

HIGH PERFORMING SYSTEMS FOR TOMORROW

AI Plan Summary DRAFT

*The following document is a **draft** overview of the public AI plans or strategy statements that we were able to locate on line in English for all of the HPST jurisdictions. We expect to update this document with information from the questionnaire that we asked each jurisdiction to complete before the meeting. We will circulate an updated document at that point.*

As of April 2019, Canada, Estonia (as part of the Nordic-Baltic Region), Finland, Japan and Korea have all published master plans or documents outlining an AI strategy. Hong Kong and Singapore have key initiatives and made targeted investments but do not have a single AI plan for the jurisdiction. Finland's plan is one of the most in-depth documents and includes an assessment of the country's strengths and weaknesses and lays out a plan of recommended action steps as part of its national development strategy.

Most of the HPST jurisdiction plans focus on supporting research to develop jurisdiction expertise on new forms of AI, establishing data and digital infrastructures, coordinating government agency investments in innovation and R&D, and outlining ethical guidelines to make them competitive in the global race for AI. These high-level documents do not articulate the implications of AI on educational strategies or what kinds of skills students will need to develop in order to be successful in a future AI economy.

British Columbia/Canada

While many of the Canadian provinces are investing in and supporting the expansion of AI in their economies, most, including British Columbia, do not at this point have their own provincial AI strategy or plan. [Quebec](#) is an exception.

The 2017 *Pan-Canadian Artificial Intelligence Strategy* is a five-year, C\$125 million (US\$94 million) plan to invest in AI research and talent. The strategy has four goals: (1) increase the number of AI researchers and graduates, (2) establish three clusters of scientific excellence, (3) develop thought leadership on the economic, ethical, policy, and legal implications of AI, and (4) support the national research community on AI.

The Canadian Institute for Advanced Research leads the strategy in close partnership with the Canadian government and the three new AI Institutes: the Alberta Machine Intelligence Institute (AMII) in Edmonton, the Vector Institute in Toronto, and MILA in Montreal.

Canada's AI strategy focuses primarily on research and talent development. Its initiatives—the new AI Institutes, CIFAR Chairs in AI, and the National AI program—are all geared towards enhancing Canada's international profile as a leader in AI research and training. The CIFAR AI & Society Program examines the policy and ethical

implications of AI, but the overall Canadian strategy does not include policies such as investments in strategic sectors, data and privacy, or skills development.

Estonia

Estonia is currently developing its own national AI action plan that will address using AI responsibly, potential economic incentives, and priority pilot programs. [Guidelines](#) are expected by spring 2019. [Those guidelines are now available here.](#)

In May 2018, the Ministers responsible for digital development from Denmark, Estonia, Finland, the Faroe Islands, Iceland, Latvia, Lithuania, Norway, Sweden, and the Åland Islands released a four-page [Declaration on AI in the Nordic-Baltic Region](#). The set of countries agreed to collaborate and cooperate to maintain their position as the leading region in Europe for digitalization. The focus is using AI to assist in solving major societal challenges by increasing efficiency and promoting innovation. They specified that they will collaborate on: (1) improving opportunities for skills development, (2) enhancing access to data, (3) developing ethical and transparent guidelines, standards, principles, and values, (4) developing standards for hardware and software that enable privacy, security, and trust, (5) ensuring AI gets a prominent role in European discussions of the Digital Single Market, (6) avoiding unnecessary regulations, and (7) using the Nordic Council of Ministries to facilitate policy cooperation. The declaration focuses on taking a cooperative, regional approach to using AI to promote economic growth. It does not address implications for education or particular skills.

Finland

In May 2017, Finland's Minister of Economic Affairs Mika Lintilä appointed a steering group to examine how Finland can become one of the world's top countries at the application of AI technologies. Though the group will not release its final report until April 2019, it has already released two interim reports and the Finnish government has begun to incorporate the group's recommendations into government policy. The first report, [Finland's Age of Artificial Intelligence](#), surveyed Finland's strengths and weaknesses in AI and provided eight recommendations to turn Finland into a global leader in the application of AI. Key initiatives include the creation of the [Finnish Centre for AI](#) (a joint partnership by Aalto and Helsinki Universities to increase AI research, talent, and industry collaboration), an AI accelerator pilot program, and the integration of AI in the public service. A second interim report, [Work in the Age of Artificial Intelligence](#), gives an additional 28 policy recommendations related to four aspects of the future of work: growth and employment; labor market; learning and skills; and ethics. Finland's final strategy report is due to be published in April 2019. Finland's plan notes the country has a competitive advantage in its high standard of education and tech-friendly climate and commits to launching a study on how training and education programs for working adults can be made more flexible to allow for efficient reskilling.

As a related initiative, Finland has launched a "[1 percent](#)" AI scheme that aims to teach 1 percent of the country's population, or about 55,000 people, the basic concepts at the root of artificial intelligence technology. The initiative was first started as a free online university course and now over 250 companies have signed on to train their employees in AI. The government has embraced it as well. The self-paced [Elements of AI](#) course combines theory and practical exercises.

Hong Kong

Hong Kong has not yet released a formal AI plan. It has released some proposals to jumpstart the AI industry through research investments and partnerships with larger markets to increase opportunities for local and overseas AI talent. The government has established two world-class research clusters in Hong Kong Science Park, one of which is [AIR@InnoHK](#) focusing on AI and robotics technologies. Leading universities and R&D institutions from around the world are invited to join these clusters.

Hong Kong has established initiative to promote innovation in technology, including AI. The Guangdong-Hong Kong-Macao Greater Bay Area is perhaps the most significant of these. The three territories plan to establish the Bay Area as an international technology and innovation center by coordinating the use of resources and maximizing cooperation in innovation development. An [agreement](#) was signed in September 2018 between the Chinese Ministry of Science and Technology and the Hong Kong government to serve as an action guide and framework to take forward various I&T cooperation initiatives — all highlighting AI — in the coming few years. The goal is to enhance cooperation in six areas: scientific research, development of platforms, nurturing of talents, transfer of results and incubation of I&T industry, integration into national development strategies, and cultivation of an I&T atmosphere.

Japan

Based on instructions from Prime Minister Abe during the [Public-Private Dialogue towards Investment for the Future](#) in April 2016, the Strategic Council for AI Technology was established to develop “research and development goals and a roadmap for the industrialization of artificial intelligence.” The 11-member council had representatives from academia, industry, and government, including the President of Japan’s Society for the Promotion of Science, the President of the University of Tokyo, and the Chairman of Toyota.

The plan, the [Artificial Intelligence Technology Strategy](#), was released in March 2017. The strategy is notable for its Industrialization Roadmap, which envisions AI as a service and organizes the development of AI into three phases: (1) the utilization and application of data-driven AI developed in various domains, (2) the public use of AI and data developed across various domains, and (3) the creation of ecosystems built by connecting multiplying domains. The strategy applies this framework to three priority areas of Japan’s [Society 5.0](#) initiative— productivity, health, and mobility—and outlines policies to realize the industrialization roadmap. These policies include new investments in R&D, talent, public data, and start-ups.

The strategy does not address the implications for the education system, only that more researchers and AI experts will be needed and encourages greater collaboration between the government, universities and industry.

Korea

In 2017, South Korea’s government announced a [₩1 trillion \(US\\$882 million\) investment](#) in AI research over the next five years. This was followed by another announcement this year of a national [AI R&D Strategy](#) established by the Ministry of Science and the Ministry of Information and Communication. The strategy announcement include a five year, [₩2.2 trillion \(US\\$1.9 billion\) investment](#) to strengthen

the country's R&D in AI. The strategy has three parts: talent; AI technology; and investment in infrastructure. To develop AI talent, the government will establish six graduate schools in AI by 2022 with the goal of training 5,000 AI specialists (1,400 AI researchers and 3,600 data management specialists). The government also announced an initiative to train 600 young people in AI to address the immediate short term need for AI talent. Korea plans to create an AI specialized curriculum and incorporate it into university majors.

There are also several more recent initiatives as well. The government will fund large scale projects in AI related to national defense, medicine, and public safety; will start an AI R&D challenge similar to the one funded by the U.S. Department of Defense's Defense Advanced Research Projects Agency; fund the creation of an AI semiconductor by 2029; and create an AI-oriented start-up incubator to support emerging AI businesses. Korea also plans to support the development of new AI industries and is expected to make an announcement about that later in 2019.

Singapore

Launched in May 2017, [AI Singapore](#) is a five-year, S\$150 million (US\$111 million) national program to enhance Singapore's capabilities in AI. It is a government-wide partnership involving six different organizations. Its goals are to invest in the next wave of AI research, address major societal and economic challenges, and broaden adoption and use of AI within industry. The program consists of four key initiatives. First, Fundamental AI Research funds scientific research that will contribute to the other pillars of AI Singapore. Second, Grand Challenges supports the work of multi-disciplinary teams that provide innovative solutions to major challenges Singapore and the world faces. Currently the program focuses on health, urban solutions, and finance. Third, 100 Experiments funds scalable AI solutions to industry-identified problems. Finally, to foster a new cohort of AI talent, Singapore has created [AI Apprenticeship](#), a 9-month structured program available to university graduates interested in machine learning and data science.

In June 2018, the government announced [three new initiatives on AI governance and ethics](#). Principally, the new Advisory Council on the Ethical Use of AI and Data will help the Government develop standards and governance frameworks for the ethics of AI. In January 2019, Singapore released a [Model AI Governance Framework](#) that outlines key ethical principles and practices in AI deployment. In March 2019, the government [announced](#) the formation of an inter-agency task force to assess how the country should develop AI as a strategic capability and be a global testbed for the deployment of AI applications. Finally, under the country's TechSkills Accelerator program, there are two initiatives to build technical skills of citizens: [AI for Everyone](#) is a free program for the public that introduces the latest AI technologies and applications. [AI for Industry](#) has a goal of training 2,000 industry specialists in basic AI competency.

EU Commission

In April 2018, the EU Commission adopted the [Communication on Artificial Intelligence](#): a 20-page document that lays out the EU's approach to AI. The EU Commission aims to: (1) increase the EU's technological and industrial capacity and AI uptake by the public and private sectors; (2) prepare Europeans for the socioeconomic changes brought about by AI; and (3) ensure that an appropriate ethical and legal framework is in place. Key

initiatives include a commitment to increase the EU's investment in AI from €500 million (US\$561 million) in 2017 to €1.5 billion (US\$1.7 billion) by the end of 2020, the creation of the European AI Alliance, and a new set of AI ethics guidelines to address issues such as fairness, safety, and transparency. A new [High-Level Group on Artificial Intelligence](#) will act as the steering group for the European AI Alliance and will prepare the draft ethics guidelines for member states to consider.

In December 2018, the Commission released a draft coordinated [plan](#) to foster the development and use of AI in Europe. The plan proposes joint actions for closer and more efficient cooperation in four key areas: increasing investment; making more data available; fostering talent; and ensuring trust. A revised version, based on feedback collected, will be delivered to the European Commission by the beginning of April 2019.