

POLITICAL ECONOMY PROGRAM

Industrial Policy in the Information Economy

Building Knowledge, Collaboration, and AI Capabilities

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Executive Summary

The transition to the Information Economy requires the Philippines to rethink industrial policy. As knowledge, information, digital technologies, and artificial intelligence (AI) become increasingly important sources of productivity and economic value, industrial policy must focus not only on physical and financial capital but also on developing the country's knowledge and technological capabilities. This policy brief proposes a Progressive Industrial Policy centered on investments in education, research and development (R&D), digital infrastructure, knowledge sharing, and collaborative innovation. It calls for stronger partnerships among government, universities, research institutions, and businesses through Extended Value Networks and open innovation ecosystems. These partnerships can support knowledge creation, technological learning, and higher productivity across industries. The brief also emphasizes human-centered AI adoption. AI should be used to augment rather than replace workers, while human judgment, creativity, ethical reasoning, and social responsibility remain essential to decision-making. Education and workforce policies should therefore strengthen foundational learning, teacher development, digital and AI literacy, industry-academe linkages, and reskilling. Finally, industrial policy should contribute to reducing poverty, inequality, and environmental degradation. Achieving these goals requires stronger coordination among national government agencies, local governments, educational institutions, research organizations, and the private sector. By building these capabilities and institutions, the Philippines can

strengthen its capacity to participate in and benefit from the Information Economy while ensuring that technological and economic progress produces broad-based social benefits.

Introduction

The emergence of the Information Economy has fundamentally changed the drivers of productivity, competitiveness, and economic growth. As knowledge, information, and digital technologies increasingly become the primary sources of economic value, industrial policy must also evolve beyond its traditional emphasis on physical and financial resources. In this new environment, the goal of industrial policy is to develop the country's overall knowledge and technological productive capabilities—capabilities that cut across all industries rather than being confined to particular sectors. This, however, does not preclude the development of industrial policies for specific industries or sectors (Criscuolo and Lalanne 2024).

The growing importance of digital technologies, artificial intelligence (AI), and knowledge-intensive industries has fundamentally transformed the sources of productivity and competitiveness. Economic value is increasingly created not only through the production of goods, but also through the generation, dissemination, and application of knowledge across organizations and industries. Consequently, industrial

policy must evolve beyond expanding production capacity toward strengthening the country's knowledge ecosystem. This includes developing human capital, promoting innovation, supporting research and development, and creating institutions that facilitate collaboration and technological learning. Such a shift recognizes that long-term economic growth increasingly depends on the country's ability to generate, absorb, and effectively utilize knowledge and digital technologies.

Technology-driven decision-making tools include powerful algorithms and computer software capable of analyzing large volumes of data in real time, solving complex problems, detecting patterns of behavior, and generating text. Collectively referred to as artificial intelligence, these technologies possess analytical capabilities that could be leveraged to scale the country's industrial development.

AI, however, has one major shortcoming: it is emotionally neutral. AI tools are incapable of human feelings and cannot make ethical and aesthetic judgments (Vaccaro et al. 2024; Cantlon and Piantadosi. 2024). While AI is proving to be a useful decision-making tool in many spheres of human endeavor, "successful games still depend on uniquely human creativity, storytelling, artistic judgment, and community building" (Ahmed 2026). Neither AI alone nor humans alone can adequately address today's social and economic problems. Rather, effective decision-making requires the complementary application of human judgment and AI capabilities.

Addressing Today's Overarching Social and Economic Problems

In a world characterized by social, economic, and environmental crises, industrial policy must be both progressive and liberal. While progressive and liberal strategies fall within the broader ambit of economic and social policy, industrial policy has an important role to play in addressing these challenges.

Industrial policy is no longer concerned solely with promoting economic growth or increasing industrial output. In the Information Economy, it must also strengthen the capabilities that enable societies to respond to complex and interconnected challenges. Knowledge, innovation, and technological progress should therefore be directed not only toward improving productivity, but also toward generating

solutions that promote inclusive, equitable, and sustainable development.

In today's world, industrial policy should contribute to finding solutions to society's major problems. The public and private sectors must adopt appropriate strategies to address extreme poverty, economic inequality, and environmental degradation (Hauge and Hickel 2025). For their part, business firms should adopt stakeholder strategies that create value for all stakeholders, particularly their workers. Paying workers more than their market wages and providing them with comfortable working conditions make them more productive while improving firm profitability (Poblador 2022, 20–38). Thus, firms not only achieve their long-term profit objectives, but also help reduce poverty and lessen economic inequality.

The state, meanwhile, must take decisive steps to ensure that the interests of society are served. This includes implementing progressive taxation, providing financial support to those in need, improving the distribution of national income, and making quality education more accessible to disadvantaged sectors.

Industrial Policy in the Information Economy

In contrast to industrial policy under traditional production technologies, which relies primarily on physical and financial resources, industrial policy in the Information Economy is based mainly on knowledge and information embedded in human capital (Criscuolo and Lalanne 2024).

In the Information Economy, knowledge and information are the most important economic resources and the primary sources of economic value. Unlike physical and financial assets, they possess several unique properties that distinguish them from the traditional factors of production (Stiglitz 2000). These include the following:

- **They are non-rivalrous**, meaning that their value is not diminished when shared with others.
- **They are subject to increasing returns.** The more knowledge is produced and applied, the more productive and valuable it becomes.

$$V(2X) > V(X) + V(X)$$

where **X** represents a specified amount of knowledge.

- **They are subject to economies of complementation.** The combined value of complementary knowledge and information exceeds the sum of their separate values.

$$V(X,Y) > V(X) + V(Y)$$

where **X** and **Y** represent different categories of knowledge or information.

These characteristics suggest that knowledge and information create greater value when shared rather than kept within individual organizations.

Unlike traditional factors of production, knowledge also expands through continuous use, adaptation, and exchange. As knowledge circulates among firms, universities, research institutions, and government agencies, it generates innovation, improves productivity, and creates new economic opportunities. The resulting knowledge spillovers benefit not only individual organizations, but also the broader economy. Consequently, industrial policy should encourage mechanisms that facilitate knowledge sharing, interdisciplinary collaboration, and continuous learning to maximize the economic and social value of knowledge.

In the digitally driven world, value is increasingly created through Extended Value Networks (EVNs)—highly collaborative networks composed of customers, providers of physical resources, owners of knowledge and information, producers of goods and services, government agencies, and other stakeholders (Poblador 2022, 24–38).

Implications for Economic and Industrial Policy

Traditional industrial policy focused on investment in physical capital, such as machinery, equipment, and the expansion of manufacturing capacity. By contrast, industrial policy in the Information Economy focuses on the creation, dissemination, and application of data, information, and knowledge, together with the digital technologies that enable their effective use. This requires developing AI capabilities among industrial and agricultural workers, supporting research and development (R&D) in business firms and educational institutions, and encouraging public-private partnerships (Quimba et al. 2024).

Viewed from the perspective of Progressive Industrial Policy, this shift requires government to move beyond supporting individual industries toward strengthening the broader innovation ecosystem. The state's role is not only to address market failures, but also to build the institutions, capabilities, and collaborative networks that enable continuous technological learning and innovation. Investments in education, research and development, digital infrastructure, and knowledge-sharing institutions therefore become integral components of industrial policy in the Information Economy.

To strengthen the country's knowledge and technological capabilities, industrial policy should prioritize the following:

- **Support knowledge creation and sharing.** Government should encourage business firms, professional associations, and educational institutions to share complementary knowledge resources in order to expand the production of goods and services.
- **Invest in research and development.** Knowledge and digital technologies expand through continuous accumulation. Their development can be accelerated through sustained investment in R&D. The state should therefore provide greater support to universities and research institutions, such as the University of the Philippines Center for Integrative and Development Studies (UP CIDS) and the Philippine Institute for Development Studies (PIDS) (Breznitz and Gingrich 2025).
- **Promote collaborative innovation networks.** Because knowledge becomes more productive when shared, industrial policy should encourage the formation of collaborative networks among educational institutions, business firms, and government research organizations. For example, state universities and colleges (SUCs), industrial R&D units, and government research institutions may organize themselves into an Extended Value Network, with the University of the Philippines System serving as the core organization (Wulfert et al 2024.; Mbanefo and Grobbelaar 2024).
- **Strengthen open innovation ecosystems.** Collaborative research should be supported through open innovation ecosystems rather than isolated organizations because knowledge spillovers generate shared digital infrastructure

and research outcomes that benefit multiple sectors of the economy (Arcos-Guanga et al. 2024; Jha and Basu 2024).

- **Promote human-centered AI adoption.** AI possesses analytical capabilities that exceed those of humans, while humans retain the capacity for ethical and aesthetic judgment. These complementary capabilities should be combined in addressing real-world problems. Accordingly, organizations should redesign work to augment—not replace—the workforce with AI applications while expanding AI literacy across occupations.
- **Develop a national knowledge infrastructure.** Collaboration, rather than competition alone, should guide the development of the country's knowledge infrastructure. Government should facilitate networks of universities, business R&D units, government institutions, and individual scholars to create a knowledge commons that promotes knowledge sharing, increases productivity, and enhances economic value.

Implications for Business Strategy

In the Information Economy, collaboration complements competition as a strategy for innovation and value creation. Rather than relying solely on competition, firms increasingly pursue **coopetition**—the simultaneous practice of competition and collaboration among business firms, universities, and government agencies (Gnyawali and Park 2011).

This shift reflects the growing recognition that innovation is increasingly generated through networks rather than by individual organizations acting alone. Firms benefit from access to complementary knowledge, technologies, and capabilities that reside outside their own boundaries. Consequently, competitive advantage increasingly depends on an organization's ability to participate effectively in collaborative ecosystems while maintaining its capacity to innovate and compete.

The following examples illustrate how collaboration and competition coexist in the Information Economy:

- Firms within a supply chain combine complementary resources and scale up operations to increase their joint output.

- Extended Value Networks (EVNs) compete with other networks for market share. Examples include Apple and Microsoft, and McDonald's and Jollibee, which compete through their respective collaborative ecosystems.
- Firms with complementary resources may merge to achieve economies of complementation and greater scale. The recent merger of Paramount Pictures and Warner Bros., for example, was intended to strengthen their ability to compete with larger global entertainment companies such as Disney, Universal Pictures, Netflix, and Amazon.

These developments suggest that industrial policy should encourage collaboration and knowledge-sharing alongside healthy market competition in order to strengthen innovation and productivity in the Information Economy.

Educational Policy

The poor quality of education and its limited accessibility remain among the major drivers of poverty and economic inequality in the Philippines. Addressing this educational crisis requires policies that improve learning outcomes at all levels while ensuring that quality education is accessible to all. In the Information Economy, education also serves as the foundation for developing the country's knowledge, technological, and AI capabilities.

Education occupies a central role in industrial policy because human capital is the principal carrier of knowledge and technological capabilities in the Information Economy. Investments in education therefore generate returns beyond individual learners by strengthening innovation, increasing labor productivity, and enhancing the country's capacity to adapt to technological change. Educational reforms should thus be viewed not only as social investments but also as strategic economic investments that expand the nation's long-term productive capabilities.

Achieving these objectives requires a coordinated, whole-of-government approach involving the Department of Education (DepEd), the Commission on Higher Education (CHED), the Technical Education and Skills Development Authority (TESDA), the Department of Health (DOH), the Department of Social Welfare and Development (DSWD), and local government units (LGUs). Beyond strengthening basic education, policy should promote educational reform, AI literacy, vocational reskilling, and entrepreneurial education.

Priority measures include:

- Ensure that every child acquires basic literacy and numeracy at the earliest possible stage.
- Improve teacher quality through continuous professional development.
- Revise the curriculum to strengthen competencies needed in the Information Economy.
- Strengthen linkages between educational institutions and industry.
- Reduce educational inequality by prioritizing schools in rural areas, indigenous communities, and conflict-affected areas.
- Invest in reliable digital infrastructure, including internet connectivity and classroom technologies, to support digital learning and AI readiness.

Policy Recommendations

Drawing on the preceding discussion, the following policy directions may help strengthen the Philippines' industrial policy in the Information Economy:

1. **Develop national knowledge and technological capabilities.** Industrial policy should prioritize investments in knowledge creation, research and development, digital technologies, and AI capabilities to strengthen long-term productivity and innovation.
2. **Promote collaborative innovation ecosystems.** Government should encourage stronger partnerships among universities, research institutions, business firms, and government agencies through Extended Value Networks (EVNs) and other collaborative platforms that facilitate knowledge sharing and innovation.
3. **Strengthen education and workforce development.** Educational policies should improve foundational learning, expand AI and digital literacy, strengthen industry-academe linkages, and support lifelong learning and workforce reskilling.
4. **Adopt human-centered AI policies.** AI should complement rather than replace human capabilities. Public and private organizations should promote responsible AI adoption while ensuring that ethical judgment, creativity, and human decision-making remain central to economic and social development.

5. **Advance inclusive and sustainable development.** Industrial policy should contribute to addressing poverty, inequality, and environmental degradation by ensuring that technological progress and innovation generate broad-based social and economic benefits.

6. **Strengthen public sector coordination.** Effective industrial policy requires close coordination among national government agencies, local governments, educational institutions, and the private sector to build a coherent national innovation system.

Conclusion

The transition to the Information Economy requires a corresponding transformation in industrial policy. As knowledge, information, and artificial intelligence increasingly become the principal drivers of economic growth, industrial policy must move beyond its traditional emphasis on physical capital toward developing the country's knowledge and technological capabilities.

Such a transformation requires more than technological adoption. It calls for sustained investments in education, research and development, collaborative institutions, and innovation ecosystems that enable knowledge creation and technological learning across society. Equally important is ensuring that artificial intelligence complements rather than replaces uniquely human capabilities, including ethical judgment, creativity, and social responsibility.

For the Philippines, the challenge is not simply to participate in the Information Economy but to build the institutions and capabilities necessary to thrive within it. By fostering collaboration among government, industry, academe, and civil society, Progressive Industrial Policy can strengthen the country's innovation ecosystem while ensuring that economic development remains inclusive, sustainable, and responsive to society's most pressing challenges.

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