



Düsseldorf, 7 April 2017

A ROADMAP for Digitalisation: Policies for a Digital Future

Annex paper 1 to the Declaration of the Ministers responsible for the Digital Economy

Two years ago, in Antalya, G20 Leaders took note that we are living in a digital age and the effective use of digital technologies is an important driver for efficiency-enhancing and economic structural optimisation. In 2016, in Hangzhou, G20 countries agreed to the G20 Digital Economy Development and Cooperation Initiative which proposed some common understanding, principles and key areas of development and cooperation for the digital economy. In Düsseldorf, the G20 Task Force on the digital Economy has furthered the G20 Blueprint on Innovative Growth, Ministers responsible for the digital economy welcome and discussed this work plan for the G20 on digitalisation. A ROADMAP for Digitalisation: Policies for a Digital Future will build on the great work already done and deliver on areas G20 countries have identified as key areas. A study of the OECD “Key Issues for Digital Transformation in the G20” has been presented in the Ministerial Meeting.

1. Improve world-wide access, adoption and effective use of digital technologies for all

The growth of the digital economy has enabled the rapid spread and uptake of digital technologies, however adoption and use varies among G20 countries by demographic categories, level of economic development, industry and firm size.

The G20 Ministers responsible for the digital economy intend to:

- Share information and experiences to support improving access, adoption and effective use of digital technologies, including emerging technologies for new telecommunications services and applications, to boost digital economy development and digitally include underrepresented or disadvantaged groups.
- Share information and experiences with a view to identify good practices for digital strategies and learn from implementation challenges and outcomes.
- Discuss ways on how to use digital technologies to overcome wealth gaps and income disparities.
- Encourage G20 countries to develop digital strategies that support the Connect 2020 Agenda’s goals and strive to connect domestically all people by 2025.
- Encourage G20 countries to foster the incubation, development and adoption of various digital economy business models as enablers for sharing economy, workforce digitalisation and financial inclusion for addressing the need for reducing wealth and income disparity.

2. Expand digital infrastructure

G20 countries encourage continual investment in the development of digital infrastructures to meet existing and future demand, and help bridge digital divides.

The G20 Ministers responsible for the digital economy intend to:

- Promote a competitive environment and pro-investment policies that stimulate investment in digital infrastructure and welcome public private partnerships and commercial equity investment funds as well as social funds to invest in digital infrastructure and ICT applications.
- Work constructively together to extend coverage to underserved communities or individuals.
- Take action on the Global Infrastructure Connectivity Alliance Initiative endorsed last year by G20 Leaders.¹

3. Adapting policies in an increasingly digital and information and knowledge driven global economy

Digitalisation affects many aspects of the economy and society. Policy formulation will require coordination across government ministries and among different levels of government as well as participation of all interested parties and stakeholders.

The G20 Ministers responsible for the digital economy intend to:

- Share best practices and lessons learned regarding the impacts of digitalisation and policy approaches to adapt to a knowledge driven global economy.
- Encourage investment in the digital economy that enables new scalable and replicable business models.
- Further discuss on innovative digital economy business models and frameworks as enablers for the sharing economy, workforce digitalisation and financial inclusion.
- Cooperate to improve global digital economic development to help bridge the digital divides in the fields of infra- structure, data security and digital skills and capacity building.
- Follow the debate on taxation taking place in the Finance Minister's track.

4. Foster competition in the digital economy

Digitalisation creates new opportunities to increase consumer choice and provide innovative new products and services. The lines between offline and online business models are becoming increasingly blurred, and there are new competitive dynamics.

The G20 Ministers responsible for the digital economy intend to:

- Encourage the exchange of best practices to foster competition including to expand innovation, and prevent anti-competitive restrictions.
- Note the ongoing work by the OECD in the area of competition, to consider reviewing the OECD Competition Assessment Toolkit in light of digitalisation.

1 **G20 Leaders' Communique Hangzhou Summit** – Para 39... “We endorse the Global Infrastructure Connectivity Alliance launched this year to enhance the synergy and cooperation among various infrastructure connectivity programs in a holistic way. We ask the WBG to serve as the Secretariat of the Alliance, working closely with the Global Infrastructure Hub (GIH), OECD, other MDBs, and interested G20 members to support its activities.” ...

5. Support MSMEs in reaping the benefits of digitalisation and addressing the challenges

It is important to foster the use of advanced digital technologies among MSMEs, however their ability to swiftly adopt new technologies, to learn by doing, to innovate, and to optimise their production can be constrained by their small scale, and lack of resources limiting their ability to reap the benefits of the digital economy.

The G20 Ministers responsible for the digital economy intend to:

- Promote a more entrepreneurial friendly environment by encouraging programmes such as angel investor networks and matchmaking services to foster existing and innovative new business models and tap into existing and new sources of financing.
- Exchange experiences and good practices on national initiatives with a view to facilitating connections between these programmes across G20 countries, including through the Entrepreneurship Research Centre on G20 Economies.
- Encourage digital start-ups through a more entrepreneurial friendly environment as vehicles for innovation, entrepreneurship, employment opportunities and inclusive economic growth. Availability of technology and capacity building by these MSMEs is a critical element for the development of the start-up ecosystem, alongside the availability of adequate sources of financing, and further cooperation between industry and academia.

6. Encourage continued development of the IoT and the digitalisation of production

G20 countries can share good practices and identify areas of further cooperation on how to encourage the development of IoT and an efficient digitalisation of production.

The G20 Ministers responsible for the digital economy intend to:

- Work together in the areas of digitalisation of production as well as smart cities, smart mobility, IT security and smart farming.
- Share best practices on the digitalisation of production to facilitate digital transformation on a global level and to benefit all G20 countries.
- Encourage centres of excellence, digital hubs (for Start-ups), and clusters to inform and support MSMEs, as well as to explore synergies with various partners, including large companies.
- Encourage learning partnerships e. g. between national initiatives and different interested parties and stakeholders.

7. Enable all people to adapt to and excel in the digital economy and society

Digital skills are increasingly a precondition for participating in modern economic, social, cultural, political and civic life. In order to better prepare our citizens for the opportunities and challenges of globalisation and the digital revolution we need to ensure that everyone can benefit and adapt to new occupations and skills needs.

The G20 Ministers responsible for the digital economy intend to:

- Encourage and promote effective strategies on digital literacy and skills development for the digital economy enabling citizens, especially underrepresented or disadvantaged groups, to successfully adapt to the requirements of the digital economy and society.
- Work with the Employment Working Group to build on Annex 2 recommendations including the G20 Initiative to Promote Quality Apprenticeships and the G20 Skills Strategy, to help address the challenges brought on by digitalisation. This could require targeted actions and capacity building reflecting the different stages of development of G20 countries.

- Work with the Development Working Group to build synergies with the G20 initiative on promoting skills development for the digital economy and employment prospects for women and girls, particularly in developing and emerging countries.
- Foster digitalisation in order to strive towards meeting the goals agreed upon in the 2030 Agenda and the Sustainable Development Goals to end poverty, protect the planet and ensure prosperity for all.²

8. Strengthen trust in the digital economy

Trust and security are fundamental to the functioning of the digital economy; without them, uptake of digital technologies may be limited, undermining an important source of potential growth and social progress.

The G20 Ministers responsible for the digital economy intend to:

- Exchange experiences on how to build trust and encourage the use of risk-based technical standards, guidelines and best practices to identify assess and manage security risks by both the public and private sectors, especially for MSMEs.
- Encourage the development of national privacy strategies while taking into account the different needs in countries. We recognise the importance of promoting interoperability between privacy frameworks of different countries.
- Within the Argentinian Presidency of the G20 we will discuss international public policy issues related to privacy and security in the digital economy.

9. Promote consumer protection online

Despite the steady increase of business-to-consumer e-commerce, there remains considerable untapped potential. Consumer protection is of great importance to promote inclusive growth built on adequate and effective intellectual property rights protection and enforcement are essential to building the trust needed to further develop these markets for the benefit of consumers and businesses alike.

The G20 Ministers responsible for the digital economy intend to:

- Further study new business models in relation to consumer trust.
- Discuss under the Argentinian Presidency how to protect consumers in the digital economy including and inviting international organisations for example UNCTAD, the OECD and Consumers International.

10. Measuring the digital economy

Underpinning our success is the ability to know what progress we have made which also means improving measurement of the digital economy, because robust statistics are the foundation on which good, evidence-based policy advice is based.

The G20 Ministers responsible for the digital economy intend to:

- Welcome the work of the G20 Trade and Investment Working Group on Measuring Digital Trade, which is an important part of the broader issue of measuring the digital economy.
- Note the “OECD-IMF Interim report on the impact of digitalisation on measures of GDP” and look forward to the G20 Action Plan to Improve Measurement of the digital economy in Macroeconomic Statistics, to be delivered by the OECD and IMF working in collaboration with other international organisations and national statistical organisations later this year.

² The end of the sentence was taken from the UN’s website on the SDGs

- Encourage international organisations, such as the IMF, ITU, OECD, UNCTAD, World Bank and the WTO, in collaboration with national statistical compilers, to elaborate on frameworks for analysing key issues in digitalisation at the country level taking into account the structure of the local economy and statistical capacity.
- Endeavour to define a set of metrics that all economies can consider collecting with a view to developing a list of core, cross-country comparable ICT indicators to better support the evidence base and policy making by countries.

11. Bridging the Digital Gender Divide

Digitalisation has created new avenues for the economic empowerment of women. However, G20 countries are concerned that the benefits of digitalisation are not being equitably shared by women.

Depending on geographic and social conditions, women experience higher access barriers to technologies and digital financial services. Women also face skills, participation and leadership gaps which prevent them from fully participating in the digital economy.

To support the equitable participation of women in the digital economy, G20 Ministers responsible for the digital economy intend to:

- Share national practices on efforts to bridge the digital gender divide.
- Consider taking action across a range of key policy areas, subject to national circumstances, including developing national action plans to achieve Target 2.5.A of the Connect 2020 Agenda: “Gender equality among Internet users should be reached by 2020”.
- Support initiatives to develop digital financial services that are accessible and appropriate for women.
- Encourage the review of existing digital strategies to ensure they incorporate a gender perspective that addresses women’s needs, circumstances, capabilities and preferences; and mainstream gender impact analysis.
- Increase female participation in STEM education and employment.
- Explore opportunities for developing metrics that capture gender disaggregated data where possible on the level of access, use and benefits.

Digital skills in vocational education and training

Annex paper 2 to the Declaration of the Ministers responsible for the Digital Economy

Digital skills and competencies are driving forces of innovation and competitiveness of G20 economies and partner countries. Digitalisation is changing some occupational fields and professions as requirements to employees' qualifications evolve. Thus, digital literacy and digital skills should be elements of all forms of education and professional training over the life cycle. Starting from early education to vocational and university education to life-long learning – the acquisition of digital skills is essential in all these periods, especially in the transition from job to job. In particular, learning digital skills in vocational education and on-the-job training potentially increases employability and reduces the vulnerability to job loss due to changing task requirements. G20 recall the Digital Economy Development and Cooperation Initiative concluded in Hangzhou, China. In this regard, digital inclusion and the use of digital technology to enhance inclusion should remain key elements of promoting the digital economy in which no one is left behind.

As stated in the G20 Initiative to Promote Quality Apprenticeship, vocational education and training are important as they enhance the skills of the workforce. The close link between theory and practice in apprenticeship programs as well as during on-the-job-training can help to promote digitalisation in G20 economies and partner economies. Teaching apprentices digital skills and the use of digital media promotes the dissemination of up-to date knowledge on digitalisation in an enterprise. Apprentices can immediately apply their knowledge and induce spill-over effects to other employees. Vice versa, a skilled worker who is committed to digital on-the-job-training can help apprentices and other staff in their company to adjust to digitalisation. To address the lack of digitally skilled labour on a global level, there is an increasing need to support developing and emerging economies to design quality labour-market oriented vocational education and training.

Promotion of digital literacy, high quality education and acquisition of digital skills will help diminish digital divides between and within countries. Also, it will foster occupational and social participation in an increasingly digitised world and promote inclusive growth. In addition, it can contribute to digital capacity building within governments, as an efficient government needs a capable workforce. Science, technology engineering and mathematics (STEM)-skills are critical enablers of active participation in the digital economy, especially for women whose participation and graduation rates in those fields are below those of men in many countries. Lawful access to and effective use of digital technologies has the potential to benefit disadvantaged or underrepresented groups³ as well as foster their social and economic empowerment. Improving their digital skills will help increase their employment prospects and their participation as users, employees, entrepreneurs, innovators and leaders of the global digital economy. In addition, digital technologies offer advantages to teach and develop skills among communities that are displaced by natural and/or human driven disasters. Further, participation in work by persons with disabilities could be facilitated by accessible digital technologies and training.

3 These groups may include for example: poorest citizens, citizens from low-density and remote areas, seniors women and girls, persons with disabilities, indigenous peoples and other vulnerable groups.

Building on the G20 Initiative to Promote Quality Apprenticeship, we intend to undertake the following actions, especially targeting disadvantaged or underrepresented groups, and as appropriate to national circumstances by:

- Encouraging strategies on developing curricula on acquiring digital skills and applying digital learning technologies in vocational education (including rapid skills training programs) and on-the-job-training to upgrade employees' digital skills taking into account enterprises' needs.
- Identifying the skills needed in the future to contribute to inclusive and quality apprenticeship programs and enable enterprises, especially SMEs, to be successful in the digital economy. In line with the G20 Skills Strategy continuously monitor the need for digital skills in the workplace, in administration and in government and adjust education and training programs according to the developments in the changing world of work.
- Promote entrepreneurial skills including the orientation towards opportunity, proactivity and innovation as a complement to digital skills.
- Encouraging public and private sector, academia and social partners in designing and adapting apprenticeship programs which promote the acquisition of digital skills.
- Providing schools with the appropriate infrastructure, administrative framework and necessary resources to successfully teach digital skills and competencies also with regard to the requirements of digitalisation of production.
- Utilizing the potential of digital and e-learning technologies and accessible ICTs to increase learning outcomes of disadvantaged or underrepresented groups and enabling an effective life-long learning. Promoting the exchange of best practices and draw lessons for G20 countries in this field.
- Bridging the gender digital divide by ensuring that programs that foster digital skills in vocational education and training are equally attractive and accessible to both genders. Building synergies with the G20 initiative “#eSkills4Girls” on promoting digital skills and employment prospects for women and girls in emerging and developing countries.
- Improving teachers' and trainers' qualifications through continuous education enabling them to provide high quality teaching of digital content and apply digital education technology.
- Raising the awareness of the importance of digitalisation with regard to competitiveness and the ability of enterprises to innovate among apprentices, skilled workforce, teachers, managers and the general population.
- Strengthening dialogue between enterprises, start-ups, vocational schools, local authorities, training providers, social partners and other relevant actors and promoting exchanges on digital skills needed as well as training opportunities required by companies, e.g. by setting up regional or sector-specific clusters. These clusters also may support MSMEs which may not have adequate resources to develop digital training programs.
- Improving training and education of digital skills globally by strengthening the exchange of best practices among G20 countries, partner economies and other countries leading the digital education field, thereby respecting the particular challenges in developing countries.

G20 Priorities on Digital Trade

Annex paper 3 to the Declaration of the Ministers responsible for the Digital Economy

Digitalisation has a vast impact on our economies. Digital trade and technology have triggered a profound transformation of economic and trade structures. This was recognised by the G20 Leaders, who agreed in Hangzhou in 2016 to welcome the B20's interest to strengthen Digital Trade.

In 2017, with a view to deepening discussions and cooperation in order to identify opportunities and challenges related to Digital Trade, the German G20 Presidency invited G20 Members to continue this exchange, notably in the Trade and Investment Working Group (TIWG). G20 Members thank the International Organisations, in particular OECD, WTO, UNCTAD, World Bank, ITC and IMF, for their valuable input on the topic.

G20 Members agree as follows:

Measuring Digital Trade

G20 Members share the common objective to foster informed and evidence-based policy-making regarding Digital Trade, for which reliable data is critical. In view of the complexity of measuring Digital Trade, and with the aim to improve it, more work is needed.

G20 Members acknowledge challenges in measuring Digital Trade, including such technical and complex issues as the definition and scope of Digital Trade, the collection of basic and new sources of reliable data, appropriate accounting frameworks, and the classification of certain transactions as trade in goods or trade in services or both.

G20 Members therefore support efforts to intensify work already underway in relation to mapping and measuring Digital Trade, as an important part of the broader issue of measuring the digital economy. To this end, G20 Members support further progress on this work by national statistical agencies and International Organizations. We encourage the Inter-Agency Task Force on International Trade Statistics (TFITS, co-chaired by OECD and WTO) to engage more actively with all national statistical agencies, as well as with the business community, to develop proposals for efficient reporting systems.

G20 Members would welcome further work by the International Organizations, within their respective mandates, to:

- for the purpose of measuring Digital Trade, make proposals to responsible authorities for a common understanding of Digital Trade that is broad enough to cover existing approaches, and flexible enough to take into account on-going technological evolution, new ways of providing goods and services, and changes in regulatory classifications;
- identify both biases and gaps in measuring Digital Trade in statistics, including related to transactions not leaving a monetary footprint; and
- suggest ways to address these challenges and propose any areas where early progress could be made.

International Organizations are invited to present the result of their reflections and proposals for possible future work to the TIWG under the upcoming Argentinian G20 Presidency.

International Frameworks on Digital Trade

Recalling G20 Leaders' commitments on the international dimension of the digital economy set out in their communiqués in both Hangzhou and Antalya, and noting the important work of the Task Force on the digital economy, G20 Members have considered how to foster digital economy development and trade and deepen their understanding and discussion, and have agreed as follows:

- G20 Members will follow through on the G20 Digital Economy Development and Cooperation Initiative agreed in Hangzhou as part of their efforts to unleash the potential of the digitaleconomy, by fostering digital economy development and trade;
- G20 Members will engage constructively in WTO discussions relating to E-commerce with the WTO's Eleventh Ministerial Conference (MC 11) in mind;
- G20 Members recognize that full implementation of the WTO Trade Facilitation Agreement holds the prospect of enhancing the contribution E-commerce makes to lowering costs and increasing efficiency in international trade;
- G20 Members support the results of the 6th Appraisal of the WTO Trade Policy Review Mechanism, by which elements related to E-commerce may be included in WTO Secretariat's reports and, on a voluntary basis, in Members' reports;
- G20 Members will remain pro-actively and constructively engaged in other international fora with responsibilities related to various aspects of Digital Trade to sustain and improve, as appropriate, predictable and transparent frameworks;
- G20 Members will cultivate transparent digital economy policy making in accordance with the G20 Digital Economy Development and Cooperation Initiative and share best practices as useful tools for capacity building of policymakers; and
- the TIWG will keep Digital Trade prominently on its agenda with a view to reporting further under Argentina's G20 Presidency.

Recognizing the Development Dimension of Digital Trade

G20 Members agree that Digital Trade has potential to boost inclusive growth and jobs, but may also bring challenges, in particular to developing and least developed countries. At the same time, G20 Members acknowledge that intensified and concerted action is needed to enhance the ability of developing and least developed countries to more fully engage in Digital Trade. G20 Members agree on the common goal to strive to address the factors contributing to digital divides and contribute to fully inclusive Digital Trade.

G20 Members recognize that enhancing the ability of developing and least developed countries to achieve Digital Trade readiness and to more fully engage in Digital Trade requires specific capacities in a number of areas. These include digital infrastructure, technological development, skills, transparent and predictable regulatory frameworks, and availability of payment solutions. G20 Members emphasize the need for information sharing, capacity building and cooperation to enable and enhance the participation of developing and least developed countries in Digital Trade and in regional and global value chains.

To this end, G20 Members:

- agree to further deepen the discussion within the TIWG on the development dimension of Digital Trade;
- commit to continue the exchange of best practices of Digital Trade policies, including on sound regulatory frameworks and on measures to support increased Digital Trade;
- welcome collaborative efforts, including under the auspices of the e-Trade for All Initiative, involving developing countries, donors, the private sector and relevant International Organizations, within their respective mandates, to identify the constraints on Digital Trade and develop appropriate responses; and
- invite relevant International Organizations, within their respective mandates, to prepare a report to the TIWG under the upcoming Argentinian G20 Presidency. This report could identify factors affecting Digital Trade readiness and propose options for reducing barriers to Digital Trade and improving the performance of developing and least developed countries in this area to promote inclusive and sustainable growth.