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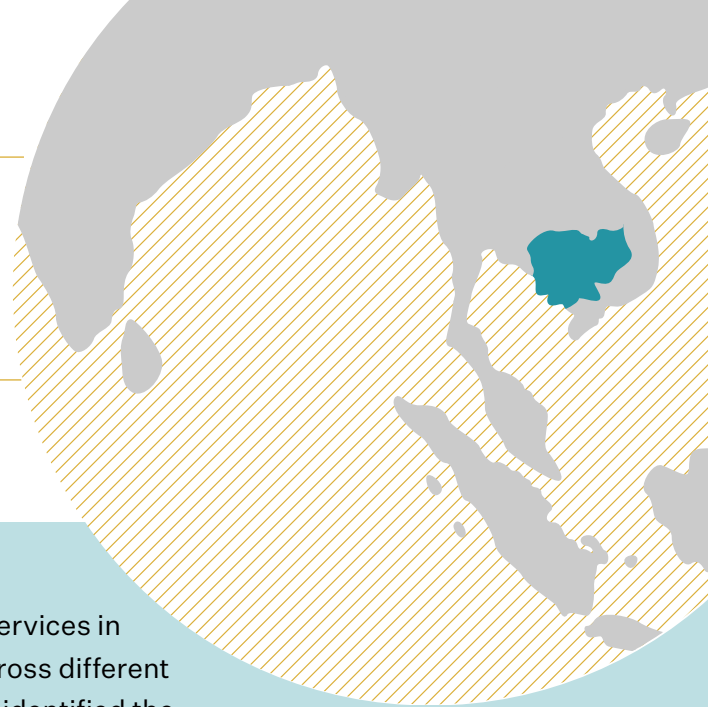
# CAMBODIA

## Seeking artificial intelligence approaches to national research missions

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### Key takeaways

- The collective efforts in developing cloud-based services in the country has been supported by local actors across different sectors. The National Research Agenda 2025 has identified the national challenges and has put a plan to address these challenges.
- There is limited funding and capacity for research in Cambodia as well as weak alignment between research work and national challenges. Cultural caution around uncertain technologies makes a part of why education is predominantly prioritized for engineering and accounting.
- Among the immediate priorities are strengthening of the infrastructure for data and computing power as well as upskilling and expansion of AI practitioners.

In the rapidly developing landscape of technological advancement, Cambodia stands poised to integrate machine learning and AI into its national science systems. We delve into the strategic approach taken by Cambodia, exploring various facets ranging from the government's perspective on AI's impact to the institutional arrangements and stakeholder involvement essential for fostering innovation and economic growth.

### Human-centred policies

At the heart of Cambodia's strategy lies a keen awareness of the transformative power of AI across diverse sectors. With a vision aligned with global AI trends, the Government of Cambodia is crafting human-centred policies aimed at driving responsible AI research and development (R&D). The Ministry of Industry, Science, Technology and Innovation (MISTI) has published the report *AI Landscape in Cambodia: Current Status and Future Trends* (MISTI, 2023a). This forward-thinking approach underscores Cambodia's commitment to leveraging technological innovations to enhance its socio-economic development, as the Supreme National Economic Council outlined in its *Cambodia Digital Economy and Society Policy Framework 2021–2035* (SNEC, 2021).

### Institutional framework

Institutional arrangements play a crucial role in facilitating Cambodia's AI agenda, with the government spearheading initiatives to initiate and integrate changes. Collaborative frameworks and knowledge-sharing platforms are instrumental in fostering collaboration among multidisciplinary research and innovation sectors, paving the way for holistic development. *Cambodia's Science, Technology & Innovation Roadmap 2030* (MISTI, 2021)

emphasizes that the National STI Policy prioritizes five pillars: governance, human capital, R&D, collaboration and ecosystem building. In addition, MISTI (2023b) developed the *Digital Tech Roadmap*, pinpointing machine learning and AI as key technologies for national digital technology development. According to the MISTI (2023c) *Science, Technology & Innovation Report 2022*, MISTI has the mandate as a government entity to oversee the STI sector, and is responsible for promoting the network of AI, robotics and automation in Cambodia.

### **National research missions**

The *National Research Agenda 2025* detailed by MISTI (2022) identified eight national research missions: 1) local food; 2) reliable energy supply; 3) quality education; 4) electronic and mechanical spare parts; 5) cloud-based services; 6) electricity and potable water; 7) carbon neutrality; and 8) digitally-enhanced health. The key research areas to support mission 5 on cloud-based services are infrastructure, software, cybersecurity and accessibility. These services would be provided to businesses in Cambodia to develop their digital capacities and store their data locally. MISTI, the Ministry of Education, Youth and Sport and the Ministry of Post and Telecommunications are all leading institutions in implementing policy instruments – ranging from legal and policy frameworks to human resources, infrastructure and collaboration – in accomplishing the cloud-based services research mission, with the National Council of Science, Technology and Innovation as the guiding body. Currently, universities and research institutions such as the CamTech University, Royal University of Phnom Penh, Institute of Technology of Cambodia, Cambodia Academy of Digital Technology and Kirirom Institute of Technology, as well as broadband networks and service companies, software producers and cybersecurity companies, have been producing research to accomplish the cloud-based services research mission.

### **Challenges and pathways to research and innovation in Cambodia**

The National Research Agenda (MISTI, 2022) highlighted five challenges facing the national research and innovation system, all of which are relevant to AI research:

- There is national underinvestment in R&D and limited policy support to promote research.
- There is limited alignment between research activities and national challenges, and insufficient contribution of academic research to private sector innovation activities and policy-making.
- There is limited research capacity in the public and the private sectors.
- Research institutions need strengthening and resources.
- There is need for stronger university–industry linkages and sustainable international collaborations.

In response, the National Research Agenda developed four pathways to achieve the country's national research missions:

1. Invest in research to support the eight research missions.
2. Strengthen the role and capacities of public research institutions.
3. Support research careers.
4. Incentivize research activities and collaboration.

## **Missing pieces**

One urgent area of concern for Cambodia is the significant data and computing power required for effective machine learning algorithms. Infrastructure limitations and a shortage of skilled practitioners in the AI field present immediate barriers for Cambodia. The lack of available talent and financing hampers AI research and experimentation, hindering the country's ability to fully capitalize on AI's potential benefits. Additional support in the form of public-private partnership and international collaboration will be required to address these challenges.

Cultural challenges also loom large as Cambodia delves deeper into AI adoption. A cautious yet experimental mindset is essential to navigate the uncertainties and errors inherent in AI implementation. Furthermore, fostering innovation, critical thinking, and science, technology, engineering, arts and math education is crucial to equip the workforce with the skills necessary for successful AI development and deployment. Cambodia's current education landscape is skewed towards the context of a developing country, with civil engineering and accounting as predominant majors. Without a strong foundation and culture of scientific reasoning, the impact of AI research and applications will be limited.

## **Opportunities ahead**

MISTI collaborated with the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2022) in developing the report *Mapping Research and Innovation in the Kingdom of Cambodia*. UNESCO's Global Observatory of Science, Technology and Innovation Policy Instruments survey conducted in 2021 conveyed that R&D expenditure and human capital in Cambodia were both limited. On the positive side, Cambodia is taking steps to integrate AI effectively into its science systems. 'Networking, matchmaking and/or partner search for R&D/innovation activities' and 'support for infrastructure' were the two highest-ranked types of R&D and innovation-related support or services provided, at 50 percent and 40 percent consensus respectively.

In conclusion, Cambodia offers a compelling narrative of a nation poised to harness the transformative potential of machine learning and AI for sustainable socio-economic development. The median age of Cambodia is 27 years, with a large majority of the population integrating social media, e-commerce and mobile banking applications into their daily lives. With the unique combination of a young, tech-savvy population and a lack of legacy technologies, Cambodia has the unique characteristics to leapfrog conventional technological and industrial revolutions. Although late to the game, the timing is opportune for Cambodia to adopt AI at the national level, in an era where the power of AI is now more accessible than ever. Through strategic planning, stakeholder engagement and a commitment to inclusivity, Cambodia is charting a path towards a future where technological innovation drives progress and prosperity for all.

## References

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