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Accelerating growth through Innovation

CTPECC
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About the CTPECC

CTPECC is a full member of Pacific Economic Cooperation Committee (PECC), which is an international organization for economic cooperation in the Asia-Pacific region and plays a key role in consultation and advice on APEC's major initiatives and plans. The participation of CTPECC is to assist the government in researching and analyzing economic cooperation plans, and to strive for greater opportunities to participate in cooperation mechanisms and dialogues.

Facilitating APEC Innovation to Navigate the Troubled Waters of Global Geopolitical Uncertainty

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Preface

As this year's host economy, Korea proposes the "Building a Sustainable Tomorrow" theme of APEC 2025, highlighting the interconnected pillars: "Connect, Innovate, and Prosper," to foster resilience, sustainability, and inclusivity across the Asia-Pacific region. Among these pillars, Korea particularly denotes "innovate" as "seek ways to strengthen the economic competitiveness of the Asia-Pacific region through innovation and digitalization, while focusing on bridging the digital gap and creating an inclusive technology ecosystem."[1]

Indeed, as one of the widely recognized concepts to boost economic growth, innovation has been directly mentioned in the 2023 United States priorities, the 2021 New Zealand priorities, the 2020 Malaysia priorities, and indirectly referred to as a subtheme in the 2024 Peru agenda. The frequent appearance of innovation as a signature notion of APEC policy priorities in recent years indicates that the importance of this concept has been broadly embraced among APEC economies, while its multivarious applications to foster economic prosperity and enhance technological development have also been fully appreciated by numerous APEC host economies. This is why "innovation," as a repeatedly cited term, has not lost its charm and continues to be one of the most favorable terms for APEC policymakers. Meanwhile, it has been viewed as a panacea for tackling various issues and a promising appeal for APEC economies to approach a bright economic future.

Despite cliché and banality, as it may sound, innovation serving as the core of modern economic competitiveness may play a prominent role for

1."Emblem of the APEC 2025 KOREA," APEC 2025 KOREA website, https://apec2025.kr/?menuno=92

APEC members to navigate the troubled waters of global geopolitical uncertainty, as APEC economies currently sail under the fast-changing turbulence of the global economy. This article aims to articulate the significance of innovation in facilitating APEC economic growth in today's fluctuating environment of geopolitical instability.

Rapidly Changing APEC Landscape

The APEC landscape and the global political economy have experienced drastic turbulence and turmoil in the past decade. Economic challenges, geopolitical turmoil, and natural disasters have continuously profoundly impacted the APEC community and tested its inherent coherence and solidarity.

Undoubtedly, the creation of APEC in 1989 signifies the new era of the post-Cold War and the beginning of fast-growing economic globalization. While APEC's goals aim to promote regional economic growth, cooperation, and trade, those golden maxims have been gradually eroded by the rise of trade protectionism and assaulted by relentless criticisms from economic nationalists, questioning the unjust and unfair practices of free trade and the failed promises of economic liberalism.

The critical challenge APEC encounters, like the global economy, primarily comes from the United States' disgruntlement and discontent about the current operations in international trade and business practices. Washington complains that its excessive dependence on overseas goods and overconsumption are detrimental to its national security and long-term economic prospects, which is neither healthy nor sustainable. Hence, it intends to restore manufacturing industries by overhauling imbalanced international trade practices and realigning global supply chains.

As the world's largest economy among APEC members, Washington's initiatives to reorient the directions of international trade and investments have brought profound repercussions on other APEC members and APEC's development. The most consequential impact is the US-China trade war and its ripple effects on various economic activities. This trade conflict devastates the economic divide between Washington and Beijing and deeply traumatizes APEC's solidarity as a consensus-building forum to facilitate regional cooperation and economic growth. The intensified economic tensions between the two economic giants also pose a dilemma to other APEC members regarding which side they have to take, despite their reluctance. This outcome further dampens the divergence among APEC members and raises the difficulty of reaching any meaningful consensus within APEC.

In addition to economic discord, the mounting geopolitical tensions between APEC members also cast political shadows and embed ticking time bombs in the region, not only triggering regional instability but also undermining APEC's long-term economic prospects. The geopolitical rivalries and competitions between the US and China, the US and Russia, Taiwan and China, the Philippines and China, Japan and China, and so forth, no doubt negatively influence APEC members' willingness to cooperate under the APEC framework and inevitably reduce APEC's coherence and solidarity in the long run.

Although APEC has proclaimed itself as an open regional economic forum and been deliberately downplayed its political involvement, it is hard to deny that APEC's critical pillars to support its institutional infrastructure are composed of various building bricks, including free trade, open

market, and multilateral liberalism in the economic aspect, and US-led post-Cold War political order at the political front. Nevertheless, those key components are now either challenged or trembled. That is why many international institutions, including APEC, have rarely achieved meaningful accomplishments lately. It is not purely due to the dysfunctionality of these multilateral institutions, but because the swift changes in the international environment have severely dismantled their political and economic underpinnings.

Innovation as a Key to Rejuvenating APEC's Economic Dynamics

Despite profound political divergences and economic disparities among APEC members, APEC economies all agree on further enhancing regional economic prosperity through innovation. Since it has been widely perceived that innovation plays a pivotal role in driving economic growth and competitiveness, facilitating and employing innovation to strengthen its technological progress and enhance economic competitiveness has become the primary task for all APEC members.

Most importantly, two practical approaches enshrined by APEC, including capability-building and best practices, are best suited for APEC members to employ innovation as a compass and a tool to navigate the uncharted waters of emerging economic activities under today's precarious climate of geopolitical uncertainty. The following sections illustrate the notion of innovation, the uneven development of innovation in the APEC region, and policy suggestions to enhance innovative cooperation among APEC economies.

Uneven Innovation Development in APEC

Innovation has been broadly perceived as a concept related to developing new technologies. However, innovation has much more complex and multifaceted implications than many expect. The OECD defines innovation as "the successful development and application of new knowledge." At the same time, another OECD document details it as "the implementation of a new or significantly improved product (that is, a physical good or service), process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations."[2]

As indicated above, innovation involves invention and the practical application of invention. It can be related to technologies or non-technologies. Without digging into the abundant literature discussion on innovation, it is essential to recognize that innovation comes in multiple forms, including products, services, production, marketing methods, organizational models, business models, and social innovations. As a result, innovation should be viewed as an ecosystem with various development processes and supportive environments to cultivate and nurture its growth.

Since innovation is considered a critical driver of economic growth, job creation, wage increase, and industrial competitiveness, many countries strive to foster a beneficial environment conducive to innovation growth by initiating multifaceted policies. Nevertheless, an undeniable fact is that different economies, due to their various endowments and resources, have dissimilar strengths and capabilities in promoting innovation

2.OECD, The OECD Innovation Strategy (Paris: OECD, 2010), p. 20.

development, particularly in the APEC region.

One report indicates uneven innovation development among APEC economies by evaluating APEC members' performances in six core innovation policy areas: 1. Open and non-discriminatory trade, market access, foreign direct investment, and standards policies; 2. Science and research and development (R&D) policies that spur innovation; 3. Digital policies that enable robust deployment of information and communications technology (ICT) platforms that support a broad range of digital applications; 4. Intellectual property rights (IPR) protection policies; 5. Robustness of domestic competition and new firm entry; 6. Open and transparent government procurement policies. This study ranks each APEC member's score in each policy area while aggregating scores in six policy areas to show its overall ranking.[3]

This study finds that APEC members, like Australia, Canada, Taiwan, Japan, Singapore, and the US, had the most robust innovation policy capacities, while other members, like Chile, Korea, and Malaysia, were in the mid-tier, and Brunei, China, Indonesia, Mexico, Russia, and so on, were in the lower-tier. Although the results in this study may seem outdated now, the uneven distribution of innovation capabilities among APEC economies has not changed dramatically. This adequately suggests an imperative task for APEC economies to strengthen their cooperation and collaboration in improving a significant innovation gap among APEC members.

Innovation Divides and Bridges to Overcome

With the rapid development of artificial intelligence (AI) in recent years, the innovation gap among APEC economies will likely worsen rather than narrow. Furthermore, the aforementioned geopolitical tensions and trade war between the US and China further exacerbate tech-nationalism and protectionism among APEC members, emphasizing the utilization of export controls and technological bans to prohibit the outflows of sensitive technologies to rivalrous countries.

For instance, the former Biden administration's AI Diffusion Rule, which was issued in January 2025, aimed to control advanced AI chips and model weights by restricting access to these technologies based on three tiers of countries, on the grounds of national security.[4] It perfectly exemplifies how tech-nationalism and geopolitical factors undermine the spread of innovation in the technological field.

The technological competition over the semiconductor industry, AI technologies, quantum computing capabilities, biotech development, etc., between the two economic giants has become more severe than ever, which deepens the innovation divides among APEC members while hindering any meaningful innovation cooperation in the region. Since APEC members may be forced to take sides between Beijing and Washington regarding technological development, it becomes challenging for APEC to promote innovation exchanges and cooperation.

3. The Information Technology & Innovation Foundation, Innovation, Trade, and Technology Policies in Asia-Pacific Economies: A Scorecard, Nov. 2011. https://d1bcsfjk95uj19.cloudfront.net/files/2011-apec-innovation-scorecard.pdf
4. John Villasenor, "The new AI diffusion export control rule will undermine US AI leadership," Brookings, January 23, 2025. https://www.brookings.edu/articles/the-new-ai-diffusion-export-control-rule-will-undermine-us-ai-leadership/

Despite the obstacles and hindrances in technological innovation, it should not be ignored that it accounts for only one aspect of innovation. Other dimensions of innovation and innovation policy by the government can still achieve fruitful potential for APEC economies to cooperate and collaborate. As mentioned, sharing APEC economies' best practices and capacity-building in various innovation aspects will likely enhance APEC members' innovation capabilities significantly. Doing so can avoid the sensitivities of national security concerns, while facilitating innovation exchanges and cooperation among APEC economies harmoniously and constructively.

When reviewing APEC innovation, it generally refers to technology innovation, digitalization, industrial competitiveness, and creating an attractive investment environment. Specifically, APEC activities related to innovation cover a wide span of items, including innovation in science, technology, and industry to strengthen competitiveness; promoting digital applications and development, like APEC Innovation City; enhancing SME innovation and industrial upgrading in productivity and quality; cultivating a more business-friendly environment attractive to investment; encouraging youth innovation and entrepreneurship; facilitating innovation knowledge exchanges and experience-sharing among APEC economies; and so forth.

In this context, the 2025 APEC host economy, Korea, stresses the efforts to narrow the digital gap and create an inclusive technology ecosystem to strengthen resilience, sustainability, and inclusivity among APEC members. It implies that, aside from the areas involved in high-tech competitions between great powers, APEC economies have plenty of room to cooperate and exchange their innovation policies and experiences. Particularly, regarding mutually shared issues and objectives, like how to apply innovation to enhancing resilience and sustainability, and how to initiate and implement innovation policies to foster an inclusive and inventive environment and ecosystem, are constructive, practical, and meaningful agendas worthy of further policy deliberation through the sharing of best practices and capability-building.

Conclusion: Taiwan Can Help

As the epicenter of geopolitical tensions and the focal point of high-tech competitions between great powers, Taiwan has demonstrated its resilience, flexibility, and, most importantly, tremendous innovation and renewing capabilities, which empower Taiwan's robust economic momentum and reward its worldwide reputation as a successful innovation model.

Compared to developed economies with abundant capital and solid high-tech foundations, or other state-led economies that provide generous subsidies and policy support, Taiwan's innovation stories offer precious and practical experiences for most APEC economies that are determined to foster innovation development with limited resources. Taiwan's innovation policy and public-private partnership in facilitating an innovation ecosystem also serve as an effective model and one of the best solutions to bridge and narrow the digital gap among APEC members.

Hence, under the 2025 APEC policy priorities, Taiwan should capture this opportunity and fully utilize its innovation expertise and strengths to showcase another diplomatic outreach of "Taiwan Can Help!" to advance APEC innovation development during this precarious era of geopolitical uncertainty.

Net-Zero Transportation and the Political Calculus of "Countering China": Is the Golden Age of Electric Vehicles Facing a Challenge?

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The world is grappling with the intensifying threat of climate change, and in response, governments across the globe are pledging to achieve "net-zero" carbon emissions. The transportation sector has emerged as a key target in these efforts. According to the International Energy Agency (IEA), transportation accounts for approximately 24% of global CO2 emissions, with passenger vehicles contributing nearly 45% of that figure. As a result, electric vehicles (EVs) are being positioned as a core solution for reducing carbon emissions. EVs are not only supported by environmental policies due to their zero tailpipe emissions, but also by advancements in technology, declining battery costs, and expanding infrastructure, all of which have helped them become a focal point in the market.

In 2022, global EV sales reached around 10.7 million units, representing 14% of total new car sales. Notably, China accounted for more than 60% of the global market, driven by robust government support, the rapid expansion of charging infrastructure, and the rise of domestic automakers such as BYD and SAIC. This dominance has put pressure on traditional automotive powers in Europe and the United States, and concerns over China's leadership in the EV market are growing internationally.

However, this shift in the global market is not merely an economic or technological phenomenon; it is underpinned by complex geopolitical factors. As China continues to expand its EV footprint, particularly with its aggressive push into Europe and the U.S., regional competition is intensifying. In 2023, the European Union launched anti-subsidy and anti-dumping investigations into Chinese EVs, accusing Chinese automakers of unfairly entering the European market through state-backed subsidies. Similarly, the U.S. is considering imposing tariffs of up to 100% on

Chinese EV imports, a move that could significantly alter the competitive landscape for Chinese brands in the global market.

Against this backdrop, a critical question arises: Will the world's dependence on EV technology evolve in the coming years? As geopolitics increasingly shape global markets, the development of EV technologies may take a more diversified path. Will Western countries and emerging markets in Southeast Asia turn to alternative technologies, such as hybrid electric vehicles (HEVs) and hydrogen fuel cell vehicles (FCEVs), as potential countermeasures to China's dominance in the pure EV sector?

In recent years, the global automotive market has appeared increasingly focused on a singular technological path: electric vehicles (EVs). However, with growing geopolitical uncertainties and the complex dynamics of regional economic interests, this trend may not be as irreversible as once thought. Recent developments suggest that hybrid electric vehicles (HEVs) and hydrogen fuel cell vehicles (FCEVs), once seen as transitional technologies, are regaining attention in the market.

The resurgence of these technologies is driven not just by their technical advantages, but also by a growing recognition among policymakers that relying solely on EVs may not be sufficient to solve carbon emissions issues in the short term. While EVs achieve "zero tailpipe emissions" during operation, their dependence on electricity places immense pressure on national power grids. For countries still heavily reliant on fossil fuels for electricity generation, this creates a paradox: even as EV adoption accelerates, if the electricity powering them is generated from coal or natural gas, the overall carbon footprint remains significant. According to a report by the International Energy Agency (IEA), global electricity demand is growing at an annual rate of 2%, and this growth is expected to accelerate with the expansion of the EV market, posing significant challenges for supply chains and infrastructure.

China currently dominates the global electric vehicle battery market, holding over 70% of market share. This growing reliance on Chinese supply chains for EVs has raised strategic concerns in Europe and the United States. As a result, many countries are considering more diversified solutions to ensure their energy and economic security. In this context, hybrid vehicles and hydrogen fuel cell technologies are once again being considered by policymakers, as they not only offer a path to reduced emissions but also alleviate some of the pressure on existing infrastructure and the electric grid.

In the coming years, the trajectory of the global transportation revolution will be heavily influenced by a combination of government policies, geopolitical tensions, and evolving market demands. As competition intensifies in the EV sector, governments will be forced to reassess their long-term decarbonization strategies, which could alter the balance between pure electric vehicles, hybrid technologies, and hydrogen fuel cell cars. With the ongoing adjustments to global policies and the rise of emerging markets, the future of EV technology remains uncertain, and the broader automotive industry will undergo significant shifts.

While the rapid growth of the EV market is impressive, it does not necessarily mean that pure EVs will be the dominant transportation solution in the long run. In fact, as China continues to lead in the EV space, hybrid electric vehicles—which have been around for longer—are once again gaining attention among Western policymakers. This shift

is not purely a technological issue, but a result of the broader political and economic chess game being played out on the global stage.

The Revival of Hybrid Electric Vehicles and Technical Challenges

Hybrid Electric Vehicles (HEVs) were initially introduced as a transitional technology to bridge the gap between traditional internal combustion engine (ICE) vehicles and pure electric vehicles (EVs). Over the past few years, hybrids began to lose prominence as EVs rapidly gained traction in the market. However, in 2022, global sales of HEVs reached approximately 3.1 million units, with Toyota's Prius setting a benchmark, having sold over 6 million units in total. This indicates that there is still a demand for hybrid technology, especially in markets where the infrastructure for EVs remains underdeveloped, such as in parts of Southeast Asia and Europe, where hybrid technology offers a practical stopgap solution.

From a technical perspective, however, hybrids are not a long-term solution. HEVs need to operate both an internal combustion engine and an electric motor, which adds complexity to the design. This dual system increases maintenance costs and adds to the overall weight of the vehicle, reducing its energy efficiency. Rather than investing heavily in this dual-technology system, it may be more beneficial to focus on improving the energy efficiency of conventional fuel engines or enhancing battery technology for EVs.

Furthermore, HEVs are seen as a temporary fix rather than a long-term strategy. In the future, the automotive industry will likely split into two paths: one focusing on highly efficient fuel engines and the other continuing to develop pure EVs. From an economic perspective, the mass adoption of hybrid vehicles is challenging due to higher production costs and the complexity of maintaining dual systems. The future market will lean toward simplified, singular technologies.

The Role of Hybrid and Hydrogen Vehicles

However, current international political and market dynamics may present short-term advantages for hybrid vehicles. As China continues to dominate the global EV market—particularly through brands like BYD and SAIC—Western markets are feeling competitive pressure. In response, both the U.S. and the EU have initiated antitrust investigations into China's EVs and are considering imposing steep tariffs. These policies suggest that Western countries may temporarily encourage hybrid vehicles to reduce their dependence on Chinese EVs, while building up their domestic EV production capabilities.

It's important to note, however, that such policy inclinations are likely short-term strategies. In the long run, Western nations are expected to focus more on developing high-efficiency EVs, as these remain central to decarbonization and energy transition efforts. Hybrids may serve as a political "bridge" to temporarily curb China's market dominance while giving Western industries time to catch up in EV technology.

Beyond hybrids, hydrogen fuel cell vehicles (FCEVs) are often touted as another future solution for reducing carbon emissions. The advantages of hydrogen vehicles include longer range, shorter refueling times, and the potential for zero emissions if hydrogen is produced from renewable energy sources. However, hydrogen vehicles face their own set of challenges, particularly with infrastructure.

Compared to EVs, the costs of building hydrogen refueling stations are significantly higher and the technology is more complex, making large-scale adoption difficult.

From a technical standpoint, hydrogen vehicles face high production, storage, and transportation costs for hydrogen fuel, which slows down market expansion. While companies like Toyota have heavily invested in hydrogen technology, producing vehicles like the Toyota Mirai, commercial scalability remains a challenge. According to Bloomberg New Energy Finance, global sales of hydrogen vehicles in 2022 totaled just around 10,000 units, a stark contrast to the millions of EVs sold.

The widespread adoption of hydrogen vehicles is highly dependent on government investment in infrastructure and supportive market policies. Compared to EV charging infrastructure, the construction of hydrogen refueling stations requires significantly more time and capital, making it difficult for hydrogen vehicles to compete with EVs in the short term.

Short-Term Policy Shifts and the Diversification of Global Transportation Development

As nations around the world accelerate their efforts to achieve net-zero carbon targets, electric vehicles (EVs) have made significant progress as the primary technological solution in recent years. However, the political factors behind this trend have become increasingly complex. Particularly in the context of the technological rivalry and geopolitical competition between the United States and China, the new energy vehicle market has become a critical battlefield in international relations. While the global push for net-zero carbon emissions is irreversible, countries may explore more diverse transportation technologies to maintain the competitiveness of their domestic industries.

It is important to note that hybrid electric vehicles (HEVs) and hydrogen fuel cell vehicles (FCEVs) may be viewed as temporary alternatives in this geopolitical context. However, this does not mean that they will become long-term mainstream solutions. Facing intense competitive pressure from Chinese EVs, particularly from brands like BYD and SAIC, Western countries may choose to temporarily support hybrid technology or invest more resources in developing hydrogen vehicles to reduce their reliance on Chinese EVs and their supply chains. Such strategic adjustments are more politically and economically motivated rather than based on the long-term technical advantages of these alternative technologies.

From an international relations perspective, the competition between the U.S. and China over new energy technology extends beyond transportation. It encompasses the entire global strategy for energy transition. In this context, Western nations may employ a variety of policy tools, such as tariffs, subsidies, or even technological blockades, to maintain their competitive edge in the field of new energy technologies. Such forms of technological protectionism could temporarily slow down the penetration of Chinese EV manufacturers into global markets, giving Western companies the time to catch up technologically.

However, from an economic and environmental perspective, long-term reliance on hybrid or hydrogen vehicles is clearly not an ideal solution. Hybrid technology requires maintaining both an internal combustion engine (ICE) and an electric system,

which leads to higher production and maintenance costs and reduces overall energy efficiency. In contrast, pure EV technology offers greater simplicity and long-term economic viability. As battery technology continues to advance, the cost of EVs is rapidly decreasing, approaching the price levels of traditional fuel vehicles.

As for hydrogen vehicles, while they may have potential applications in specific sectors such as commercial transportation, they face significant infrastructure challenges in the short term. The costs associated with building hydrogen refueling stations are high, and the technological complexity involved makes it difficult for hydrogen vehicles to compete with EVs on a large scale. In the next few decades, hydrogen vehicles may find niche applications in certain regions and industries, but they are unlikely to achieve widespread market penetration.

International Politics and the Reshaping of the Global Automotive Industry

Returning to the international political dimension, the competition over new energy vehicle technology is no longer merely a battle between companies but has become part of national strategies. The technological competition between the U.S. and China involves not only corporate subsidies and tariff policies but also a broader contest for global influence. In this context, the temporary support for hybrid and hydrogen vehicles in the West can be seen as an effort to maintain technological diversity and respond to the challenge posed by China. However, the current trend suggests that pure EVs will remain the dominant technological path for achieving global net-zero carbon targets.

This short-term strategy of technological diversification will bring about certain changes in the global automotive industry. Firstly, the development of EVs will become increasingly linked to geopolitics, with heightened competition and cooperation between nations, leading to greater policy uncertainty in the global market. Secondly, multinational companies will need to navigate differing technological standards and policy environments across various markets, which will place greater demands on their supply chain flexibility and innovation capabilities.

In summary, the future of the global automotive industry will be deeply shaped by international politics and technological competition. While EVs remain central to achieving net-zero carbon goals, the intensifying global competition may lead to the temporary rise of other technologies, such as hybrids and hydrogen vehicles. Ultimately, the development of the global transportation market will depend on how nations balance technological innovation, national security, and environmental objectives. In this global transportation technology revolution, political and economic factors will continue to reshape the future market landscape.

Inclusion by Design: Redefining Equity in the Age of AI-Driven Health Systems

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1.Introduction

The centralisation of health data has become a defining issue in digital health governance. International institutions such as WHO, OECD, G20, and APEC now frame digital platforms as foundational infrastructure for scalable public health responses, AI deployment, and universal health coverage (UHC). Health data is increasingly treated as a strategic asset through which states anticipate, standardise, and intervene.

Yet this institutional shift brings unresolved tensions. Data is often stored and used under frameworks that lag behind emerging technologies like Large Multimodal Models (LMMs). The separation between AI and health governance raises persistent questions about accountability, inclusion, and coherence.

This article starts from that tension. By tracing how institutional frameworks and technological infrastructures embed normative assumptions, it argues that inclusion is no longer just about access, but about who can participate, decide, and act within AI-driven health systems.

2.How Health Data become a hotspot

International organisations such as WHO and OECD increasingly emphasise the need for integrated, centralised health data systems. These frameworks present health data not just as a digital resource, but as infrastructure for interoperable systems equipped for crisis response and long-term innovation[1] [2]. Centralisation is seen as key to scalable platforms enabling evidence-based governance, algorithmic decision-making, and cross-sector collaboration. Beyond governments, private actors now shape

1.WHO (2020). Global strategy on digital health 2020–2025.
2.OECD (2022). Health data governance for the digital age: Implementing the OECD recommendation on health data governance. OECD Publishing.

digital health architecture, prioritising control over standards, integration, and model development. The focus has shifted from volume to quality: datasets that are longitudinal, demographically diverse, and structured for machine learning.

However, the institutional arrangements surrounding these infrastructures remain fragmented. Legal frameworks governing data access, cross-border transfers and secondary use vary widely across jurisdictions. The rise of LMMs further complicates this landscape. As noted by the WHO[3], LMMs rely on high-quality, ethically governed data but span a fragmented AI value chain with unclear accountability. Developers, service providers, and health institutions operate in separate domains, with no overarching framework linking design, use, and post-deployment oversight. These tensions are not merely technical. They raise deeper questions: who gets to build, govern, and benefit from systems that define what health means—and whose needs matter.

3.Digital Health Gap and the quest for healthcare inclusion

Despite the growing enthusiasm for AI-driven health systems, many governments still struggle to secure the basic foundations of universal health coverage (UHC), such as access, financing, and primary care. This results in a stark divide: while innovation thrives in some contexts, basic care remains inaccessible in others. The dominant vision of future care often assumes the presence of strong infrastructure and standardised data, but such conditions are rarely met in many health systems. Digital health is only meaningful when it aligns with institutional capacity and the underlying values of governance.

This recognition has entered multilateral agendas. G20 and APEC Health Working Groups both frame AI as a strategic tool to advance UHC. Under South Africa's G20 presidency in 2025, primary health care (PHC) is presented as the most inclusive and cost-effective pathway to system resilience, in response to catastrophic health costs and a depleted workforce. Meanwhile, this year's G20 agenda also prioritises a more inclusive approach to AI development, tied to a broader blueprint for bridging access gaps[4]. APEC, hosted by South Korea, highlights aging populations and surging care demands as regional priorities, with expectations that AI can help digitalise UHC and make it more affordable[5].

With major international actors issuing clear plans and commitments, it becomes more important to assess how these visions translate into practice. AI development in digital health has relied on platform- and model-oriented ecosystems, shaped predominantly by business logic rather than equity. Model training, data access, deployment capacity, and execution thresholds remain deeply uneven across markets.

The WHO's emphasis on embedding AI into health applications led to the establishment of the ITU–WHO Focus Group on AI for Health (FG-AI4H) in 2018. This initiative aims to develop international evaluation standards for AI-based health solutions, starting with a benchmarking framework to support fair and sustainable progress toward UHC. The group has set up working streams on regulatory considerations (WG-RC), clinical evaluation (WG-CE), and methodological and data

3.WHO. (2024). Ethics and governance of artificial intelligence for health: Guidance on large multi-modal models. World Health Organization. https://doi.org/10.53022/whodoc/9789240084759
4.G20 HWG (2025). Issue note: Accelerating universal health coverage through a primary health care approach. G20 South Africa 2025.
5.APEC (2025). Why health must be a priority for the Asia-Pacific region's economic recovery.

standards, seeking to translate innovation into reproducible and accountable applications[6].

Yet, despite its ambition to build an assessment model for AI health governance, FG-AI4H remains a soft coordination mechanism. Its non-binding nature limits its ability to address deeper regulatory fragmentation. A striking example is the divide between software regulated as a medical device (SaMD) and software embedded in a device (SiMD)[7]. This distinction is not only increasingly blurred by technical convergence—it is also profoundly political. It reveals the structural collision between one of the world's most rapidly evolving industries and one of its most rigid regulatory regimes.

Under such circumstances, inclusion is unlikely to emerge through scale alone. If digital health is shaped solely by private innovation and high-level advocacy, inclusion risks becoming a polished label—detached from accountability or systemic fairness. The key question, then, is not whether we have achieved technological breakthroughs, but whether governance systems distribute participation, benefits, and voice.

4.Logics of Inclusion in AI-Driven Health

In this final paragraph, I'd like to say a bit more about how inclusion takes shape through technical innovation. Telemedicine has long been imagined as the promised land of future care, where home-based services thrive and systems become sustainable[8]. Yet a gap remains between its technical presence and actual accessibility. The key lies in rethinking presence—not placing more doctors at a distance, but enabling decision-making even in their absence. This is also where Agentic AI comes in[9]. These systems interpret data, detect patterns, and generate contextualised feedback. They do not replace the workforce, but extend clinical logic into inaccessible spaces.

But their presence alone does not guarantee equity. Benefiting from agentic AI requires reliable infrastructure and the capacity to interpret outputs. Those with digital literacy and contextual understanding remain most likely to benefit. Inclusion here is not about who receives care, but who can act.

Even this logic depends on infrastructure and expertise. Yet in many settings, the workforce exists while technical support does not. The question, then, is not how to simulate presence, but how to return agency to those already present.

No-code AI tools respond to this by offering a different logic. While not yet prevalent in formal healthcare governance, they represent an alternative approach that lowers technical barriers and invites broader participation. As open-source and adaptable technologies, they challenge the notion that AI belongs only to specialists or advanced facilities. Their value lies not only in function, but in enabling action. This capability empowers frontline workers already embedded in the system, yet often excluded from shaping it. Decision-making becomes a shared process, rooted in access rather than expertise—not as a rejection of clinical authority, but as a redistribution of governance across the system.

6.ITU & WHO. (2023). ITU-WHO Focus Group on Artificial Intelligence for Health (FG-AI4H).

7.Chapman, S. (2025). Towards identifying good practices in the assessment of digital medical devices: Insights from several OECD countries (OECD Health Working Papers No. 177). OECD Publishing.

8.Keelara, R., Sutherland, E., & Almyranti, M. (2025). Leading practices for the future of telemedicine: Implementing telemedicine post-pandemic (OECD Health Working Papers No. 173). OECD Publishing.

9.Kuziemsky, C., Maeder, A. J., John, O., Gogia, S. B., Basu, A., Meher, S., & Ito, M. (2019). Role of artificial intelligence within the telehealth domain. Yearbook of Medical Informatics, 28(1), 35–40. https://doi.org/10.1055/s-0039-1677897

Table A. Comparative Logics of Digital Health Inclusion[10]

Model	Telemedicine + Agentic AI	No-code AI Tool
Logic Of Inclusion	Delegating clinical interpretation to systems to extend presence	Returning operational authority to non-technical frontline workers
Focal Mechanism	System substitution, real-time response, predictive capacity	Technological decentralisation, lower barriers, user autonomy
Institutional Requirements	Risk governance, ethical frameworks, interoperable data infrastructure	Capacity-building, interface design, local deployability
Core Potential	Presence-as-care	Decision-as-access

5.Conclusion

Inclusion in digital health is often mistaken for access, coverage, or platform uptake. Yet genuine inclusion depends on who holds the capacity to act, interpret, and shape healthcare systems. Despite growing global advocacy for AI adoption and data standardisation, coordination mechanisms like FG-AI4H lack the authority to address structural disparities. As a result, governance remains shaped by resource-rich economies, while lower-capacity systems are left with limited space to participate.

Technologies such as no-code AI offer a different logic, aiming to democratise digital health by lowering technical barriers and restoring agency to frontline actors. But their impact depends on institutional support, local capacity, and meaningful integration. Digital tools should not merely expand coverage—they must enable participation. The future of digital health must be built not on technological speed, but on governance structures that share decision-making power and embed equity in practice.

10.This table reflects the author's original synthesis. ChatGPT was used to assist in the initial organisation of ideas but did not determine the analytical framework.

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