**Towards a technology-driven economy**

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In today’s world, technology has emerged as the driving force behind socioeconomic development. Its transformative impact is evident across various sectors, influencing economic growth, education, healthcare and governance.

Many disruptive technologies are changing the way we live, work, manufacture, and commute. One such highly disruptive innovation has been the internet.

The internet has evolved into a global platform that connects individuals, businesses and governments. E-commerce platforms like Amazon and Alibaba have disrupted traditional retail, while social media networks like Facebook and Twitter have reshaped communication, advertising, and even political discourse.

Mobile innovations have revolutionized industries such as finance (mobile banking), healthcare (telemedicine), and education (e-learning). Mobile technology has also empowered individuals in remote and underserved areas, providing access to information, services, and economic opportunities that were previously out of reach.

Disruptive innovations in telecommunications, particularly the expansion of 4G and 5G networks, are transforming connectivity on a global scale. These technologies go beyond facilitating faster internet speeds; they enable the Internet of Things (IoT), smart cities, and a host of applications that enhance efficiency and connectivity. For example, the M-Pesa mobile payment system in Kenya has revolutionized financial services, particularly in regions with limited access to traditional banking.

Another important disruptive innovation has been that of renewable energy technologies such as solar and wind power that have far-reaching implications for both environmental sustainability and socioeconomic development. These innovations challenge traditional energy sources and contribute to the transition to a more sustainable and eco-friendly energy landscape.

Countries investing in renewable energy, like Germany with its Energiewende policy, are not only reducing their environmental footprint but also fostering new industries and creating jobs in the renewable energy sector.

But perhaps the most important disruptive forces to emerge in the last two decades have been Artificial Intelligence (AI) and machine learning (ML). They represent disruptive innovations that are reshaping the future of work and productivity. From automation in manufacturing to algorithmic trading in finance, AI and ML are influencing various sectors.

While these technologies enhance efficiency and decision-making, they also raise concerns about job displacement. However, when harnessed strategically, AI and ML have the potential to create new job opportunities, particularly in areas such as data science and AI development.

Blockchain technology, initially developed as the underlying technology for cryptocurrencies like Bitcoin, is now disrupting and transforming many industries. Blockchain applications in finance (smart contracts), supply chain management, and healthcare (secure health records) have the potential to streamline processes, reduce fraud, and create more efficient systems that contribute to socioeconomic development.

We are also on the verge of witnessing a huge transformation in the transportation sector by the advent of lectric vehicles. Companies like Tesla, Google’s Waymo, and traditional automakers are investing heavily in autonomous vehicle technology. Beyond the convenience of self-driving cars, the impact extends to logistics, public transportation, and urban planning.

Autonomous vehicles have the potential to enhance road safety, reduce traffic congestion, and create new business models in the transportation sector.

Another transformative technology is that of precision agriculture. Driven by disruptive innovations such as GPS technology, sensors, and data analytics, precision agriculture is revolutionizing the way we approach farming. These technologies enable farmers to optimize resource use, monitor crop health, and increase yields. By embracing precision agriculture, Pakistan can address the challenges of food security, reduce environmental impact, and create more sustainable agricultural practices that contribute to overall socioeconomic development.

One good example of how the use of high technology has transformed nations is that of South Korea. The country’s rapid transformation from a poor, war-torn nation to an economic powerhouse is closely linked to its technological advancements. Investments in research and development (R&D), coupled with a strong emphasis on education in science and engineering, have propelled South Korea to the forefront of the global technology landscape. Companies like Samsung and LG have become synonymous with innovation, driving economic growth and shaping South Korea’s global influence.

China presents another excellent example. The country has executed a vibrant and dynamic policy of technological leapfrogging, thereby rapidly advancing from an agrarian society to a global tech leader. China’s investments in areas such as artificial intelligence, 5G technology, and e-commerce have positioned it as a major player in the Fourth Industrial Revolution.

The integration of technology into various facets of Chinese society has not only boosted economic development but also contributed to advancements in healthcare, infrastructure, and urban planning.

Turning to Africa, we find that Rwanda presents a good example of how the use of technology is propelling it forward. It has emerged from the genocide of 1994, and the country’s commitment to digital infrastructure, including widespread internet access, has facilitated advancements in healthcare, education, and entrepreneurship.

Rwanda’s innovative use of drones for medical deliveries and the establishment of tech hubs demonstrate how technology can bridge gaps and contribute to the overall development of a nation. From economic powerhouses like China and South Korea to smaller nations like Rwanda, the strategic use of technology has facilitated advancements in various sectors.

For Pakistan, to chart a similar course, we need to invest in and harness the power of technology for sustainable and equitable socio-economic development. To do so we must prepare the foundations by investing in quality education, science, and innovation. We must also create an ecosystem in which private enterprises can flourish and expand, creating hundreds of thousands of new jobs in high tech fields. For the first time in the history of Pakistan, a provincial government has quietly taken the lead in this respect and has begun to set aside a sizeable amount of funds towards developing a knowledge-based economy.

Under the visionary leadership of its former chief minister Murad Ali Shah and under the patronage of Mr Bilawal Bhutto-Zardari, the Sindh government has started contributing a huge sum of Rs22 billion to strengthen its universities and research centres so that they can better contribute to the process of socio-economic development.

The contributions of Dr Azra Pechuho in health education and research that have led to the development of the first forensic science centre, a virology centre and many others in Karachi University, deserve our unreserved praise. Kudos to Sindh. Other provinces must follow the same path.

At the national level, there is stagnation with the operational budget of all government universities frozen at about Rs66 billion for the last six years, despite the Herculean efforts of the Higher Education Commission (HEC) to procure proper funding. This has resulted in the transformation of our universities to colleges as their funding has been reduced by 70 per cent in real terms due to inflation and devaluation.

What is needed is a visionary, honest technocrat federal government that can propel this nation to a technology driven knowledge economy.

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