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Digitalization of Global Governance in NBIC-Convergence Era

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Abstract

The rise of globalization processes at the turn of the 20th – 21st centuries led to the growth of interdependence in the international arena – the development of transnational business networks, emergence of new supranational political structures, increasing flows of people, capital, goods and information at intercontinental distances (Ilyin 2000; Castells 2011). Modern processes are named by researchers as the Fourth Industrial Revolution which is characterized by convergence of digital, physical and biotechnologies (Schwab 2016). Globalization of ICT leads to the formation of new frameworks of cross-cultural interactions, expands control over conflict situations and strengthens international cooperation in ensuring global and regional security, accelerates social politics (education and health care) and human capital by increasing employment, inclusion in active life of socially isolated groups of people, overcoming deprivation, poverty and various forms of discrimination, eliminating territorial, administrative, civilization and cultural barriers. The risks and threats of globalization processes are created by the actors of subnational and transnational levels using both legitimate and criminal activities. Modern world development is focused on enhancing of e-government technologies in public administration by increasing the qualitative level of qualification and technological effectiveness of public service and reducing their cost.

Keywords: *globalization, ICT, NBIC-Convergence Era, the Fourth Industrial Revolution, technological development, digitalization, global governance, soft power, digital diplomacy, e-government, democracy.*

Globalization of IT (ICT) as a New Geostrategic Reality

Contemporary global technological era in Russian social science research discourse is analyzed as an epoch of NBIC-convergence (convergence of nano-, bio-, and information technologies and cognitive science) in interconnection with the sixth long cycle (wave) of N. Kondratieff (K-cycle 2030 – 2040 – 2070) and Cybernetic revolution (MANBRIC-revolution) – a new stage of innovative technological development triggered by medical technologies, nano- and biotechnologies, robotics, information technologies (3D printing) and cognitive science (Grinin, Korotayev, and Tausch 2016).

In Western economic science the convergence of digital, physical technologies and biotechnologies is analyzed in the concept of the Fourth Industrial Revolution, the current stage of growing technological development during which technological innovations emerge and extend with unprecedented speed – from nanosensors and Internet of nanothings (IoNT), artificial intelligence and interfaces of a human brain; neural networks, 'big data' and 3D printing to quantum computers (WEF 2016a, 2016b; Manyika, Chui *et al.* 2013). The fundamental and global nature of the Fourth Industrial Revolution, according to Klaus Schwab, poses new threats connected with the crises which revolution may cause in labor market, provoking income inequality and problems of geopolitical security, social value system and ethical structures (Schwab 2016).

Globalization is the most popular paradigm describing the contemporary post-industrial world development: economies and people around the world begin to suffer from the impact of the first effects of the Fourth Industrial Revolution, creating global market of the capitals, goods, people, information and work (Ilyin 2000; May 2015). Technological revolution (especially digitilization) is clearly related to increase in productivity across the economies. But the paradox of globalization is that, despite the global convergence of business, global productivity growth has slowed, the labor market has become more polarized and inequality is growing in those countries where change of ratio of the income is in favor of the capital and to the detriment of work (World Bank Group 2016).

The Center – Periphery research model which divides the countries of the world, according to GDP (GDP per capita), labor and capital productivity, is imposed by the civilization paradigm of increasing economic power of the developing world (new 'emerging powers' – Russia, India and China) (Grinin and Korotayev 2016). China which has held the leading position in the export of high-tech products since 2004 demonstrates the most significant progress in technological development (see Fig. 1).

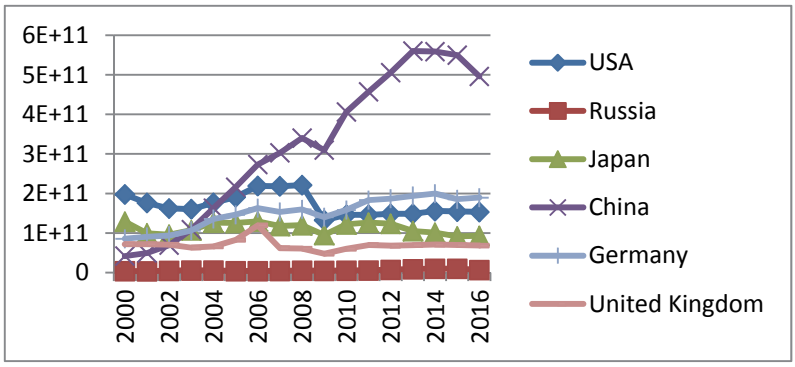


Fig. 1. World leaders in high-technology export (in current US$)

Source: World Bank 2017. Global Development Indicators (WDI).
URL: http://data.worldbank.org/data-catalog/world-development-indicator

According to the research model of World Bank experts, the level of technological development correlates with the income of the country (GDP) and goes through three phases: the phase of emergence (low-income countries), the phase of *transition* (upper-middle income and lower-middle income countries) and the phase of transformation (high-income countries) (World Bank Group 2016). According to OECD, the US, Canada, China, the UK are at the core of the international ICT patent cooperation network. Japan, India, Israel, Korea, Sweden, Switzerland, Germany and France are in the second echelon. In the general global trend of growth of patents number the share of patents connected with computer technologies and intercomputer interactions is identified (OECD 2015b).

OECD countries spend up to 2 % of their budgets on IT. The effectiveness of ICT investments is the highest in the UK, Korea and Denmark (OECD 2015c). The ICT sector accounted in average for 4–7.6 % of GDP in most OECD countries. South Korea (4.6 %), Japan (3.8 %), the United Kingdom (3.1 %), the USA (43.5 %) were among the leading countries in 2017 (High School of Economics 2018) (see Fig. 2).

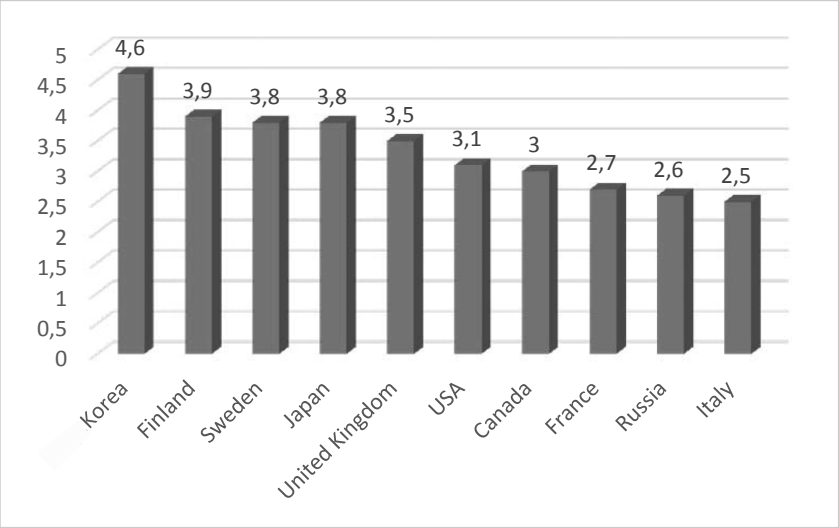


Fig. 2. ICT sectors in 2017

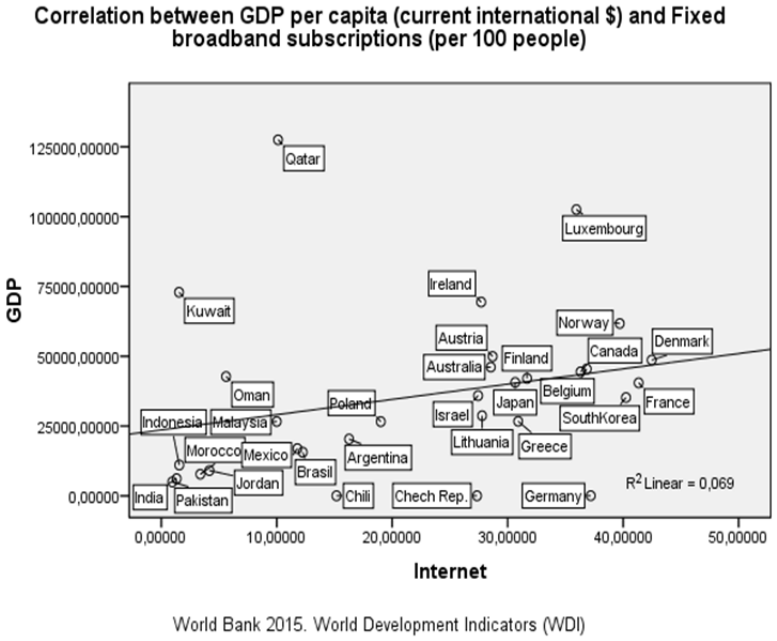
Source: Higher School of Economics 2018.

Computerization is the driven force of modern technological progress which goes through four stages: the first stage (1956–1976) was characterized by the introduction of centralized mainframe computers and satellite technologies, the second one (1976–1992) – by the rise of personal computers and ro-

botechnics, the third stage – by the development of Internet networked computers (1992–2008) and the fourth one – by rising Internet of things (IoT), quantum computing, neural networks of artificial intelligence in perspective (2016–2025) (Institute for Government 2016).

Internet is rapidly developing technology: about 70 % of people have an access to high-speed Internet (broadband or 3G). According to the Cisco forecasts, by 2041 network capacity will increase by 500 times, the number of the connected devices will exceed 50 billion (RBC 2016b) by 2020. During the period of 1997–2013 in OECD countries e-commerce increased from 31 % to 50 % among individuals, and among business firms – up to 21 % (OECD 2015a; UNSTAD 2015).

Internet intensifies economy: each 10 % increase in the number of high-speed Internet connections leads to 1.3 % increase in GDP growth (WEF 2016d) (see Fig. 3).



World Bank 2015. World Development Indicators (WDI)

Fig. 3. Correlation between GDP per capita (current international $) and fixed broadband subscriptions (per 100 people)

Source: World Bank 2015.
URL: http://data.worldbank.org/data-catalog/world-development-indicator

Russia shows significant progress in the sphere of information technology development: the contribution of ICT sector to GDP and the general employ-

ment is estimated at 3 % (World Bank Group 2016). Internet economy contribution in Russia (together with the market of electronic payments) in 2015 was accounted for 2.4 % of GDP (RBC 2016a). World Bank experts define the key problems of Russian IT development: ineffective legislative and regulatory framework, weak protection of intellectual property; insufficiently favorable conditions for business and innovations including inaccessibility of the most modern technologies and low level of technology absorption by the business companies; limited access to financing and unsettled geopolitical crisis aggravated by the sanctions that prohibit export of dual-use technologies and limit the existence of the venture capital (World Bank 2016).

Globalization of digital technologies is in the first echelon of Cybernetic (MANBRIC) revolution, the initial phase of which can be reduced to scientific and information one due to the development of planning, forecasting, marketing, logistics, product management, distribution of resources and communication (at the same time the most radical changes take place in the sphere of information and communicative technologies) (Grinin L., Grinin A., and Korotayev 2016, 2017). During the Cybernetic revolution exponential technological growth is followed by hyperbolic growth of world literacy rate which is now higher than ever before in human history; there is a growing number of researchers and research in the world (Korotayev 2009; Korotayev, Khaltourina, Malkov *et al.* 2010).

Globalization of ICTs is evolving under the Centre-Periphery model with the special geopolitical reality of the growth of developing countries. In the international cooperation in ICT-related sciences the central place is occupied by the civilizational ties between the USA and China, the second echelon is occupied by Great Britain, France, Germany, Italy, Canada and Australia (OECD 2015b). The core of international network in ICT-related science field creates cooperation between USA and China, second network is Great Britain, France, Germany, Italy, Canada and Australia. Inequality is observed in the creation of Internet content: 85 % of materials indexed by Google are produced in USA, Canada and EU. There is the same rating of the countries in the world scientific journals (World Bank Group 2016).

Globalization of ICTs affects the wide system of world politics – the geostrategic structure of international relations defined by the categories of centers and factors of power, which are shaping a new world order governed by supranational and intergovernmental institutions under international law (Morgenthau 1985). The Nobel laureate J. Stiglitz characterizes the modern world system as ‘global governance without global government’, rightly pointing to the lack of check and balance, isolation of institutions and individual decision-making without taking into account the views of developing countries (Stiglitz 2002).

Global Governance in the New Digital Era

In modern conditions the foreign policy potential of subjects of the international relations, increasingly includes non-material factors of power called as 'soft power' in the theory of international relations (Ney 2004) which make integration, dialogue and cooperation an important part of world politics and diplomacy, *i.e.* relations focused on ideological values of democracy, sovereignty and independence, ensuring the interests and strengthening of positions of the states on the world arena. According to 'soft power' theoreticians R. Keohane and J. Ney (2012), 'an opportunity to disseminate freedom of information increases belief potential in the world of policy'.

As a strategic factor of world politics, the phenomenon of 'soft power' is implemented in other forms than geopolitical factors of Cold War based on balance of bipolar power and nuclear control. Global communication impacts are extraterritorial, not fixed by state or any local borders, and implemented in the global media system through ICT and the Internet, covering the formats of the G20 summits, supranational integration alliances, and influential international forums.

Digital revolution led to the creation of a new paradigm of global governance – 'digital diplomacy' – which originally emerged in the USA in the 2000s with the creation of the working group on 'E-diplomacy' whose priorities included knowledge management and political planning (Kulik 2013). The essential limiting factor of modern e-governance process is the lack of democracy and openness in public politics on the world arena. According to the report 'Government Transparency and Secrecy', 'in perspective diplomatic negotiations can be even more removed from public access because of probable leaks' (Ginsberg, Carey, and Halchin 2012).

The integration of information and communicative technologies (ICT) in public administration accelerates economic growth, social equality and governance outcomes for greater transparency, integrity and citizen's engagement, community problem-solving and mediation (European Parliament 2015; Institute for Government 2016; OECD 2005, 2011a, 2011b, 2013*;* Lau 2017). As reported by the United Nations, the role of ICT contributes to sustainable development of public administration in health protection, education and employment, science, business, and agriculture; the development of ICT and global interdependence have an impact on human progress – overcoming digital inequality, development of the intellectualized communities, increase in scientific and technological innovative potential, particularly in the spheres of medicine and power (UN 2000). The current phase of the scientific and technological revolution accelerates the processes of broad public sector modernization, analyzed in research discourse under the concepts of 'New public management'

and 'Good governance' which includes: citizen participation in politics; rule of law; transparency; responsiveness; orientation to consensus; equality and inclusion; efficiency; accountability of the power to citizens (McLauglin, Osborne, and Ferlie 2002; Shafritz, Russel, and Borick 2009).

Digitalization goes beyond the administrative support areas and begins to explore greater potential in a broader range of public welfare service areas. ICT (especially social media) have the potential to make policy process more inclusive and thereby increase trust between government and citizens (OECD 2005). ICT (*e.g.*, Internet communications) enhance the quality of human potential by increasing employment (especially for women) and inclusion, developing of outsourcing business processes, providing new opportunities for one billion disabled people (80 % of whom live in developing countries), overcoming inequality and various forms of discrimination and human rights violations (World Bank Group 2016).

The digital revolution puts the following issues on the agenda of global governance as geostrategic reality: 1) the further integration: the global community should unite and reach consensus on the common principles for managing of technological development, if it aims to earn digital dividends and avoid technological risks (WEF 2016d); 2) digital inequality as the main global risk: more than 55 % (about 4 billion) of people in the world are still unconnected because of illiteracy (one-fifth of the world population remains illiterate) or poverty (including 13 % of the people living under the international poverty line mostly in developing countries) (World Economic Forum 2016c); 3) increasing internationalization of global Internet governance in the context of discussions on the US Internet control practices. According to Nye (2014), 'there is no single regime for the governance of cyberspace, there is a set of loosely coupled norms and institutions that ranks somewhere between an integrated institution that imposes regulation through hierarchical rules, and highly fragmented practices and institutions with no identifiable core and non-existent linkages'; 4) global 'ideological' conflicts between USA and authoritarian regimes concerning the protection of freedom of Internet, struggle to censorship (*Broadcasting board of Governors*) and human rights protection in the digital age (*Open Net Initiative*); 5) cyber security and security of government data agenda of global governance due to hacking and cybercrimes in the context of virtual scandal concerning the Russian hacking in Trump Election Campaign of 2016: in strategy of national security of Russian Federation till 2020 information threat is posed as the major threat to sovereignty of the country. The Internet is considered as a channel of distribution of extremism and terrorism, imposing someone else's ideology and foreign policy promotion, means of information warfare (Kulik 2013).

Conclusion

International experience shows that at the current stage of technological revolution in the epoch of NBIC-convergence the growth of information technologies, knowledge and analytical support of political process became the basis for activation of governmental policy on digitization of public governance and enhancing digital diplomacy and e-government technologies into public administration. Nevertheless, researchers overcome 'cyber-enthusiasm' over the rise of digital technologies and e-governance and critically note it was expected that digitization will open a new era of accountability, expansion of human rights, political participation of citizens and self-organized virtual communities. The UN notes that 'building confidence and security in the use of information and communications technologies for sustainable development should be a priority of nation states in the context of rising challenges of cybercrimes from harassment to crime and terrorism' (UN 2016). The progress of digital technologies in global diplomacy and public administration is complicated by global risks of the information and communication environment: information leakages, cybercrimes, proliferation of illegal content, human rights violation.

References

Castells M. 2011. *The Rise of the Network Society*. Information Age Series Book 13. 2nd ed. Kindle Edition.

Ginsberg W. R., Carey M. P., and Halchin L. E. 2012. *Transparency and Secrecy: An Examination of Meaning and Its Use in the Executive Branch*. November 8. URL: https://www.hsdl.org/?abstract&did=725871.

Grinin L. E., and Korotayev A. V. 2016. *Middle East, India and China in Globalization Processes.* Moscow: Moscow Branch of 'Uchitel' Publishing House. *In Russian* (Гринин Л. Е., Коротаев А. В. *Ближний Восток, Индия и Китай в глобализационных процессах*. М.: Моск. ред. изд-ва «Учитель»).

Grinin L., Grinin A., and Korotayev A. 2016. Forthcoming Kondratieff Wave, Cybernetic Revolution and Global Ageing. *Technological Forecasting & Social Change* 115: 52–68.

Grinin L., Korotayev A., and Tausch A. 2016. *Economic Cycles, Crises and the Global Periphery*. Springer International Publishing.

Grinin L., Grinin A., and Korotayev A. 2017. The MANBRIC-Technologies in the Forthcoming Technological Revolution. *Industry 4.0. Entrepreneurship and Structural Change in the New Digital Landscape* / Ed. by T. Devezas, J. Leitão, and A. Sarygulov, pp. 243–261. Springer International Publishing.

Higher School of Economics. 2018. *Sector ICT in Russia.* URL: https://issek.hse.ru/news/227732702.html.

Ilyin M. V. 2000. Stabilization of Development. *Megatrends of World Development* / Ed. by M. V. Ilyin, and V. L. Inozemtzev, pp. 183–191. Moscow: Ekonomika.

In Russian (Ильин М. В. Стабилизация развития. *Мегатренды мирового развития* / Ред. М. В. Ильин, В. Л. Иноземцев, с. 183–191. М.: Экономика).

Institute for Government. 2016. *Making a Success of Digital Government.* URL: https://www.instituteforgovernment.org.uk/sites/default/files/publications/IFGJ4942_Digital_Government_Report_10_16%20WEB%20%28a%29.pdf.

Korotayev A. V. 2009. Compact Mathematical Models of the World System Development and Their Applicability to the Development of Local Solutions in Third World Countries. *Systemic Development: Local Solutions in a Global Environment* / Ed. by J. Sheffield, pp. 103–116. Litchfield Park, AZ: ISCE Publishing.

Korotayev A., Khaltourina D., Malkov A., Bozhevolnov Y., Kobzeva S., and Zinkina Yu. 2010. *The Law of History: Mathematical Modelling and Forecasting of World and Regional Development.* Moscow: URSS.

Kulik S. A. 2013. *E-diplomacy. Beginning. Analytical Report of Institute of Social Development.* URL: http://www.insor-russia.ru/files/EDiplomacy_0.pdf.

Keohane R. O., and Nye J. S. 2012. *Power and Interdependence.* The 4th Ed. Harvard University.

Lau E. 2017. *E-Government and Drive for Growth and Equity.* URL: http://www.belfercenter.org/sites/default/files/legacy/files/lau-wp.pdf.

May C. 2015. *Who's in Charge? Corporations as Institutions of Global Governance.* Palgrave Communications 1 (December): 15042. URL: http://www.palgrave-journals.com/articles/palcomms201542.

Morgenthau H. J. 1985. *Politics among Nations.* New York: McGraw-Hill.

McLauglin K., Osborne P., and Ferlie E. (Eds.) 2002. *New Public Management. Current Trends and Future Prospects*. London: Routledge.

Manyika J., Chui M., Dobbs R. *et al.* 2013. *Disruptive Technologies: Advances That Will Transform Life, Business, and the Global Economy*. McKinsey & Company. URL: http://www.mckinsey.com/insights/business_technology/disruptive_technologies.

Ney J. 2004. *Soft Power. The Means to Success in World Politics.* N. Y.

Nye J. S., Jr. 2014. *The Regime Complex for Managing Global Cyber Activities.* Waterloo, ON: CIGI. URL: www.sbs.ox.ac.uk/cybersecurity-capacity/system/files/The%20Regime%20Complex%20for%20Managing%20Global%20Cyber%20Activities.pdf.

OECD. 2005. *E-government for Better Government*. URL: http://www.oecd.org/gov/digital-government/e-governmentforbettergovernment.htm.

OECD. 2011a. *Multilingual Summaries to Government at a Glance 2011*. URL: http://www.oecd-ilibrary.org/content/book/gov_glance-2011-en.

OECD. 2011b. *OECD Guide to Measuring the Information Society*. URL: http://www.keepeek.com/Digital-Asset-Management/oecd/science-and-technology/oecd-guide-to-measuring-the-information-society-011_9789264113541-en#page1.

OECD. 2013. *OECD E-government Project*. URL: http://www.oecd.org/gov/digital-government/45072415.pdf.

OECD. 2015a. *Measuring the Digital Economy: A New Perspective*. URL: http://www.keepeek.com/Digital-Asset-Management/oecd/science-and-technology/measuring-the-digital-economy_9789264221796-en#page1 Digital Economy Outlook.

OECD. 2015b. *Digital Economy Outlook.* URL: http://ec.europa.eu/eurostat/documents/42577/3222224/Digital+economy+outlook+2015/.

OECD. 2015c. *Government at a Glance.* URL: http://www.oecd-ibrary.org/docserver/download/4215081e.pdf?expires=1487752025&id=id&accname=guest&checksum=044CF59FD7E83097EF0BB96BC55B572B.

RBC. 2016a. *Digital Economy: Course of RuNet.* November 1. URL: www.rbcplus.ru/pdf/581834957a8aa95c35f8c9c8/rbcplus_None_1.pdf.

RBC. 2016b. *Digital Jump*. November 1. URL: http://www.rbcplus.ru/news/5818245b7a8aa94e9d46d797.

Shafritz J. M., Russel E. W., and Borick C. P. 2009. *Introduction to Public Administration*. New York: Routledge.

Schwab K. 2016. *The Fourth Industrial Revolution*. New York: Crown Business.

Stiglitz J. E. 2002. *Globalization and Its Discontents*. New York: W. W. Norton.

UNDP. 2010. *Human Development Report. The Real Wealth of Nations. Path to Human Development.* URL: http://hdr.undp.org/en/content/human-development-report-2010.

UN 2000. *Resolution Adopted by the General Assembly 55/2. United Nations Millennium Declaration*. URL: http://www.un.org/millennium/declaration/ares552e.htm.

UN. 2016. *United Nations E-governance Survey.* URL: https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2016.

World Bank. 2016. *Ways of Achievement of Comprehensive Economic Growth. Russian Federation. Complex Diagnostic Testing of Economy*. URL: http://www.vsemirnyjbank.org/ru/country/russia/publication/systematic-country-diagnostic-for-the-russian-federation-pathways-to-inclusive-growth.

World Bank. 2015. *Global Development Indicators (WDI).* URL: http://data.worldbank.org/data-catalog/world-development-indicators.

World Bank Group. 2016. *Digital Dividends.* Report on World Development. URL: http://documents.worldbank.org/curated/en/961621467994698644/pdf/102724-WDR-WDR2016Overview-ENGLISH-WebResBox-394840B-OUO-9.pdf.

WEF. 2016a. *Global Competitiveness Report 2016–2017.* URL: https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1/.

WEF. 2016b. *Global Information Technology Report 2016.* URL: https://www.weforum.org/reports/the-global-information-technology-report-2016/.

WEF. 2016c. *Internet for All. A Framework for Accelerating Internet Access and Adoption.* URL: http://www3.weforum.org/docs/WEF_Internet_for_All_Framework_Accelerating_Internet_Access_Adoption_report_2016.pdf.

WEF. 2016d. *Top 10 Emerging technologies of 2016.* URL: https://www.weforum.org/agenda/2016/06/top-10-emerging-technologies-2016/.