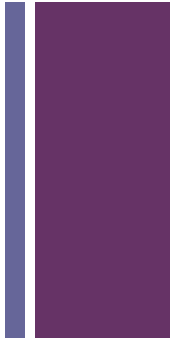




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ALEXANDER  
INNOVATION  
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# pArtneRship foR AddressiNG mEgatrends in ICT

## Output 3 (O3) Foresight Study

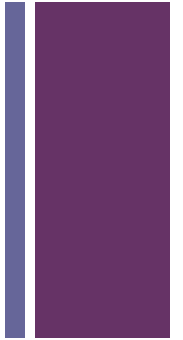
Sofia  
31 January 2020

Anastasios Andronikidis, Alexander Innovation Zone

[acanastasios@gmail.com](mailto:acanastasios@gmail.com)



# CHAPTER 1: A GLIMPSE AT THE WORLDWIDE LANDSCAPE OF ICTs



- 1.1 A bigger picture
- Digitalization and modern technologies
  - a great impact on global economy
  - complete industries revolutionised fundamentally
  - the way people
    - think,
    - live
    - and work significantly transformed.
- ICT
  - the infrastructure
  - and components that enable modern computing.



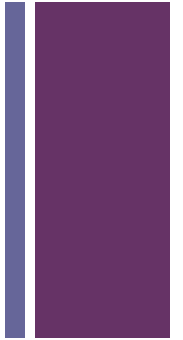
# 1.1 A bigger picture (1/4)



- no single, universal definition of ICT
- the term means
  - all devices,
  - networking components,
  - applications
  - and systems
- that allow people
  - and organizations
    - businesses,
    - non-profit agencies,
    - governments
    - and criminal enterprises to interact in the digital world.



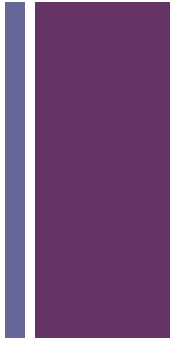
# 1.1 A bigger picture (2/4)



- The World Bank,
- numerous governmental authorities
- and non-government organizations (NGOs) advocate policies and programs
- bridge the digital divide
  - by providing greater access to ICT
  - among those individuals and populations struggling to afford it.
- those without ICT capabilities are
- left out of the multiple opportunities and benefits that ICT creates
- fall further behind in socio-economic terms.



# 1.1 A bigger picture (3/4)



- One of The United Nations Sustainable Development Goals (SDG) to
  - "significantly increase access to information and communications technology
  - and strive to provide universal and affordable access to the internet in least developed countries by 2020."
  - Economic advantages found both
    - within the ICT market
    - as well as in the larger areas of business and society as a whole.



# 1.1 A bigger picture (4/4)

## What is actually happening?

- Between 2005 and 2019, the number of Internet users grew on average by 10 per cent every year.
- The global penetration rate increased from nearly 17 per cent in 2005 to over 53 per cent in 2019.
- An estimated 4.1 billion people are using the Internet in 2019, reflecting a 5.3 per cent increase compared with 2018.
- In developed countries, most people are online, with close to 87 per cent of individuals using the Internet.
- In the least developed countries (LDCs), on the other hand, only 19 per cent of individuals are online in 2019.
- Europe is the region with the highest Internet usage rates, Africa the region with the lowest Internet usage rates.
- Almost the entire world population (97 per cent) lives within reach of a mobile cellular signal.
- The number of active mobile- broadband subscriptions per 100 inhabitants continues to grow strongly, with an 18.4 per cent year-on-year growth.
- Mobile-cellular subscriptions have also continued to grow, while fixed-telephone subscriptions continue to decline steadily.



# Components of ICT.

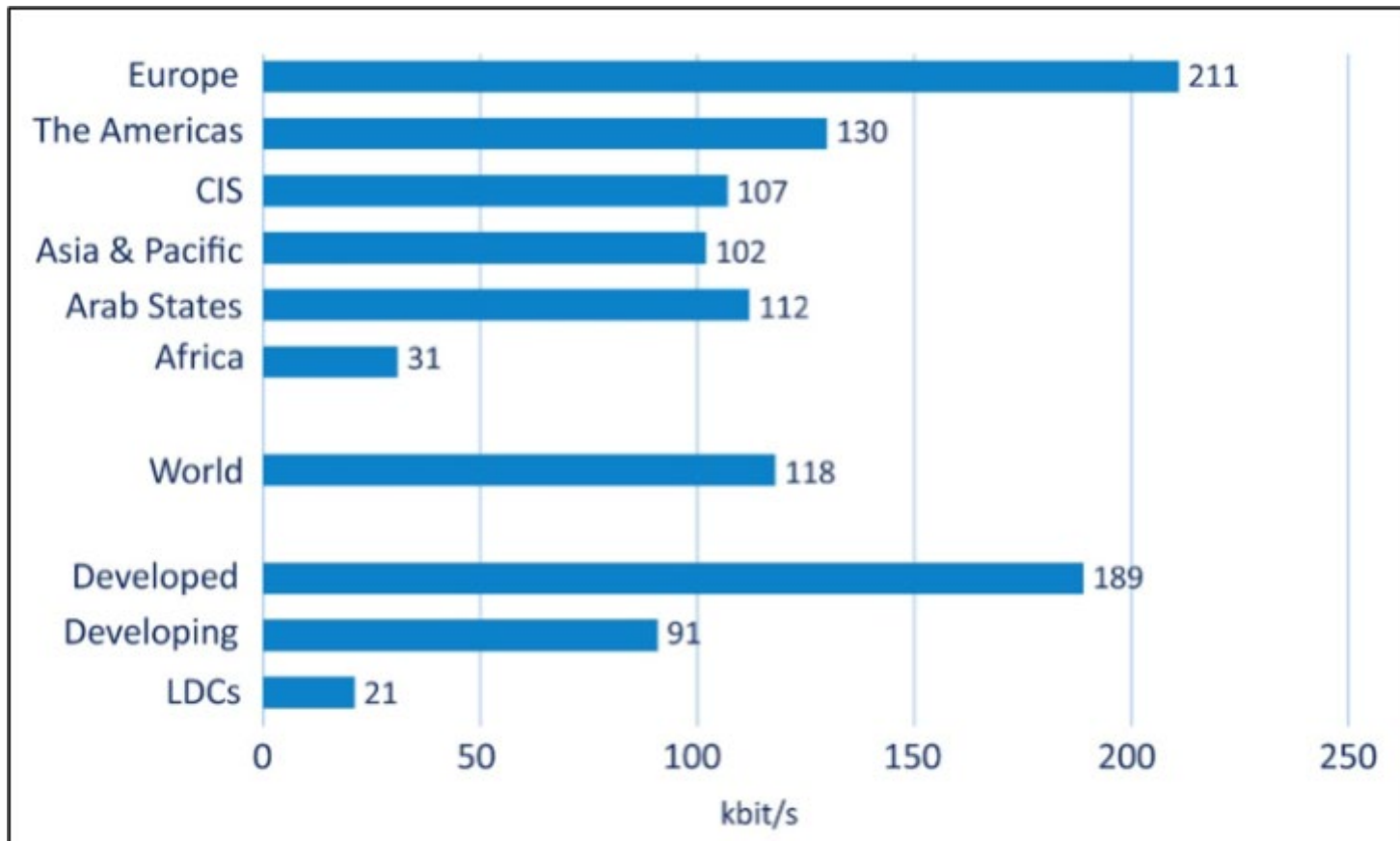
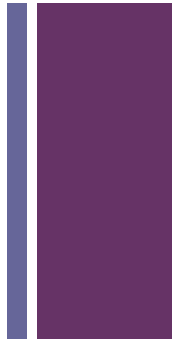
Source: searchcio.techtarget.com





# International bandwidth usage per Internet user (kbit/s), by region (2019)

Source: ITU

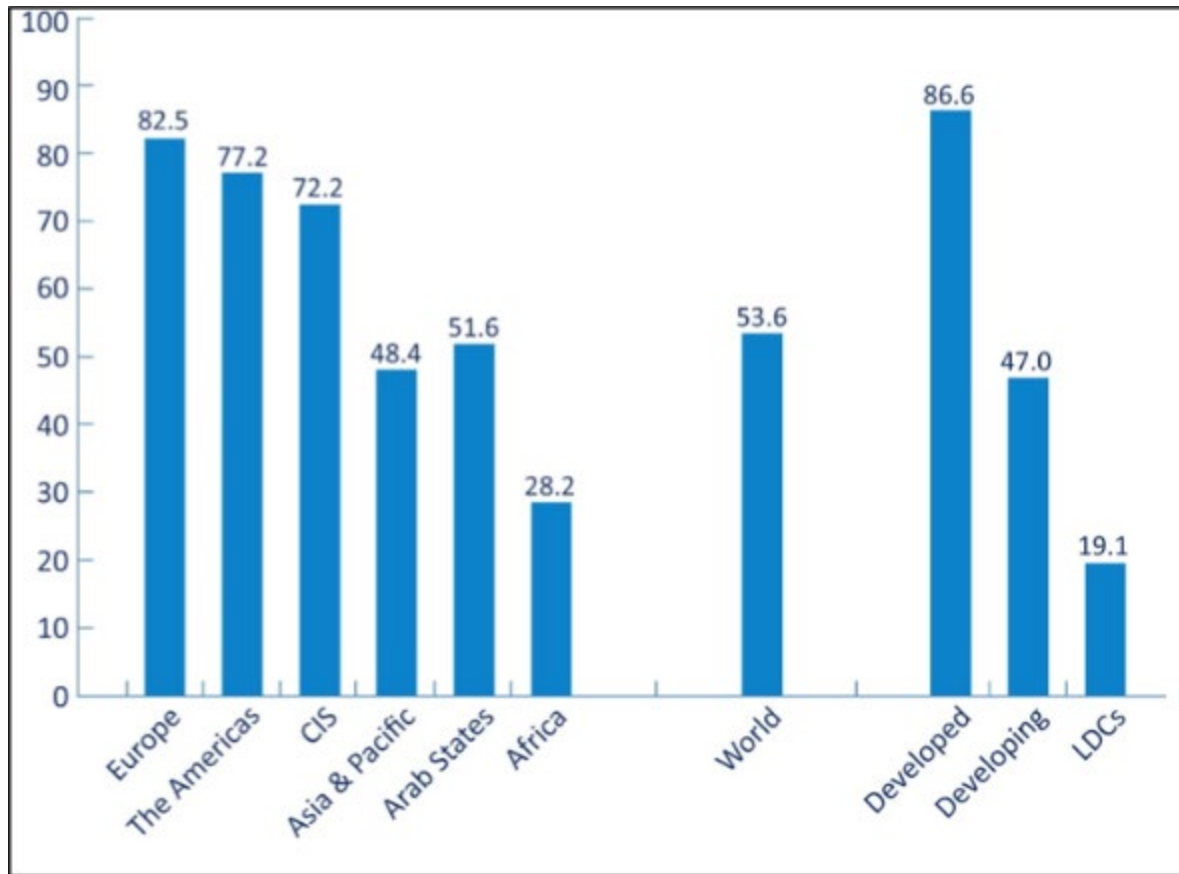






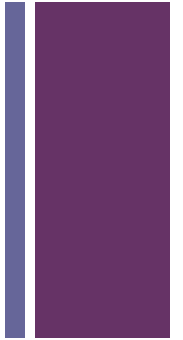
# Percentage of individuals using the Internet, by region and development status (2019)

Source: ITU





## 1.2 ICT & European Union (1/7)



- In 2015 the EU ICT sector Value Added was 581 billion euros,
- employed 5.8 million people
- and spent 30 billion euros on R&D (BERD) business expenditures.
- The ICT sector represented
  - 3.9% of the EU value added in 2015,
  - 2.5% of the employment,
  - 15.7% of total BERD,
  - 18.6% of the R&D personnel
  - 20.6% of the researchers.



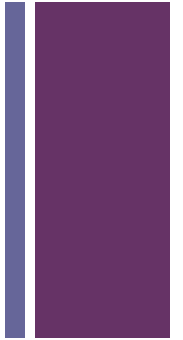
## 1.2 ICT & European Union (2/7)



- ICT sector in 2015 more dynamic than the whole EU economy,
  - value added increased 5.2%,
  - employment 1.8%
  - and BERD 2.9%.
- The ICT GBARD in the EU was 6.4 billion euros, represented
  - 6.7% of total public funding in R&D (total GBARD)
  - and 0.04% of total GDP.



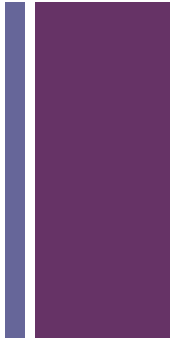
## 1.2 ICT & European Union (3/7)



- By 2016, 1 in 5 enterprises (20%) in the European Union employed ICT specialists.
- Adoption of the latest digital innovations
  - a key factor in the overall competitiveness of economic regions and national economies.
- This rapid increase challenges
  - policymakers,
  - stakeholders
  - and economic actors,
- not only in Central-Eastern Europe, but all across Europe
- new ways of collaboration with higher education institutions
- and the private education sector to ensure the number and quality of the ICT workforce for the next decade.



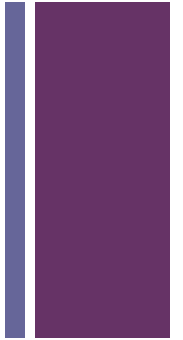
## 1.2 ICT & European Union (4/7)



- The requirements that the sector has to comply with, are changing
- constant need of developing
  - knowledge,
  - competencies,
  - and soft-skills.
- In 2018, 8.9 million professionals worked as ICT specialists across the EU-28
  - 3.9 % of the total workforce of the countries researched.



## 1.2 ICT & European Union (5/7)



- In only ten years, the number of ICT specialists in the EU has increased by more than 40%.
- In 2020, the European labour market is projected to be lacking more than 670,000 ICT professionals
- SMEs and multinational companies are competing for ICT workforce to be able to correspond with the urging needs of digital transformation.
- Big enterprises are more likely to fill the gaps with own employees
  - SMEs usually work with external suppliers.



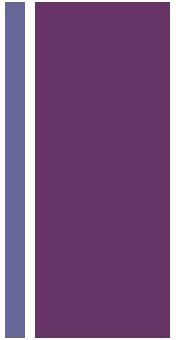
## 1.2 ICT & European Union (6/7)



- ICTs continue to be an effective resource for reducing existing costs,
- a tool for innovation and revenue growth through the creation of new services and ways of working in value chains and networks.
- Competitiveness,
- innovation
- and job creation in the European industry
- are being increasingly driven by the use of new information and communication technologies.
- need to be backed up by a workforce that has the knowledge and skills to apply these novel technologies efficiently.



## 1.2 ICT & European Union (7/7)

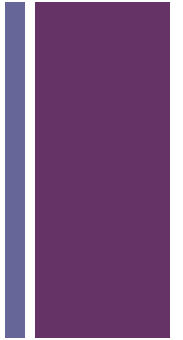


- A shortage of ICT specialists and workers with advanced ICT skills could hamper Europe's growth objectives.
- Digital transformation should be supported with a wide-range of actions on the governmental level.
- Europe's future competitiveness
  - ability to stay relevant in areas that are the most likely to generate innovation and growth in the short term
  - training and educating the digital workforce in the right direction.





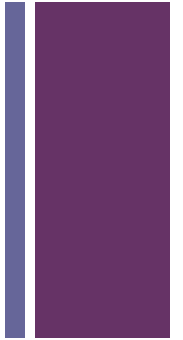
## 1.3 CURRENT ISSUES (1/2)



- Elemental ICT infrastructure
  - simple computer networks and internet access
  - a key asset for most businesses regardless of sector.
- These technologies are now so widely used that they are considered essential for the operation of businesses.
- In contrast, advanced infrastructures and information services are more important in the future economy than systems and technology,
- as they allow and encourage the creation of new ways of managing business relationships and new models of entrepreneurship in an evolving digital economy.



## 1.3 CURRENT ISSUES (2/2)



- Europe suffers from a lack of professional ICT skills and a lack of digital literacy.
- exclude many citizens from the digital society and economy due to ICT assimilation.
- The magnitude of the digital skills challenge requires a long-term strategy and new partnerships between European,
  - national,
  - regional,
  - public and private players
  - including civil society.



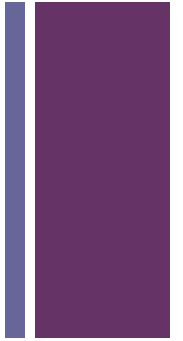
# 1.4 THE DIGITAL SKILLS GAP IN EUROPE (1/2)



- Having a digitally skilled labour force and population is crucial
  - for the creation of a Digital Single Market in Europe
  - and for receiving its benefits, for European competitiveness and for an inclusive digital society.
- However,
  - 44% of European citizens do not have basic digital skills.
  - 37% of people in the labour force – farmers, employees, and factory workers lack sufficient digital skills,
  - despite the increasing need for such skills in all jobs.



## 1.4 THE DIGITAL SKILLS GAP IN EUROPE (2/2)



- Europe also lacks skilled ICT specialists to fill the growing number of job vacancies in all sectors of the economy.
- need to modernise our education and training systems,
- which currently do not prepare young people sufficiently for the digital economy and society,
- and to move to a life-long learning approach
- so that people can adapt their skills sets throughout their life-times as needed.



# The metro map of the Great Coalition of Europe Committee on Digital Jobs

Source: [ec.europa.eu/digital-agenda/en/grand-coalition-digital-jobs-0](http://ec.europa.eu/digital-agenda/en/grand-coalition-digital-jobs-0)





# Key facts for Greece

Source: <https://www.cedefop.europa.eu/>

