting annually. • Develop a voluntary APEC Platform Certification scheme for platforms demonstrating MSME-inclusive governance.

Table 12. Actionable Measures for APEC/PPSTI (Priority Area 6)

4.7 Priority Area 7: Measure Progress and Share Knowledge Across Economies

The survey revealed extensive variation in digital maturity across economies, highlighting gaps in both data collection and evidence-based policy design. Limited sample size and incomplete information restrict the ability to monitor progress and benchmark performance. Effective policy requires robust and consistent measurement as well as mechanisms to disseminate knowledge.

Action	Recommended Approach
Expand digital maturity data collection	Conduct comprehensive surveys across all 21 APEC economies to collect statistically significant data. This involves gathering information disaggregated by enterprise size, sector, geography, and the level of gender equality to identify disparities and target interventions effectively. Use consistent frameworks to ensure comparability over time.
Establish a centralized knowledge hub	Create an APEC MSME Digital Transformation Knowledge Hub that aggregates best practices, case studies, policy frameworks, and tools. The hub should be searchable, regularly updated, and designed to facilitate replication of proven approaches across economies. Include implementation guides and evaluation frameworks to better support informed policy decisions.
Continue public-private dialogues	Convene dialogues to enable direct knowledge exchange between economies at different stages of digital maturity. Include facilitated problem-solving sessions to address shared challenges. Peer learning should complement expert instruction as practitioners can provide practical insights into implementation.
Invest in program evaluation	Conduct rigorous evaluations of digital transformation programs, assessing both outputs (e.g., number of MSMEs trained) and outcomes (e.g., changes in business performance, innovation). Use experimental or quasi-experimental designs where feasible; otherwise, implement process evaluations to capture implementation experiences and lessons learned. Disseminate findings widely to inform program refinement.

Table 13. Measuring Progress and Sharing Knowledge Across Economies (Priority Area 7)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
- Design and administer an expanded MSME Digital Maturity Survey to all 21 APEC economies by mid-2026, targeting minimum 50 responses per economy. - Develop specifications and procure development of the APEC MSME Digital Transformation Knowledge Hub platform. - Establish baseline digital maturity scores for all 21 economies as a reference point for progress tracking.	- Institutionalize the MSME Digital Maturity Survey as a biennial APEC monitoring instrument with published economy scorecards. - Resource the Knowledge Hub for ongoing curation, adding at least 20 new case studies per year and maintaining a policy repository. - Develop a peer-review mechanism where economies formally assess each other's MSME digital transformation programs.

Table 14. Actionable Measures for APEC/PPSTI (Priority Area 7)

4.8 Priority Area 8: Mainstream Gender Equality

This priority area focuses on dismantling the structural, financial, cultural, and informational barriers that prevent female entrepreneurs from fully participating in and benefiting from digital transformation. It emphasizes targeted financing mechanisms, capacity-building programs, leadership development, data and evaluation systems, and ecosystem partnerships to ensure meaningful inclusion.

Action	Recommended Approach
Establish women-focused digital entrepreneurship programs	Design and fund dedicated programs providing female MSME owners with end-to-end digital transformation support: initial diagnostic, tailored training, implementation coaching, peer networking, and follow-up advisory. Programs should be delivered in accessible formats and address confidence barriers alongside technical skills.
Address gender inequality in digital finance	Require that at least 30% of MSME digital transformation financing facilities be earmarked for women-owned or women-led enterprises. Develop gender equality-focused investment criteria for APEC-aligned funds and support alternative financing models that do not rely on traditional collateral. Mandate collection and reporting of sex-disaggregated data for all MSME finance programs.
Mandate gender diversity in platform ecosystems	Require platform operators receiving public funding or operating under APEC-aligned frameworks to meet minimum gender equality standards, including sex-disaggregated reporting on MSME participation and leadership. Develop platform governance guidelines that embed gender equality criteria into onboarding, algorithmic design, and vendor selection processes.
Build women's digital leadership pipelines	Establish mentorship matching programs connecting aspiring women digital entrepreneurs with established female leaders in technology and business. Create regional women's digital leadership forums under the APEC banner to provide networking opportunities, showcase role models, and co-create solutions. Require that PPSTI-funded innovation labs achieve gender equality in participation and that micro-credential programs actively recruit and support female participants. Track pipeline outcomes through sex-disaggregated data on leadership progression and program completion rates.
Address cultural and social barriers to women's digital participation	Fund research on the cultural and social factors limiting women's digital transformation in different APEC economies and develop context-sensitive interventions. Support community-based digital champions—both men and women—who can change norms and encourage women's business digitalization in conservative social contexts. Include modules on gender equality in training programs for government officials administering MSME support programs.

Table 15. Mainstreaming Gender Equality (Priority Area 8)

Actionable Measures for APEC/PPSTI:

Short-Term Actions	Long-Term Actions
• Task PPSTI focal points with conducting an audit of all existing MSME digital transformation programs in their economies based on gender equality. • Develop an APEC Gender Equality and Digital Transformation Policy Checklist for use by member economies in program design. • Convene a dedicated Gender Equality and MSME Digital Transformation side event at the next PPSTI meeting, inviting women MSME leaders as keynote speakers. • Establish a 30% minimum gender equality earmark for all APEC-co-funded MSME digital transformation financing facilities.	• Integrate a inclusive digital transformation goal into the next APEC MSME Development Roadmap and PPSTI workplan. • Establish a Women’s MSME Digital Transformation Fund under APEC with contributions from member economies and private sector partners. • Develop a Women in MSME Digital Leadership Network with annual summits, a mentorship platform, and co-investment opportunities. • Negotiate voluntary commitments from major APEC-region platform companies to achieve gender equality among MSME users by 2030.

Table 16. Actionable Measures for APEC/PPSTI (Priority Area 8)

4.9 Implementation Priorities

While all eight priority areas warrant attention, the current evidence points to three priorities for immediate action. These priorities are grounded in the APEC Putrajaya Vision 2040, which commits to inclusive, high-quality growth that delivers tangible benefits to MSMEs. They also reflect the goals of the APEC Internet and Digital Economy Roadmap to bridge digital divides and build capacity across member economies.

First, there is a need to address the “digital processes” gap. Many MSMEs adopt digital tools but fail to capture their full value because workflows are not redesigned around them. Targeted support—in the form of process digitalization consulting, industry-specific templates, and interoperability standards—can help businesses restructure operations and maximize the benefits of their digital investments. This can in turn advance the deeper economic integration envisioned under the APEC Putrajaya Vision 2040.

Second, it is essential to scale proven financial mechanisms. With financial constraints identified as the top barrier, expanding successful models such as risk-sharing facilities, voucher programs, and gender-equality lens financing can directly address the most commonly cited impediment to digital transformation. This will also deliver on the Vision’s call for growth that leaves no MSME behind.

Third, bridging the training-implementation gap is of paramount importance. Collaborative innovation labs, peer learning networks, and hands-on implementation support present more promising pathways than simply expanding traditional training programs. This also aligns with the human capital development objectives that PPSTI and the Aotearoa Plan of Action have pinpointed as central to the region's digital future.

4.10 Conclusion

Digital transformation is not an end in itself, but a means to achieve the balanced, sustainable, and inclusive growth articulated in the APEC Putrajaya Vision 2040. MSMEs are key to this vision, and their digital advancement determines whether technological change will concentrate economic opportunity or distribute it broadly.

The recommendations presented in this report draw on insights from across the APEC region, combining empirical evidence of current challenges with the practical experience of economies and enterprises addressing them. They are predicated on the notion that effective policy must operate at multiple levels simultaneously: infrastructure, finance, skills, processes, regulation, ecosystems, and knowledge.

Above all, these recommendations acknowledge that MSME digital transformation is fundamentally about people—the entrepreneurs who take risks to build businesses, the workers whose livelihoods depend on enterprise success, and the communities sustained by local economic activity. Policy succeeds when it enables these people to harness technology in pursuit of their own goals, not when it imposes uniform solutions that ignore the diverse realities of MSMEs across the region. Keeping people at the heart of this agenda is ultimately what will determine whether digital transformation delivers on its promise.

As APEC member economies continue this work, that commitment to people must translate into collective action: accelerating progress, sharing knowledge generously, addressing barriers directly, and ensuring the digital economy becomes a vehicle for broadly shared prosperity rather than a source of new divisions.

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Annex 1: Dimensions and Subdimensions of the Holistic Digital Maturity Model

Dimensions	Subdimensions
1. Digital Strategy	1.1. Vision
	1.2. Leadership
	1.3. Strategies
	1.4. Business Model
	1.5. Operating Model
2. Digital Value	2.1. Create Value
	2.2. Deliver Value
	2.3. Capture Value
3. Digital Processes	3.1. Process Architecture and Business Process
	3.2. Value Chain
	3.3. Core Processes
	3.4. Management and Support Processes
4. Digital Technology and Data	4.1. Data Analytics
	4.2. Management Information Systems (MIS) and Applications
	4.3. Security and Risk Management
5. Digital Work	5.1. Working Style
	5.2. Skills and Capabilities
	5.3. Training and Development
	5.4. Collaboration
6. Digital Governance	6.1. Organization and Roles
	6.2. Ecosystem
	6.3. Program Management
	6.4. Culture
	6.5. Ethics

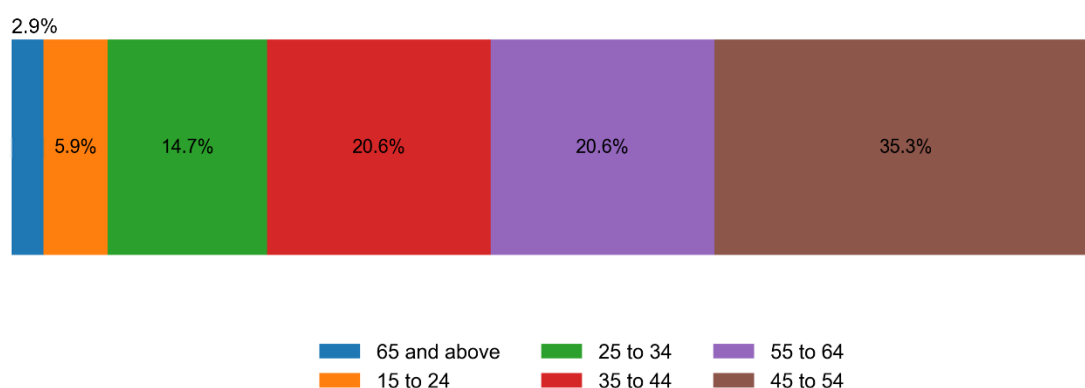
Annex 2: Demographic and Organizational Overview of Survey Sample

Note: Due to rounding, percentages may not sum exactly to 100%.

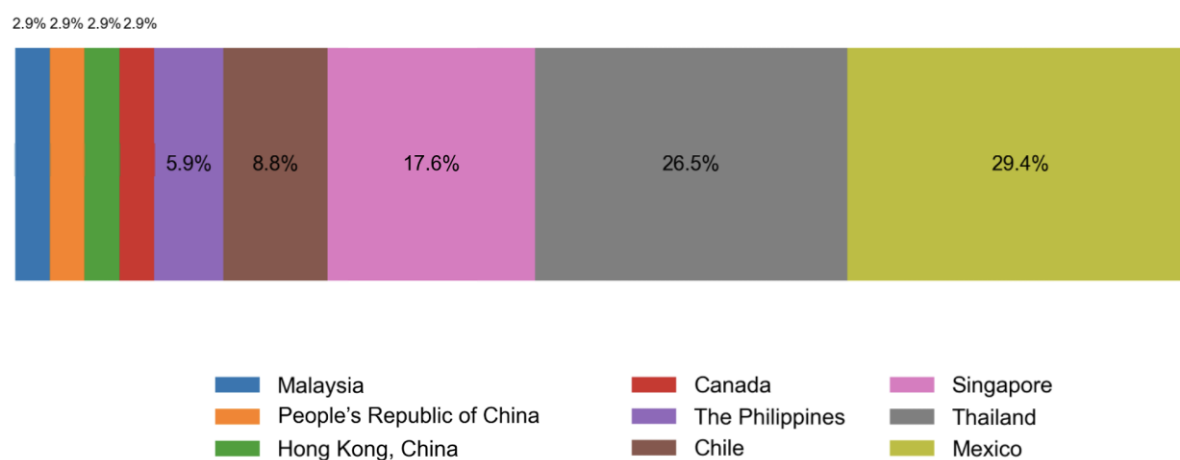
What is your sex?



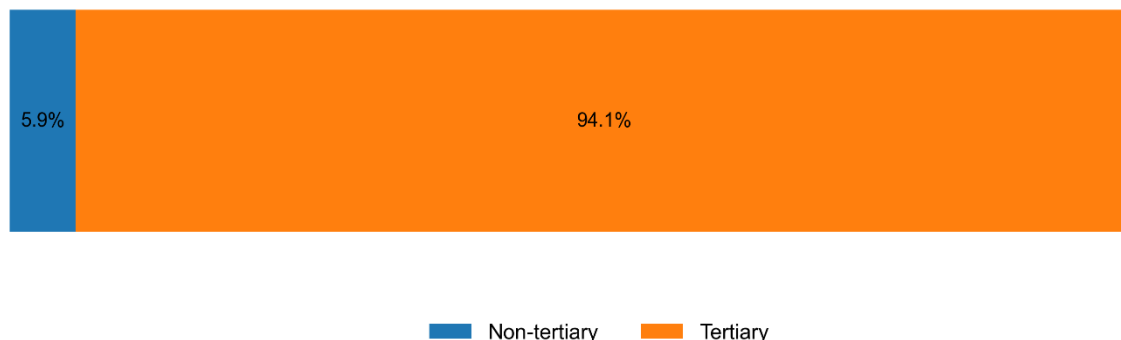
How old are you?



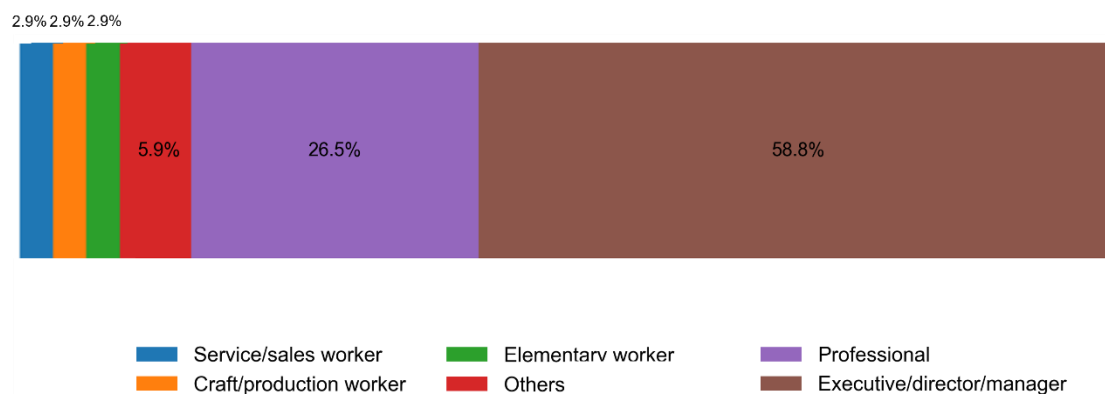
Which APEC member economy do you represent?



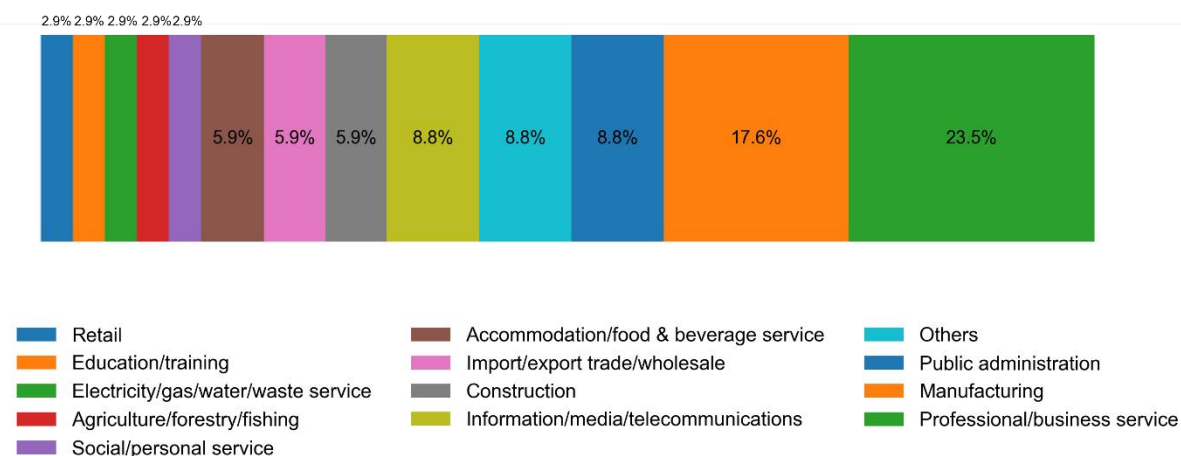
What is the highest education level you have achieved to date?



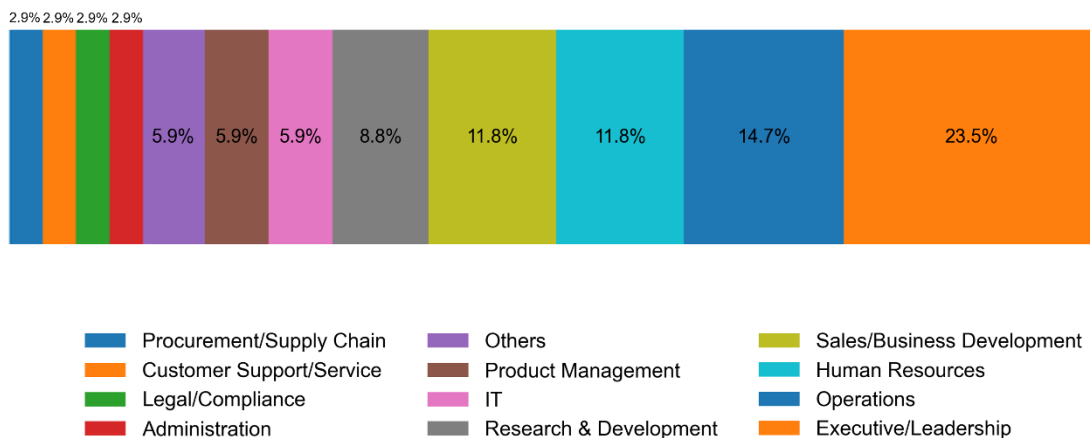
Which of the following best describes your current professional level?



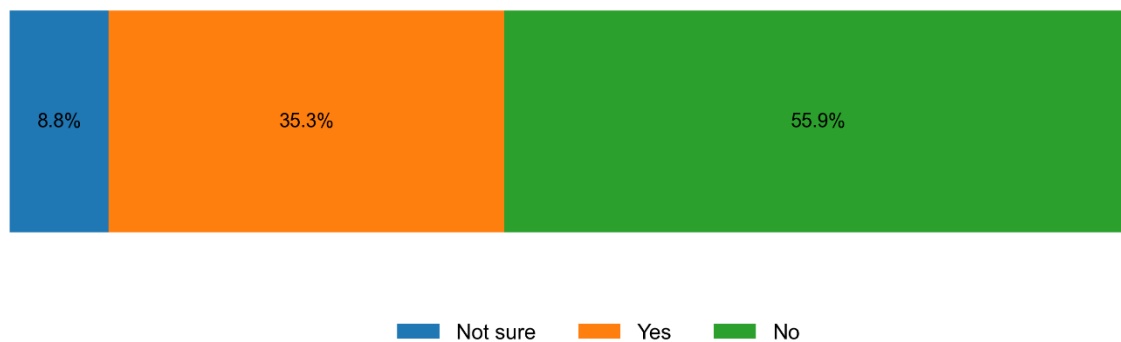
Which industry does your organization belong to?



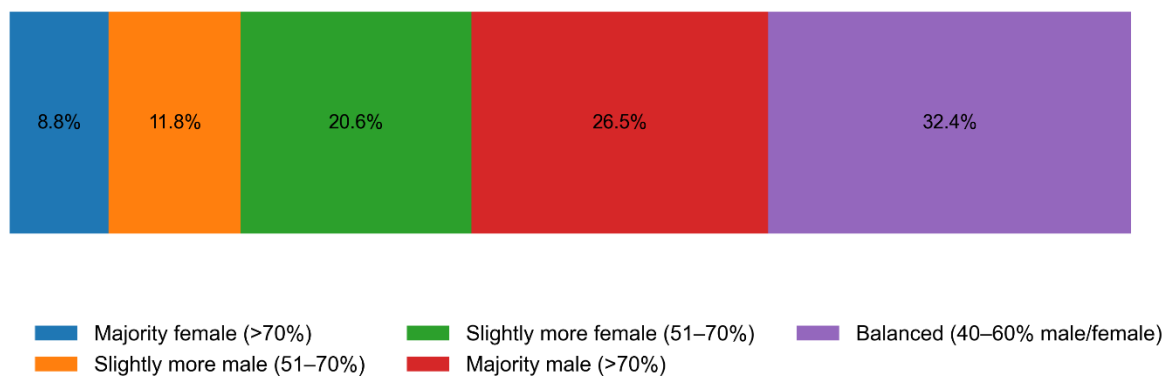
Which department do you belong to in your organization?



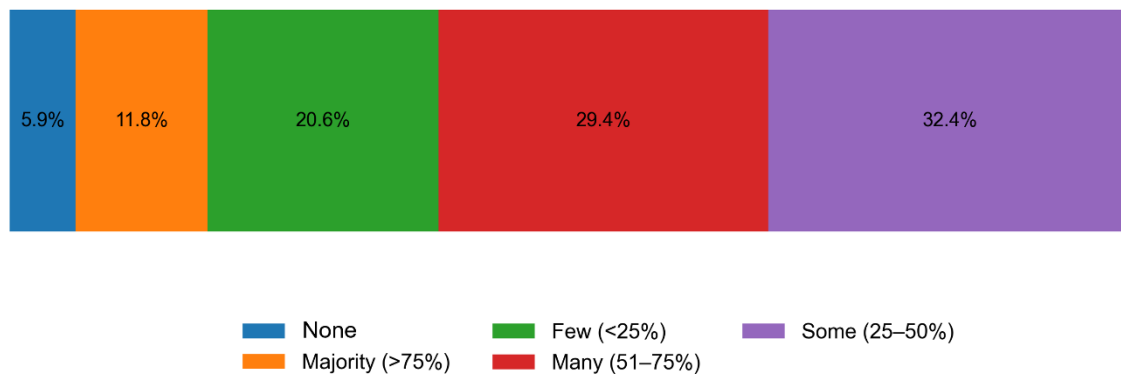
Is your organization owned by a woman?



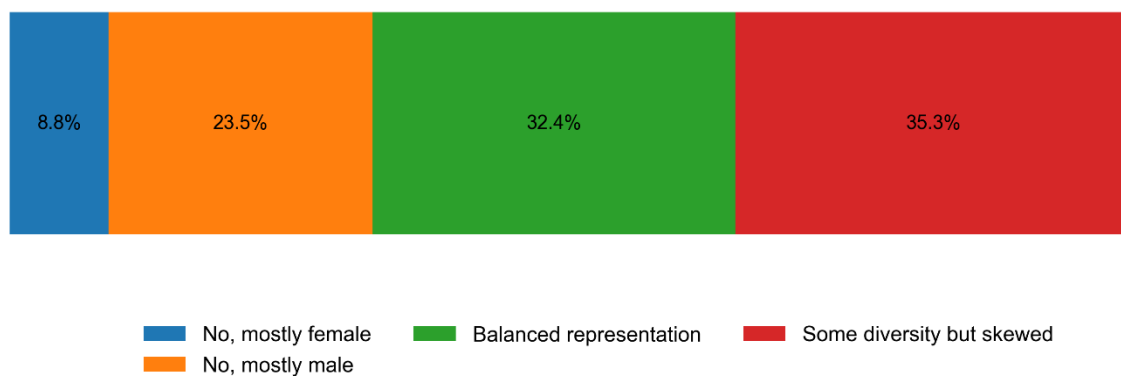
What is the approximate gender distribution in your organization?



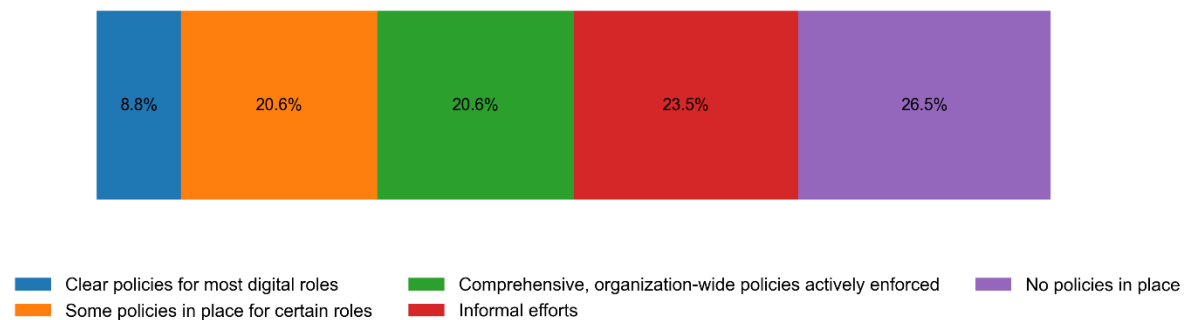
What proportion of leadership positions in your organization are held by women?



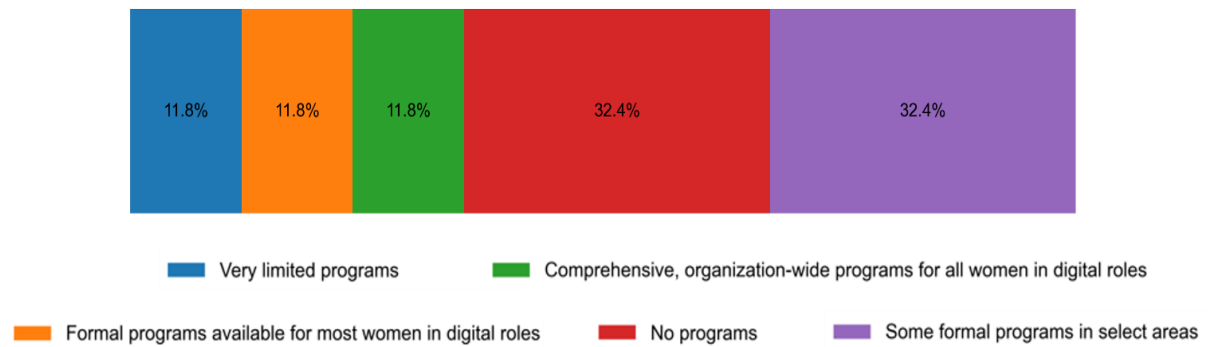
Are digital roles in your organization filled by a diverse mix?



To what extent does your organization promote gender equality in digital roles?



To what extent does your organization provide mentorship or development programs for women in digital roles compared to those for men?



Annex 3: Digital Maturity Scores by Member Economy

Digital Maturity Scores for APEC Member Economies Across the Six Dimensions

	Digital Strategy	Digital Value	Digital Processes	Digital Technology and Data	Digital Work	Digital Governance	Overall Digital Maturity Score
Canada	3.20	3.00	2.25	2.67	3.25	3.20	568
Chile	3.47	3.44	3.25	3.00	3.58	3.83	665
People's Republic of China	2.40	2.17	2.63	2.67	3.00	2.90	508
Hong Kong, China	3.60	3.67	3.25	3.33	3.00	3.60	656
Malaysia	2.90	2.50	2.93	3.17	2.58	2.80	540
Mexico	3.07	2.72	3.33	3.78	3.25	3.37	624
The Republic of the Philippines	3.31	3.37	3.08	3.37	3.36	3.56	643
Singapore	3.20	4.00	3.25	4.00	3.75	3.80	696
Thailand	3.70	3.50	2.88	3.67	3.13	3.60	656

Digital Maturity Scores by Subdimension for Each Member Economy

Canada

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	3
	1.2. Leadership	3
	1.3. Strategies	4
	1.4. Business Model	3
	1.5. Operating Model	3
2. Digital Value	2.1. Create Value	3
	2.2. Deliver Value	2
	2.3. Capture Value	4
3. Digital Processes	3.1. Process Architecture and Business Process	3
	3.2. Value Chain	3
	3.3. Core Processes	3
	3.4. Management and Support Processes	3
4. Digital Technology and Data	4.1. Data Analytics	3
	4.2. Management Information Systems (MIS) and Applications	3
	4.3. Security and Risk Management	2
5. Digital Work	5.1. Working Style	3
	5.2. Skills and Capabilities	3
	5.3. Training and Development	4
	5.4. Collaboration	3
6. Digital Governance	6.1. Organization and Roles	3
	6.2. Ecosystem	3
	6.3. Program Management	4
	6.4. Culture	4
	6.5. Ethics	2

Chile

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	3.33
	1.2. Leadership	3.33
	1.3. Strategies	3.33
	1.4. Business Model	3.67
	1.5. Operating Model	3.67
2. Digital Value	2.1. Create Value	3.33
	2.2. Deliver Value	3.33
	2.3. Capture Value	3.67
3. Digital Processes	3.1. Process Architecture and Business Process	3
	3.2. Value Chain	3.33
	3.3. Core Processes	3.33
	3.4. Management and Support Processes	3.33
4. Digital Technology and Data	4.1. Data Analytics	3.67
	4.2. Management Information Systems (MIS) and Applications	3
	4.3. Security and Risk Management	2.33
5. Digital Work	5.1. Working Style	4.33
	5.2. Skills and Capabilities	3.33
	5.3. Training and Development	3.33
	5.4. Collaboration	3.33
6. Digital Governance	6.1. Organization and Roles	3.5
	6.2. Ecosystem	3.67
	6.3. Program Management	3.33
	6.4. Culture	4.33
	6.5. Ethics	4.33

People's Republic of China

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	2.5
	1.2. Leadership	2.5
	1.3. Strategies	3
	1.4. Business Model	2
	1.5. Operating Model	2
2. Digital Value	2.1. Create Value	3
	2.2. Deliver Value	2
	2.3. Capture Value	1.5
3. Digital Processes	3.1. Process Architecture and Business Process	2
	3.2. Value Chain	3
	3.3. Core Processes	3
	3.4. Management and Support Processes	2.5
4. Digital Technology and Data	4.1. Data Analytics	3
	4.2. Management Information Systems (MIS) and Applications	2.5
	4.3. Security and Risk Management	2.5
5. Digital Work	5.1. Working Style	2.5
	5.2. Skills and Capabilities	3
	5.3. Training and Development	2.5
	5.4. Collaboration	4
6. Digital Governance	6.1. Organization and Roles	3
	6.2. Ecosystem	3.5
	6.3. Program Management	2
	6.4. Culture	3
	6.5. Ethics	3

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	4
	1.2. Leadership	5
	1.3. Strategies	3
	1.4. Business Model	3
	1.5. Operating Model	3
2. Digital Value	2.1. Create Value	4
	2.2. Deliver Value	4
	2.3. Capture Value	3
3. Digital Processes	3.1. Process Architecture and Business Process	3
	3.2. Value Chain	3
	3.3. Core Processes	4
	3.4. Management and Support Processes	3
4. Digital Technology and Data	4.1. Data Analytics	3
	4.2. Management Information Systems (MIS) and Applications	3
	4.3. Security and Risk Management	4
5. Digital Work	5.1. Working Style	4
	5.2. Skills and Capabilities	2
	5.3. Training and Development	3
	5.4. Collaboration	3
6. Digital Governance	6.1. Organization and Roles	4
	6.2. Ecosystem	4
	6.3. Program Management	3
	6.4. Culture	3
	6.5. Ethics	4

Malaysia

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	2.3
	1.2. Leadership	3.5
	1.3. Strategies	2.6
	1.4. Business Model	3
	1.5. Operating Model	3.1
2. Digital Value	2.1. Create Value	2.7
	2.2. Deliver Value	2.7
	2.3. Capture Value	2.1
3. Digital Processes	3.1. Process Architecture and Business Process	2.9
	3.2. Value Chain	3
	3.3. Core Processes	2.8
	3.4. Management and Support Processes	3
4. Digital Technology and Data	4.1. Data Analytics	3.4
	4.2. Management Information Systems (MIS) and Applications	3.2
	4.3. Security and Risk Management	2.9
5. Digital Work	5.1. Working Style	2.7
	5.2. Skills and Capabilities	2.5
	5.3. Training and Development	2.3
	5.4. Collaboration	2.8
6. Digital Governance	6.1. Organization and Roles	2.4
	6.2. Ecosystem	2.9
	6.3. Program Management	2.6
	6.4. Culture	2.8
	6.5. Ethics	3.3

Mexico

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	3.17
	1.2. Leadership	3.67
	1.3. Strategies	2.83
	1.4. Business Model	2.67
	1.5. Operating Model	3
2. Digital Value	2.1. Create Value	2.83
	2.2. Deliver Value	2.67
	2.3. Capture Value	2.67
3. Digital Processes	3.1. Process Architecture and Business Process	3.17
	3.2. Value Chain	3.33
	3.3. Core Processes	3.5
	3.4. Management and Support Processes	3.33
4. Digital Technology and Data	4.1. Data Analytics	3.67
	4.2. Management Information Systems (MIS) and Applications	3.5
	4.3. Security and Risk Management	4.17
5. Digital Work	5.1. Working Style	3
	5.2. Skills and Capabilities	3
	5.3. Training and Development	3.33
	5.4. Collaboration	3.67
6. Digital Governance	6.1. Organization and Roles	3.17
	6.2. Ecosystem	3.33
	6.3. Program Management	2.83
	6.4. Culture	3.33
	6.5. Ethics	4.17

The Republic of the Philippines

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	3.33
	1.2. Leadership	3.67
	1.3. Strategies	3.33
	1.4. Business Model	3
	1.5. Operating Model	3.22
2. Digital Value	2.1. Create Value	3.22
	2.2. Deliver Value	3.44
	2.3. Capture Value	3.44
3. Digital Processes	3.1. Process Architecture and Business Process	3
	3.2. Value Chain	3
	3.3. Core Processes	3.22
	3.4. Management and Support Processes	3.11
4. Digital Technology and Data	4.1. Data Analytics	3.44
	4.2. Management Information Systems (MIS) and Applications	3.33
	4.3. Security and Risk Management	3.33
5. Digital Work	5.1. Working Style	3.44
	5.2. Skills and Capabilities	3.44
	5.3. Training and Development	3.22
	5.4. Collaboration	3.33
6. Digital Governance	6.1. Organization and Roles	3.33
	6.2. Ecosystem	3.22
	6.3. Program Management	3.44
	6.4. Culture	3.78
	6.5. Ethics	4

Singapore

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	4
	1.2. Leadership	3
	1.3. Strategies	3
	1.4. Business Model	4
	1.5. Operating Model	2
2. Digital Value	2.1. Create Value	4
	2.2. Deliver Value	4
	2.3. Capture Value	4
3. Digital Processes	3.1. Process Architecture and Business Process	4
	3.2. Value Chain	3
	3.3. Core Processes	3
	3.4. Management and Support Processes	3
4. Digital Technology and Data	4.1. Data Analytics	4
	4.2. Management Information Systems (MIS) and Applications	4
	4.3. Security and Risk Management	4
5. Digital Work	5.1. Working Style	4
	5.2. Skills and Capabilities	4
	5.3. Training and Development	3
	5.4. Collaboration	4
6. Digital Governance	6.1. Organization and Roles	3
	6.2. Ecosystem	4
	6.3. Program Management	4
	6.4. Culture	4
	6.5. Ethics	4

Thailand

Dimensions	Subdimensions	Score
1. Digital Strategy	1.1. Vision	4.5
	1.2. Leadership	4.5
	1.3. Strategies	3.5
	1.4. Business Model	3.5
	1.5. Operating Model	2.5
2. Digital Value	2.1. Create Value	3.5
	2.2. Deliver Value	3
	2.3. Capture Value	4
3. Digital Processes	3.1. Process Architecture and Business Process	3
	3.2. Value Chain	3
	3.3. Core Processes	3
	3.4. Management and Support Processes	2.5
4. Digital Technology and Data	4.1. Data Analytics	3.5
	4.2. Management Information Systems (MIS) and Applications	3.5
	4.3. Security and Risk Management	4
5. Digital Work	5.1. Working Style	3.5
	5.2. Skills and Capabilities	3
	5.3. Training and Development	3
	5.4. Collaboration	3
6. Digital Governance	6.1. Organization and Roles	4
	6.2. Ecosystem	3
	6.3. Program Management	4
	6.4. Culture	3
	6.5. Ethics	4

Annex 4: Summary of Presentations at APEC Public-Private Dialogue

Opening Session

The opening session featured a welcome speech by the host economy, opening remarks from APEC's PPSTI, and remarks from the host organization, DiDi Global Inc.

Welcome Speech

Ms Cheng Cheng, Program Officer at the Multilateral Cooperation Division of the Department of International Cooperation in the Ministry of Science and Technology of the People's Republic of China, welcomed participants to Guangzhou and highlighted the indispensability of MSMEs to APEC economies. Ms Cheng noted encouraging domestic progress in digital adoption even as she acknowledged persistent challenges in accessing and integrating digital technologies. She framed the dialogue as vital for devising scalable solutions to the shared challenges facing MSMEs.

Opening Remarks

Dr Hwanil Park, Chair of PPSTI and Senior Research Fellow at the Republic of Korea's Science and Technology Policy Institute, stated that MSMEs account for more than 97% of enterprises and employ over 50% of the population, yet often lag behind larger firms in productivity, innovation, and market diversification. He outlined key challenges hindering MSME digital transformation and drew attention to the role governments play in supporting MSMEs by building digital infrastructure, providing skills training, facilitating connections to technology providers, and de-risking innovation through pilot programs and testbeds. Dr Park also referenced key initiatives spearheaded by PPSTI that are vital for translating research into practical tools, replicating successful models, and promoting the broader diffusion of innovation across economies.

Host Organization Remarks

Mr Nan Chen, Vice President of Public Affairs at DiDi Global Inc., the People's Republic of China, emphasized the company's journey from a local ride-hailing platform in Beijing to a mobility technology provider serving over 500 million users across more than 4,000 cities. He highlighted how digital technologies have enabled DiDi to optimize operations, ease congestion, improve sustainability, and create economic opportunities for both MSMEs and individual entrepreneurs. Citing examples from Australia; Chile; Japan; and Peru, he emphasized that regional expansion is anchored in local adaptation, partnerships, and capacity-building. He concluded that public-private collaboration is critical for inclusive, sustainable, and balanced digital transformation.

Keynote Session: MSME Digital Transformation in APEC: An Interim Update

The keynote session was delivered by [Professor Reuben Ng](#) from the Lee Kuan Yew School of Public Policy. He presented a comparative overview of MSME digital transformation across nine APEC economies, drawing on survey findings to assess performance across six dimensions. Based on this analysis, the economies were classified as either Adopters or Performers. Prof Ng highlighted the strengths and weaknesses of each group and outlined tailored recommendations. He concluded with case studies of two women-led MSMEs: Javara and Adlina Anis.

Session 1: Governance Landscape – Benchmarking Global Policy Practices

Session 1 featured best practices presented by six representatives from the public sector. The session was moderated by Dr Yu Song, Director and Professor of the XIPU Institution, Xi'an Jiaotong-Liverpool University, the People's Republic of China. Dr Song steered discussions to surface practical policy tools supporting MSME digital transformation. She drew out comparative insights regarding both the strengths and limitations of public-sector approaches and identified lessons and cross-sectoral collaboration opportunities relevant to all APEC economies.

Presentation 1: Digital Transformation of MSMEs in Russia

Speaker: Ms Daria Nozhenko, Head of Asia-Pacific Division, Department for Multilateral Economic Cooperation and Special Projects, Ministry of Economic Development, Russia

Ms Nozhenko presented Russia's platform-driven approach to MSME digital transformation, positioning it as a key component of domestic competitiveness and productivity rather than a standalone technology agenda. Digital adoption in Russia is high: 90% of MSMEs use digital tools, leading to 20 to 30% reductions in operational costs. However, only 16% of MSMEs fully integrate advanced systems such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and analytics. Common constraints include a shortage of skilled personnel, concerns over information security, and the need to prioritize clear returns on investment.

Ms Nozhenko highlighted two flagship initiatives: 1) the "Efficient and Competitive Economy" Project, which takes an integrated approach combining finance, infrastructure, skills development, and market access; and 2) the MSP.RF platform, a unified digital entry point that provides access to registration, finance, training, advisory support, and market-linking opportunities.

Presentation 2: From ZGC Science City to the World

Speaker: Ms Lian Dai, Deputy General Manager, Beijing Zhongguancun Science City Innovation Development Co., Ltd., People's Republic of China

Ms Dai spoke about the evolution and internationalization of Zhongguancun (ZGC) Science City, a leading innovation hub in Beijing integrating 37 universities, 96 domestic research institutes, and 636 academics.

ZGC Science City's strategic framework covers five pillars: 1) Industrial Services (sector-specific platforms converting research into commercial products); 2) Technology Investment (a 30-billion-RMB Growth Fund targeting hard tech sectors); 3) Space Operation (300,000+ square meters customized for different business stages); 4) International Operation (a global innovation network); and 5) Ecological Cooperation (conferences, workshops, and programs connecting scientists, investors, and entrepreneurs). Ms Dai described ZGC Science City as a model of integrated innovation blending industrial services, investment, infrastructure, internationalization, and collaborative networks.

Presentation 3: Digital Technology and Data Infrastructure: Business Environment and Business Support Policies in Hong Kong, China

Speaker: Mr Anson Chan, Deputy Head of Investment Promotion (Southern China), InvestHK, Hong Kong, China

Mr Chan placed emphasis on Hong Kong, China's status as a global technology and finance hub. In 2025, Hong Kong, China ranked third in the IMD World Competitiveness Ranking, retained its status as the world's freest economy according to the Fraser Institute, and led globally in IPO fundraising.

Mr Chan outlined six pillars of Hong Kong, China's digital and business environment: 1) Academic Excellence and Institutes; 2) R&D Facilities and Incubation Programs; 3) A Vibrant Startup Community; 4) Access to Capital and Fundraising; 5) Government Policies and Incentives; and 6) Springboard for Growth. These pillars render Hong Kong, China a conducive environment for MSMEs to adopt digital technologies and compete globally.

Presentation 4: Papua New Guinea SMEs Development and Challenges

Speaker: Mr Norman Songo, Senior SME Coordinator, Department of Commerce and Industry, Papua New Guinea

Mr Songo outlined Papua New Guinea's overall MSME policy framework, anchored in the Strategic Development Plan 2010–2030, the SME Policy 2016, the MSME Policy 2022, and the MSME Medium-Term Development Plan 2022–2026. A flagship initiative is the SME Agriculture Financing Project. Coordinated through a risk-share facility from 2021 to 2025, the project mobilized approximately USD 220 million annually and disbursed loans to over 4,000 MSMEs across more than 20 provinces. Capacity-building programs have reached over 1,000 aspiring entrepreneurs across several provinces, covering financial management, business registration, e-commerce, and access to banking services.

Persistent challenges include limited access to finance, infrastructure constraints and geographical barriers affecting rural enterprises, capacity gaps within local government offices, and restricted access to technology and market opportunities. Mr Songo called for stronger investment in business infrastructure, expanded technical support for provincial offices, increased startup capital, and greater use of digital platforms to improve coordination and support informal enterprises in transitioning to the formal economy.

Presentation 5: Peru's Policy on Advancing MSMEs' Digital Development

Speaker: Dr José Luis Segovia, Director of Evaluation and Knowledge, National Council of Science, Technology and Innovation, Peru

Dr Segovia presented Peru's domestic policy framework for advancing MSME digital development. Peru's National Plan for Digital Transformation to 2030 includes six objectives: 1) Digital Connectivity; 2) Digital Economy; 3) Digital Government; 4) Digital Innovation; 5) Digital Trust; and 6) Digital Talent. The Micro y Pequeña Empresa (MYPE) Program guides enterprises through a five-phase pathway: sensitization, diagnosis, advisory, adoption, and scaling. It is supported by the Transformation Center Network, which comprises qualified public and private organizations providing specialized services. ProInnovate provides non-reimbursable funding for innovation and technological development, supporting initiatives ranging from product validation to digital transformation and business scaling.

Digital maturity assessments reveal persistent gaps: micro-enterprises score 48%, small enterprises 51%, medium enterprises 59%, and large enterprises 63%. Remaining challenges include rural–urban infrastructure disparities, skill shortages, and cultural resistance to change. Upcoming priorities include expanding the Transformation Center Network, increasing MYPE participation in digitalization programs, aligning domestic budgets with digital priorities, and improving digital adoption indicators across sectors.

Presentation 6: APRU Project Showcase: APRU x Google Tech Policy Hackathon

Speaker: Ms Joey Chu, Senior Manager, Events, Association of Pacific Rim Universities (APRU)

Ms Chu spoke about APRU's university-led initiative to foster inclusive digital transformation through multi-stakeholder engagement and student innovation. APRU is a network of over 60 leading universities across 18 APEC economies. It has generated more than USD 500 billion in annual research output and educated over two million students annually.

The 2025 APRU × Google Tech Policy Hackathon engaged 299 interdisciplinary students from 40 universities across 15 APEC economies, creating 70 innovative policy and technical solutions. Focus areas included digital poverty and minority inclusion, online security, SME support in the digital economy, workforce development, financial access for underserved communities, and disaster resilience through technology. Key outcomes included an innovation pipeline for MSME digital transformation, cross-sector collaboration to deliver scalable solutions, development of a future-ready workforce equipped with artificial intelligence (AI) and data literacy, and a replicable model for APEC economies to pilot inclusive digital programs. The initiative illustrates how university networks can complement government and private-sector efforts by parlaying academic research and student-led innovation into practical and scalable solutions.

Highlights from Session 1

Across the six presentations, a clear consensus emerged: effective MSME digital transformation requires coordinated public-sector action covering infrastructure, finance, skills, and market access. While approaches varied by economy, speakers were unanimous in highlighting integrated platforms, structured support pathways, and sustained government commitment as foundational enablers.

Session 2: Frontier Practices – Digital Transformation from Industry

Session 2 featured best practices presented by seven representatives from the private and academic sectors. The session was moderated by Dr Liang Chen, Associate Professor of Strategy and Entrepreneurship, Singapore Management University, Singapore, who guided discussions toward the opportunities and challenges facing the private sector. He shared his perspectives on technology innovation, the commercialization of digital business models, and the support private sector actors need from other stakeholders to scale digital adoption.

Presentation 1: DiDigitalízate: The Digitalization Program to Empower Small Restaurants and Help Them Grow

Speaker: Mr Vicente Roqueñí López, Head of Government Affairs and Public Policy for Latin America, DiDi Mexico, Mexico

Mr López shared about “DiDigitalízate,” a free training and support platform established by DiDi Food to enhance the digital capabilities of small restaurant businesses. The initiative rests on three planks. First, it frames digitalization not simply as a technical upgrade, but also as a generational bridge that empowers family-run businesses to innovate and secure their legacies. Second, it responds to the economic realities in Mexico, where small restaurants constitute 96% of the sector and generate more than half of total revenue, yet nearly 55% of new establishments fail within two years. This makes digital readiness a precondition for survival. Third, the program addresses a clear market demand; a survey of 500 SMEs revealed that over 76% were eager to hone their digital skills.

Launched in Mexico through a partnership with business chambers, DiDi Food, and Anahuac University, the project has since registered over 1,500 SMEs. Its expansion to Colombia has seen participating restaurants report increased customer traffic and commercial activity. By removing financial barriers to quality training, the program also safeguards intergenerational livelihoods, demonstrating how private-sector platforms can drive SME digitalization through accessible, targeted capacity-building.

Presentation 2: Accelerating MSMEs’ Integration into Industrial Chain Transformation — JD Technology’s Practice

Speaker: Mr Zhijun Zhang, Head of Industry Solutions, JD Cloud, People’s Republic of China

Mr Zhang presented JD Technology’s model for integrating MSMEs into digitally enabled industrial supply chains. Serving about 700 million annual active users and at least 8 million enterprise clients, JD’s approach centers on an integrated supply chain system combining products, warehousing and logistics, and cloud-based technologies. Its “Ten Knots of Sugarcane” theory

maps the supply chain across ten areas, enabling MSMEs to plug into different nodes of the value chain rather than operate in isolation.

Since 2017, JD has invested approximately RMB 160 billion in R&D. Through JD Cloud, the company provides external technology services powered by AI, big data, cloud computing, and IoT. The JoyAI large language model supports industrial-scale AI adoption, while the JoyAgent platform delivers AI productivity solutions, with more than 20,000 AI agents operating internally. JD's Digital Humans, deployed across more than 40,000 brands, has reportedly boosted conversion rates by over 30%. The presentation illustrated how a digitally intelligent, open supply chain can help MSMEs reduce costs, shorten innovation cycles, and access global markets.

Presentation 3: Social-Economic Benefit of Climate Weather and Water Service

Speaker: Mr Jun Yu, Regional Officer, World Meteorological Organization

Mr Yu spoke about the socioeconomic imperative of climate weather and water services, highlighting how human-induced climate change has intensified global risks. He introduced the World Meteorological Organization (WMO) as the authoritative voice of the United Nations on these issues and a major platform for international data cooperation. A focal point of the presentation was the Early Warnings for All (EW4All) initiative, which aims to protect every individual through early warning systems by 2027. This initiative operates through four integrated pillars: 1) risk mapping and analysis; 2) open data exchange for precise forecasting; 3) timely dissemination of warnings through trusted channels; and 4) establishment of response mechanisms for rapid recovery.

To mitigate chronic and acute climate risks, Mr Yu recommended integrating climate risk data into core business planning, deploying real-time monitoring and early warning systems, improving cross-sector data sharing, and strengthening preparedness mechanisms.

Presentation 4: Two Favorite Stories of Digital Entrepreneurship in the Executive Classroom at SMU

Speaker: Dr Cyndi Man Zhang, Associate Professor of Strategic Management, Lee Kong Chian School of Business, Singapore Management University, Singapore

Dr Zhang drew on two case studies used in executive teaching to illustrate how digital entrepreneurship can scale innovative business models in Southeast Asia. The first covered eFishery—the first aquatech startup in Asia—which achieved unicorn status in 2023 after raising USD 200 million in a Series D funding round valuing the company at USD 1.4 billion. Through a combination of hardware, data, and digital platforms, eFishery provides automated feeding solutions for fish and shrimp farmers alongside input

procurement and market access, building an integrated value chain that supports productivity, sustainability, and food security.

The second case examined Cru, a niche digital platform for wine investment, storage, and trading, which enables global trading and improves liquidity, effectively treating wine as an alternative investment asset. Both cases highlight that Southeast Asia's diverse digital maturity landscape presents both obstacles and opportunities, and that sustained success necessitates a deep understanding of local consumer behaviors, regulatory nuances, and infrastructure gaps.

Presentation 5: DiDi Enterprise: Empowering SMEs through Technology

Speaker: Mr Jian Chu, Senior Director, DiDi Enterprise, DiDi Global Inc., People's Republic of China

Mr Chu detailed how DiDi Enterprise leverages digital integration and AI to streamline enterprise mobility for SMEs. With over a decade of experience serving 500,000 companies, DiDi has evolved from a ride-hailing service into a comprehensive business travel ecosystem. This evolution centers on five pillars: 1) urban mobility transformation; 2) enterprise-focused solutions; 3) expansion of a full-service travel platform; 4) growing role of AI; and 5) long-term commitment to sustainability and efficiency.

DiDi's AI dispatch system analyzes real-time data to optimize matching, forecast demand, suggest routes, and balance supply through dynamic pricing, thereby reducing idle time for drivers and improving reliability for commuters. Enterprise clients alone accounted for an estimated reduction of 13,900 metric tons of carbon emissions in 2024. The "DiDi for Business" platform consolidates approval workflows, bookings, and financial reconciliation, lessening administrative burdens without requiring additional IT infrastructure, while also providing data-driven insights for route optimization, expense anomaly detection, and vendor benchmarking. Future developments will concentrate on the AI Trip Assistant, which automatically generates itineraries and synchronizes bookings with user calendars, allowing SMEs to modernize their mobility operations and enhance productivity without heavy capital investment.

Presentation 6: Innovation Through Collaboration: NIO's Full-Stack Technology and Open Partnerships

Speaker: Ms Cheng Gong, Director of Technology Collaboration, Head of Technology-Funded Project, NIO Inc., People's Republic of China

Ms Gong examined how digital transformation underpins NIO's growth as a premium smart electric vehicle manufacturer and how collaboration stimulates innovation across the broader ecosystem. Central to NIO's transformation is a full-stack technology strategy which spans twelve domains, supported by more than 11,000 R&D personnel and 9,000 patents globally. State-of-the-art technologies include NIO's first proprietary chip for smart-driving and NOMI, the world's first in-vehicle AI system.

Beyond internal innovation, collaboration advances digital transformation. NIO has set up battery swap partnerships with firms across the automotive, transportation, and energy sectors. It has also engaged in more than 150 collaborative projects with over 80 universities. For MSMEs, the key takeaway is the ecosystem effect: by standardizing technologies such as battery swapping and intelligent systems, NIO opens up new opportunities for smaller firms in manufacturing, software, and components. This shows how advanced digital transformation at the enterprise level can engender spillover benefits across industries.

Presentation 7: Full-Scenario Digital-Intelligent Solutions for New Energy Agricultural Machinery

Speaker: Dr Tianchu Yang, General Manager, Lexiang (Jiangsu), New Energy Equipment Co., Ltd., People's Republic of China

Dr Yang explored how digital and intelligent agricultural machinery can ameliorate structural challenges in farming while creating new opportunities for smaller producers. He framed global agricultural development through four evolutionary stages: 1) traditional; 2) mechanized; 3) automated; and 4) intelligent.

Technologies such as satellite positioning, intelligent monitoring terminals, and assisted driving systems are already being deployed to facilitate precision farming and data-driven decision-making. This transition is further reinforced by domestic policy support and the expanding market for smart machinery. Key pain points include energy waste, environmental pollution, high costs, and technical gaps. These constraints are particularly burdensome for MSMEs that lack the capital for large-scale upgrades. Proposed solutions include hybrid electric tractor chassis, intelligent vehicle control systems, and autonomous orchard robots. These innovations can lower labor intensity and enable smaller farms to transition toward more efficient and environmentally sustainable production models.

Highlights from Session 2

The seven presentations underscored that private and academic sectors are generating diverse and scalable models for MSME digital transformation. Beyond individual innovations, the presentations pointed to a broader shift toward ecosystem-based approaches, where platforms, sector-specific solutions, and university-industry partnerships combine to narrow the gap between research and real-world adoption.

Concluding Remarks

Mr Leju Ma, Senior Business Director and Engineer at DiDi Global Inc., the People's Republic of China, closed the dialogue by reflecting on the myriad contributions from academia, large corporations, innovative startups, and grassroots platforms. He said these perspectives attest to the tangible and ongoing reality of digital transformation in the APEC region. He stressed that despite the technical focus of the discussions, people remain at the heart of these efforts. Mr Ma also highlighted the unique institutional value of APEC and PPSTI in convening policymakers, academics, and industry leaders, noting that this ecosystem facilitates a level of collaboration that transcends mere information exchange.

Mr Ma reaffirmed DiDi's commitment to hosting such public-private dialogues to deepen these connections, and expressed appreciation to all speakers and participants for their contributions. He urged the community to sustain the momentum generated during the dialogue to further advance regional innovation and cooperation.

END OF REPORT

