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G20 AI Strategies Overview

This report summarizes the efforts of the G20 member states to promote AI. Since Canada released its strategy in 2017, 11 other G20 members have followed suit, but each nation has approached their AI strategy differently. Our analysis shows that there is no one formula to achieve a national AI strategy. Thus, strategies range in focus and cover aspects such as funding, research, infrastructure, ethics, jobs, standards, and data governance. Currently, 12 of the 20 G20 members have published national AI strategies. In the summaries below, we cover the main goals and areas of focus for each strategy. We are also simultaneously releasing an analysis of how these strategies cover the governance of various types of data used in AI which can be found at datagovhub.org

Argentina	Draft National Plan of Artificial Intelligence (Not in English)

Argentina is currently working on the National Plan of Artificial Intelligence. This strategy has yet to be published and is currently in the consultation phase.

Australia	2018-2019 Australian budget: Australian Technology and Science Growth Plan — building Australia's Artificial Intelligence capability to support business

Australia's national AI strategy comes from their budget for 2018-2019.

The Government will provide $29.9 million over four years to build AI capabilities and support businesses.

This measure supports business innovation in sectors such as digital health, digital agriculture, energy, mining, and cybersecurity through:

- Funding for the Cooperative Research Centres Program to support projects in AI and ML

- Funding for AI and ML-focused PhD scholarships and school-related learning to address skill gaps

- The development of a Technology Roadmap, Standards Framework, and a national AI Ethics Framework to identify global opportunities and guide future investments.

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Brazil	No dedicated AI strategy

Brazil has yet to publish a dedicated AI strategy. However, Brazil has published an E-Digital Strategy that does include AI along with other digital transformations.

Canada	[Pan-Canadian AI Strategy](#)

Canada's AI plan is a five-year plan that designates $125 million in investment to Canadian AI. The plan is led by the Canadian Institute for Advanced Research (CIFAR). The strategy largely focuses on AI research and increases in talent.

Main goals:

- Increase the number of artificial intelligence researchers and skilled graduates in Canada
- Increase collaboration between partnering AI institutes
- Develop global thought leadership on the economic, ethical, policy and legal implications of advances in artificial intelligence.
- Support a national research community on artificial intelligence

Overall, the strategy seeks to enhance Canada's international profile in AI research and training through increasing the productivity in AI academic research and collaboration among AI institutes in Canada to attract and retain outstanding AI talent in Canadian universities and industry. This strategy hopes to eventually translate these AI research discoveries in the private and public sectors leading to socio-economic benefits for Canada.

China	[A New Generation Artificial Intelligence Development Plan (2017)](#) (Translation provided by New America)

China's AI plan has four basic principles:

1. Technology-led. Through long-term support, strive to lead in transformational and disruptive breakthroughs in methods, tools, and systems for AI

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2. System layout. Systematically develop a targeted strategy taking advantage of the socialist system to concentrate resources to undertake major AI projects

3. Market-dominant. Accelerate the commercialization of AI technologies to create competitive advantage. Utilize the government in planning, policy support, security, market regulation, and ethical regulation

4. Open-Source and Open. Promote open-source sharing between industry and academia. Promote collaboration between military and civilian entities to achieve technological innovation.

Three steps to achieve this:

- By 2020, China should have made major progress in advancing AI models and methods, be competitive in AI at the global level, and establish AI ethical norms, policies, and regulations in some areas.

- By 2025, China should have made major breakthroughs in AI technologies and theory becoming a world leader in AI. China should have the initial establishment of laws and regulations, ethical norms, and AI security assessments in place.

- By 2030, China should be the world's primary leader in AI with multiple AI technology innovations and personnel training centers.

China's AI Open Source Software Development League has also put out a strategy on how to boost China's standing in AI open source. The strategy has three main parts:

1. Adopt and participate in AI open source

2. Lead locally on AI open source such as natural language processing for the Chinese language

3. Lead the trend in AI open source and emphasize systems to evaluate AI open source

France	[For a Meaningful Artificial Intelligence: Towards a French and European Strategy (2018)](#)

France's AI plan indicates six main goals:

1. Opening data. Public authorities must create new ways of producing and opening up data to restore a balance of power between smaller and larger companies. Terms and

conditions for access to this data must be set up on public interest grounds. Focus will be put on the healthcare, environment, transportation mobility, and defense-security sector.

2. Promote agile and enabling research. Coordinate an interdisciplinary network across academic institutions in France to attract AI talent and prevent a brain drain to other countries.

3. Future of the labor market. Set up a lab to investigate labor and professional training public policy to anticipate and experiment with the future of work.

4. Environmental issues. France can raise international awareness of the environmental impact of AI. Promote research into making the physical infrastructure of AI more environmentally friendly. And make ecological public data open to the public.

5. AI Ethics. Create a national advisory committee on ethics for digital technologies and AI to study and give opinions on AI ethics while also facilitating public debate.

6. Inclusive and diverse AI. Work to close the gender gap in people working in AI and have public authorities take up AI initiatives to tackle social issues.

Germany	[Artificial Intelligence Strategy (2019)](#)

Germany's AI plan lists three main goals:

1. Aim to make Germany and Europe a leading center for AI and thus help safeguard Germany's competitiveness in the future.

2. Insure responsible development and use of AI which serves the good of society.

3. Integrate AI into society in ethical, legal, cultural, and institutional terms through public discourse and policy measures.

Twelve action items to reach these goals:

1. Strengthen research in Germany and Europe on AI

2. Create centers of innovation competition in Germany and Europe

3. Provide targeted support to help smaller companies adopt AI

4. Improve access to venture capital to help start new AI-based companies

5. Study employment forecasts to adjust strategies to make AI adoption more humane

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6. Treat AI as an inter-disciplinary subject in the support of vocational training and attracting talent

7. Integrate AI into the public sector for a more efficient and accessible government

8. Increase the availability of data held by the public and private sector while protecting personal rights, the right to control one's data, and other fundamental rights

9. Review the existing regulatory framework to make sure AI-based decisions are "ethics by, in and for design"

10. Provide funding to experts and SMEs to take part in setting international AI standards

11. Work on an international level including the EU, regional agreements and guidelines, and economic cooperation to advance AI development

12. Keep an open dialogue with the public while advancing the AI strategy

India	National Strategy for Artificial Intelligence #AIForAll (2018)

India's national AI strategy four ways forward to harness the power of AI:

Research and application of AI

- Provide fiscal support to establish a research center focusing on AI research

- Provide PhD fellowships, incentivize collaboration among academic institutions, and provide faculty fellowships

- Set up a common cloud platform for big data analytics

- Reform IP law pertaining to AI

- Create a space for international collaboration

Reskilling and training

- Create a national skills qualification framework and standards for AI related jobs

- Incentivize colleges and schools to adopt AI related classes into their curriculum

- Establish a committee to examine and report on the future of work

Accelerating Adoption of AI

- Establish a platform for the sharing of public data in machine readable format

- Explore partnerships and crowdsourcing to help annotate data

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- Be visible in AI related initiatives to foster collaboration and help policymakers realize AI's full potential

Responsible AI Development

- Set up ethics councils at the established research centers
- Implement a data protection framework and create sectorial guidelines
- Help establish research into ethics, privacy, legal aspects, social sustainability, and global competitiveness

Indonesia	No dedicated AI strategy

Italy	[White Paper on Artificial Intelligence at the service of citizens](#)

Italy's AI strategy focuses on the use of AI in the Public Administration in promoting digital transformation.

The plan addresses challenges to this digital transformation effort:

1. Ethical challenges – The need to generate general principles or equity, respect for freedom, and to guarantee individual and collective rights.

2. Technological challenges - The priority is to work on personalization and adaptivity to allow the Public Administration to operate more individually.

3. Skills challenges – The State bears the responsibility to reshape the education system and encourage lifelong learning to keep up with these changes and make sure civil servants and the public sector are properly trained.

4. Data challenges – Data must be good quality and exempt of as much biases as possible. The need to ensure equal and non-discriminatory access to anyone wishing to use open data must be met.

5. Legal challenges – Use of AI must deal with the issues of privacy, transparency, and accountability. The issue of guaranteeing transparency in algorithmic decisions while protecting the copyright of the creators of the algorithm must be dealt with,

6. Public Administration adoption challenges – Acknowledges the need to understand the

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importance of training public employees, particularly officials and managers, on the functioning, benefits, as well as ethical and technical implications on the use of AI technologies in the public sector.

7. Preventing inequalities challenge - The Public Administration must pay great attention to the development of inclusive, accessible, transparent, not discriminatory and free-from-bias solutions.

8. Measuring the impact challenges - Multidisciplinary quantitative and qualitative research is needed to assess the impact of AI. The research should focus on measuring people's quality of life and customer satisfaction and organizations' efficiency and effectiveness.

9. The human being – Promote the understanding of AI by closing the gap between research, industry, and society.

Ten recommendations follow at the end of the strategy:

1. Promote a nation platform dedicated to the development of AI to assist in the collection and annotation of data, as well as models.

2. Ensure AI used by the Public Administration does not harm privacy or security of citizens and allow for the reproducibility of the AI and evaluation of verifiability.

3. Digitizing and annotating Italian language corpora to assist AI based on the natural language.

4. Develop customizable recommender systems that facilitate interaction with the services offered by public administrations.

5. Create the National Competence Centre that can provide predictions to facilitate positive impacts and reduce risks of the use of AI by public administrations.

6. Facilitate the dissemination of skills through the promotion of certification of professionals working in the area of AI.

7. Create a Public Administration 4.0 plan to encourage the Public Administrations investment in AI.

8. Support the collaboration between research, business accelerators and innovation hubs, both public and private, at the national and European level.

9. Establish a Trans-disciplinary Centre on AI to address ethical issues and involve experts and citizens to transform technical and social considerations into regulations,

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standards and technical solutions.

10. Define guidelines and processes based on the principle of security-by-design in the use of AI.

Japan

[Artificial Intelligence Technology Strategy (2017)](#)

Japan's national AI strategy focuses on four areas to apply AI: Productivity; Health, Medical Care, and Welfare; Mobility; and Information Security. The strategy focuses on using three centers (research institutions) as the main places to implement the AI strategy.

Artificial Intelligence Development Phases:

Phase 1: Utilization of AI and data will increase together with new seeds of growth in related service industries.

Phase 2: Public use of AI and data is developed and new industries, such as service industries, will expand.

Phase 3: An ecosystem is established as various multiplying domains are connected and merged.

- Approaches for R&D and social implementation of AI

1. R&D – encourage coordination between the three research centers and promote AI projects based on industry-academia-government collaboration.

2. Fostering of Human Resources – Create education programs to make effective workers and encourage collaboration between universities and industry.

3. Environmental Maintenance of Data – Strengthen data maintenance in priority sectors. Use industry-academia-government collaboration to strengthen data maintenance.

4. Start-up support - Help large corporations coordinate with startups and create open innovation-type platforms. In addition to funding at the pre-seed stage.

5. Promotion of understanding of AI – It is important for not only manufacturers, but service providers and users to understand AI so that development is not restricted.

Mexico

[Towards an AI Strategy in Mexico: Harnessing the AI Revolution (2018)](#)

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Mexico's national AI strategy has five areas of focus:

1. Governance, government, and public services

- Create an AI steering group

- Design the administrative framework of the Office for AI, which will support the implementation of the national strategy across departments

2. Research and development

- Create a national center for AI research

- Strengthen collaboration between academia and industry

- Map use needs for AI, reform IP law, create a data sandbox, and create incentives for AI research and development

3. Capacity, skills, and education

- Develop official programs and certifications for Mexican civil servants and AI training programs

- Broaden AI education beyond computer science and teach computational learning in school

- Increase the number of master's and PhD programs in AI and data science

4. Data infrastructure

- Maintain an open data infrastructure

- Create datasets that are representational of Mexico

- Update and reform privacy laws to address privacy issues with AI

5. Ethics and regulation

- Anti-competition law should be reviewed and reformed to address the value of data

- Create a Mexican AI ethics council to issue guidelines and set quality marks

Republic of Korea	[Mid- to Long-Term Master Plan in Preparation for the Intelligent Information Society Managing the Fourth Industrial Revolution (2017)](#)

- Establish a national data management system that facilitates machine learning

- Convert public data to open data connected to private and public data platforms

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- Facilitate the adoption of private cloud computing and platforms by large corporations holding data by reforming relevant laws

- Support services that match data-owning with data-analyzing businesses

- Find different measures to support the distribution and utilization of data by data type

- Support data analyzing businesses in the four data types of search, location, purchase, and social media data

- Introduce big data learning programs and certificates

- Invest in research and design to promote AI technologies

- Increase support and foster innovation in AI research methods

- Reform research and development effectiveness by disclosing machine learning data through national R&D projects

Republic of South Africa	No dedicated AI strategy

Russia	No dedicated AI strategy

Although Russia has not developed a national AI strategy, the Ministry of Defense, Ministry of Education, as well as other ministries have released a ten-point plan for AI (translation and summary provided by Defense One):

1. Create a consortium of leading scientific, educational, and industrial organizations

2. Establish a fund to provide expertise on automated systems

3. Provide secondary education and specialist education in AI

4. Build an AI lab for research

5. Establish a National Center for Artificial Intelligence

6. Understand and monitor long-term developments in AI globally

7. Ministry of Defense will organize war games to determine the impact of AI

8. Establish a system to assess the compliance of AI systems.

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9. Have these proposals discussed at the domestic military forums.

10. Establish an annual AI conference.

Saudi Arabia	No dedicated AI strategy

Turkey	No dedicated AI strategy

United Kingdom	[AI Sector Deal (2018)](#)

The United Kingdom's strategy has 5 areas of focus:

1. Investment

- Raise total R&D investment in AI technologies to 2.4% of GDP by 2027

- Invest up to £20 million in the application of AI in the services sector

2. Education

- Develop a prestigious global Turing Fellowship program to both attract and retain the best research talent in AI

- Build towards an additional 200 doctoral studentships in AI by 2020-2021

- Invest £406m in skills like math, digital, and technical education and support 8,000 computer science teachers

3. Infrastructure

- Publish more high-quality public data in an open, easily findable, and reusable format

- Provide legal certainty over the sharing and use of data

- Work with major stakeholders to identify barriers to sharing data

- Explore frameworks like 'data trusts' for mechanisms to share data

- Invest over £1 billion to develop 5G

4. Business environment

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- Establish a new Office for Artificial Intelligence to work with the AI Council to create and deliver the AI strategy

- Establish a new £2.5bn Investment Fund incubated in the British Business Bank.

5. Places

- Invest £21 million to support regional tech companies and startups

- Invest over £1bn in digital infrastructure

United States	[American AI Initiative (2019)](#)

The United States' AI plan indicates key areas of emphasis:

1. Invest in AI research and development - Direct federal agencies to prioritize AI in their R&D budget

2. Unleash AI resources - Direct federal agencies to make Federal data, models, and computing resources more open while maintaining the safety, security, civil liberties, privacy, and confidentiality

3. Setting AI governance standards - Direct federal agencies to guide the development of AI to encourage adoption and trust. Emphasizing NIST's role in developing appropriate technical standards for reliable, robust, trustworthy, secure, portable, and interoperable AI systems

4. Building the AI workforce - Prioritize fellowship and training programs for increasing skilled workers

5. International Engagement and Protecting our AI Advantage - Develop and implement a strategy to protect US advantage in AI while opening up new markets

On January 8, 2020, the White House proposed a [set of principles](#) to govern AI development in the private sector as a part of [The American AI Initiative](#). The proposed set of principles has ten key aspects:

1. Public trust in AI: "It is therefore important that the government's regulatory and non-regulatory approaches to AI promote reliable, robust, and trustworthy AI applications, which will contribute to public trust in AI"

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2. Public participation: "Agencies should provide ample opportunities for the public to provide information and participate in all stages of the rulemaking process, to the extent feasible and consistent with legal requirements"

3. Scientific integrity and information quality: "Consistent with the principles of scientific integrity in the rulemaking and guidance processes, agencies should develop regulatory approaches to AI in a manner that both informs policy decisions and fosters public trust in AI"

4. Risk assessment and management: "Regulatory and non-regulatory approaches to AI should be based on a consistent application of risk assessment and risk management across various agencies and various technologies."

5. Benefits and costs: "Agencies should, when consistent with law, carefully consider the full societal costs, benefits, and distributional effects before considering regulations related to the development and deployment of AI applications."

6. Flexibility: "When developing regulatory and non-regulatory approaches, agencies should pursue performance-based and flexible approaches that can adapt to rapid changes and updates to AI applications."

7. Fairness and non-discrimination: "When considering regulations or non-regulatory approaches related to AI applications, agencies should consider, in accordance with law, issues of fairness and non-discrimination with respect to outcomes and decisions produced by the AI application at issue, as well as whether the AI application at issue may reduce levels of unlawful, unfair, or otherwise unintended discrimination as compared to existing processes."

8. Disclosure and transparency: "In addition to improving the rulemaking process, transparency and disclosure can increase public trust and confidence in AI applications."

9. Safety and security: "Agencies should promote the development of AI systems that are safe, secure, and operate as intended, and encourage the consideration of safety and security issues throughout the AI design, development, deployment, and operation process."

10. Interagency coordination: "Agencies should coordinate with each other to share experiences and to ensure consistency and predictability of AI-related policies that advance American innovation and growth in AI, while appropriately protecting privacy, civil

liberties, and American values and allowing for sector- and application-specific approaches when appropriate."

European Union	[Communication on Artificial Intelligence (2018)](#)

The European Union's strategy creates a framework for development with seven areas of focus:

1. Investment in AI

    - Target investment of EUR 20 billion per year by the Union, public, and private over the next decade

    -The Union Horizon Europe and the Digital Europe programs to invest at least EUR 1 billion per year between 2021-2027

    - Remove barriers that might create a fragmented market and strengthen key enablers like common standards

2. Encourage collaboration between research organizations and companies as well as increase financing for start-ups

3. Foster collaboration among research centers and invest in research at the EU level to prevent duplication

4. Member states will share best practices on how to retain a talented workforce while the EU will fund master's and PhDs

5. Clarify data protection law when it comes to research in AI to help increase trust. Create common European data spaces and pool resources to build the next supercomputers used to train AI

6. Create an AI ethics guideline

7. Increase understanding of how AI can enhance the security sector, be protected from security threats, and how AI can be used for malicious purposes.