POLICY BRIEF

Youth Innovation for SDGs in the 4th Industrial Revolution

Introduction

The Fourth Industrial Revolution (4IR) is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres, collectively referred to as cyber-physical system.[1] It is marked by emerging technological breakthroughs in a number of fields, including artificial intelligence, robotics, the internet of things, quantum computing, nanotechnology, additive manufacturing, 3D printing, and ever improving internet and processing speeds.

The emergence and proliferation of new technologies offers the potential to aid sustainable development through new and more efficient ways to meet the needs of a growing world. Nimble and innovation driven start-ups may be able to more efficiently deliver the same services as existing giants, and new markets can be created for goods and services that do not yet exist, thereby offering immense opportunities for start-ups. However, there are also risks on the horizon that will need to be navigated, particularly around labour dislocation and exacerbating inequalities.

Opportunities of frontier technologies

Similar to previous industrial revolutions, the Fourth Industrial Revolution has the potential to improve people's quality of life economically, socially, and environmentally. 4IR is expected to become the key driver of economic growth, improving labour productivity, lowering transaction costs and revamping barriers to market entry. A new economic shift is driving from machine learning and artificial intelligence, to analytics, and cyber security developments such as blockchain.[1] These technologies offer new ways of doing business. For example, 3D-Printing enables most start-ups to implement and sell ideas with a minimum initial investment. Start-up entrepreneurs with new ideas can now bring the product to reality with 3D-Printing with a lower cost of initial capital.

Additionally, Artificial Intelligence (AI) can improve the efficiency of many industries through automation and offer more precise actions guided by data. Already, AI is being used to detect health conditions early, and to develop more customized treatment based on individual circumstances, thus creating opportunities for new businesses to offer personalized and bespoke solutions. The increased proliferation of the Internet and internet connected devices (the Internet of Things) allows real time collection of data and rapid interventions when necessary, for example in the regulation of traffic flows in cities or workarounds in production processes. These innovations have potential benefits for both businesses and society, and policies that align the Fourth Industrial Revolution with the SDGs offer us opportunities to do both.

These technologies can also represent opportunities for start-ups to 'disrupt' the market and compete for market share with existing dominant incumbents by delivering a better product or leveraging efficiency-gaining technologies. Applying these technologies to specific problems can also generate new markets entirely, offering opportunities for innovation driven start-ups.

Challenges for Young Innovators

For these opportunities to be realised, the rules of the market must be fair. Anti-competitive practices such as barriers to entry, and unregulated monopolies pose a risk for start-ups to be able to bring new innovations to the market and compete on a level playing field, therefore reducing the innovation output for the economy and squandering the potential of young innovators.

New opportunities for young people are even more important in the context of declining traditional employment opportunities. Persistently high youth unemployment rates are now common across many regions of the world. In the Asia-Pacific region, 220 million people aged 15-24 are not in education, training or employment.[2]

Furthermore, the rise of automation will exacerbate the challenge of unemployment. In the Republic of Korea, which has the highest robot density in the world, the decline of jobs for young people has spread from manufacturing industries to professional and clerical jobs as well, even whilst the country enjoys relatively robust economic growth.[3] A key driver of this increasing unemployment has been labour saving technologies.

As it is less costly for firms to reduce recruitment of new staff rather than laying off existing staff, the impact of technological unemployment is disproportionately affecting young people trying to enter into the labour market. Whether technology generates more jobs in the aggregate and in the long term is still uncertain; however even if in the long term there is a net positive effect, the dislocation of employment in the near future is of important concern to the current generation of young people, particularly given the important role that entry-level positions play in setting up a longer-term career.

Sustainable and Inclusive 4IR

A unique aspect of this industrial revolution compared to previous industrial revolutions is that it is happening in a context where the discussion on social and environmental impacts are being connected to technology. This link is evident in the rise of social enterprises and impact investing, as well as the adoption of the Sustainable Development Goals and the identification of technology and innovation as crucial to the achievement of these goals.

The imperative to "leave no one behind" and of "sustainability" is just as relevant in the digital world. Inclusion in the context of the 4IR lead us to address inequalities in the technology and innovation process, for example the drastic gender disparities in the technology sector and the embedding of biases in AI. At the same time, the legacy of climate change as a result of the first and second industrial revolutions reminds us that unintended consequences and negative externalities of technologies can leave lasting environmental damage if not mitigated.

Technological inequality is one risk that is becoming more apparent. The digital divide is already well documented as one source of technological inequality. More evidence has also been found of another form of technological inequality, one that increases the share of national income towards capital and away from labour. IMF data shows around half of the decline in labour's share of income in advanced economies is due to technology.[4] Research also shows that due to network effects that can mimic monopoly characteristics, there is a phenomenon of 'winner takes all' or 'winner takes most' where a dominant player crowds out competitors large or small.

Given this context, there are a number of policy areas that can be considered to shape 4IR towards a more sustainable and inclusive path:

- improving the functioning of a competitive market and enabling new start-ups to enter
- reforming education and training to upgrade the skills of young people
- incentivising the inclusion of underrepresented groups in the development of new technologies
- enhancing social protection systems to meet the needs of those increasingly being left behind by new technologies
- foster innovation and entrepreneurship that are aligned with the SDGs

Discussion Questions

- How can start-up developers maintain their competitive edge in the new digital economy?
- What key technologies have inherent potential to contribute to social and environmental progress, and how can they be further honed by current start-up ecosystems?
- What policies are necessary to ensure that start-ups have a level playing field to compete?
- How can start-ups better access relevant and necessary data to better compete in the market?
- What are some of the ways in which young people are already taking advantage of the demand for new technologies to disrupt industries?
- How do we mitigate against some of the risks, particularly given 'winner takes all' or 'winner takes most' effects?

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[1] *The Fourth Industrial Revolution: what it means and how to respond*, World Economic Forum, 2016. https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

[2] *Technological Change & The Future of Jobs*, UNDP, 2018, in press.

[3] *Why Korea's Youth Unemployment Rate Rises*, KDI, 2017.

[4] World Economic Outlook, International Monetary Fund, 2017

The Citypreneurs Policy Briefs aim to provide a background introduction on topics to be discussed at Citypreneurs to generate forward-looking discussions among key stakeholders. The views and options expressed in the briefs are the author's own and do not necessarily reflect the official policy of the UN.

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