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VOICE OF WOMEN IN INNOVATION

RETHINKING THE PURPOSE AND DIRECTION OF INNOVATION

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We are currently living through a race for technological innovation that is reshaping global politics and redefining the future of humanity, while pushing planetary limits towards unknown and potentially catastrophic outcomes. This makes it essential to reflect on some key questions: What is the purpose of innovation? Who gets to innovate and to what end? And how can we steer innovation towards a future that supports all people, ecosystems and the planet itself? Let's unpack the way we think about technology, innovation and economic development, with the help of brilliant female economists. They show that innovation is by far neutral, and develop a systemic analysis that invites us to think about the purpose and direction of innovation.

Innovation – from anthropology to policy labs

How do we define innovation? It is one of those intuitive yet loosely defined terms. Perhaps we find a hint in the way we understand the history of humanity, through concepts like evolution, progress, development, and more recently, innovation. In this light, it may not come as a surprise that the understanding of innovation as a sequential process comes from early debates in anthropology, as anthropologists considered both creative invention and geographical diffusion as integral to processes of cultural change. We start with the idea of innovation as a human creative disposition, both in terms of invention and as a social process. Management studies and economics popularised a linear model of innovation that begins with basic research, followed by applied research and development, production and commercialisation of a product. Innovation becomes the key driver of economic growth, operationalised through measurable inputs such as R&D investment and outputs such as number of patents granted. We begin to see the sketch of a broader interactive innovation system with networks of relationships among different actors who play discrete roles in driving the innovation process – from researchers and universities, entrepreneurs and innovative businesses, to state funding and policy. This systemic approach characterises a national system of innovation. One thing is certain - innovation is typically attributed to technology firms and the private sector, and innovation professionals may be more familiar with the concept of open innovation, including idea-to-launch or the stage-gate model. But there has also been a proliferation of public sector innovation labs and agencies using design thinking to improve their services by prototyping and testing potential solutions with citizens and end users. Moreover, beyond national innovation systems where both the private and the public sector innovate, innovation is now diffused among global value chains and highly unequal economies. In this context, who truly gets to innovate, and to what end?

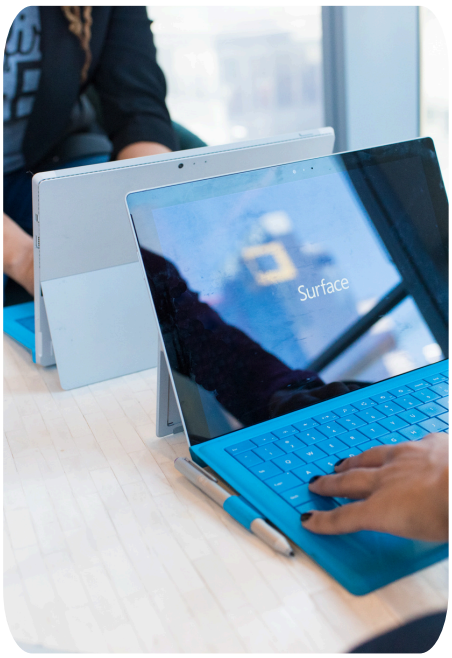
Technological revolutions and the role of the state

One framework that helps us navigate the layered process of innovation is the concept of ***technological revolutions*** developed by world-leading thinker on innovation, Carlota Perez. She identified five technological revolutions since the industrial revolution, moving onwards to the age of steam, the age of steel, the age of oil and mass production, and the current age of information technology and communications (ICT). Her core insight is that each revolution begins with a radical innovation - such as the microprocessor in the current ICT era – that goes on to shape the economy in two key ways. First, it gives rise to a new *technological system*, as the initial breakthrough is adopted and further developed into new products through incremental innovation. Second, it establishes **a *techno-economic paradigm*** defined by new business models that lower production costs, increase productivity, and boost profitability, and hence enable the widespread application of new technologies. Perez highlights **the crucial role of finance** in driving experimentation with new technologies. Equally important is **the role of the state** in setting a clear *direction* for innovation and ensuring that technological revolutions are deployed for the benefit of society through effective **policy and regulation**.

But the role of the state is not limited to that. Another influential economist, Mariana Mazzucato, reminds us that the state has historically been a major innovator, which often made high-risk investments before the private sector stepped in. Public investment in foundational technologies – as was the case for GPS and the internet – often lays the groundwork for corporate innovations. In this light, the state can play a major role in shaping markets and set the direction of economic growth, for example, by pursuing mission-oriented objectives such as the green transition. Mazzucato actively works with governments across the world to build state capacity for innovation and dynamic capabilities within public administration to catalyse long-term public value.

Windows of opportunity for developing countries

Both Perez and Mazzucato understand innovation as a fundamentally political and social process. But while our conceptualisation of innovation is heavily influenced by the history of industrialisation and technological change in the West, what are the prospects of innovation in the developing countries, where both finance and state capacity are weaker? Concerned with the technological dependency that characterises developing economies – as observed in the context of import substitution industrialisation in her home country, Venezuela – Perez shifted her attention to windows of opportunity presented by the segmentation of markets and global networks of production in value chains. While that stands true for India and the ICT revolution, in the current race for AI - perhaps the last iteration in the ICT revolution - the windows of opportunity may well be shrinking.



This has less to do with technology than with a structural transformation within contemporary capitalism itself. Apart from opportunities in offshore manufacturing, the development of global value chains had the parallel effect of concentrating knowledge and innovation capabilities into a small group of global firms. This is the shift that Cecilia Rikap uncovers as the rise of intellectual monopoly capitalism: a system in which leading corporations capture and control the production and diffusion of knowledge across global networks. The concentration of knowledge as intangible assets is a phenomenon that has intensified dramatically in the first decades of the 21st century: by 2020, intangible assets accounted for over 90% of the total assets of S&P500 companies, up from just 17% in 1975. Rikap highlights the disproportionate power that leading digital economy companies – such as Amazon, Microsoft, Google, as well as Chinese ones like Alibaba, Tencent or Huawei – wield over innovation, through exclusive access to data and proprietary algorithms and the ability to appropriate and privatise knowledge produced within broader innovation networks. Moreover, the processing of these unprecedented and ever-increasing amounts of data comes at a great environmental cost.

Innovation for innovation's sake?

This brings us to a crucial point. Between the optimism of Perez and Mazzucato and the structural analysis of Rikap, our task is to remain critical and pragmatic. Innovation is not neutral as it operates within the broader dynamics of capitalism and uneven development that ultimately shape people's lives. Beyond product-, firm-, sector- and even technological- innovation, how can we cultivate a more systemic understanding of innovation? Are we simply innovating for innovation's sake? Can we shape the direction of innovation to support sustainable development goals and respect planetary limits? What, ultimately, is the purpose of innovation, and what do we risk missing if we don't question its direction?

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