CAREC DIGITAL STRATEGY 2030

Mid-Term Review – November 2025

For Ministers' Endorsement
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Abbreviations

4IR	Fourth Industrial Revolution
ADB	Asian Development Bank
AI	Artificial Intelligence
ASAN	Azerbaijani Service and Assessment Network
CATS	CAREC Advanced Transit System
CAREC	Central Asia Regional Economic Cooperation
CDTF	CAREC Digital Trade Forum
CERT	Computer Emergency Response Team
DPIS	Digital Public Information System(s)
DPI	Digital Public Infrastructure
EBRD	European Bank for Reconstruction and Development
eID	Electronic Identity
e-TIR	Electronic Transports International Routiers
GCI	Global Cybersecurity Index
GII	Global Innovation Index
GPU	Graphics Processing Unit
ICE	Information Common Exchange
ICT	Information and Communication Technology
IMF	International Monetary Fund
IsDB	Islamic Development Bank
ITU	International Telecommunication Union
MCIT	Ministry of Communications and Information Technology
MSME	Micro, Small and Medium-sized Enterprise
MTR	Mid Term Review
NOC	Network Operations Center
NSDI	National Spatial Data Infrastructure
OSI	Online Services Index
PPP	Public-Private Partnership
PRF	Program Results Framework
QR	Quick Response (code)
SME	Small and Medium-sized Enterprise
SOC	Security Operations Center
SOM	Senior Officials' Meeting
TA	Technical Assistance
TRACECA	Transport Corridor Europe–Caucasus–Asia
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
WB	World Bank
WTO	World Trade Organization

Executive Summary

The CAREC Digital Strategy 2030, launched in 2020, provides a unifying framework to accelerate digital transformation and create an integrated CAREC Digital Space. This Midterm Review (MTR) evaluates progress made during the first implementation phase (2020–2025) across five strategic pillars: leadership and governance, policy enablers and safeguards, infrastructure and platforms, digital skills, and innovation and entrepreneurship. The purpose of this review is to assess the extent of regional advancement, highlight achievements, and identify persistent challenges and gaps requiring coordinated responses.

Since the launch of the strategy, the member countries have mainly focused on their national digital transformation plans. There are also a few examples of regional collaboration among member countries, as well as a willingness to cooperate; however, given the challenges highlighted in the report, progress at the regional level has been minimal. Notable achievements at the national level of countries include the expansion of broadband connectivity, the establishment of digital governance frameworks, the rollout of digital public infrastructure such as digital identification, payments, and data exchanges, e-government services, the strengthening of cybersecurity and data regulations, and significant investments in digital skills and entrepreneurship. Internet penetration has increased significantly across the region, and collaborative platforms have been launched to support trade and integration. Innovative ecosystems are emerging, backed by venture networks, accelerators, and startup hubs. These reforms have laid a solid foundation for further regional integration and have demonstrated that sustained political will, adequate financing, and robust institutional capacity are critical drivers of success.

Progress, however, has been uneven. While some economies have advanced quickly in deploying scalable platforms, piloting digital identity systems, and testing AI-driven services, others continue to face slower progress due to limited resources and weaker institutional capacities. The MTR highlights ongoing challenges across the region, including fragmented regulations, inconsistent cybersecurity readiness, limited cross-border interoperability, and financing constraints that impede long-term infrastructure development. Unequal access to digital skills also remains an obstacle, with women, rural populations, and underserved communities disproportionately excluded from opportunities. Although innovation ecosystems are growing, they are still limited by gaps in early-stage finance, fragmented markets, and the outward migration of entrepreneurs seeking scale in more developed ecosystems.

The lessons learned from the first five years are clear. Strong political commitment and leadership are essential for maintaining progress. Flexible regulatory strategies are needed to respond to fast technological changes without hindering innovation. Building trust within communities helps with adoption and promotes inclusivity. Public–private partnerships are crucial for raising capital and scaling infrastructure projects. Cross-border pilot projects, such as those in digital trade and transit, have shown great success in highlighting the advantages of cooperation and laying the foundation for deeper integration.

Looking ahead to 2030, the MTR outlines priority regional initiatives to close persistent gaps and enable greater collaboration. These include strengthening governance through a regional academy, a dedicated technical assistance facility, and a governance framework with clear accountability mechanisms. Infrastructure priorities focus on completing critical fiber corridors, scaling renewable-powered and climate-smart data centers, and exploring new digital corridors to diversify bandwidth and enhance resilience. Regulatory harmonization is to be advanced

through a regional trust and interoperability framework, a cybersecurity and digital resilience mechanism, and shared standards for data protection and cross-border transactions. Digital inclusion will be promoted by scaling the CAREC Digital Skills and Talent Mobility Platform and embedding gender-responsive targets into all regional programs. Innovation will be supported through the operationalization of a regional Fund of Funds, the expansion of the Innovation Network, and the creation of a CAREC AI Collaboration Platform to guide responsible and ethical adoption of emerging technologies.

To ensure accountability, a CAREC Digital Scorecard is proposed to track measurable outcomes, including cross-border service adoption, platform usage, reductions in transaction times, and participation in skills programs, particularly among women and rural communities. Over time, this will evolve into a CAREC Digital Integration Index to benchmark progress against global peers. A rolling Digital Master Plan will also be established to consolidate infrastructure, innovation, and governance initiatives into a coherent investment pipeline.

To advance the 2025–2030 roadmap, CAREC countries must strengthen their collaboration with development partners. ADB, alongside other development partners, can be key to mobilizing resources and supporting regional digital integration.

The Midterm Review concludes that CAREC member countries have laid a strong foundation for a digitally integrated regional economy. By addressing gaps in institutional capacity, harmonizing regulations, expanding sustainable financing, and ensuring inclusive participation, the region can move decisively toward its 2030 vision of a unified digital space. With strengthened governance and sustained cooperation, digital services, platforms, and data flows will increasingly move seamlessly across borders, unlocking new opportunities for trade, innovation, and growth. Ensuring that these benefits are broadly shared will make digital transformation a driver of resilience, competitiveness, and equitable prosperity across the CAREC region.

Introduction

1. The CAREC Digital Strategy 2030, launched in 2020, acts as a catalyst for regional digital cooperation among Central Asian Regional Economic Cooperation (CAREC) member countries. It aims to establish a unified CAREC Digital Space, fostering inclusive economic growth, enhanced public services, and regional competitiveness through the use of digital technologies.

2. Since 2020, notable progress has been achieved across CAREC's diverse membership, which includes advanced digital economies as well as those still working to close fundamental connectivity gaps. At the start of the strategy, more than half of the region's population lacked internet access, highlighting a significant digital divide that had been exacerbated by the pandemic. This gap was evident as some countries quickly transitioned to online education and remote work, while others faced challenges due to limited infrastructure, particularly affecting rural and marginalized communities.

3. This Midterm Review evaluates the achievements and challenges faced during the initial implementation phase (2020–2025). It assesses progress across **the strategy's five key pillars: leadership and governance, policy enablers, infrastructure and platforms, digital skills, and innovation and entrepreneurship,** as well as key sectoral transformations. Emphasis is placed on both nationwide successes and regional collaboration, identifying obstacles that require stronger regional coordination and collaboration. Based on national reports, CAREC Secretariat inputs, global indicators, and stakeholder consultations, this review highlights practical priorities and recommendations aimed at speeding up digital integration and effectively closing remaining gaps for the next strategy phase (2025–2030).

Methodology

4. The Midterm Review of the CAREC Digital Strategy 2030 was prepared using a comprehensive methodology. Consultations were held with National Focal Points (NFPs) , Government agencies, and the private sector representatives to gather perspectives on progress and challenges. Structured surveys were conducted across member countries to collect both quantitative and qualitative insights. The Review drew on reports and data from national institutions, international organizations, and industry associations. In rare cases, recent developments published in international media and official press releases were included with respective citations. The report was reviewed by Resident Missions (RMs) and by ADB's Digital Sector Office (DIG). All feedback and recommendations from these reviews were carefully considered and fully incorporated into the final version of the report. This blended approach ensured that the findings were evidence-based, reflected diverse perspectives, and provided a credible foundation for assessing progress and shaping regional recommendations.

Pillar 1: Leadership, Governance, and Investment in the Digital Economy

5. The establishment of the CAREC Digital Strategy Steering Committee in 2021 significantly enhanced collaboration among member countries. Regular regional forums fostered coordinated investments and policy discussions. For instance, Azerbaijan and Kazakhstan have initiated communication with the Kyrgyz Republic, Tajikistan, and Turkmenistan to share

information and technology related to their Digital Public Information Systems, though these discussions remain at an early stage.

6. Between 2020 and 2025, CAREC member countries made significant progress in digital leadership, governance, and investment. Several nations established clear national strategies supported by measurable goals and designated funding.

7. **Azerbaijan** has established a comprehensive national digital governance framework, which serves as a model of institutional integration. Central to this are the Digital Bridge backbone, the Digital Login authentication gateway with over 4 million users, and a mobile-based e-signature system integrated across more than 220 public and private platforms, supporting tens of millions of secure transactions each year. The well-regarded ASAN[1] system continues to expand its role as a one-stop platform for public services, earning international recognition for its innovative approach. The country's socio-economic strategy for 2022–2026 emphasizes digital development, backed by sustained government commitment to digital innovation. Azerbaijan has made notable progress in digital governance and investment in the digital infrastructure. High-level commitment to digital transformation in Azerbaijan is reflected in the country's adoption of forward-looking policy frameworks, including the National Artificial Intelligence Strategy 2025–2028 and the Digital Development Concept. These strategic documents articulate Azerbaijan's vision for a sustainable, innovation-driven, and citizen-centric digital economy. They emphasize priorities such as resilient digital infrastructure, data-driven governance, and the development of a knowledge-based economy. Azerbaijan's leadership in digital innovation has also gained international recognition. The national myGov e-government portal received the 2024 WSIS Prize in the e-Government category, highlighting the country's progress in digital governance and its commitment to service excellence.

8. The **People's Republic of China (PRC)** Digital China Action Plan creates a comprehensive framework for integrating artificial intelligence into the economy, ensuring the digital sector makes a significant contribution to GDP growth. The country has also built a national cyber-ID system that supports a secure Digital Public Infrastructure for millions of users. At the regional level, the PRC plays a vital governance role by providing investment, technical expertise, and models such as smart city solutions and green digital practices, which are increasingly being adopted across CAREC countries.

9. Georgia has advanced digital governance by implementing significant reforms that simplify business processes, strengthen intellectual property protections, and create a supportive environment for ICT development. The government actively encouraged private-sector involvement through innovative public-private partnerships (PPPs), which attracted substantial funding [2]from private investment. These initiatives, along with the expansion of digital public infrastructure, have positioned Georgia to better integrate digitalization into governance and institutional modernization, supporting regional cooperation efforts.

10. **Kazakhstan** has made significant progress in digital transformation through its Concept of Digital Transformation, Development of the ICT Sector, and Cybersecurity (2023–2029),

[1] https://asan.gov.az/en
[2] https://www.adb.org/sites/default/files/publication/1006411/public-private-partnership-monitor-georgia-2024.pdf

which supersedes the earlier "Digital Kazakhstan" program and sets the medium-term policy framework. The country has invested approximately $500 million to expand broadband access, digitize government services, and enhance ICT innovation. The Ministry of AI and Digital Development is leading implementation, and a draft national AI law and a comprehensive Digital Code are under parliamentary review. Digital public services, such as the national family card and the eGov portal, are widely used, showcasing strong institutional leadership.

11. The **Kyrgyz Republic** has shown strong political commitment to digital transformation, guided by the "Digital Kyrgyzstan 2019–2023" strategy and the establishment of a Ministry of Digital Development. Through the Tunduk[3] interoperability platform, launched in 2021. By 2024, Tunduk had connected more than 70 agencies and supported over 3.5 billion interagency transactions annually, significantly reducing the number of procedural steps. The State Portal of Electronic Services now provides about 1,400 services. The country has launched a national eID system through a mobile app, requiring agencies to no longer request documents that are already available digitally. These reforms have enhanced transparency and positioned Kyrgyzstan as a notable example in open data and civic technology, with strong backing from development partners.

12. **Mongolia** has shown a strong commitment to digital transformation through its ICT Vision 2030 plan and national strategies for AI and data management. The government introduced the E-Mongolia[4] platform, which consolidates over 1,200 public services and is projected to serve 1.8 million users by 2025. This platform has significantly reduced procedural delays and enhanced public service delivery, featuring a mobile "super-app" version that has reached over 2 million users. Mongolia's advancement in adopting digital governance has also been shared regionally through events like the ICT Expo 2024, where it showcased its experiences with e-government and digital parliament systems.

13. **Pakistan** has advanced its digital transformation through robust policy frameworks and institutional reforms. The Digital Pakistan Policy[5] and the Digital Nation 2025[6] Act provide strategic guidance, while the 2022 national cloud policy mandates the migration of government services to cloud platforms and encourages local hosting providers to enhance scalability and efficiency. Foundational digital public infrastructure is anchored by the NADRA[7] biometric identity system, which covers over 90% of the population and supports service delivery and financial inclusion. Pakistan has also made significant progress in advancing its digital infrastructure and e-governance agenda. The Right of Way (RoW) issue has largely been resolved, with key authorities waiving fees and national legislation under preparation. All schools and healthcare facilities in the Federal Capital are being connected via fiber, supported by local ISPs providing high-speed broadband. The Islamabad City App is expanding its digital services, including P2G payments through RAST. A unified National Citizen Portal is being developed, offering single sign-in access via Pak Digital ID. The National IT Board (NITB) is also establishing a Fusion Center and Command and Control

[3] https://tunduk.gov.kg/en
[4] https://e-mongolia.mn/Start
[5] https://uraanpakistan.pk/e-pakistan/
[6] https://pakistancode.gov.pk/english/UY2FqaJw1-apaUY2Fqa-apaUY2Npa5praQ%3D%3D-sg-jjjjjjjjjjj
[7] https://www.nadra.gov.pk/

Centre to ensure interoperability across agencies. Additionally, NITB has engaged consultants for an 18-month program to plan and design the Citizen Portal, including gap analysis, scalable architecture, and inter-agency coordination.

14. **Tajikistan** has significantly enhanced its digital governance framework through its first Digital Public Services Portal, E-Hukumat[8], backed by a new Public Services Center in Dushanbe, with plans to expand regionally. The efforts demonstrate an increasing political commitment to digital transformation, despite persistent challenges to institutional capacity. The government is integrating digital transformation objectives into the country's development agenda. Government policies play a crucial role in facilitating the eventual digital transformation and e-governance, notable initiatives including the Concept of the Digital Economy, approved in 2019; the Medium-Term Program for the Development of the Digital Economy 2021–2025; and the Strategy for the Development of Artificial Intelligence until 2040. These policies outline a comprehensive strategy to integrate modern digital technologies into the national economy. On 28 December 2024, the President declared 2025–2030 as the period for developing the digital economy and innovation. The activation of the Agency for Innovation and Digital Technologies under the President in 2024 and the recent adoption of the National E-Commerce Program 2025–2029 underscore the government's commitment to digital transformation.

15. **Turkmenistan** has embarked on a Digital Economy 2019–2025 program that outlines an ambitious plan for digitalization. However, progress remains constrained by an underdeveloped ICT infrastructure and limited digital market maturity. Government operations still rely heavily on paper-based processes, and public e-services are minimal. Despite these challenges, the government has begun targeted modernization efforts, such as launching 5G services in Arkadag city in 2025 and gradually implementing e-government and smart mobility systems.

16. **Uzbekistan** has quickly advanced its digital transformation under the Digital Uzbekistan 2030[9] strategy, supported by nearly $2.5 billion in investments in ICT infrastructure, digital education, and e-government reforms. A strong political commitment and comprehensive reforms have enabled Uzbekistan to make rapid progress in digital innovation in recent years. Governance has been improved through platforms like myGov[10], a unified Interactive Government services portal, which now provides over 300 online services, including licensing, civil registry, and cadastral records. These accomplishments are confirmed by international recognition: Uzbekistan ranked 63rd globally in the UN E-Government Index (2024) and 43rd in the 2023 GovTech Quality Index, joining the top-tier Group A countries.

Key Challenges Under Pillar 1

17. While some CAREC members have developed advanced governance systems, others still face ongoing institutional gaps and weak implementation capacity. This uneven progress hampers regional alignment and highlights the need for targeted technical assistance to support lower-capacity economies and encourage more consistent implementation across the

[8] https://egov.tj/?lang=en
[9] https://www.undp.org/sites/g/files/zskgke326/files/2025-05/uz_digital-economy-study_eng.pdf
[10] https://my.gov.uz/en

region. Additionally, the digital divide within the region remains significant, restricting equal access to opportunities and slowing the overall pace of transformation.

18. At the same time, securing long-term funding for digital infrastructure remains a major challenge, particularly for economies with more constrained fiscal space and market scale. Regulatory hurdles, limited incentive structures, and underdeveloped public–private partnership models have hampered consistent private sector involvement. Addressing these issues will require coordinated regional efforts, stronger institutional frameworks, and policies designed to attract and sustain private investment.

19. Regional collaboration is also limited by the lack of common standards for data interoperability and secure cross-border data exchange. Without harmonized frameworks, it becomes difficult to integrate national systems into regional platforms or to expand successful models across borders. Establishing shared protocols and strengthening regional mechanisms for digital cooperation will be essential to ensure that CAREC countries can fully utilize collective resources and develop a seamless digital ecosystem.

Pillar 2: Digital Policy Enablers and Safeguards

20. Between 2020 and 2025, CAREC member countries made significant progress in strengthening their digital policy frameworks, improving cybersecurity measures, and refining regulations that support digital trade and commerce. Several nations implemented major regulatory reforms aimed at reducing barriers to digital business and increasing consumer protection.

21. In 2022, CAREC launched the CAREC Digital Trade Forum as a regional platform to align cross-border e-commerce policies, share best practices, and support pilot implementation of paperless trade solutions. These platforms helped take initial steps toward regulatory harmonization, especially in digital trade and cross-border data flows. For example, a notable outcome was the implementation of a pilot e-TIR[11] (electronic Transports Internationaux Routiers, electronic - International Road Transport) system in 2024 (a CAREC-supported pilot jointly carried out under the Digital and Trade Strategies) involving Kazakhstan, Azerbaijan, and Georgia, which simplified customs procedures and reduced cross-border transit times by about 40%.

22. In 2024, cybersecurity regulations were not adopted in the Republic of Azerbaijan. However, the Rules on Ensuring the Security of Critical Information Infrastructure in the Republic of Azerbaijan were approved by Decision No. 229 of the Cabinet of Ministers of the Republic of Azerbaijan dated July 17, 2023. Its cybersecurity and AI institutions are also being positioned to contribute to regional discussions, ensuring alignment with international standards. Azerbaijan approved its Artificial Intelligence Strategy for 2025–2028 by presidential decree in March 2025. The country's progress is reflected in its ranking on the ITU Global Cybersecurity Index, where it scored 93.76/100 in 2024, demonstrating strong preparedness and a solid policy environment to protect its growing digital ecosystem. Azerbaijan increased its UN Digital and Sustainable Trade Facilitation score to a 92.47% implementation rate[12]. The Digital Finance e-verification platform connects nearly 100 financial institutions to government

[11] The electronic version of the TIR (Transports Internationaux Routiers) system, enabling paperless, real-time customs transit management. It streamlines cross-border trade by replacing paper TIR Carnets with digital processes. https://etir.org/
[12] https://www.untfsurvey.org/economy?id=AZE

databases using a consent-based model to ensure secure data access. Similarly, over 2,600 government entities now use the electronic document circulation system (RSD), enabled by new regulations recognizing digital documents. The Azerbaijan Cybersecurity Center (AKM), launched with international partners, develops local cyber talent and solutions. Its divisions, CyberEdu, CyberPark, and CyberCollab, trained over 160 certified specialists by end-2024 and supported local start-ups through hackathons and R&D.

23. The **People's Republic of China (PRC)** has established robust cybersecurity and identity systems that foster trust and provide a secure foundation for digital services. These efforts, along with solid national rules, support both local uptake and international sharing of digital systems. PRC UN Digital and Sustainable Trade Facilitation score[13] is 92.47%. PRC is implementing the Digital China Action Plan, which integrates AI across the economy, serving as a de facto national AI framework. However, PRC still faces issues with regional legal consistency, as scattered laws and policies across borders prevent smooth digital trade and interoperability within CAREC.

24. Georgia has implemented cybersecurity measures and policy reforms that are gradually enhancing digital resilience. Georgia secured 91.92/100 in the ITU GCI 2024 (Tier 2), reflecting advancing progress and strong cybersecurity maturity. Still, existing frameworks are limited in scope, creating gaps in data protection and preparedness against escalating cyber threats. Ongoing improvements are essential to support Georgia's progress in governance and infrastructure. The country has developed frameworks for cybersecurity and AI regulation, including the creation of a National AI and Big Data Lab (2021) and a National Payment Corporation to supervise digital finance. Georgia increased its UN Digital and Sustainable Trade Facilitation score [14]to 90.32%. While regulatory advancements are notable, challenges persist in attracting more private-sector R&D investment and addressing new risks arising from the growing use of digital technologies, such as data protection and cybersecurity resilience.

25. **Kazakhstan** has taken notable steps to strengthen digital safeguards by adopting a comprehensive national cybersecurity strategy and supporting legislation on data protection and digital finance. Institutions such as the Ministry of AI and Digital Development and dedicated cyber units oversee implementation, while regulatory reforms have enabled innovation in areas like open banking and secure interbank QR payments. These measures have enhanced trust in digital services and positioned Kazakhstan among the stronger performers in the region, reflected in its Tier 2 ranking on the ITU Global Cybersecurity Index 2024 with a score of 94.04/100. Kazakhstan's UN Digital and Sustainable Trade Facilitation score[15] is 76.34%. Nonetheless, gaps remain in ensuring consistent enforcement across regions and in aligning national frameworks with evolving international and regional standards. Kazakhstan is transitioning its AI Concept (2024–2029) into a formal national AI strategy, supported by a draft AI law and the forthcoming Digital Code, and a national supercomputing program to underpin AI model training and large-scale data analysis.

26. The **Kyrgyz Republic** has made notable progress in developing its regulatory environment with the approval of a comprehensive Digital Code that establishes a legal precedent for cross-border digital harmonization. The Kyrgyz Republic achieved 65.59/100 in the ITU GCI

[13] https://www.untfsurvey.org/economy?id=CHN
[14] https://www.untfsurvey.org/economy?id=GEO
[15] https://www.untfsurvey.org/economy?id=KAZ

2024 (Tier 3), indicating steady progress in establishing foundational cybersecurity systems. However, cybersecurity and data governance frameworks remain incomplete, with gaps in incident response protocols and interoperability standards. The Kyrgyz Republic UN Digital and Sustainable Trade Facilitation score[16] is 84.95%. The Kyrgyz Republic does not yet have a formal AI strategy; however, it has established a National AI Council and is preparing to adopt a strategy aimed at integrating AI across its state processes. Strengthening these protections will be vital to maintaining trust in digital services and ensuring secure regional integration.

27. **Mongolia** has strengthened its national strategies by enacting cybersecurity and data protection laws, establishing a legal framework for trustworthy digital services, and AI-driven governance. Mongolia achieved a score of 56.36/100 in the ITU GCI 2024 (Tier 3), marking a solid advancement in establishing its cybersecurity landscape. Mongolia is preparing to announce its National AI Strategy, guided by recent policy initiatives. Mongolia increased its UN Digital and Sustainable Trade Facilitation score[17] to 90.32%. At the same time, further strengthening is needed in areas such as cybersecurity and data system integration to enhance resilience and ensure more sustainable service delivery.

28. **Pakistan** has taken steps to strengthen digital regulation and policy safeguards. The government introduced its first Cyber Security Policy in 2021 and is also drafting a new national broadband policy aimed at reaching 85% 4G coverage. These efforts seek to improve security, service quality, and investment readiness. Pakistan achieved a Tier 1 ranking in the ITU Global Cybersecurity Index (GCI) 2024 with a score of 96.69/100. Pakistan's federal cabinet has officially approved the National AI Policy 2025, which establishes an AI Council, a regulatory sandbox, venture funding, and a target to train one million AI professionals by 2030. Pakistan increased its UN Digital and Sustainable Trade Facilitation score[18] to 80%. However, challenges remain, such as regulatory gaps, limited system interoperability, and underdeveloped PPP frameworks, which the private sector has identified as priority areas for reform in the 2025–2030 period.

29. **Tajikistan** has implemented a series of legal measures to build trust in digital services, including decrees on e-signatures, cashless payments, e-commerce, and cybersecurity. Broader laws on cybersecurity, data protection, electronic transactions, and digital identities have also been passed. Tajikistan achieved a score of 25.36/100 in the ITU GCI 2024 (Tier 4), marking a gradual evolution of its cybersecurity framework. However, government-imposed restrictions on internet access, such as social media controls and high licensing fees, continue to limit the ICT sector's potential. Tajikistan launched initiatives such as the AI Academy and the AreaAI zone in 2025; however, no national AI strategy has been confirmed. Tajikistan ranks lower on international cybersecurity indexes, suggesting scope for continued improvement in enforcement and resilience. Tajikistan UN Digital and Sustainable Trade Facilitation score[19] is at 60.22%.

30. **Turkmenistan** has expressed formal interest in aligning its cybersecurity, personal data, and digital ID frameworks with regional CAREC standards, aiming to establish a unified legal digital framework that supports interoperability, trust, and smoother cross-border trade and data exchange. Turkmenistan scored 25.85/100 in the ITU GCI 2024 (Tier 4), marking the

[16] https://www.untfsurvey.org/economy?id=KGZ
[17] https://www.untfsurvey.org/economy?id=MON
[18] https://www.untfsurvey.org/economy?id=PAK
[19] https://www.untfsurvey.org/economy?id=TJK

beginning of its evolution in cybersecurity readiness. Turkmenistan UN Digital and Sustainable Trade Facilitation score[20] is 42.46%. Currently, however, cybersecurity frameworks remain weak compared to international benchmarks, which limit trust in digital services and hampers regional integration. Turkmenistan currently has no formal national AI strategy or law, though it is exploring AI applications in various sectors.

31. **Uzbekistan's** cyber threat monitoring landscape includes government initiatives such as the UZSOC (Cyber Threat Monitoring and Management System), implemented by the state-owned enterprise UZINFOCOM[21] under the Ministry for Development of Information Technologies and Communications, to detect and manage cyber threats in real time. It also includes the Cybersecurity Center of the Central Bank[22] (CERT-CBU), which monitors financial sector vulnerabilities and coordinates incident responses. Updated legal frameworks on digital identity and personal data protection are in place, with a draft law on data privacy planned for 2025. Uzbekistan scored 89.20/100 in the ITU GCI 2024 (Tier 2), demonstrating its advancing performance and growing cybersecurity capacity. Uzbekistan adopted a National AI Strategy to 2030 in 2024. Uzbekistan increased its UN Digital and Sustainable Trade Facilitation score[23] to 92.47% out of 100. Other measures include progressive laws on e-commerce and digital signatures, which recognize foreign e-signatures to promote cross-border trade. These steps, although important, are still challenged by ongoing cybersecurity risks, including high-profile incidents that highlight the need for more vigorous enforcement and effective data governance.

Key Challenges Under Pillar 2

32. Regional collaboration on digital policy remains limited to a small number of pilot projects. While these initiatives demonstrate the potential for cross-border cooperation, they are not yet sufficient to address the wider gaps in legal and regulatory alignment needed for a cohesive regional digital environment.

33. Regulatory fragmentation continues across CAREC, with varying national approaches to digital trade, data protection, and digital governance. These inconsistencies create compliance burdens, complicate cross-border transactions, and limit the scale of regional digital integration.

34. Cybersecurity readiness is highly uneven across the region. Some countries have established advanced frameworks and institutions, while others continue to struggle with resource constraints, technical expertise, and enforcement capacity, leaving parts of the region more vulnerable to cyber threats.

35. Consumer protection, data privacy, and data governance frameworks remain inconsistent. While several members have strengthened laws and safeguards, others lag behind, undermining user trust and constraining the wider adoption of digital services across borders.

[20] https://www.untfsurvey.org/economy?id=TKM
[21] UZINFOCOM – State Unitary Enterprise under the Ministry for Development of Information Technologies and Communications, uzinfocom.uz
[22] Cybersecurity Center of the Central Bank of Uzbekistan (CERT-CBU), cbu.uz/en/cert/about
[23] https://www.untfsurvey.org/economy?id=UZB

36. The rapid adoption of AI and other advanced digital technologies, such as robotics, quantum computing, blockchain, IoT, 5G, extended reality (XR), edge and cloud computing, biotechnology, nanotechnology, and cyber-physical systems, introduces new risks that most existing frameworks are not yet equipped to handle. Gaps in ethical standards, accountability mechanisms, and oversight capacity raise concerns about preparedness for the next stage of digital transformation.

Pillar 3: Digital Infrastructure, Resilience, and Platforms

37. Between 2020 and 2025, CAREC countries expanded their digital infrastructure, boosting connectivity and resilience throughout the region. Major investments focused on upgrading broadband networks, establishing cross-border fiber optic links, and increasing mobile broadband coverage.

38. **Azerbaijan** has achieved notable improvements in digital infrastructure, with internet use reaching 88% in 2025 and widespread 4G coverage across the country**.** Investments have supported more than 20 fixed broadband subscriptions per 100 people, nationwide fiber backbone upgrades, and the ongoing Trans-Caspian fiber optic project, all aimed at boosting cross-border connectivity. The development of secure public cloud and data exchange infrastructure has enhanced the resilience and scalability of services. In parallel, digital solutions have been integrated into transport, including e-tolls and digital rail tracking with TRACECA[24]. The Digital Trade Hub further strengthens the country's platform landscape by enabling remote company formation, e-signatures, and cross-border access to essential business services, complemented by pioneering e-Residency and m-Residency programs. Key digital platforms have been launched to streamline service delivery. The myGov portal offers 386 services and 67 digital documents to over 1.5 million users, enabling online access to essential public services. MyGov Business, under development, will offer a similar one-stop platform for businesses. Digital Bridge connects 71 government agencies and over 150 systems for real-time data exchange. Digital Finance links nearly 100 financial institutions to government databases for instant, consent-based verification. The RSD system enables over 2,600 public entities to exchange 2 million digital documents monthly, replacing paper workflows. To ensure these platforms operate effectively nationwide, the "Online Azerbaijan" project, led by the Ministry of Digital Development and Transport, extends high-speed internet access, including to remote areas, by replacing outdated ADSL and copper networks with modern GPON-based fiber-optic infrastructure. Implemented through a public-private partnership, the initiative has expanded broadband access 13-fold, reaching nearly 3 million households and achieving full national coverage. It represents a key step in Azerbaijan's digital transformation under the Strategic Roadmap for Telecommunications and IT.

39. The People's Republic of China (PRC) has provided over $200 million in grant support for digital infrastructure in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, while also advancing its own digital connectivity through investments in AI, big data, high-performance computing, and 5G deployment. These efforts contribute to CAREC's connectivity goals and expand partner financing for core infrastructure upgrades.

40. Through effective PPP frameworks, **Georgia** mobilized substantial private-sector investment to expand its broadband infrastructure. As a result, internet penetration rose from around 70%

[24] TRACECA (Transport Corridor Europe-Caucasus-Asia) is an international transport program involving 14 countries from the European Union, Eastern Europe, the Caucasus, and Central Asia. https://traceca-org.org/en/about-traceca/

in 2020 to 91.5% in 2024, while more than 95% of enterprises gained access to the internet, predominantly through fixed-line connections. These advances highlight the country's success in building a resilient digital backbone that supports both citizens and businesses.

41. **Kazakhstan** has heavily invested in expanding its digital infrastructure, including approximately $200 million (2021–2024) to extend its nationwide fiber-optic backbone and upgrade mobile broadband networks. These efforts increased internet penetration to 96% by 2024, making it one of the highest rates globally, and connected over 120 villages via fiber or LTE. The country also launched 5G pilots, with plans for commercial rollout in major cities in 2025. These initiatives, along with the digital tenge pilot (2024–2025) and preparations for Open Banking under the 2023–2025 Financial Sector Strategy, highlight Kazakhstan's commitment to developing resilient platforms for governance and commerce.

42. The **Kyrgyz Republic** has achieved 99% 4G population coverage and expanded its digital infrastructure. Despite this progress, connectivity in remote mountain villages remains limited, making projects like the CASA-1000[25] and the proposed CAREC Digital Corridor project[26] (Which in under the scoping study stage) essential to support digital infrastructure.

43. **Mongolia** has expanded its national fiber network by 30%, connecting all provincial (aimag) centers with high-speed internet. Remote areas are increasingly served through Starlink connectivity and solar-powered base stations, while a new national satellite is planned to further enhance coverage. Despite these improvements, connectivity outside Ulaanbaatar remains inconsistent, with slow speeds limiting access in rural and nomadic communities. Meanwhile, innovative initiatives like using blockchain for trade documentation (e-certificates of origin) and the single window platform show how Mongolia is utilizing digital platforms for resilience and cross-border integration.

44. Internet penetration in **Pakistan** grew from 35% in 2019 to about 46% in 2024, adding over 116 million users. It has 193 million cellular subscribers, 58% broadband penetration, 79% mobile tele density, and around 75 million social media users. Despite this growth, challenges persist. While mobile 3G/4G coverage is widespread, access to fixed broadband in smaller cities and the service quality remain limited. At the regional level, Pakistan is participating in CAREC fiber and trade corridor projects, strengthening its role as a potential gateway between Central and South Asia.

45. Internet connectivity in **Tajikistan** has steadily improved, with penetration increasing from 20% in 2019 to about 57% by 2025, driven by the expansion of fiber routes, including a direct link with China. Mobile operators have expanded 3G and 4G coverage to more valleys, though affordability remains among the highest in the CAREC region. Key initiatives include the CAREC-aligned Green Corridor Demonstration Project[27], which established a Digitalization Center to support road condition surveys and transport data systems. Planned infrastructure projects, such as Rogun Hydropower and CASA-1000, will strengthen regional energy reliability, which is critical for digital infrastructure. In the future, these projects could also provide opportunities to co-deploy fiber cables along transmission lines, further supporting domestic and cross-border connectivity. Despite these advances, infrastructure is still underdeveloped compared to regional peers, and rural areas continue to face significant access challenges.

[25] https://www.casa-1000.org/
[26] https://www.carecprogram.org/uploads/S2b_CAREC-Digital-Corridor-Pakistan-Scoping.pdf
[27] https://www.adb.org/sites/default/files/project-documents/54286/54286-001-pam-en.pdf

46. In **Turkmenistan**, about 35% of the population has internet access, which is one of the lowest rates in the region, reflecting major infrastructure gaps and restrictive policies. However, Turkmenistan is modernizing its infrastructure through smart city projects, ICT expansion, and transport upgrades. These efforts include climate-resilient highways (such as the Ashgabat–Turkmenabat corridor), electrified railways, and the modernization of the Port of Turkmenbashi, where a unified digital logistics portal is being developed. Smart mobility systems and GPS-based transit are also being introduced in major cities. Regionally, the proposed Turkmenistan–Azerbaijan fiber optic link across the Caspian could be transformative if completed, greatly improving the country's connectivity and decreasing reliance on other constraints.

47. As of July 1 2025, **Uzbekistan** had 36.49 million mobile subscribers, equal to 96.8 per 100 people, and 288 licensed Internet providers, with total international bandwidth at 4,200 Gbps. In Jan–Jun 2025, the telecom sector generated 11.86 trillion soums, showing a 13.1% year-on-year growth[28]. By 2030, the government plans to introduce a national cloud platform and build 20 new data centers with a combined capacity of over 500 MW through investor partnerships, making Uzbekistan's commitment towards building data infrastructure and service scalability.

Key Challenges Under Pillar 3

48. Despite major infrastructure investments, large disparities in rural broadband access persist. Remote and mountainous areas remain poorly served, with limited or unreliable connectivity. For landlocked countries without access to submarine cables, reliance on costly terrestrial transit routes also drives up prices and increases latency, limiting competitiveness. Satellite-based connectivity remains costly and is often unaffordable for rural populations, making it difficult to achieve broad adoption. High equipment costs, service fees, and technical limitations in challenging terrains further constrain its viability as a scalable solution

49. Network resilience and cross-border integration remain uneven across the region. Limited redundancy and inadequate backup infrastructure make smaller and less-connected economies more vulnerable to disruptions, while inconsistent regulatory frameworks and divergent technical standards hinder the creation of seamless regional digital links.

50. The development of scalable regional platforms, such as shared cloud services and data centers, is progressing unevenly. While some countries are advancing rapidly, others lag behind, creating gaps in the region's overall capacity to host, secure, and exchange digital services at scale.

Pillar 4: Digital Skills and Competencies

51. Between 2020 and 2025, CAREC member countries significantly expanded their efforts to improve digital skills and competencies, driven by increased investments in education, training programs, and regional collaborations. Digital literacy initiatives and specialized ICT education greatly enhanced workforce readiness and promoted broader digital inclusion throughout the region. The CAREC Institute's e-learning platform, launched in 2020, provides accessible

[28] Statistics Agency under the President of the Republic of Uzbekistan — stat.uz

virtual training on digital policy, innovation, and governance, especially for countries with limited travel and training resources.

52. Through initiatives like the 4IR Academy, **Azerbaijan** has increased opportunities for developing digital skills across its workforce. While over 65% of the population in Azerbaijan possess basic ICT skills, gaps remain especially in rural areas, and women and other underserved groups continue to face barriers to digital and financial inclusion[29]. These challenges highlight the need for targeted efforts to ensure that Azerbaijan's digital transformation is inclusive and benefits all segments of society. Azerbaijan is actively developing a digitally skilled workforce. The Technest Scholarship Program has supported over 9,300 students in ICT training by mid-2025, while nationwide coding courses, bootcamps, and STEM initiatives promote digital literacy across all age groups. Programs like Founders Academy and SAGE Mentorship offer internships with global tech firms, giving young professionals real-world experience. Regular hackathons and competitions, such as InnoStart and EcomX, foster innovation and support startup development. To meet global standards, Azerbaijan has introduced international certification programs, with 41 professionals and 8 organizations certified in digital and innovation skills by 2025, enhancing the country's global competitiveness.

53. The **People's Republic of China (PRC)** has made significant investments in digital literacy programs, resulting in about 61% of adults and 65% of minors achieving functional digital literacy. These initiatives improve workforce readiness and ensure that the population can benefit from and contribute to the expanding digital economy. Through efforts like the Global E-commerce Education Alliance, the PRC also supports capacity building in CAREC countries, ensuring that knowledge transfer and training are part of its regional engagement.

54. **Georgia** made notable progress in digital literacy, with rates increasing from 60% in 2020 to 85% by 2024. This growth was driven by targeted national digital education initiatives and the expansion of online learning platforms, which enhanced workforce readiness and broader digital inclusion.

55. **Kazakhstan** has invested approximately $40 million through the "Digital Kazakhstan 2025" initiative to implement nationwide digital literacy training and specialized ICT education programs. By early 2025, digital literacy levels had reached nearly 93%, one of the highest rates in the region, and the number of ICT professionals had grown significantly. These achievements ensure that the workforce can support the country's rapidly expanding digital economy and highlight Kazakhstan's achievement in digital skills readiness.

56. **Kyrgyzstan** has focused on regional harmonization of ICT skills standards to ensure workforce development programs are aligned with cross-border credential recognition. The expansion of practical e-learning delivery, especially for rural and underserved communities, has been prioritized. The pandemic sped up the introduction of digital learning content, while the growing use of mobile money platforms further promotes digital inclusion. These efforts are enhancing workforce readiness; however, ongoing investment is needed to address rural and gender gaps.

57. To promote inclusion, **Mongolia** has launched digital literacy programs, including mobile training units for herder communities and rural populations. These efforts have helped the

[29] https://documents1.worldbank.org/curated/en/099030225124017361/pdf/P179107-29a67399-3f3d-4a32-b852-d70b4fe599c7.pdf

wider adoption of digital services and increased internet penetration to about 83.0% in 2025, with 2.90 million internet users, despite geographic and population challenges. Digital skills development is also progressing in healthcare, with telemedicine networks connecting 17 provincial hospitals, enhancing access to health services in remote areas.

58. **Pakistan** produced over 30,000 ICT graduates[30] in the year 2021-22, establishing itself as a regional hub for digital talent. This workforce supports a growing export market of digital services to more than 170 countries. However, digital literacy remains inconsistent, with notable gaps among women and rural communities, highlighting the need for more inclusive programs. Efforts to improve education and training are increasingly linked to the broader digital economy agenda, ensuring skills meet market demands.

59. In **Tajikistan**, digital literacy has improved but remains limited, with relatively few trained ICT professionals and ongoing brain drain as skilled workers migrate abroad. National initiatives such as #DigitalMillat and #IT-Club, launched in 2025, aim to promote digital inclusion among youth and support grassroots innovation through community-based training. Additional skills development is provided by IT parks, innovation programs, and CAREC-supported workshops on topics like e-customs and border digitization. These efforts are beginning to enhance national capacity; however, sustained investment in digital education and inclusion is essential to close the persistent skills gaps.

60. **Turkmenistan** has emphasized the importance of broad digital literacy programs, particularly for women and youth. Training in IT and digital skills is woven into both the education system and efforts to modernize the public sector. These efforts are part of a national inclusion plan that promotes access to digital jobs and aims to bridge the urban–rural gap in digital participation.

61. **Uzbekistan** embarked on initiatives such as the “One Million Uzbek Coders” platform (launched with UAE support), to increae digital literacy from approximately 50% in 2020 to over 75% by 2025. The UNDP–Uzum partnership in Uzbekistan is expanding digital and financial literacy, aiming to train thousands from vulnerable groups nationwide through regional workshops and e-learning programs. Over 10,000 entrepreneurs already sell on Uzum Market, with more than 30% of participants[31] being women.

Key Challenges Under Pillar 4

62. Despite major progress, access to digital skills and training remains uneven. Rural and remote communities continue to face limited opportunities for education and capacity building, reinforcing a persistent rural–urban divide in digital inclusion.

63. Gender disparities in digital literacy and participation in ICT training are still significant. Women, especially in underserved areas, are underrepresented in skills programs, which limits both workforce diversity and the overall inclusiveness of the digital economy.

[30] https://moitt.gov.pk/SiteImage/Downloads/MoITT-YB-21-22.pdf
[31] https://www.undp.org/uzbekistan/press-releases/uzum-and-undp-join-forces-boost-digital-skills-uzbekistan

64. Skilled workforce migration further compounds challenges in some parts of the region, as trained professionals often seek opportunities abroad. This brain drain limits the availability of qualified talent domestically and slows the development of resilient local digital ecosystems.

65. Fragmented credentialing and the lack of mutual recognition of digital skills across borders hinder workforce mobility and the creation of a regionally integrated pool of digital professionals.

Pillar 5: Innovation, Entrepreneurship, and ICT Competitiveness

66. From 2020 to 2025, CAREC member countries expanded their innovation ecosystems, promoted digital entrepreneurship, and improved the competitiveness of their ICT sectors. Notable successes included creating dedicated innovation hubs, implementing major policy reforms to support tech startups, and boosting cross-border collaboration among entrepreneurs and innovators.

67. **Azerbaijan** has made significant progress in fostering innovation and entrepreneurship, supporting over 300 startups through initiatives like the Baku Innovation Hub and Sabah Hub, as well as new venture funds such as Caucasus Ventures. The government actively promotes entrepreneurship via the Innovation Agency, which has issued grants to more than 100 startups and established a Technopark in Baku. Azerbaijani startups are experiencing strong growth in fintech, e-commerce, and digital services, fueled by supportive policies and roughly $40 million in direct government investments from 2021 to 2025. The introduction of the Startup Visa and the rollout of the Artificial Intelligence Strategy (2025–2028) further demonstrate the country's goal of positioning itself as a regional technology hub, boosting both competitiveness and cross-border collaboration. Azerbaijan is fostering innovation and ICT competitiveness through university-led startup incubators, regional innovation centers, and improved venture funding. Key initiatives include academic entrepreneurship programs, the Caucasus Ventures and InMerge Ventures funds, and a Tech Diaspora Program connecting overseas experts with local startups. Azerbaijani startups gain global exposure by participating in major international tech events, boosting competitiveness and attracting investment.

68. The **People's Republic of China (PRC)** startup ecosystem is deeply integrated into national programs and benefits from substantial support through national incubators and government venture capital funds, which help accelerate the growth of local SMEs and innovation-driven companies. Thousands of firms focusing on AI, blockchain, and data-driven solutions are expanding under the Digital China Action Plan. At the regional level, PRC offers market opportunities for CAREC startups and SMEs, including access to global platforms such as Alibaba. Pilot projects in AI-enabled commerce and other frontier technologies showcase PRC's active role in fostering innovation, while its efforts in green technologies and smart cities provide models that others in CAREC can replicate.

69. **Georgia** promoted ICT competitiveness by establishing PPP-backed accelerators, innovation hubs, and IT Parks that support SME-led ventures in fintech and cybersecurity. Startups in these sectors are increasingly attracting outside capital, supported by the Georgian Innovation and Technology Agency (GITA) driven by the targeted policy reforms that simplified business registration, enhanced intellectual property protections, and offered direct government assistance to early-stage companies. Despite these achievements, overall investment remains limited, and further efforts are needed to attract regional startups to choose Georgia

as a base for scaling into both Central Asia and European markets, due to its unique geography, thereby strengthening Georgia's ambition to become a regional hub for innovation and entrepreneurship.

70. **Kazakhstan's** flagship Astana Hub has become one of the region's top innovation centers. By 2025, it supported over 1,600 technology companies (including more than 800 startups), attracted $250 million in venture capital, and helped create about 5,000 new jobs in the tech sector. Programs like the Silkway Accelerator (in collaboration with Google) and AI'preneurs have nurtured hundreds of SMEs, drawing international funding and recognition. Kazakhstan has also advanced digital finance innovation, processing over 12.8 billion cashless transactions in 2024, piloting interbank QR payments, and enabling cross-border e-wallet interoperability through partnerships such as Kaspi[32] Pay. Kaspi has had a transformative impact on the digital economy, driving the rapid adoption of cashless payments, enabling cross-border e-wallet interoperability, and serving as a model for how fintech innovation can accelerate financial inclusion, digital trade, and regional competitiveness. These efforts firmly establish Kazakhstan as one of the top 75 startup ecosystems worldwide and a regional hub for innovation and competitiveness.

71. Although the **Kyrgyz Republic's** startup ecosystem is still in its early stages, the country is actively enhancing its innovation capacity. It has endorsed participation in the CAREC Regional Startup and GovTech Hub and is promoting public-private partnerships to attract innovation in logistics, fintech, and e-services, with support from international partners such as the ADB and the World Bank. The Tunduk platform itself has become a cornerstone for SME and startup-led digital solutions, demonstrating how government-backed platforms can serve as springboards for local innovation. However, limited access to venture capital continues to hinder startup growth beyond the domestic market.

72. **Mongolia's** innovation ecosystem is supported by the e-Business Portal and national innovation hubs, which offer opportunities for SMEs to develop AI-enabled and digital solutions. Thousands of companies have already gained from these platforms, while international partnerships are helping position Mongolian startups in the global market. Initiatives in AI programs and the AI Ambassadors movement show how Mongolia is building competitiveness in emerging technologies. Its involvement in cross-border innovation dialogues within CAREC illustrates how Mongolia is bridging experiences between Central and East Asia, using digital leapfrogging to strengthen its role in the regional digital economy.

73. **Pakistan's** startup ecosystem has experienced remarkable growth, with investments exceeding $373 million[33] in 2021, driven by a surge in early-stage startups. Platforms like Daraz[34], JazzCash[35], and Easypaisa[36] have expanded nationwide, reaching millions of users. The government has also established National Incubation Centres, supporting over 660 startups[37] in sectors such as fintech, e-commerce, health tech, and education. Diaspora-led initiatives like Paklaunch connect entrepreneurs with international investors, enhancing competitiveness. The launch of the Raast instant payment system in 2022 marked a significant milestone, processing more than 100 million transactions in its first year and greatly advancing financial inclusion. All these efforts bolster Pakistan's goal of becoming a key player

[32] https://kaspi.kz/
[33] https://punjab.gov.pk/node/6250
[34] https://daraz.com/
[35] https://www.jazzcash.com.pk/
[36] https://easypaisa.com.pk/
[37] https://moitt.gov.pk/ProjectDetail/ZDZjYzY3ZDAtZTQ2OS00NGRhLTliNmItMzJmMzdiYTY3ZDE0

in regional digital trade and entrepreneurship; however, sustaining this growth will require improved interoperability and increased private-sector funding.

74. **Tajikistan's** innovation ecosystem is expanding, with the launch of IT Park Dushanbe in 2025 as a dedicated digital innovation zone. Supporting initiatives like the AI Academy, Ilmhona[38], and the creation of AreaAI, the region's first special economic zone for the entire AI supply chain, provides training, incubation, and infrastructure support for MSMEs (Micro, Small and Medium-sized Enterprises) and startups. Although achievements have been made, limited access to affordable finance and a still-developing policy environment continue to hinder startup growth and competitiveness, underscoring the need for greater private-sector involvement and donor assistance.

75. **Turkmenistan's** innovation ecosystem remains in its early development stages, but it is growing through smart city projects and specific incentives. Policies have been put in place to support IT startups and small digital businesses, especially in logistics, urban mobility, and education. Incentives for data centers and innovation collaborations are being established, while public-private partnerships (PPPs) are actively encouraged in areas like airports, ports, and mobility hubs. The private sector, represented by the Union of Industrialists and Entrepreneurs, emphasizes the importance of Green Digital Infrastructure, renewable energy integration, and stronger PPP frameworks to foster growth and attract investment.

76. **Uzbekistan** has developed a vibrant startup scene, led by IT Park Uzbekistan and the Digital Startups Program, which together host over 1,000 resident companies. Annual ICT exports are expected to reach $1.2 billion in 2025, up from $900 million in 2024. Foreign-capital enterprises have grown more than eightfold since 2017, and now one out of every ten ICT companies are a foreign-owned one. To enhance competitiveness, a new law is being drafted to govern the International Center for Digital Technologies "Enterprise Uzbekistan" under English law standards. Programs like Uzbekistan Connect are also linking local startups with international investors, strengthening the country's role as a growing hub for regional and global digital trade.

Key Challenges Under Pillar 5

77. Startup ecosystems across the region remain uneven. Smaller and less-developed markets face persistent barriers such as limited access to venture capital, underdeveloped incubator and accelerator infrastructure, and restrictive regulatory environments. These factors reduce investment appeal and slow the growth of innovation-driven enterprises.

78. Regulatory fragmentation and market barriers continue to constrain ICT competitiveness. Differences in standards, licensing requirements, and digital service regulations complicate cross-border expansion and prevent startups from scaling effectively within the region.

79. Early-stage financing and innovation funding remain concentrated in a few hubs, leaving many markets underserved. This imbalance reduces opportunities for entrepreneurs outside major centers to access risk capital, mentorship, and international networks.

80. Brain drain and uneven distribution of talent further hinder the sustainability of innovation ecosystems. Skilled entrepreneurs and ICT professionals often migrate to larger markets,

[38] https://ilmhona.org/

depriving emerging ecosystems of the talent needed to boost competitiveness and expand innovation capacity.

81. Weak commercialization pathways for research and innovation outputs restrict the translation of new ideas into market-ready products and services. Limited industry–academia linkages and insufficient applied R&D capacity slow the pace of innovation-driven growth.

82. Many startups prioritize fundraising as a strategy to relocate to more advanced ecosystems in the West or Southeast Asia, where deeper capital markets and global accelerators exist. This outward movement highlights the difficulty of retaining scale-oriented entrepreneurs within CAREC, weakening the region's ability to build competitive, self-sustaining ecosystems.

Digital Transformation in Key Sectors and Regional Initiatives

83. CAREC countries sped up digital transformation in trade, logistics, health, and education from 2020 to 2025, supported by stronger regional cooperation. Key logistics projects, such as e-TIR (Kazakhstan–Azerbaijan–Georgia), the Digital Rail Corridor (Azerbaijan–Kazakhstan–Georgia), and the CAREC Advanced Transit System, digitized customs and freight, cutting transit and delivery times by about 25–40% and boosting freight volumes. Uzbekistan's use of e-TIR and the CAREC Digital Corridor resulted in an estimated 50–67% drop-in average border crossing times. Additionally, Kazakhstan and Uzbekistan tested digital road-freight permits, while Azerbaijan's Digital Trade Hub and e-Residency enabled remote company setup, banking, and tax services.

Implementation Challenges and Obstacles

84. **Institutional Capacity and Financing Gaps:** Institutional capacities across the region vary considerably, with economies at more advanced stages of development continuing to strengthen governance frameworks and implementation capabilities, while others, particularly those with limited administrative and resource bases, continue to face constraints. These differences can slow infrastructure development, weaken technology adoption, and limit digital inclusion. Moreover, economies with narrower market scale and relatively nascent regulatory environments often face greater challenges in attracting private investment due to perceived market risks and policy complexity. Ensuring sustainable financing also remains a common challenge, as long-term private capital remains constrained by regulatory uncertainty, heightened investment risks, and insufficient incentive structures. These conditions mean that economies with comparatively constrained fiscal space remain more reliant on development partners and international cooperation to sustain progress.

85. **Regulatory Fragmentation and Policy Barriers:** Regulatory fragmentation continues to worsen implementation challenges, as inconsistent digital rules and different data protection laws make cross-border integration harder. Licensing requirements and compliance systems for digital businesses also differ greatly, creating operational hurdles that restrict startups from expanding regionally. These challenges highlight the need for improved regional coordination, greater harmonization of regulatory frameworks, and targeted capacity-building efforts, especially for smaller and less-resourced economies that struggle most to meet broader regional standards.

86. **Digital Divides and Inclusion Challenges:** Persistent digital divides continue to limit equitable access to the benefits of digitalization. Rural areas remain inadequately served despite substantial national investments, while gender-based disparities persist as women are consistently underrepresented in digital skills training programs, particularly in underserved communities. Beyond access and skills, digital financial inclusion also remains uneven. Many underserved populations and small businesses still lack access to affordable and secure digital financial services, which restricts their ability to participate fully in the digital economy and reduces opportunities for startups to scale and innovate.

87. **Innovation Ecosystems and Trust Deficits:** The region's startup ecosystems remain underdeveloped, with entrepreneurs facing limited access to finance, mentorship, and enabling regulations (Annex 2). These weaknesses slow the growth of competitive digital solutions and reduce the capacity to foster a vibrant and resilient innovation landscape. At the same time, building trust is critical for advancing cross-border digital integration. While some members have strengthened personal data protection frameworks and adopted national cybersecurity strategies, progress is uneven. Cooperation is emerging through joint cybersecurity training workshops, threat intelligence sharing, and the development of secure interoperability platforms; however, gaps remain that highlight the importance of sustained collaboration and coordinated policy alignment.

Key Lessons Learned (2020–2025)

88. **Sustained Government Commitment and Leadership:** Ongoing high-level support from the government accelerates digital transformation through improved implementation, resource allocation, and institutional effectiveness. Inconsistent or weak backing causes delays, funding shortages, and slower progress. Incorporating digital objectives into national strategies and securing political advocacy are key for long-term success.

89. **Flexible and Adaptive Regulatory Approaches:** Regional integration requires flexible regulations that can keep up with new technologies and business models. Overly rigid frameworks hinder innovation and collaboration. Incremental harmonization and mutual recognition demonstrate the importance of balancing flexibility with stability and safeguards.

90. **Community-level engagement and trust-building:** Inclusive, bottom-up participation fosters trust and reduces resistance to digital change. Programs involving local stakeholders, especially in underserved areas, enhance adoption and satisfaction. Culturally sensitive, context-specific initiatives ensure broader acceptance and long-term sustainability.

91. **Strategic Role of Public-Private Partnerships (PPPs):** PPPs promote infrastructure development and innovation by leveraging private investments. Clearly defined frameworks with specified roles and risk-sharing attract substantial capital and lessen public financing burdens. Well-designed PPPs serve as drivers for scalable digital growth.

92. **Cross-border Pilot Projects:** These projects effectively demonstrate the benefits of regional integration while testing regulations and operations. Limited-scope initiatives help build trust, address bottlenecks, and lay the groundwork for broader cooperation. Targeted, well-managed pilots can greatly advance CAREC's digital strategy.

Strategic Recommendations and Implementation Roadmap (2025–2030)

93. The Midterm Review confirms that CAREC countries have made significant digital progress between 2020 and 2025. To fully leverage the potential of digital transformation and address institutional disparities, fragmented regulations, uneven infrastructure, financing gaps, and digital divides, a coordinated set of regional initiatives is recommended. These initiatives will deepen regional integration, close persistent gaps, and scale successful digital solutions across the CAREC region.

a. Regional Governance and Institutional Capacity and Infrastructure Investment

94. CAREC should enhance its governance structures by defining responsibilities, establishing accountability mechanisms, and implementing strategic oversight, drawing lessons from the ASEAN Digital Integration Framework and the EU's Digital Single Market. Building on these models would help accelerate regulatory convergence, strengthen trust, and create an attractive environment for investment.

95. To support this, a **Regional Digital Governance Academy**, possibly hosted by the CAREC Institute, should deliver training and mentoring for digital officials. A Digital Strategy Implementation TA Facility should provide technical support and coordination for member countries with limited capacity. A Regional Digital Governance Framework with explicit standards, roles, and accountability measures, supported by a Regional Digital Governance Working Group and biannual benchmarking reviews, should guide oversight.

96. **Infrastructure Development and Financing** Critical cross-border projects must be completed, with priority given to the Trans-Caspian Fiber Optic Cable (2025–2026), which will expand international bandwidth, reduce latency, and enhance digital resilience for landlocked economies. Additionally, Pakistan has proposed the CAREC Digital Corridor Project, now in the scoping study stage. The initiative is envisioned to boost cross-border digital connectivity and lay the groundwork for stronger regional integration.

97. The Regional Digital Infrastructure Financing Facility should be established to mobilize blended financing for fiber networks, cloud platforms, and regional data systems. This would coordinate with development partners, attract private capital, and build a regional project pipeline. Preparatory steps include an infrastructure gap assessment by 2026 and an investor roadshow in 2026-2027.

98. A **Green Digital Infrastructure Initiative** (2025–2029) will promote renewable-powered data centers and energy-efficient systems. A regional green data center, strategically linked to fiber corridors, would anchor sustainable cloud and AI services. Alongside this, the proposed South Asia–Central Asia Digital Corridor (Scoping Study) will explore new high-speed routes to the Arabian Sea via Pakistan's submarine cable infrastructure, diversifying bandwidth access.

99. CAREC should also consider a **Regional Spatial Data Infrastructure Framework** (CAREC NSDI) to enable interoperable geospatial systems for agriculture, disaster preparedness, infrastructure planning, and biodiversity monitoring.

b. Regulatory Harmonization and Trust

100. CAREC should establish a **Regional Digital Regulatory Harmonization Framework** covering mutual recognition of digital identities, signatures, and authentication credentials, unified cybersecurity standards, common data protection principles, and shared IP frameworks. A CAREC Digital Regulatory Task Force should lead these efforts, supported by structured consultations with the private sector.

101. A **Regional Cybersecurity and Digital Resilience Framework** is needed, including a voluntary CERT network for joint threat intelligence sharing, shared cyber hygiene protocols, and cooperation on cybersecurity risks mitigation and management. Digital trade corridors, building on pilots like e-TIR, should be expanded, culminating in a CAREC Digital Regulatory Harmonization Agreement by 2026. Immediate steps include establishing the Task Force, conducting a regulatory gap analysis in 2026, and rolling out pilot harmonization schemes by 2027.

c. Skills Development and Inclusion

102. The **CAREC Digital Skills and Talent Mobility Platform** (2025–2030) will promote recognition of digital credentials, regional skills alignment, and inclusive digital training. It will work closely with the CAREC Institute's e-learning platform, ensuring training delivery at scale while the Mobility Platform manages policy and recognition.

103. Gender-responsive targets should be embedded, aligned with the CAREC Gender Strategy 2030. Targets include at least 50% female participation in ICT training and measurable improvements in rural digital literacy by 2030. Tailored women- and youth-focused tracks will be integrated into program design and monitoring.

d. Innovation, Entrepreneurship, and Emerging Technologies

104. The **Regional Fund of Funds** and **CAREC Innovation Network** (2025–2028) will channel early-stage capital into startups with cross-border potential. Regional startup competitions, hackathons, and accelerators will expand the ecosystem, with economies with more constrained fiscal space and market scale standing to benefit significantly from enhanced regional linkages. An updated regional innovation ecosystem map is expected to be ready by 2025, and an annual CAREC Innovation and Investment Forum will commence in 2026 to connect startups with investors.

105. The CAREC Regional AI Collaboration Platform (2026–2030) will coordinate national AI strategies, promote ethical AI in public services, and facilitate access to shared computing infrastructure and regulatory sandboxes. This platform will ensure CAREC establishes itself as a unified entity in responsible AI development. It will operate as a virtual and policy-driven network, bringing together centers of excellence, innovation hubs, and regulatory bodies from member countries. Through joint research programs, regional datasets, and AI talent exchanges, the platform will strengthen collective capacity and foster cross-border innovation.

e. Implementation and Monitoring

106. To ensure accountability, a **CAREC Digital Scorecard** should be published annually, tracking outcomes such as cross-border service adoption, platform usage, time savings, and inclusion of women and rural populations. Over time, this can evolve into a CAREC Digital Integration Index, benchmarking progress across interoperability, cybersecurity, AI capacity, and credential recognition.

107. Consistent tagging of cross-border digital projects will improve visibility. A **CAREC Digital Master Plan** and rolling investment framework should consolidate key regional initiatives, including digital corridors, green data centers, innovation zones, and trust infrastructure, into a coherent pipeline aligned with national strategies and private-sector investment priorities

f. Engaging Development Partners for Regional Digital Transformation (2025–2030)

108. To implement the Strategic Recommendations and Roadmap, CAREC countries must deepen collaboration with development partners and key stakeholders of the CAREC partnership. The Asian Development Bank (ADB), as the Secretariat of CAREC, has placed digitalization at the center of its agenda, both as a cross-cutting theme and an emerging sector. The newly established Digital Sector Office, with a vision, is to empower DMCs (Developing Member Countries) to leapfrog into a digitally prosperous, inclusive, resilient, and sustainable future. Alongside ADB, other partners, including the World Bank (WB), the European Bank for Reconstruction and Development (EBRD), the Islamic Development Bank (IsDB), the International Monetary Fund (IMF), the United Nations Development Programme (UNDP), the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), and the World Trade Organization (WTO), bring critical expertise and financing. Strong coordination with these partners will be essential to mobilize resources and advance regional digital integration.

Conclusion

109. As CAREC countries advance towards 2030, regional digital integration holds substantial promise for inclusive economic growth, enhanced public services, and greater regional resilience. The strategic recommendations outlined in this review, including strengthening governance and institutions, bridging infrastructure gaps, harmonizing regulations, expanding digital skills, fostering innovation ecosystems, advancing green digital infrastructure, and robust monitoring mechanisms, are designed to address persistent challenges and capitalize on emerging opportunities.

110. To fully realize the ambitious vision of a unified CAREC digital space, continued commitment, strengthened cooperation, and sustained investments remain essential. To support implementation, CAREC should establish a structured platform for coordination with development partners, aligning technical assistance and financing around regional priorities and reducing duplication across national programs. By strategically aligning national efforts with regional initiatives and maintaining a clear focus on inclusive and equitable digital transformation, CAREC countries can significantly enhance regional competitiveness, deliver tangible benefits to all citizens, and ensure a resilient and prosperous future.

Annex 1: CAREC Digital Strategy 2030 – Monitoring and Accountability Framework

Strategic Recommendation	Key Performance Indicators (KPIs)	Responsible Entity	Supporting Entities	Reporting Frequency
Regional Digital Governance & Institutional Capacity	Institutional readiness index; Number of trained public officials; Number of harmonized regulations adopted Number of countries receiving institutional TA; Secretariat coordination milestones achieved (e.g. Scorecard publication, platform convenings)	National ICT Ministries; CAREC Secretariat	National regulatory bodies; Regional training institutes	Annual
Infrastructure Development & Sustainable Financing	Rural internet penetration (% increase); Length of fiber-optic cable installed (km); Volume of blended/private investment mobilized ($ million)	National infrastructure ministries; CAREC Secretariat	ADB, private-sector partners	Bi-annual
Regulatory Harmonization & Trust Frameworks	Number of mutual recognition agreements signed; Reduction in cross-border transaction processing times (%); Number of cybersecurity incidents effectively managed	CAREC Digital Regulatory Task Force	National regulators; Cybersecurity agencies	Annual
Digital Skills & Inclusion	Digital literacy rate increase (%); Women's participation in digital skills programs (% of total); Number of certified digital professionals trained; Number of recognized digital credentials issued; Participation in cross-border digital training pathways; E-learning platform user growth by country	National Education Ministries; CAREC Secretariat	Regional educational institutions; Gender-focused NGOs	Annual

Innovation & Entrepreneurship Ecosystem	Number of regional startups supported; Amount of venture capital mobilized ($ million); Number of regional startup acceleration programs conducted	CAREC Innovation Network; National Innovation Agencies	Startup incubators; Regional venture capital funds	Annual
Green & Climate-Resilient Digital Infrastructure	Number of renewable-powered data centers operational; Energy efficiency savings (%)	National Environmental Ministries; CAREC Secretariat	Private-sector infrastructure providers; ADB Climate Finance	Annual
Implementation & Monitoring Frameworks	CAREC Digital Integration Scorecard; Number of stakeholder consultations conducted; Completion rate of scheduled reports (%); of regional digital projects formally tagged under CAREC; Status of Digital Master Plan adoption (drafted, approved, under implementation)	CAREC Secretariat; National Digital Strategy Committees	National ICT agencies; Independent evaluators	Bi-annual

Annex 2: CAREC Digital Strategy 2030 – Startupblink Global Ecosystem Ranking 2025

Country	Global Rank 2025	Annual Growth
PRC	13	45.9%
Kazakhstan	70	21.3%
Georgia	71	8.9%
Pakistan	72	11.9%
Azerbaijan	74	24.5%
Mongolia	80	-
Uzbekistan	98	89.9%

Note: Other CAREC Countries are not in the top 100 listings

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