United Nations TD/B/EDE/3/2

United Nations Conference on Trade and Development

Distr.: General
23 January 2019

Original: English

Trade and Development Board
Intergovernmental Group of Experts on E-commerce and the Digital Economy
Third session
Geneva, 3–5 April 2019
Item 3 of the provisional agenda

The value and role of data in electronic commerce and the digital economy and its implications for inclusive trade and development*

Note by the UNCTAD secretariat

Executive summary

The present note addresses the increasing role of data in electronic commerce and the digital economy, in the context of digital and data divides within and between countries. A data-driven economy gives rise to new opportunities for wealth creation and for addressing development challenges, but it also raises various potential concerns related to, for example, data privacy and security, cross-border data flows, market concentration and taxation. Transforming these opportunities and challenges into inclusive trade and development requires adequate policy responses at the national and international levels. The note concludes with a set of guiding questions decided by member States at the second session of the Intergovernmental Group of Experts on E-commerce and the Digital Economy.

* Mention of any firm or licensed process does not imply the endorsement of the United Nations.

GE.19-01129(E)

1901129

Introduction

1. At its sixty-fifth session, part I, held from 4 to 8 and 25 and 26 June 2018, the Trade and Development Board decided that the focus of the third session of the Intergovernmental Group of Experts on E-commerce and the Digital Economy should be on the value and role of data in electronic commerce (e-commerce) and the digital economy and its implications for inclusive trade and development (see TD/B/65(1)/9, annex IV).

2. The evolving digital economy is characterized by the emergence of a platform-based ecosystem of digital products and services that are developing through a combination of widespread and continuous measurement and data collection by the Internet of things, data flowing from user's data as well as from sensor-laden factory automation systems and ubiquitous, Internet-connected user devices. This is generating "big data" pools that can be mined and analysed for patterns and correlations that would otherwise remain hidden. The results can be fed into systems where artificial intelligence, machine learning and automated decision-making are used to upgrade system elements and even an entire system. Platforms hosted by players such as Alibaba, Amazon, Apple, Facebook, Google, Microsoft, SAP, Tencent and others already have big data at the centre of their business models.

3. Data obtained from the use of digital technologies can provide new sources of knowledge, innovation and profits, if analysed effectively and transformed into intelligence. For example, detailed data collected from the behaviour of platform users and online consumers can allow platform owners to innovate and offer new, better and/or more customized products and services that can be monetized. Data analytics can also be used to support progress towards the 2030 Agenda for Sustainable Development.

4. Gains, however, are not automatic, and there are various concerns related to data-driven developments. Watchdogs, regulators and consumers are increasingly expressing concerns about the implications for security, privacy and ownership and of the use of personal data. Moreover, growing reliance on data, combined with strong network effects, can give companies that control the data considerable market power, raising the risk for market dominance and anti-competitive behaviour.

5. As trade is increasingly becoming digitalized, cross-border data flows are becoming more important for international transactions. Activities affected by digitalization go beyond online trading and supply chain coordination, to using information and communications technologies (ICTs) for the integration of a wider range of activities into single systems, thus making value chains increasingly data driven.

6. Against this background, chapter I of the present note looks at the increasing importance of data in e-commerce and the digital economy. Digital and data-related divides are addressed in chapter II two. Chapter III discusses the value of data. Chapter IV looks at the specific challenges of data privacy and security, market concentration and the implications for raising government revenue. Policy and regulatory implications regarding data protection, regulation of cross-data flows and competition and taxation policies are explored in chapter V. Chapter VI focuses on possible needs for capacity-building related to data analytics and artificial intelligence, while chapter VII concludes with a set of guiding questions.

I. The increasingly important role of data in the digital economy

7. Global Internet Protocol traffic, a proxy for data flows, has grown dramatically in the past two decades. In 1992, global Internet networks carried approximately 100 gigabytes (GB) of traffic per day. Ten years later, global Internet traffic amounted to 100 GB per second. By 2017, global Internet Protocol traffic had surged to more than 45,000 GB per second, due to both qualitative and quantitative changes in the content of

Internet traffic. By 2022, at 150,700 GB per second, global Internet Protocol traffic is expected to be 75 times the volume it was in 2007.[1]

8. A novel aspect of the digital economy is the aggregation of large amounts of data in the cloud. Digitalization allows data to flow from all corners of industry and society, not only from sensors built into production lines, but also from electric meters, security cameras, customer service call logs, online clicks, point-of-sale registers, status updates on social media and post reactions (such as "likes"). Access to and analyses of data are becoming crucial for the competitiveness and expansion of companies across sectors. Manufacturers and exporters increasingly depend on data analytics, not only because they have digitized their operations, but also because they use support services that require access to data, such as shipping and logistics, retail distribution and finance.

9. The shift towards cloud computing can be seen as a step change in the relationship between telecommunications, businesses and society as a result of massively enhanced processing power, data storage and higher transmission speeds, accompanied by sharp price reductions. For example, the average cost of 1 GB storage capacity fell from more than $400,000 in 1980, to $0.02 in 2016.[2] Users can access a scalable and elastic pool of data storage and computing resources as and when required.

10. The externalization and aggregation of computing resources and data storage in the cloud allow data to be pooled and analysed in vast quantities. It also reduces the costs for small businesses of accessing information-technology hardware and software and does not require developing information-technology skills in-house. Cloud-based applications can provide a convenient way for firms to integrate their operations and management into applications available across multiple sites and devices.

11. The Internet of things concerns the extension of connectivity beyond people and organizations to objects and devices. Sensors are currently embedded at low cost in robots and production equipment, as well as in operator wearable devices, industrial vehicles, buildings, pipelines and household appliances. Falling prices of sensors that can continuously transmit small volumes of data, with low power requirements, have made this possible.[3] Wireless transmission allows remote devices to link easily to larger systems. Since data are collected continuously in real time, from multiple sources and at multiple points in a system, vast amounts of data can be accumulated. In this context, the main characteristics of big data are volume, velocity and variety.

12. Internet of things devices send information to be stored and processed in the cloud and streamline processes and information flows. According to one estimate, approximately 500 billion Internet of things devices will be deployed by 2030.[4]

13. The increasing importance of data in the economy raises various questions related to the implications for inclusive trade and development of digital and data divides. These are discussed in next chapter.

II. Digital divides

14. The ability of actors in developing countries to benefit from increasingly data-driven e-commerce and digital economy is affected by their capacity to access and use ICTs in an affordable manner. Significant gaps persist in these areas, both between and within countries.

[1] Cisco, 2018, Cisco visual networking index: Forecast and trends, 2017–2022, White paper.

[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).

[3] Kshetri N (2017). The economics of the Internet of Things in the global South. Third World Quarterly, 38(2): 311–339.

[4] Cisco, 2016, Internet of things, At-a-glance. Available at https://www.cisco.com/c/dam/en/us/products/collateral/se/internet-of-things/at-a-glance-c45-731471.pdf.

15. According to the International Telecommunication Union, 51.2 per cent of the global population were using the Internet at the end of 2018. Thus, slightly less than half of the world population remains offline. In the least developed countries, less than 20 per cent of persons were using the Internet, compared to more than 80 per cent in developed countries.[5]

16. The digital economy can allow microenterprises and small and medium-sized enterprises to increase their access to markets and productivity. However, many microenterprises and small and medium-sized enterprises, especially in rural and remote areas, are ill prepared to engage in and benefit from e-commerce and the digital economy, including data collection and analysis. They face barriers such as limited access to affordable digital and data infrastructure, payment solutions, trade logistics, skills, consumer and data protection and financing of digital entrepreneurship. Another aspect of the digital divide is that most data centres are located in developed countries.[6] The UNCTAD business-to-consumer e-commerce index is one illustration of the divides that exist in the preparedness of countries to engage in e-commerce and the digital economy (table 1).[7]

Table 1
UNCTAD business-to-consumer e-commerce index: Regional values, 2018

	Share of population using the Internet[a] (%)	*Share of population with an account[b] (% of population, aged 15 and above)*	*Availability of secure Internet servers[c] (normalized)*	*Postal reliability index[d]*	*Index value (2017 data)*
Africa	26	40	29	24	30
East, South and South-East Asia	48	62	57	62	57
Latin America and the Caribbean	54	53	54	24	46
Western Asia	71	58	51	42	57
Transition economies	65	59	65	71	65
Developed	84	93	88	81	86
World	54	60	56	49	55

Source: UNCTAD secretariat calculations, based on data from 2017 or the latest available data.

[a] International Telecommunication Union.

[b] World Bank, account ownership at a financial institution or with a mobile money service provider.

[c] Netcraft.

[d] Universal Postal Union.

17. The evolving digital landscape offers women entrepreneurs new opportunities to strengthen their businesses and become more effective. At the same time, there is evidence of a "gender digital divide" that excludes women entrepreneurs from the opportunities and benefits of a data-driven economy, due to lack of literacy, skills, access, resources and other factors. The gender gap is more pronounced in developing countries, particularly in the least developed countries. In 2017, the proportion of women using the Internet worldwide was
12 per cent lower than that of men, while in the least developed countries, only one in seven women was using the Internet compared with one in five men.[8]

[5] International Telecommunication Union, 2018, Statistics, global and regional estimates, 7 December. Available at https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx (accessed 18 January 2019).

[6] Based on data available at https://www.datacentermap.com/ (accessed 21 January 2019).

[7] The index measures the readiness of countries to engage in online commerce.

[8] International Telecommunication Union, 2017, ICT facts and figures 2017, available at https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2017.pdf.

18. With the world becoming more digital, youth are the drivers in connectivity and online platforms. About 71 per cent of youth worldwide are online.[9] As a result of digitalization, there is a rise in use of social media and electronic trade, as well as increasing exposure to online risks. Youth's creativity and innovation translate business ideas into solutions for inclusive trade and development, but their achievements hinge on the opportunities available to engage in decent work. Young people are considered "digital natives". However, they do not necessarily possess the skills needed to seize job opportunities emerging in the digital economy.

19. Digital divides are due to factors such as insufficient access and affordability, lack of technical and digital skills, including on data analytics, absence of relevant content or local language content and safety concerns. One of the great challenges of digitalization is therefore to achieve inclusion so that no one is left behind. Addressing these divides is important to attain inclusive trade and development objectives. Unless properly tackled, digital and data-related divides between and within countries will widen, exacerbating existing inequalities. This will require significant capacity-building efforts, including skills development, at the national, regional and international levels, as discussed in chapter VI.

III. The value of data in electronic commerce and the digital economy

A. Data monetization

20. Digital data are becoming an essential input in decision-making, production processes, transactions and relationship management across an ever-increasing swath of the agricultural, manufacturing and services sectors. As the digital economy evolves further, data will become even more inextricably interwoven with all aspects of the world economy, including the functioning of the Internet, global value chains and international trade.

21. Big data are opening doors for analysis, value creation and the application of artificial intelligence. Big data can be "mined" for insights that enable data-driven decision-making by businesses, government agencies and persons or organizations with access to the data and the means to carry out further analysis. Big data can lead to new levels of understanding of business and social dynamics.

22. The value of digital data arises once data are transformed into "digital intelligence". Under new business models that have emerged, global digital platforms create value by aggregating and analysing data. This value can then be monetized in various ways:[10]

(a) Platform user data can be leveraged to provide targeted advertising services (e.g. Google, Facebook).

(b) Data from the Internet of things and sensors can be used to support innovation and to make supply chains more efficient (e.g. Caterpillar, Rolls Royce).

(c) E-commerce platforms can use data collected from sellers and buyers on their platforms to offer better services or to raise fees for using the platforms (e.g. eBay, Jumia, Amazon).

(d) Companies can sell or rent out, as a service, the infrastructure or software needed to operate in a data-driven economy (e.g. Amazon Web Services).

23. Although some digital platforms may provide many services and products free of charge, consumers and users end up paying in the form of giving firms and application developers detailed information, sometimes unknowingly, about their location, preferences, relationships and personal habits. It is this knowledge that can be monetized.

[9] United Nations Children's Fund, 2017, *The State of the World's Children: Children in a Digital World*, New York.

[10] Srnicek N, 2016, *Platform Capitalism*, Polity Press, Cambridge.

24. Data are invaluable in terms of gaining a competitive advantage. This is why platform providers are often happy to provide services in return for data rather than money. In the digital economy, there is also a centralizing flow of data. It is possible to distinguish between raw data produced by raw data suppliers (for example, users of Facebook), value added data products produced by data companies (Facebook) and the consumers of digital products. Data are then given back to users and sold to companies seeking advertising. Thus, a global value chain for data is emerging, but, unless appropriate policies are put in place, many economies may find themselves in the low-value part of this chain and increasingly dependent on core platform owners.

25. Data monetization by global companies can have implications for developing countries in terms of lost and untaxed revenues, the increased market power of global platforms (see chapter IV), potential for misuse of personal data, underdevelopment of hosting within a country, data centres, cloud services, advertising markets and the like.

B. Potential development benefits from use of data

26. Data collection and analysis can help to manage or resolve critical global issues, assist in the creation of new scientific breakthroughs, advance human health, provide real-time streams of information (e.g. on disease outbreaks or traffic conditions), monitor natural systems, improve the efficiency of resource use, and support decision making by business people, policymakers and civil society.[11]

27. There are different ways in which big data can support sustainable development, especially when combined with mobile technologies. In sub-Saharan Africa, for instance, large sets of data on soil characteristics are mined to help determine fertilizer needs and increase productivity. For example, Bridge International Academies uses big data and algorithms to enhance early childhood and primary education in five developing countries.[12]

28. Data gathering and analysis are becoming more affordable with the availability cloud-based (on-demand) services. Small companies are able to rent cloud-based, pay-per-use data services, rather than buying expensive hardware and software systems and hiring in-house data analysts.[13]

IV. Challenges in a data-driven economy

A. Privacy and security

29. Creating trust online is critically important to seize opportunities from e-commerce and the digital economy. The handling of data is a central component of this. In the current digital world, personal data are a resource that drives much commercial activity online. How these data are used can raise concerns regarding privacy and the security of information. Recent high-profile cases with political implications helped to fuel those concerns in 2018.[14]

[11] Detailed analysis on the use of big data in health care, agriculture and other development areas is provided in UNCTAD, 2018, *Technology and Innovation Report 2018: Harnessing Frontier Technologies for Development* (United Nations publication, Sales No. E.18.II.D.3, New York and Geneva). While big data can provide opportunities for compiling indicators to support the 2030 Agenda for Sustainable Development, there are also challenges, including legal, ethical, technical and reputational challenges (see MacFeely S, 2018, The Big (data) Bang: What will it mean for compiling [Sustainable Development Goal] SDG indicators? Research Paper No. 23, UNCTAD; available at https://unctad.org/en/PublicationsLibrary/ser-rp-2018d5_en.pdf).

[12] UNCTAD, *Information Economy Report 2017*.

[13] See also http://www.un.org/en/sections/issues-depth/big-data-sustainable-development/index.html (accessed 22 January 2019), for more information on big data and sustainable development.

[14] See the 2018 article series, The Cambridge Analytica files, published by *The Guardian*, available at https://www.theguardian.com/news/series/cambridge-analytica-files (accessed 22 January 2019).

30. A 2018 survey on Internet security and trust conducted by the Centre for International Governance Innovation and Ipsos, in collaboration with UNCTAD and the Internet Society, shows growing concerns about data privacy and online security.[15] More than half of respondents in 25 economies were more concerned about their privacy online than they had been a year earlier. In the Middle East and Africa, the share of those feeling "more concerned" rose from 55 to 61 per cent. Nearly half of Internet users in North America were more concerned with their online privacy than they were the previous year, while 79 per cent said that Internet companies were the primary source of their heightened anxiety.

31. Trust in the Internet varies between countries. In many large emerging economies, such as China (91 per cent), India (90 per cent), Indonesia (88 per cent), Pakistan (87 per cent) and Mexico (84 per cent), the largest proportion of Internet users stated that they had trust in the Internet. By comparison, the corresponding shares in Japan and Tunisia were below 60 per cent.

32. Different notions of privacy and a variety of different stakeholder interests create tensions. Individuals are concerned about their right to privacy and being able to safely and confidently use online services;[16] Governments are concerned about national security and safety; and businesses are concerned about compliance burdens and regulations that may hamper innovation and trade. Concern about data privacy will also grow in developing countries, where the use of social media and other digital platforms is expanding rapidly.

33. The use of Internet of things devices raises additional privacy and security issues. These devices can record audio, video/images and location and activity in the household, the workplace and/or in public places to assist with tailoring advertisements and assist individuals with their lives or help companies or Governments improve their goods or services. This information gathering poses risks for a person's privacy if the information is misused or falls into the wrong hands. Even devices that communicate data about machines, such as information about the operation of an engine for diagnostic purposes, might betray personal information, such as the time of day a car is used and where it is driven. The absence of a traditional user interface in many Internet of things devices means that the usual process of notice and choice (i.e. consumer consent) is often unavailable.[17]

34. Internet-enabled devices also raise security concerns, as they collect sensitive information and are increasingly embedded in our surroundings. They may thus be an attractive target for people with malicious intent, either to gather information illegally or for unlawful use, or to manipulate the devices (e.g. the brakes or steering of a car). Competition to sell Internet of things devices quickly and cheaply, and to allow easy set-up, may mean that producers do not pay sufficient attention to security aspects when a device is delivered. Internet of things devices therefore sometimes lack easy processes to update software to patch up security vulnerabilities as they are discovered. Data breaches have been on the rise in recent years, reaching record numbers in 2017. More than 80 per cent of them are reported in North America.[18] For example, in 2016, hackers exploited the security vulnerabilities
of Internet-enabled home cameras and other Internet of things devices to deliver a distributed denial-of-service attack that temporarily slowed down much of the Internet in the
United States of America.[19]

[15] Centre for International Governance Innovation and Ipsos, 2018, Global survey on Internet security and trust, available at https://www.cigionline.org/internet-survey-2018 (accessed 22 January 2019).

[16] See also General Assembly resolution 68/167, on the right to privacy in the digital age.

[17] Peppet SR, 2014, Regulating the Internet of things: First steps toward managing discrimination, privacy, security and consent, *Texas Law Review*, 93:85–176.

[18] Gemalto, 2017, The year of internal threats and accidental data breaches: Findings from the 2017 Breach Level Index, available at https://breachlevelindex.com/assets/Breach-Level-Index-Report-2017-Gemalto.pdf.

[19] Shackelford SJ et al., 2017, When toasters attack: A polycentric approach to enhancing the "security of things", *University of Illinois Law Review*, 2017(2):415–475.

35. As more economic activities are digitalized, companies, organizations, Governments and individuals need to pay more attention to how they protect their online data and devices. Connecting private communications networks, industrial systems and public infrastructure to the Internet makes them vulnerable to hacking, identity theft or theft of other personal and financial information, larceny or even industrial espionage and sabotage. Finding adequate measures to protect against these threats requires shared responsibility among all stakeholders.

B. Market concentration of digital platforms

36. Digital platforms are mainly characterized by their reliance on data. Part of their market power stems from their ability to collect, process and analyse data and convert that data into digital intelligence for use in economic activities. Thus, they have the capacity to increase their competitive position. This digital intelligence represents a key asset for controlling large parts of the value of the digital economy. Whoever controls a digital platform also controls the distribution channel, and this can give the owner of the dominant platform (and data) superior information and thereby considerable market power.

37. The winner-takes-all dynamics seen in platform-based industries (e.g. Amazon, Alibaba, Google, Uber, Facebook, WeChat), where network effects accrue to first movers and standard setters, can accentuate polarization in the industrial base. Moreover, a greater ability to exploit new technologies (e.g. collecting and analysing data and turning them into business opportunities) relative to that of others with access to the same resources and technologies will increasingly drive competitiveness and the benefits accruing from the digital economy. The use of artificial intelligence can be expected to accentuate the strong market position of the few companies already in a position to leverage access to data.

38. Besides data and network effects, monopoly trends may arise from the dynamics of path dependency, which allow digital platforms to lock in users. Digital platform companies can also increase their market position by acquiring competitors or innovative firms offering complementary technologies and services. In the case of Google, the company has made more than 230 acquisitions, at times at a rate of one per week.[20] By engaging in vertical integration into other lines of business, digital platforms can outcompete rivals, imposing on them unfavourable terms and conditions or unreasonable prices.[21] The increasing market power of a few global digital platforms is reflected in different measures, such as traffic, market valuations, profits or share of intellectual property revenues. For example, 7 of the 10 largest companies in the world by market capitalization are digital companies.[22]

39. The tendency of major digital firms to acquire newcomers on the market and the considerable capital investment needed to develop a market leader position, preferably on an international scale, present considerable entry barriers for developing country companies to take full advantage of a data-driven economy. A lack of purchasing power, venture capital, Internet users and skills all act as constraints on value creation from digital data.

40. For consumers, there are also risks to consider. For example, big data, algorithms and artificial intelligence can enable instantaneous and/or individualized price discrimination, where prices are adjusted in real time based on a consumer's behaviour, perceived need for the product or service, and willingness to pay. Analyses of shopping and purchasing histories, in the context of millions of prior purchases from shoppers with similar habits, can give firms a very high level of detailed information that could weaken consumers' bargaining power.[23]

[20] Based on data from CB Insights, available at https://www.cbinsights.com/research-google-acquisitions (accessed 22 January 2019).

[21] Khan LM, 2017, Amazon's antitrust paradox, *The Yale Law Journal*, 126(3): 710–805.

[22] Pricewaterhouse Coopers, 2018, *Global Top 100 Companies by Market Capitalization*, available at https://www.pwc.com/gx/en/audit-services/assets/pdf/global-top-100-companies-2018-report.pdf.

[23] Shiller B, 2014, First degree price discrimination using big data, Working Paper No. 58, Brandeis University, United States of America.

V. Policy and regulatory implications

A. Data protection

41. The current regulatory environment for protection of data is highly fragmented.[24] Legal frameworks that protect data are often outdated or incompatible. In some cases, various pieces of legislation are introduced that are incompatible with each other. Increased reliance on cloud-computing solutions also raises questions about what jurisdictions apply in specific cases. This lack of clarity creates uncertainty for consumers and businesses, limits the scope for cross-border exchange and growth.

42. In both developing and developed countries, enforcement of privacy and security obligations is often inadequate, as authorities seek to catch up with the latest technological advances. Moreover, many developing countries still lack data protection and privacy legislation altogether (table 2). In Africa, for example, less than 45 per cent of countries have adopted such legislation, and in Oceania, no economy has data privacy legislation in place. UNCTAD has estimated that more than 400 million Facebook users reside in countries with no data protection legislation.[25]

Table 2
Share of economies with relevant electronic commerce legislation, 2018
(Percentage)

Region	*Number of economies*	*Share of electronic transaction laws*	*Share of consumer protection laws*	*Share of privacy and data protection laws*	*Share of cybercrime laws*
Developed economies	**41**	**100.0**	**87.8**	**100.0**	**100.0**
Developing economies	**135**	**69.6**	**45.2**	**41.5**	**60.7**
Africa	**54**	**55.6**	**37.0**	**42.6**	**51.9**
East Africa	18	50.0	33.3	33.3	66.7
Middle Africa	9	22.2	11.1	55.6	11.1
North Africa	6	83.3	33.3	33.3	83.3
Southern Africa	5	60.0	40.0	40.0	40.0
West Africa	16	68.8	56.3	50.0	50.0
Asia and Oceania	**48**	**72.9**	**41.7**	**35.4**	**62.5**
East Asia	4	75.0	50.0	50.0	75.0
South Asia	9	77.8	44.4	44.4	77.8
South-East Asia	11	81.8	72.7	45.5	72.7
West Asia	12	91.7	41.7	50.0	66.7
Oceania	12	41.7	8.3	0.0	33.3
Latin America and the Caribbean	**33**	**87.9**	**63.6**	**48.5**	**72.7**
Central America	8	87.5	87.5	37.5	62.5
South America	12	83.3	83.3	58.3	83.3
Caribbean	13	92.3	30.8	46.2	69.2
Transition economies	**17**	**100.0**	**17.6**	**88.2**	**100.0**
All economies	**193**	**78.8**	**51.8**	**58.0**	**72.5**

[24] For a more detailed discussion, see UNCTAD, 2016, *Data Protection Regulations and International Data Flows: Implications for Trade and Development* (United Nations publication, Geneva).

[25] UNCTAD, 2018, Global action is needed now to align digitalization and development, available at https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=1718 (accessed 22 January 2019).

Source: UNCTAD cyberlaw tracker database, available at https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Legislation/eCom-Cybercrime-Laws.aspx (accessed 26 December 2018).

43. Some Governments have begun to grapple with the security implications of the Internet of things (see box). In Germany, officials banned an Internet-enabled doll because a possible vulnerability to hacking could make it function as a concealed transmitting device. The Federal Trade Commission of the United States has sued D-Link, a maker of smart objects, alleging that the company failed to provide the advanced network security it advertised for its wireless routers and Internet cameras, thus exposing consumers to the risk of being hacked. The new Cybersecurity Law of China, effective as of June 2017, requires pre-market certification of critical network equipment and specialized security products, as well as national security reviews of critical information infrastructure. In the European Union, the General Data Protection Regulation, which took effect in May 2018, requires Internet of things manufacturers serving the European Union market "to ensure a level of security appropriate to the risk".

44. The General Data Protection Regulation has significant implications for doing business in an increasingly data-driven economy. It introduces new rights for users and responsibilities for platforms, including data portability and the right to be forgotten. Firms now have to be much clearer about how people's data are being used, and they must ask for consent to collect and use the data. The regulation is backed by enforcement mechanisms, including significant fines in case of non-compliance.

45. Importantly for developing economies, the General Data Protection Regulation applies to data on European Union citizens regardless of where data are stored or processed so that its law has in effect a global reach. A number of countries have adopted similar approaches to the General Data Protection Regulation, including Brazil, India, Japan and the Republic of Korea. Companies around the world, regardless of whether they are physically located in the European Union or not, have to upgrade their privacy and data protection schemes.

46. Coherent and internationally compatible national data protection regimes to facilitate cross-border trade will be ever-more important in the face of new technologies. More dialogue between all stakeholders is needed to achieve adequate protection.

47. The policy and regulatory challenge is to find a balance between support for processes that allow the transfer of data, on the one hand, and addressing concerns related to issues such as privacy and security, on the other. The current system for data protection is fragmented, with varying global, regional and national regulatory approaches. Rather than pursuing multiple initiatives, it would be preferable for global and regional organizations to concentrate on one unifying initiative or a smaller number of initiatives that are compatible across countries. Where possible, similarities in underlying principles should be leveraged to develop mechanisms for recognition and compatibility between different frameworks (see box). In this context, it would be useful to explore ways to ensure an effective dialogue between the trade policy and Internet policy communities.

48. Although different national data protection laws vary considerably, there is greater consensus around the core set of data protection principles at the heart of most national laws and international regimes. Some regimes (so-called omnibus regimes) apply equally to all involved in processing personal data. Others apply different rules to specified sectors (e.g. health industry), types of processing entity (e.g. public authorities) or categories of data (e.g. data about children). In such regimes, other sectors are not subject to regulatory controls at all. A distinction can also be made between regimes that operate primarily through enforcement actions brought by individuals or their representative groups and those that grant enforcement powers to a specialized supervisory authority, which exercises ongoing oversight of the conduct of those that process personal data. UNCTAD has proposed eight principles that could serve as a starting point for interoperability and harmonization efforts.[26]

[26] UNCTAD, *Data Protection Regulations and International Data Flows*.

49. In developing and promoting international and regional data protection initiatives, consideration should be given to the compliance burden, and the potential for adverse effects on trade, innovation and competition, especially from the perspective of microenterprises and small and medium-sized enterprises.

50. As the global economy shifts further into a connected information space, the relevance of data protection and the need for controlling privacy will further increase. Understanding different approaches to and potential avenues for establishing more compatible legal frameworks at the national, regional and multilateral levels is important for facilitating inclusive international trade and online commerce. The rules surrounding data protection, as well as cross-border flows of data, discussed below, affect individuals, businesses and Governments alike, making it essential to find approaches that address the concerns of all stakeholders.

B. Regulating cross-border data flows

51. The digital economy relies increasingly on cross-border data flows. A deep understanding among Governments and stakeholders of the role of data flows is therefore becoming increasingly important. For international trade it is also important that national regimes on regulating cross-border data flows are compatible across countries so as not to inhibit the adoption and proliferation of emerging technologies, with adverse effects on societal benefits.

52. Advocates of free cross-border data flows stress that such flows fuel the digital economy and generate new sources of employment, innovation and economic growth. Restricting data flows would hamper innovation, growth and development. Some consultancy firms estimate that cross-border data flows increased global gross domestic product by approximately 10 per cent in around a decade, reaching $7.8 trillion in 2014. Data flows represented an estimated $2.8 trillion of the added value.[27]

53. When considering what may be an appropriate regulatory framework, policymakers also need to factor in various concerns of Governments, consumers/users and firms over national security, privacy, movement and ownership of data, as well as economic development. Some observers stress that, as data are a valuable resource, producers of data should be adequately compensated for use of that data.

54. While issues relating to cross-border data flows have been discussed since the 1970s, they have recently become more controversial in international policy and trade discussions. Prior to the public Internet era of proprietary platforms, many multinational enterprises used international private networks to transfer data across national frontiers in pursuit of organizational efficiencies and competitive advantages. This trend provoked concerns among Governments that their national policy frameworks on privacy protection and economic regulation could be bypassed as data moved out of their national jurisdictions to other countries, where they would be subject to different laws and policies.

55. Governments have adopted different strategies to address these and other concerns, ranging from various restrictions on cross-border data flows to entering into international agreements to facilitate those flows.

56. A growing number of countries have contemplated or adopted measures that create disincentives or barriers to cross-border data flows. The reasons vary and include national security, protecting personal privacy and data, ensuring access to information related to law enforcement, preventing flows that are deemed to challenge national public order or protecting and promoting economic activity within a national territory. In some countries, policies may be part of a wider government strategy to ensure cybersovereign control over the digital economy and society. In such cases, barriers have at times been coupled with data localization policies requiring that data be retained within a given jurisdiction and processed there.

57. Excessively stringent limitations on data flows can have negative effects by limiting production, trade and innovation. Data privacy and localization requirements that

[27] Mckinsey and Company, 2016, *Digital Globalization: The New Era of Global Flows*, London.

discriminate against foreign suppliers of data and providers of downstream goods and services may raise the costs of doing business. Localization requirements for servers can also raise the cost of doing business. For example, requirements to store or process data within a country may mean that manufacturers of Internet of things devices have to build or contract local data operations in multiple countries, which can be prohibitively expensive.[28]

58. There is growing attention at different levels to the treatment of e-commerce in international trade agreements. Given that countries are at different stages of readiness with regard to e-commerce and the digital economy, and give different priority to various trade policy concerns, their responses to the evolving landscape vary considerably. Some countries are keen to include e-commerce and various issues related to the digital economy, including data, in trade agreements, while others remain cautious, preferring to safeguard their policy space in this rapidly changing environment.

59. As international trade becomes increasingly affected by the digitalization of economic activities, there is growing need for countries to consider how best to address the interface between trade policies and Internet governance. At the bilateral and regional levels, a number of free trade agreements have included provisions related to e-commerce and cross-border data flows. Some plurilateral agreements have also included similar references (see box). At the global level, it remains to be seen if and how issues related to e-commerce and the digital economy, including data-related issues, may be reflected in the work of the World Trade Organization.

Regulation of electronic commerce and cross-border data flows in trade agreements

Trade negotiations of direct relevance for e-commerce have also been undertaken in free trade agreements and bilateral, megaregional and plurilateral contexts. For example, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership is a megaregional agreement (also known as TPP-11, after the withdrawal of the United States) that requires members to allow full cross-border data transfers, bans localization requirements for computing facilities and services, prohibits requirements to transfer technology as a condition for conducting business, and prohibits the imposition of customs duties or taxes on Internet traffic. There are exemptions in sensitive areas such as consumer protection, privacy and national security.

Another example is the draft trade in services agreement, a services-only agreement that is still under negotiation among 23 World Trade Organization member States, 13 of which are developing economies. Based on information available as of April 2017, most provisions dealing with e-commerce in the draft text are in an annex on e-commerce and in another annex on localization. With regard to cross-border data flows, no agreement had been reached by early December 2016.

The most recent plurilateral initiative relevant to e-commerce is that undertaken by a group of 71 countries at the Eleventh Ministerial Conference of the World Trade Organization in December 2017. The countries issued a Joint Statement on Electronic Commerce. The group held regular meetings throughout 2018 and expect to hold a ministerial-level meeting in early 2019 to endorse the work undertaken and potentially start negotiations. Four proposals touching on cross-border data flows and data generally favour the free flow of data, but make references to legitimate policy objectives that regulators may need to pursue (including personal data protection) and, more generally, the situations and conditions under which regulators might place restrictions on the free flow of data.

Source: UNCTAD.

60. Some analysts argue that Governments' existing laws, as well as their national commitments under the General Agreement on Trade in Services of the World Trade Organization, already require the liberal treatment of computer and information services, such as those involved in cross-border data flows and data localization.[29] Rules that hinder

[28] UNCTAD, *Information Economy Report 2017*.

[29] Burri M, 2016, The World Trade Organization as an actor in global Internet governance, Paper No. 2792219, Social Science Research Network; Crosby D, 2016, Analysis of data localization measures

cross-border data flows may appear to be discriminatory against foreign providers of data services, and may therefore potentially violate commitments to liberalize trade in goods and services. In particular, data localization obligations can raise issues concerning compliance with trade liberalization commitments under the General Agreement on Trade in Services.

61. Bilateral and multilateral free trade agreements can significantly affect Internet governance issues. Many of them specifically address important issues such as data localization, encryption, censorship and transparency, all of which are generally regarded as forming part of the Internet governance landscape.

62. Different stakeholders have expressed concerns about various substantive aspects of rules governing trade in the digital economy.[30] Among the contentious issues are the inclusion of provisions concerning intellectual property, encryption, source codes, intermediary liability, network neutrality, spam, authentication and consumer protection. While many Internet experts are interested in ensuring that trade agreements will not be used to challenge privacy protection for commercial purposes, they are wary about the prospect of a proliferation of national and regional restrictions on cross-border data flows that erodes Internet openness. By imposing territorial borders on cyberspace, those restrictions may raise costs and impede the efficiency of operations, as well as constrain the ability of willing network endpoints to exchange data, and could contribute to Internet fragmentation.

63. Whether cross-border data flows should be regulated in trade agreements, as a trade matter, or discussed and regulated at other forums or organizations is still under debate. As more trade is affected by digitalization and conducted over the Internet, it becomes increasingly important for trade policymakers to factor in how the Internet itself is governed and operated.[31]

C. Competition policy

64. Given the importance of forces pushing towards market concentration in the digital economy dynamics, competition policy has an important role to play. The potential for anticompetitive practices and abuse of dominant positions of digital platforms may require adaptation of approaches to competition policy frameworks and enforcement.

65. Market power stems from the extraction, collection and use of data, while competitive strategies as well as pricing decisions may be mostly determined by algorithms. Users receive services for free. Digital platforms tend to sacrifice profits and make losses for years in order to solidify their market position. During the process, they may outcompete rivals or acquire promising ones. Thus, competition analysis based entirely on prices may not be adequate to show potential harm to competition in digital platform markets. Competition law and policy need to consider this new business strategy. For example, Germany recently revised its competition law to include digital economy concepts such as digital platforms and multi-sided markets.

66. Recent competition cases illustrate that competition authorities may be reinterpreting traditional competition and antitrust concepts for the digital economy. For instance, the European Commission fined Google €2.42 billion for abusing its dominance as a search engine by giving illegal advantage to its own comparison-shopping service. In Germany, Facebook was found to abuse its dominant position.[32]

under World Trade Organization services trade rules and commitments, E15 Initiative Policy Brief, International Centre for Trade and Sustainable Development and World Economic Forum, Geneva.

[30] UNCTAD, *Information Economy Report 2017*.

[31] For options for trade policymakers to engage with actors in the Internet community to ensure that future agreements influencing trade in the digital economy are operationally feasible and politically sustainable, see the UNCTAD *Information Economy Report 2017: Digitalization, Trade and Development*.

[32] Germany, Federal Cartel Office, 2017, Preliminary assessment in Facebook proceeding: Facebook's collection and use of data from third-party sources is abusive, 19 December, available at https://www.bundeskartellamt.de/SharedDocs/Publikation/

67. Competition authorities may need to expand the criteria regarding a monopoly's impact to go beyond only prices and consider issues such as harm to consumer privacy, impacts of digital platforms on the broader ecosystem, impacts on market structure and reductions in innovation that can support inclusive trade and development. Currently, competition authorities rarely take into account how data may be a source of monopoly power. They may also need to update their tools to prevent abusive practices, as in the case of predatory pricing. Some digital platforms may also need to be regulated as public utilities. Moreover, as digital platforms are global in reach but competition authorities are national, it is important to strengthen international cooperation in this area.[33]

68. It should be noted that the interface between the digital economy and competition policies will be further discussed at the eighteenth session of the UNCTAD Intergovernmental Group of Experts on Competition Law and Policy in July 2019.

D. Taxation

69. Taxation is a related policy area, as it can provide global digital platforms a significant competitive advantage. Reliance on digital platforms, which are based mostly on intangibles may weaken the international tax concept that places jurisdictional tax claims over profits of multinational corporation based on physical presence. Traditional corporate tax systems are based on permanent residency and have not kept up with the nature of the digital economy. This raises questions about enforcement: (a) where to tax non-resident digital businesses; (b) how to assess intra-group transactions; (c) how to classify digital goods; (d) how to identify taxpayers; and (e) where and how to collect taxes. Moreover, the digital economy may enable global digital platform companies to engage in tax optimization practices, through shifting of profits towards locations with lower taxation rates, which leads to erosion of the tax base. While this is a concern for all countries, it may have significant implications for the availability of domestic resources for development in developing countries.

70. There is growing interest among policymakers in the implications of data-driven development for taxation policies. More than 110 countries and jurisdictions have agreed to review key concepts of the international income tax system, responding to a mandate from the Group of 20 finance ministers to work on the implications of digitalization for taxation.[34] For example, in March 2018, the European Commission proposed new rules to ensure that digital business activities are taxed in a fair and growth-friendly way in the European Union.[35] Two legislative proposals were made in this context. While there have been difficulties in reaching an agreement, discussions are ongoing.

71. In a recent study on Malaysia, the World Bank identified four ways to improve taxation of digital goods and services provided by non-resident companies: tax digital transactions indirectly, by requiring suppliers to collect goods and services tax/sales and services tax, in line with international practice, or tax them directly, by (a) redefining permanent establishment rules, (b) expanding existing tax on technical services or (c) establishing a new, freestanding tax on the income from digital transactions.[36] All options were considered to have advantages and disadvantages.

EN/Pressemitteilungen/2017/19_12_2017_Facebook.html;jsessionid=4006C41AC4A53F06C21C0406F52350A4.2_cid362?nn=3600108 (accessed 23 January 2019).

[33] For a more detailed discussion, see a forthcoming study on competition issues in the digital economy that will be available for the eighteenth session of the UNCTAD Intergovernmental Group of Experts on Competition Law and Policy. See also Brusick P, 2018, *Competition Concerns in Cross-border E-commerce: Implications for Developing Countries* (Consumer Unity and Trust Society International, Geneva).

[34] Organization for Economic Cooperation and Development, Tax, available at http://www.oecd.org/going-digital/topics/tax/#d.en.496769 (accessed 23 January 2019).

[35] European Commission, Fair taxation of the digital economy, available at https://ec.europa.eu/taxation_customs/business/company-tax/fair-taxation-digital-economy_en (accessed 23 January 2019).

[36] World Bank Group, 2018, *Malaysia's Digital Economy: A New Driver of Development* (World Bank, Washington D.C.).

VI. The need for capacity-building for data analytics and artificial intelligence

72. Owning vast amounts of data can only be of value when having the analytical capacity to convert them in information and knowledge. Countries in which the capacity to transform data into business intelligence is limited are constrained in their potential to capture the economic value of data. To prevent dependence on certain countries in the context of a data-driven digital economy, development strategies need to include the objective of digital upgrading (value addition) in a data value chain, to enhance domestic capacities to move from data as a raw material, to processed digital data and artificial intelligence.

73. Beyond having access to adequate connectivity and competitive prices, the right skills are needed in order to be able to derive development benefits from mining big data. Data scientists, data engineers, data architects and data visualization specialists must also be business savvy to help enterprises capture business opportunities from the analyses obtained.

74. There is a need for more advanced digital/information and communications technology (ICT) user skills for more complex operations using basic software packages and more advanced packages (e.g. sector-specific packages for data treatment and analysis, design, architecture and accounting). Analysts of all kinds of data need to learn about new data sources, new ways of collecting data, how regulations concerning data affect what can be collected and analysed and what technologies to adopt for secure data storage and use.

75. Beyond foundational skills, a higher level of skills is required to build, supply, deploy and manage digital tools and services. Specialist skills range from those required to roll out, upgrade and repair physical ICT infrastructure (e.g. cables and hardware such as computers, routers and servers), to those possessed by software engineers, applications developers, systems architects and data scientists.

76. New technological developments give rise to new skill requirements or a different emphasis on skills. The growth of the Internet of things, for example, increases the demand for people with skills related to data analytics, business management, hardware and systems design and security.[37] As the Internet of things and big data become more widely used, data scientists and analysts become more central and strategic in the operations of many firms. The ability to determine what to do with increasing amounts of data and identifying what is valuable and what creates new business opportunities will be key. These roles, in turn, will require broader skill sets, combining analytical, software and architecture skills with business acumen and communications skills.[38]

77. Capacity-building efforts are needed to reduce the digital and data divides between and within countries, particularly those relating to youth, the rural economy, microenterprises and small and medium-sized enterprises and gender.

78. The role of official development assistance in terms of international policy on capacity-building also requires addressing. Aid in support of productive capacity development in the context of digitalization is critical, particularly for the least developed countries, which are lagging behind in digital readiness.[39] Capacity-building includes improvement of technological capacity and knowledge about how the data-driven digital economy for all actors involved, including policymakers. It is important that development partners include technical assistance for the development of digital capacities in their strategic programmes.

[37] See, for example, the European e-skills manifesto, 2016, http://www.eun.org/resources/detail?publicationID=902 (accessed 23 January 2019).

[38] See also UNCTAD, *Information Economy Report 2017*.

[39] See UNCTAD, Rapid eTrade readiness assessment of least developed countries, available at https://unctad.org/en/Pages/Publications/E-Trade-Readiness-Assessment.aspx (accessed 23 January 2019).

79. Current levels of official development assistance are inadequate. For example, only 1 per cent of all Aid for Trade funding is currently devoted to ICT.[40] Similarly, multilateral development banks invest only 1 per cent of their total commitments in ICT projects and, of this, only 4 per cent goes towards policy development.[41] Given the speed at which the digital economy is evolving and given the major digital divides that exist in many areas, it is important for the donor community to increase attention regarding the digital dimension of official development assistance strategies.

80. The UNCTAD-led eTrade for all initiatives can contribute to making the availability of assistance more transparent and easily accessible. From its launch in July 2016 to the end of 2018, the initiative has expanded from 15 partners to more than 30 partners.

81. UNCTAD can help to build the capacity of policymakers and lawmakers at the national and regional levels with regard to understanding the underlying issues underpinning e-commerce, including data-related legislation. Assistance may target in particular ministry officials in charge of law reform who need to learn more about the legal implications of ICTs; parliamentarians who have to examine new cyberlaws; and legal professionals who enforce new legislation. In view of the considerable needs in this area, however, there is a need scale up current efforts in this area as well. Only 41.5 per cent (table 2) of all developing countries have data protection and privacy laws in place.

VII. Guiding questions

82. Against this background and, as decided by the Trade and Development Board, the discussion among experts should revolve around the following guiding questions:

- What are the role and value of data in e-commerce and the digital economy in the context of inclusive trade and development?
- What are the key opportunities and challenges associated with managing and regulating data and data flows?
- What are the public policies, regulations and institutional arrangements in different countries and regions for harnessing and protecting data related to e-commerce and the digital economy, and bridging the digital divides including between and within countries and relating to youth, rural economy, microenterprises and small and medium-sized enterprises and gender?
- How could developing countries build capacities, including skills, to use new and emerging technologies such as big data analytics and artificial intelligence?

[40] UNCTAD, *Information Economy Report 2017*.

[41] World Wide Web Foundation, 2018, *Closing the Investment Gap: How Multilateral Development Banks Can Contribute to Digital Inclusion*, Washington D.C.