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Digital development: Opportunities and challenges

Note by the UNCTAD secretariat*

Executive summary

The rapid spread of digital technologies is disrupting production and trade, generating both opportunities and challenges for sustainable development. Based on a set of guiding questions received from member States, this note discusses the implications of digitalization and frontier technologies, notably in the areas of productivity, trade, employment and inequality. It concludes with a few policy recommendations for consideration by the Trade and Development Board, in particular the need for a holistic approach to policymaking at the national level, continued dialogue on possible regional and global solutions in key policy areas, improvement of women's access to opportunities offered by the digital economy and more concerted efforts to assist countries in their quest for digital readiness.

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I. Towards a new digital era

1. Digitalization has developed rapidly since the adoption of the Tunis Agenda for the Information Society in 2005. In 2018, the number of persons using the Internet exceeded half the global population for the first time. The capabilities of digital networks and devices are much greater today, and many new technologies and services have been developed, deployed and become pervasive since the World Summit on the Information Society.¹ As a result, the stakes for development are also higher.

2. As more and more people use new applications and devices more intensively and for more activities, and Internet-of-things devices and services proliferate, data have become a critical development resource. The ability of countries to access, collect and refine digital data increasingly determine the effectiveness with which frontier technologies can be deployed to support the Sustainable Development Goals.

3. It is widely recognized that digitalization has unleashed a new wave of innovation that will have profound implications for humanity, changing relationships between citizens, Governments and businesses, and that will alter the structure of societies and economies. Growth, productivity and human development will increasingly be determined by the level of integration into the digital economy. Indeed, digitalization and frontier technologies not only create new opportunities for doing business, they also bring about a number of challenges and risks.²

4. Digital technologies and platforms can reduce transaction costs for businesses and facilitate access to new customers, both in domestic and foreign markets. For example, suppliers that rely more on e-commerce may be able to cut delivery costs, especially for digitally provided content. Further, digitalization can enhance the productivity of enterprises and offer new opportunities for entrepreneurship, innovation and job creation. It can help businesses, in particular micro-, small and medium-sized enterprises, to overcome barriers to expansion and enable them to engage in peer-to-peer collaboration in innovation and use alternative funding mechanisms such as crowdfunding. In addition, new cloud-based solutions can reduce the need for investing in information technology equipment and corresponding in-house expertise. E-commerce can facilitate the scaling-up of such enterprises by providing financing opportunities and the means to build verifiable online transaction records that may help to attract new customers and business partners. Digitalization also plays a central role in extending the reach and impact of frontier technologies, many of which show great potential to enable the achievement of the Sustainable Development Goals. Artificial intelligence, big data, cloud computing, machine learning and algorithmic decision-making are all powerful instruments of change.

5. The roll-out of digital technologies also poses challenges, costs and risks. Uneven access to affordable digital technologies and limited capacities to make effective use of them can lead to an inequitable distribution of benefits. In particular, it may bypass people with limited education and low levels of literacy; people in rural areas; people with limited capability or rights to connect; and micro-, small and medium-sized enterprises. There is concern that the widespread use of new technologies, automation and online platforms will lead to job losses, growing income inequality and a greater concentration of market power and wealth. It may also have negative impacts on the bargaining power of users, consumers and workers and result in the loss of privacy. Moreover, companies, organizations, Governments and individuals should be prepared to respond to digital forms of undesirable behaviour – some of it criminal – that will move to the digital sphere. Finally, frontier technologies raise legal, regulatory and ethical challenges regarding the growing decision-making power of devices and algorithms using machine learning and large-scale data analysis.

¹ A/74/62-E/2019/6.

² UNCTAD, 2017, *Information Economy Report 2017: Digitalization, Trade and Development* (United Nations publication, Sales No. E.17.II.D.8, New York and Geneva); UNCTAD, 2018a, *Technology and Innovation Report 2018: Harnessing Frontier Technologies for Sustainable Development* (United Nations publication, Sales No. E.18.II.D.3, New York and Geneva).

6. The following sections focus on the opportunities and challenges of digitalization and frontier technologies in the areas of productivity, trade, employment and inequality.

II. Productivity growth

7. Manufacturing, services, transportation and even agriculture are turning to an expanding variety of digital technologies. Underlying technologies and processes have far-reaching implications for the organization of work, production and trade, extending existing organizational and geographic fragmentation into knowledge-intensive business functions and job categories. Companies that engage in digitalization can make their organizations more efficient, reach and serve customers more easily, speed up product development, and invent products and services at lower cost, without the need for extensive system-level expertise or in-house information technologies skills.

8. However, measuring the impact of digitalization on productivity remains difficult, and different studies reach different conclusions.³ Some studies have found that selling online boosts productivity, with the greatest impact on small enterprises and in services. Other studies highlight the importance of scale and network effects, as well as complementary factors, such as skills and organizational change. Yet other studies have failed to find strong productivity effects and argue that the world may be witnessing a return of the productivity paradox.

9. There are substantive statistical gaps and other challenges in measuring the impact of digitalization on productivity. It also takes time for technologies to diffuse and for benefits to become visible and measurable. Only a limited number of enterprises have fully embraced digitalization so far, with micro-, small and medium-sized enterprises in developing countries the farthest behind. Thus, the full productivity effects will only show up in statistics once countries and firms transition from the installation phase to the deployment phase of the digital economy.

III. Expanding global trade

10. Digital platforms are creating new opportunities for companies to engage in trade, including for micro-, small and medium-sized enterprises. They can facilitate efficiency gains through lower transaction costs and reduced information asymmetries supported by rating systems. This results in lower consumer prices, increased market access, more competition, better use of underutilized resources and increased flexibility for services providers. Both individuals and enterprises ordering or selling goods and services online across borders contribute to international trade and cross-border e-commerce.

11. According to UNCTAD statistics, global e-commerce sales grew by 13 per cent in 2017, reaching an estimated \$29 trillion. A similar surge was seen in the number of online shoppers, which increased by 12 per cent and stood at 1.3 billion people, or one quarter of the world's population. Though most Internet buyers purchased goods and services from domestic vendors, the share of those buying from abroad rose from 15 per cent in 2015 to 21 per cent in 2017. As a result, cross-border business-to-consumer sales attained an estimated \$412 billion, accounting for almost 11 per cent of total business-to-consumer e-commerce, up from 7 per cent in 2015. While business-to-business e-commerce continued to dominate, accounting for 88 per cent of all online e-commerce, the business-to-consumer segment experienced the largest growth, increasing by 22 per cent to reach \$3.9 trillion in 2017.⁴

12. Another illustration of the impact of digitalization on global trade is the expansion of exports of services that can be delivered digitally, such as insurance, business processes or

³ UNCTAD, 2015, *Information Economy Report 2015: Unlocking the Potential of E-commerce for Developing Countries* (United Nations publication, Sales No. E.15.II.D.1, New York and Geneva).

⁴ Calculations based on UNCTAD research.

financial services. In the past decade, they grew annually by 7–8 per cent and amounted to \$2.7 trillion in 2017.⁵

IV. Changing employment and skills

13. Increased digitalization and the use of frontier technologies is expected to have disruptive effects on jobs and skills.⁶ It will lead to the creation of some new jobs and occupations in various sectors, especially in relation to the production of new goods and services or the modification of existing products. At the same time, there is a risk that many tasks will become automated and/or outsourced, making other jobs obsolete and substantially changing the nature of work. Finally, digitalization may change the conditions of work. For example, online labour platforms matching tasks across the whole skills spectrum are expected to transform labour markets by favouring more flexible contracts and increasing competition among workers, possibly resulting in reduced incomes and social protection.

14. Opinions differ widely on what will be the likely overall impact of digitalization on aggregate employment, and whether job creation will outweigh job destruction. There are also some signs of job market polarization due to technological innovation, and some studies point to a higher relative risk of unfavourable impacts on women. However, while all sectors will undergo change, implications will vary considerably between sectors and countries, depending on their level of digitalization and the structure of their economies.

15. In any event, all countries will face the challenge of enabling lifelong learning so that workers can shift between occupations in the course of their careers, as digitalization makes adaptive skills ever more valuable. New skills are needed to take full advantage of the opportunities arising from new technologies – from sophisticated data analysis and algorithm development skills, computer skills required to adapt systems and develop services for local markets, through those required within businesses and other organizations, to the digital and media literacy required by individuals to find information, assess its quality and value, and use online resources. Greater participation by women in the science, technology, engineering and mathematics disciplines, where they are currently underrepresented, would help derive more value from digitalization.

V. Risk of widening inequalities

16. With regard to bridging inequalities in the developing world, digitalization brings both opportunities and risks.⁷ An optimistic vision of the evolving digital economy might emphasize the ubiquity and democratization of information, ushering in a new, equitable and environmentally sustainable growth model based on the maximization of human empowerment and well-being rather than on profits. Companies that engage in digitalization may benefit from new business opportunities and lower market entry costs, increasing the potential for economic development.

17. At the same time, there are growing concerns that new technologies will disrupt entire industries, widen existing income inequalities and lead to a further concentration of power and wealth. With the increased scope for computerization, automatization and the use of artificial intelligence, more occupations and tasks may disappear, even as output and productivity rise, bringing higher returns to capital.

18. Winner-takes-all dynamics in platform-based industries such as Google, Uber, Facebook and WeChat, where network effects accrue to first movers and standard setters, can accentuate polarization in the industrial base. Moreover, greater ability to exploit new technologies⁸ relative to others with access to the same resources and technologies will

⁵ Calculations based on UNCTAD research.

⁶ UNCTAD, 2017; UNCTAD, 2018a.

⁷ UNCTAD, 2017.

⁸ For example, collecting and analysing data and turning them into business opportunities.

increasingly drive competitiveness and benefits from the digital economy. Key digital companies are currently concentrated geographically in a handful of countries, led by China and the United States of America.

VI. Policy recommendations

19. The digital economy is creating new opportunities and challenges for trade and development, and net gains are neither automatic nor likely to be evenly distributed. The Trade and Development Board may wish to consider the following policy recommendations:

(a) With a view to securing the benefits from and minimizing the risks of digitalization, Governments should take a holistic approach that involves multi-stakeholder dialogue. In addition, national policies and strategies should focus on harnessing digital data for development by developing relevant infrastructure, skills and regulations;⁹

(b) The need for regional and international policy responses to issues related, for example, to competition, consumer protection, data ownership and protection, privacy, taxation and trade in the digital economy should be further discussed;¹⁰

(c) Women's access to opportunities offered by the digital economy should be improved to narrow the digital gender divide and give more women the possibility to earn additional income, increase employment opportunities and access information;

(d) To prevent the evolving digital economy from exacerbating digital divides and income inequalities, more concerted efforts should be made to help countries strengthen their readiness to capture the opportunities arising from digitalization, including through effective donor dialogue and by leveraging the eTrade for all initiative, led by UNCTAD, and rapid eTrade readiness assessments.

⁹ UNCTAD, 2018b, Digitalization and trade: A holistic policy approach is needed, Policy Brief No. 64, April.

¹⁰ UNCTAD, 2019, Making digital platforms work for development, Policy Brief No. 73, March.