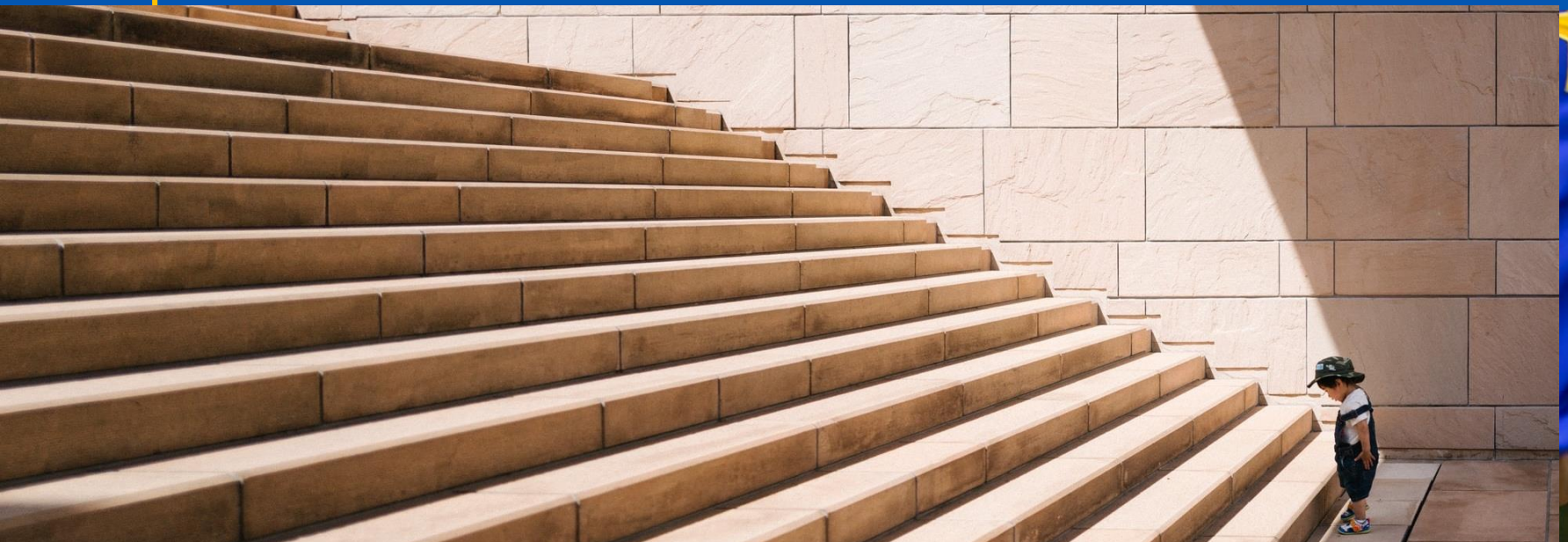
Digital Competence for Citizens

Update 2.2 to include AI and data related skills

Jan 27 2022

Digital Citizenship Plus Seminar Series



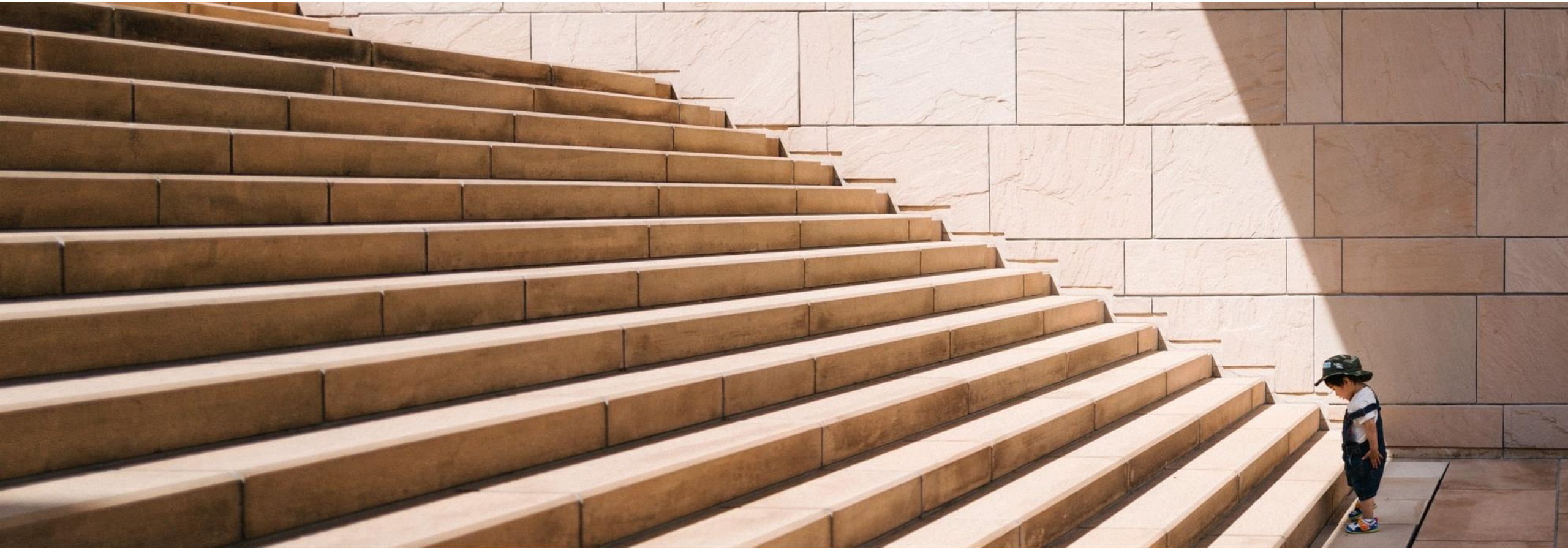
Dr. Riina Vuorikari,
European Commission
DG Joint Research Centre

Joint Research Centre (JRC)

As the **science and knowledge service of the European Commission**,

our mission is to support **EU policies with independent evidence** throughout the whole policy cycle.

Society is facing many challenges



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Digital skills challenge is high on the European Agenda!

EU wants 80% of adults to have digital skills by 2030

By EUOBSERVER

20%

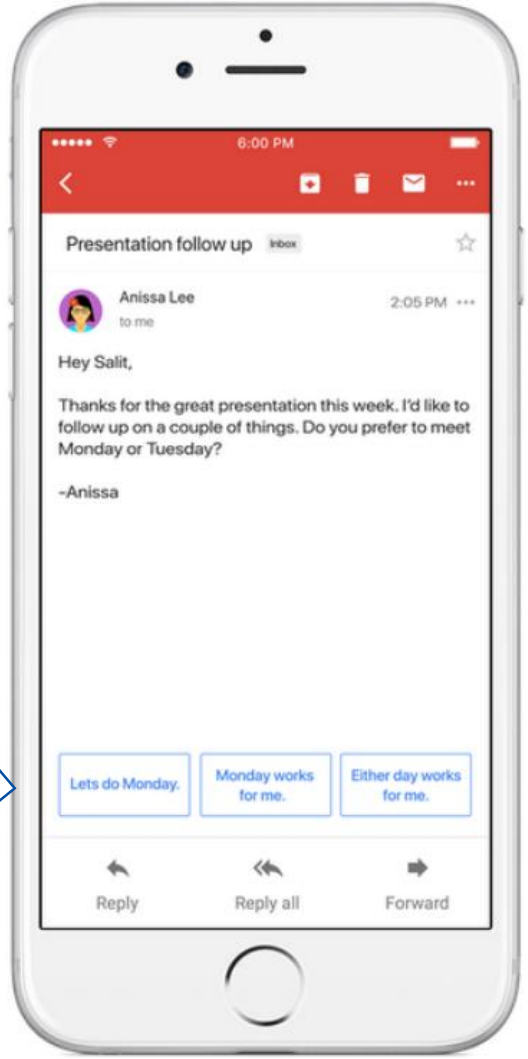
Percentage of the Recovery and Resilience Facility each EU country should dedicate to the digital transition

In this talk

1. Context (5 min)
2. **Scenario and requirements (10 min)**
3. Examples of knowledge, skills and attitudes (10 min)
4. Monitoring and setting policy targets (5 min)

Suggestions for smart replies generated by AI.

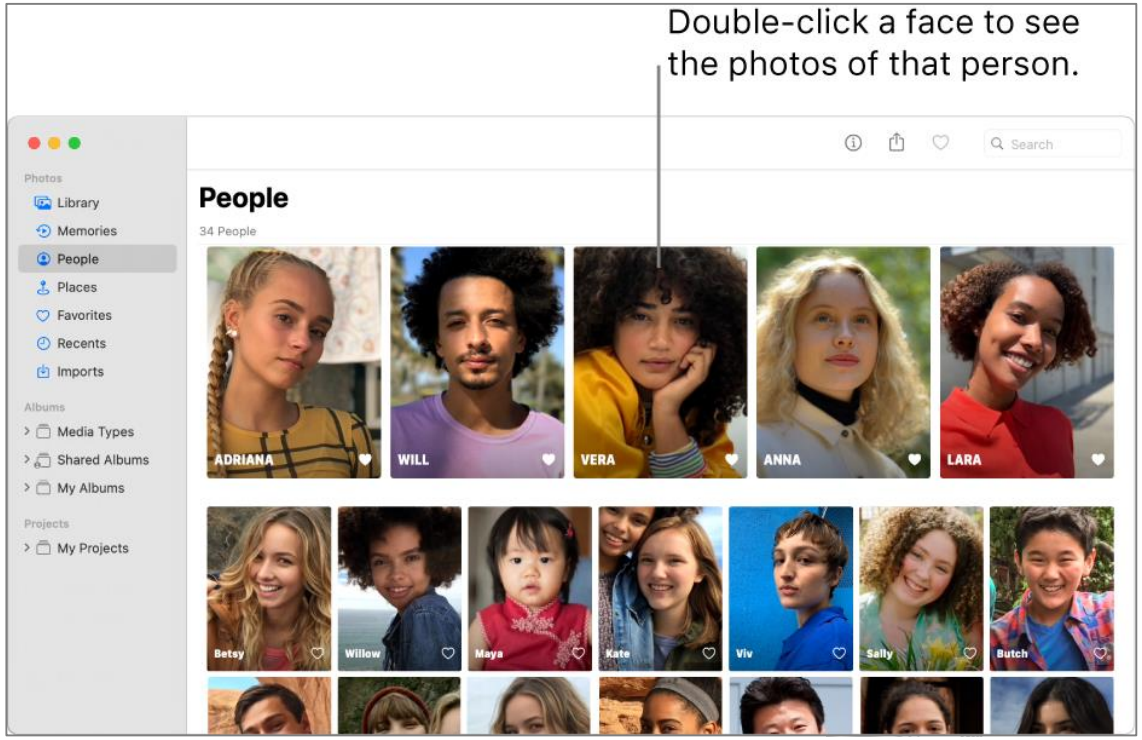
In 2017, 12% of replies on mobiles driven by this



AI empowers face recognition software, the more data you give to the system (e.g. insert name, confirm that the face belogs to a given person), the better it works.

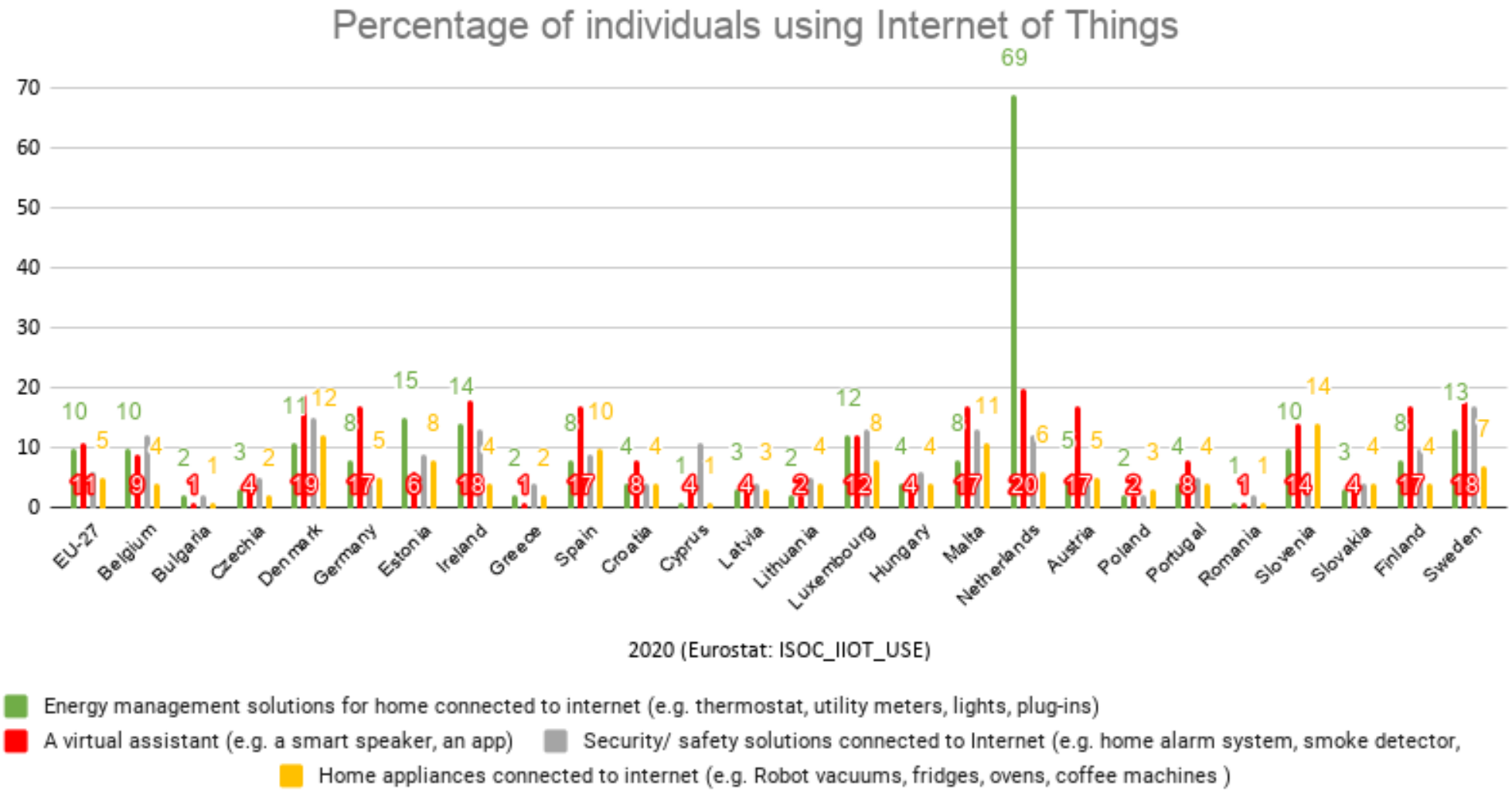
View people in your library

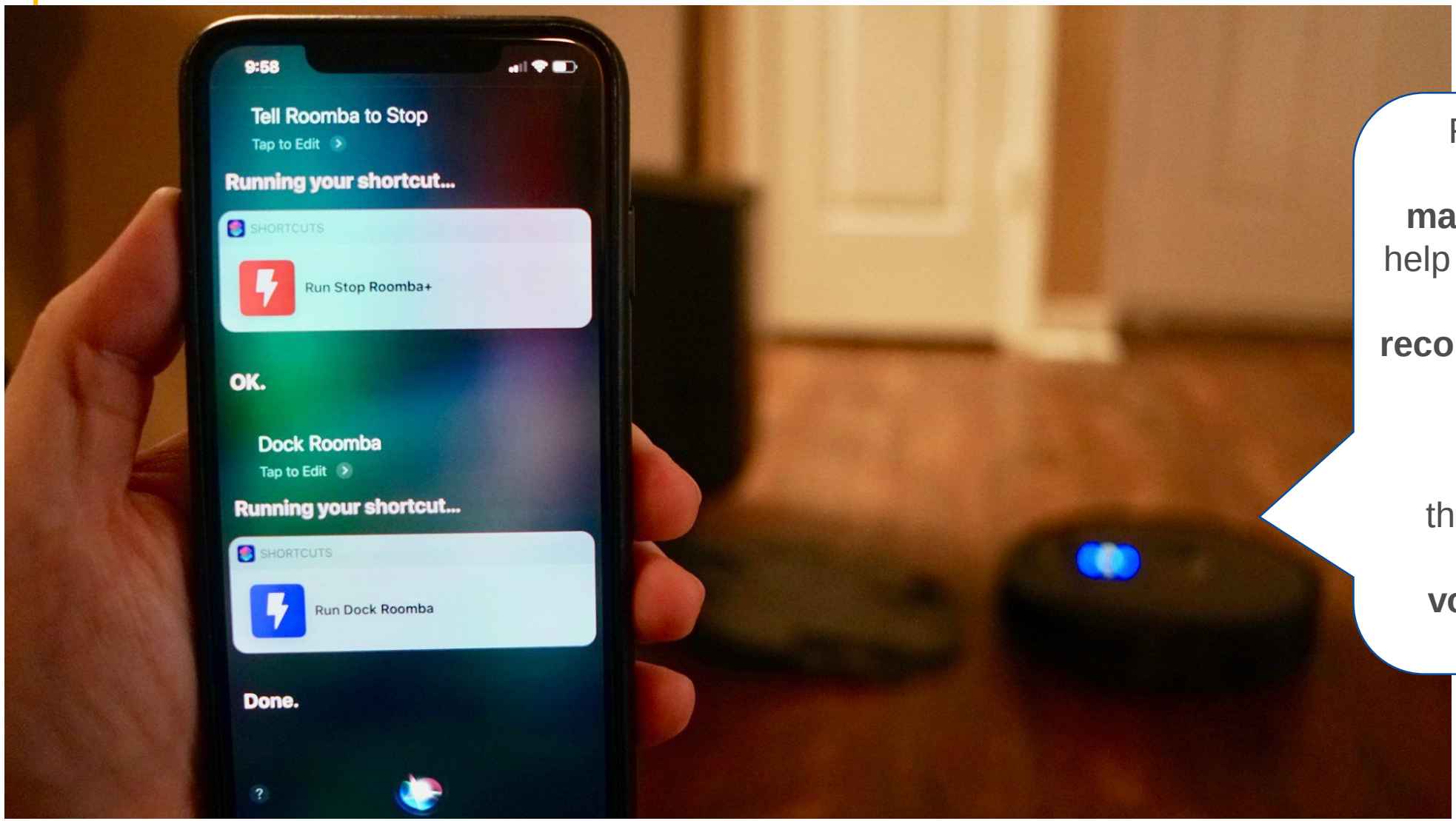
1. In the Photos app on your Mac, click People in the sidebar.



Sources: https://blog.google/products/gmail/save-time-with-smart-reply-in-gmail/; https://help.apple.com/assets/5F9C37DC680CE2523318A9E4/5F9C37E3680CE2523318A9EC/en_GB/7bfb31e3c39725feb7a7213db8f4c38a.png

Citizens interacting with smart technologies





Robot vacuums often use **machine learning** to help **map and navigate** a room, and to **recommended** cleaning schedules.

Operating the robot vacuums **through voice commands** uses AI too.

Source: https://9to5mac.com/2019/01/18/irobot-roomba-siri-control/;
* https://foundation.mozilla.org/en/privacynotincluded/irobot-roomba-s-series/

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What *knowledge*, *skills* and *attitudes* do citizens need to engage with AI systems in a confident, critical and responsibl way for learning, at work, and for participation in society?

See more at: https://ec.europa.eu/jrc/digcomp

DigComp requirements for citizens' use of AI systems

KNOWLEDGE

- *To be aware of what AI systems do and what they do not do*
- *To understand the benefits, limitations and challenges of AI systems*

SKILLS

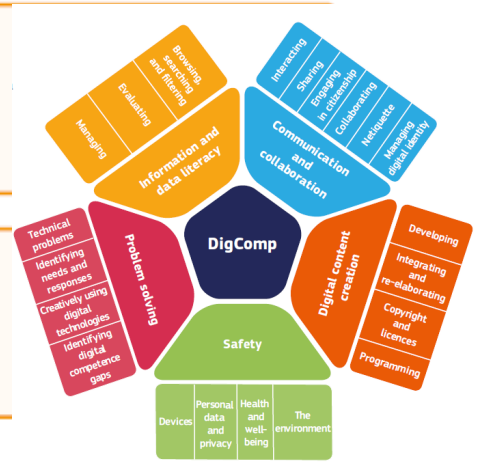
- *To use, interact and give feedback to AI systems as an end-user*
- *To configure, supervise and adapt AI systems (e.g. overwrite, tweak)*

ATTITUDES

- *Human agency and control*
- *Critical yet open attitude*
- *Ethical considerations of usage*

The DigComp conceptual model stays the same!

INFORMATION AND DATA LITERACY	Browsing, searching and filtering data, information and digital content Evaluating data, information and digital content Managing data, information and digital content
COMMUNICATION AND COLLABORATION	Interacting through digital technologies Sharing through digital technologies Engaging in citizenship through digital technologies Collaborating through digital technologies Netiquette Managing digital identity
DIGITAL CONTENT CREATION	Developing digital content Integrating and re-elaborating digital content Copyright and licences Programming
SAFETY	Protecting devices Protecting personal data and privacy Protecting health and well-being Protecting the environment
PROBLEM SOLVING	Solving technical problems Identifying needs and technological responses Creatively using digital technologies Identifying digital competence gaps



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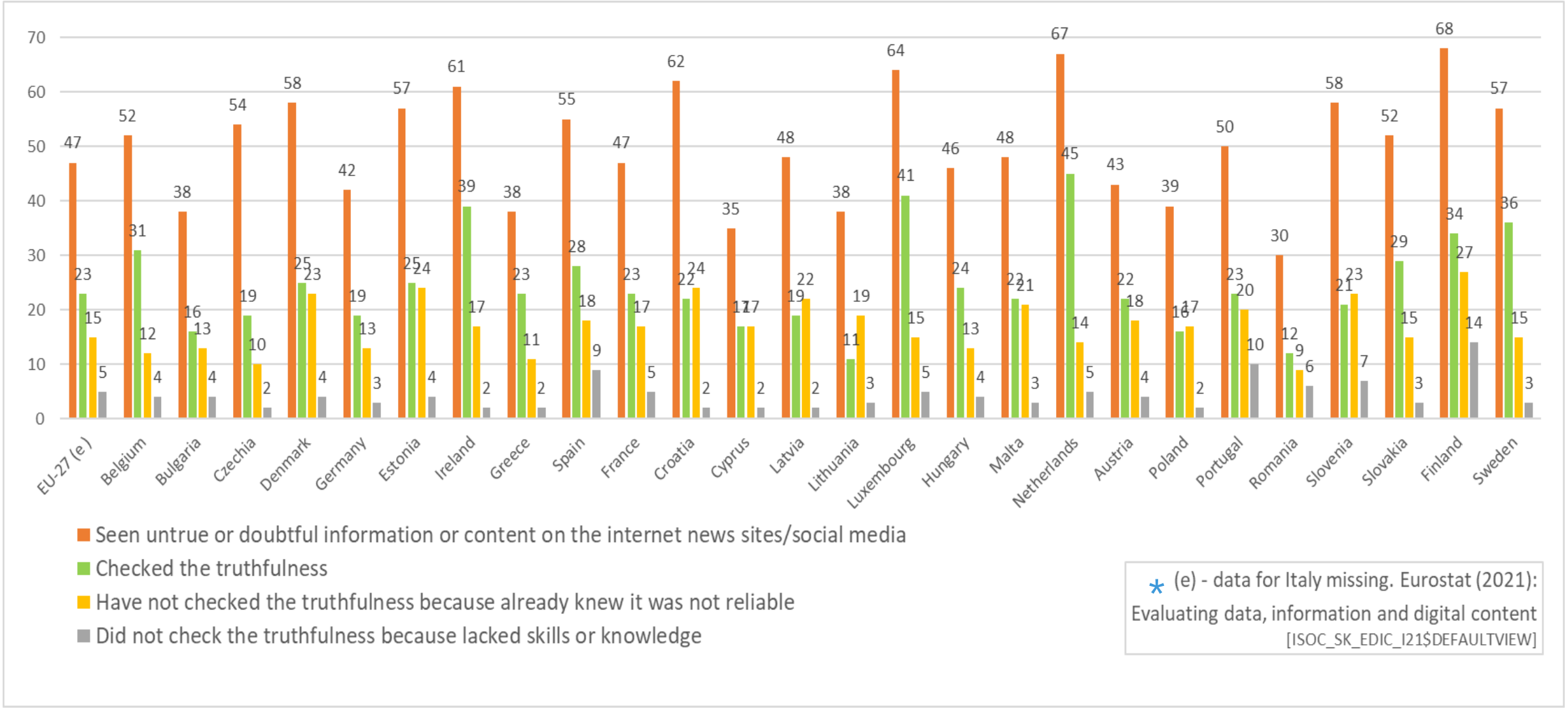
Information and data literacy

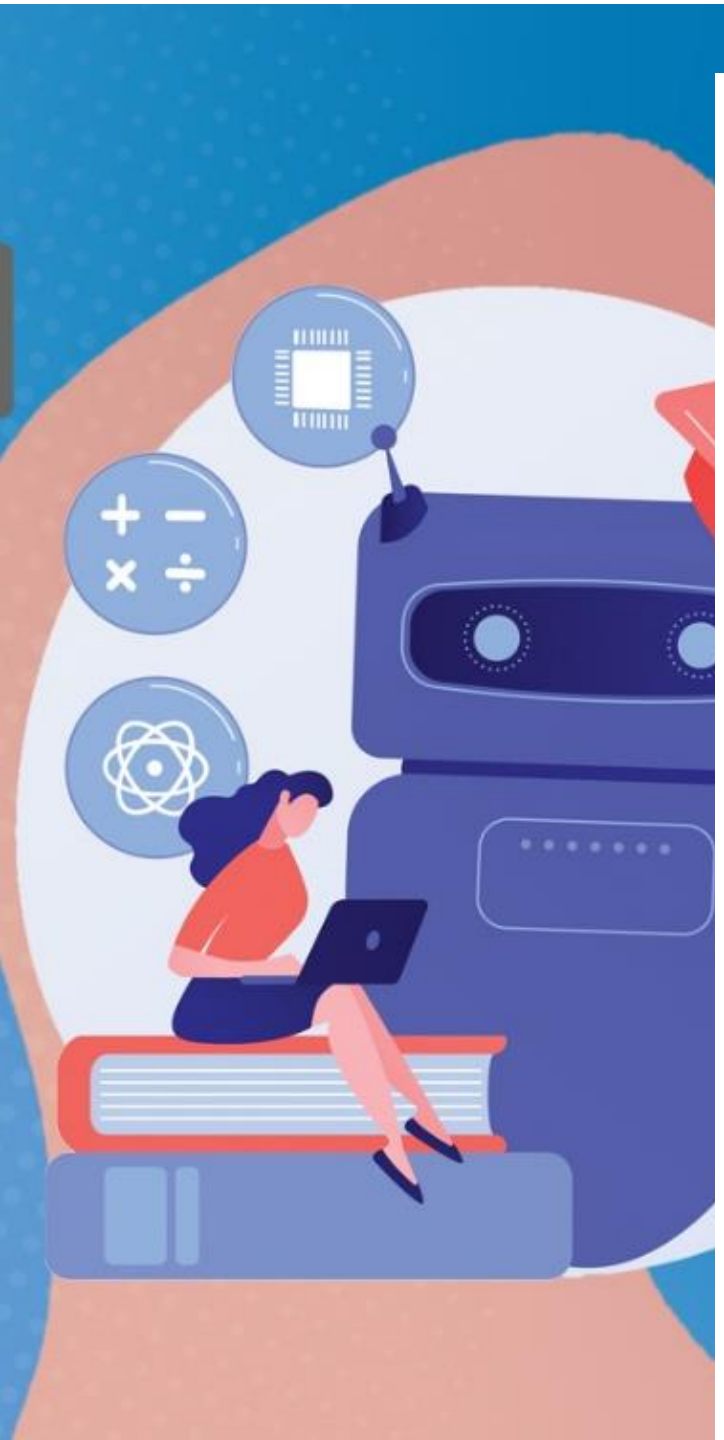
Disinformation, deep fakes, echo chambers…

1.2 Evaluating data, information and digital content

To analyse, compare and critically evaluate **the credibility and reliability of sources** of data, information and digital content.
To analyse, interpret and **critically evaluate the data, information and digital content**.

47% of Europeans have encountered untrue or doubtful content online in the last 3 months*





1.2 Evaluating data, information, content

1.2.1 To analyse, compare and critically evaluate the **credibility and reliability of sources** of data, information and digital content

KNOWLEDGE

Aware that…, knows that…, recognises that…

(IN) Aware that AI algorithms might not be configured to provide only the information that the user wants; they might also embody a commercial or political message (e.g. to encourage users to stay on the site, to watch or buy something particular, or to share specific opinions). This can also have negative consequences (e.g. reproducing stereotypes and sharing misinformation). (1.2)

(IN) Aware that some AI algorithms reinforce existing views in digital environments by creating "echo chambers" or "filter bubbles". For example, if a social media stream favours a particular political ideology, additional recommendations can reinforce that ideology without exposing it to opposing arguments. (1.2)

(IN) Weighs the benefits and risks before activating a virtual assistant (e.g. Siri, Alexa, Cortana, Google assistant) or AI-driven Internet of Things (IoT) devices as they may expose personal daily routines and private conversations. (2.6)

Open yet critical attitude

(IN) Weighs the benefits and risks before allowing third parties to process personal data, e.g. recognises that voice assistants connected to AI-driven home devices (e.g. a voice assistant on a smart phone that is used to give commands to a robot vacuum cleaner) can give access to the data to third parties (e.g. companies, governments, cybercriminals). (4.2)

Knows how to…, can do…, evaluates…

(IN) Knows how to modify user configurations (e.g. in apps, software, digital platforms) to enable, prevent or moderate the AI system's tracking, collecting or analysing data (e.g. not allowing the mobile phone to track the user's location). (2.6)

1.2 Evaluating data, information and digital content

To analyse, compare and critically evaluate the credibility and reliability of **sources of** data, **information and digital content**. To **analyse, interpret and critically evaluate** the data, **information and digital content.**

KNOWLEDGE

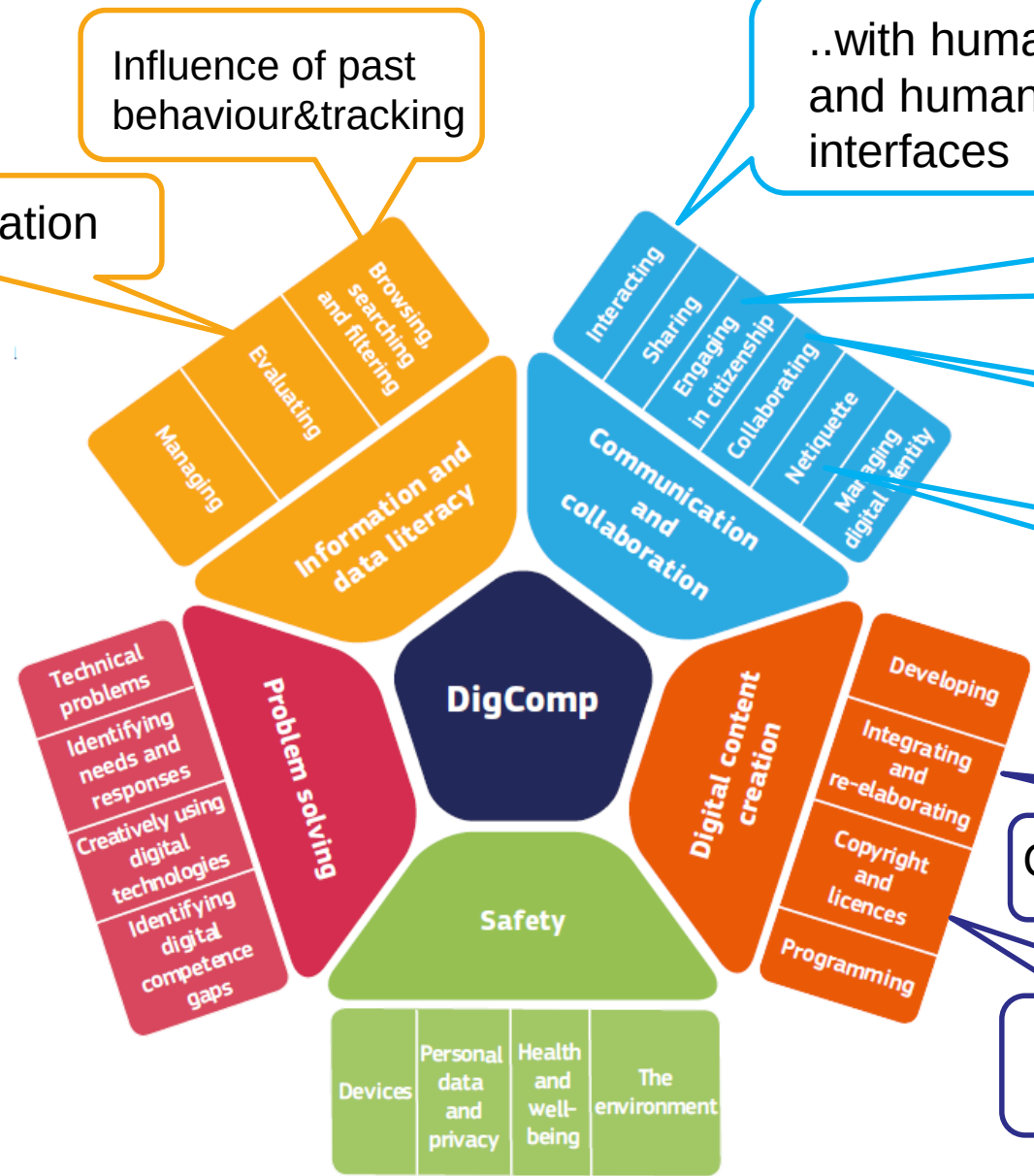
1. Aware that online environments contain all types of information and content including misinformation and disinformation, and even if a topic is widely reported it does not necessarily mean it is accurate.
2. Understands the difference between disinformation (false information with the intent to deceive people) and misinformation (false information regardless of intent to deceive or mislead people)[2].
3. Knows the importance of finding out who is behind the information and verifying it by checking multiple sources as it can help understand the point of view or bias of information and data sources.
4. Aware of potential information biases caused by algorithms, platforms' editorial choices, censorship, misinformation or disinformation, or by one's own personal limitations.
5. *Knows that the term "deep-fakes" refers to AI-generated videos of events or persons that did not really happen (e.g. speeches by politicians, celebrity faces on pornographic imagery), they are impossible to distinguish from real footage.*
6. *Aware that the data, on which AI depends, may include biases that are embedded in the models that the AI algorithms build, such that those biases can be automated and exacerbated by the use of AI. For example, images in online searches in relation to occupation may include stereotypes about male or female jobs (e.g. male bus drivers, female nurses).*
   //In appendix//
   Aware that so-called "personalised" results (e.g. from search engines, social media, content platforms) are based on patterns and averages of interactions of millions of other users, and while appropriate for groups of users, can sometimes be unsuitable for individual users (i.e. the AI might predict group behaviour but

Each competence will have around 15 examples -

out of which 1-2 related to AI and data.

More in appendix!! (around 80)

Information literacy, Communication & Content



Influence of past behaviour&tracking

Disinformation

..with humans and human-like interfaces

Participate in civic & social life and sustainable development to create social value

Digital for remote-work

Managing personal data through e-Identity

Co-creating digital artefacts (IoT) and content

Copyright, open licences

European Commission

Well-being and environmental sustainability

Importance of personal digital balance including non-use as an option

Remote-work and home

Digital health apps: for good or bad?

Respect for sustainability of natual and human resources

Aware of energy demand of devices, application and services

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DigComp 2.2 publication out in February-March 2022!

https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan/action-8_en

European Commission

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4. **Monitoring and setting policy targets (5 min)**

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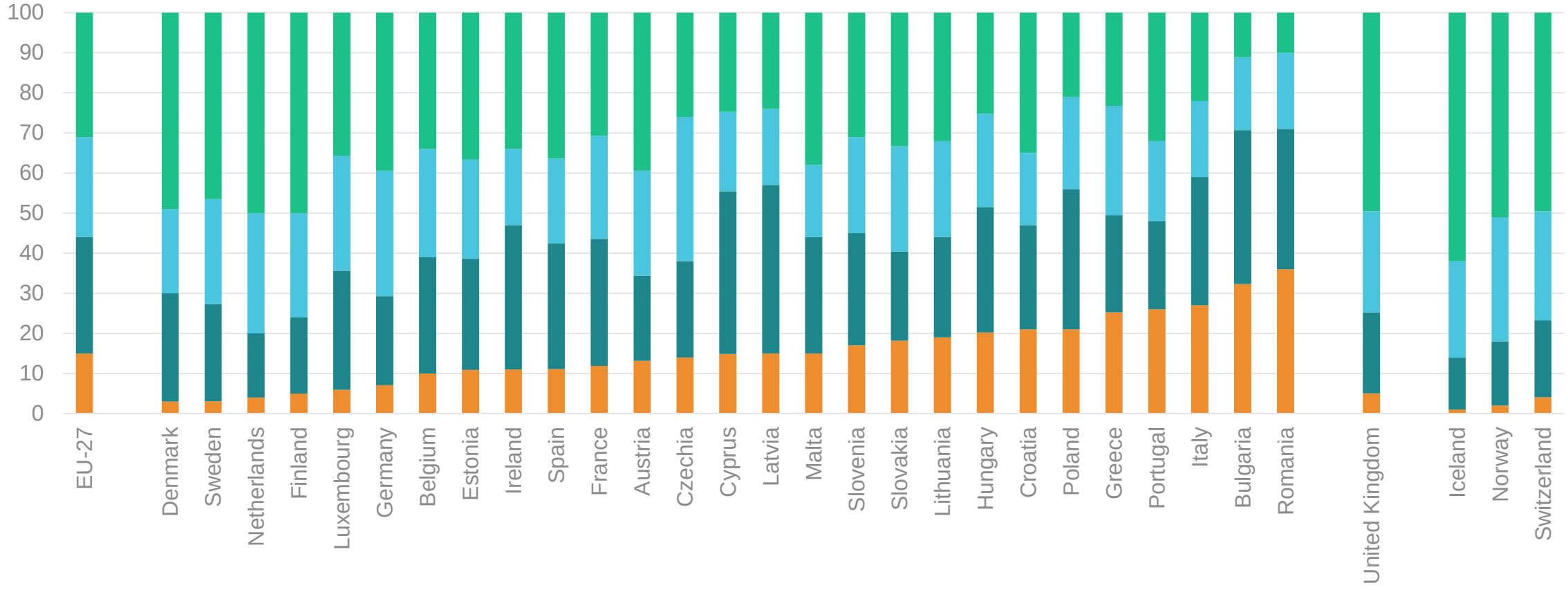
Digital Skills Indicator

part of Digital Society and Economy Index (DESI)

DSI - Overall Digital Skills Level, 2019

(%, share of individuals aged 16-74)



Slovakia: 2017 instead of 2019.
Czechia, Italy, Latvia, Luxembourg, Switzerland: break in time series.
Czechia, Sweden: low reliability.

Source: online data code isoc_sk_dskl_i

European Commission

Digital Skills Indicator (DSI)

- Uses microdata of the EU survey on the ICT usage in households and by individuals
- First piloted on the 2012, revised methodology 2015 (data for 2016, 2017, 2019)
- **Today,** this composite indicator reflects four of the five competence dimensions of the Digital Competence Framework:

  - ❑ **Information skills**
  - ❑ **Communication skills**
  - ❑ **Software skills**
  - ❑ **Problem solving skills**

For each area indicator, a level is computed based on **activities that individuals repor**t.
Then, an overall skills levels is computed.

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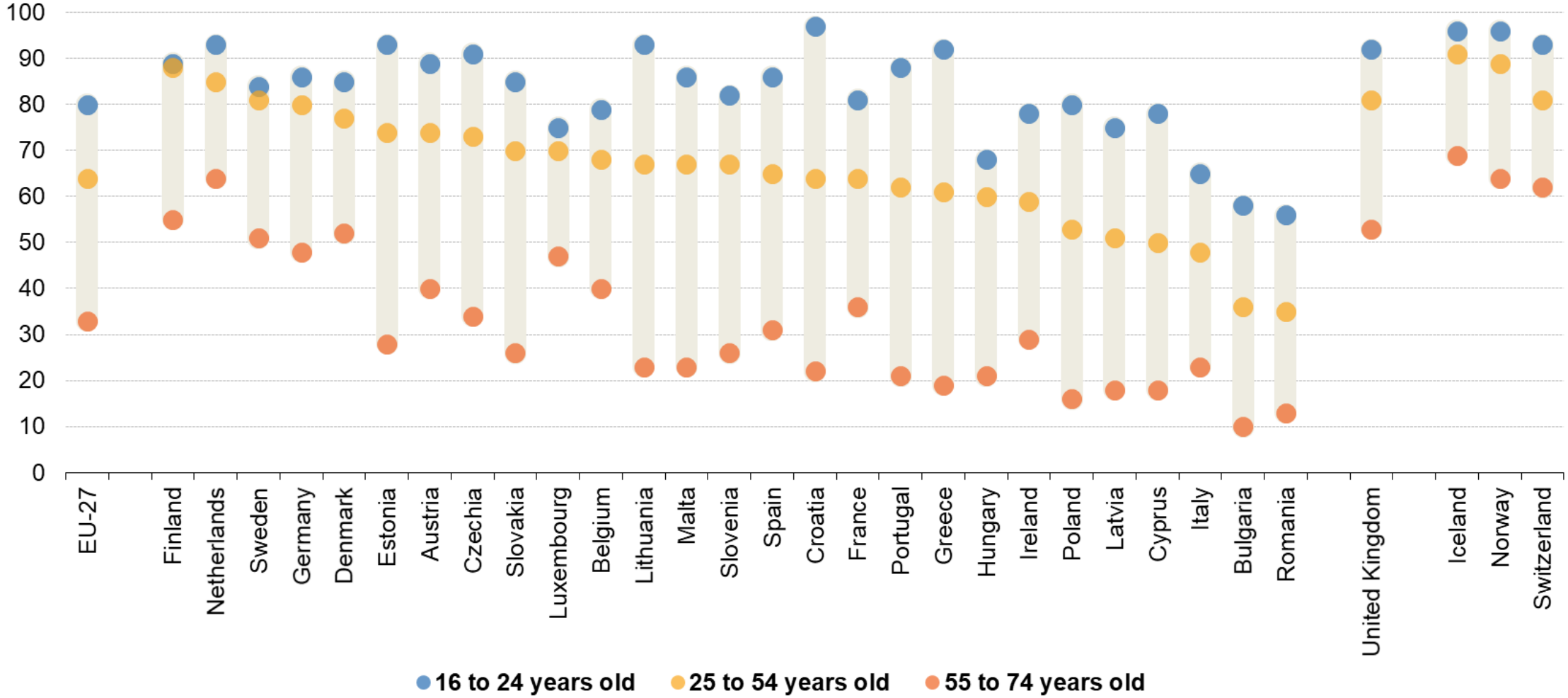
Individuals with basic or above basic digital skills, 2019

(%, share of individuals aged 16-74, by age group)



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eurostat

Why does it matter?
Digital skills challenge is a global one!

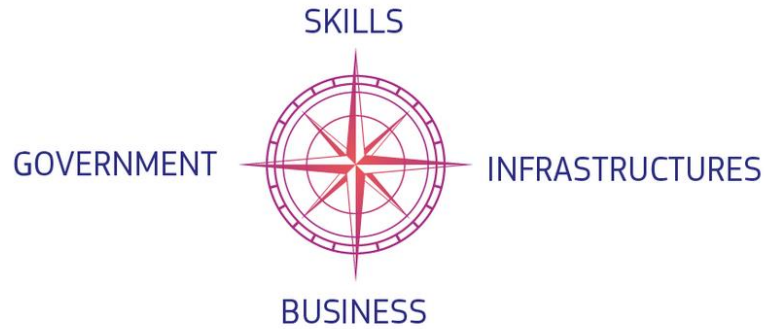
EU wants 80% of adults to have digital skills by 2030

By EUOBSERVER

20%

Percentage of the Recovery and Resilience Facility each EU country should dedicate to the digital transition

On 9 March 2021, the Commission presented a vision and avenues for Europe's digital transformation by 2030. This Digital Compass for the EU's digital decade evolves around four cardinal points:



Skills
ICT Specialists: 20 million + Gender convergence
Basic Digital Skills: min 80% of population

Digital transformat
businesses
Tech up-take: 75% of EU
Cloud/AI/Big Data
Innovators: grow scale u

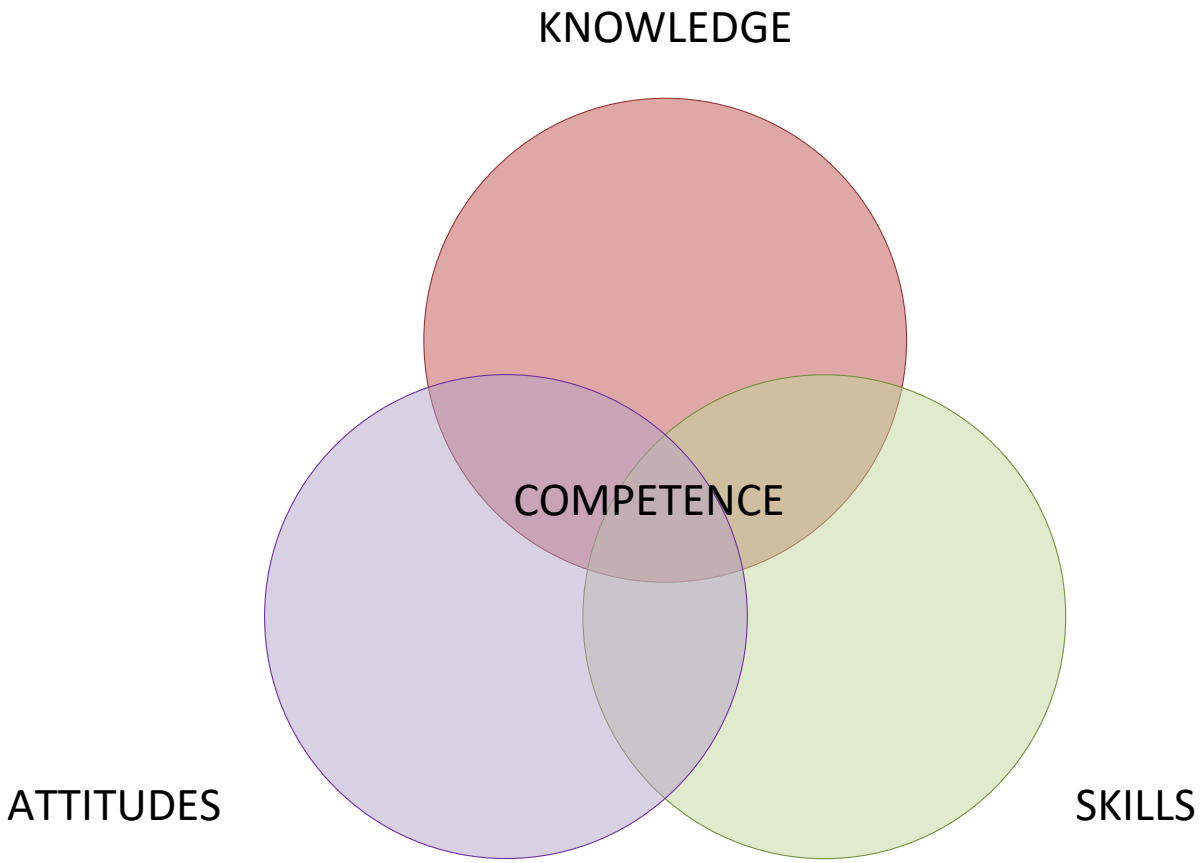
Thank you!

Contact: Riina.Vuorikari@ec.europa.eu

European Commission

What does it mean to be digitally competent?

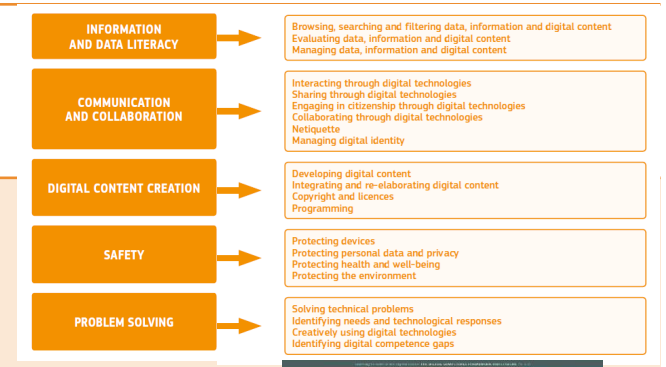
Digital competence involves confident, critical and responsible use of, and engagement with *the full range of digital technologies* for learning, at work, and for participation in society.



(Council Recommendation on Key Competences for Lifelong Learning, 22 May 2018, ST 9009 2018 INIT)

The focus of the DigComp 2.2 update

Dimension 1	Areas identified to be part of the digital competence
Dimension 2	Competence titles and descriptors
Dimension 3	Levels of proficiency for each competence
Dimension 4	**Examples of the knowledge, skills and attitudes applicable to each competence**
Dimension 5	Examples of use



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