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**ARRANGE-ICT**  
pArtneRship foR AddressiNG mEgatrends in ICT



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# pArtneRship foR AddressiNG mEgatrends in ICT

## Output 3 (O3) Foresight Study

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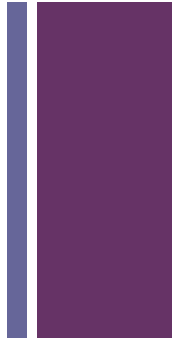
# Foresight Study for the ICT sector



- Technology Foresight (TF)
  - an essentially important tool for long-term planning at
    - Regional,
    - National or even International level
  - exploring the future to record trends and potential developments
  - the primary aim
    - improving and preparing today's decisions and strategic choices as best as possible



# Existing tools that can be used in order to deliver the TF



■ Figure 1: The 10 Most Common Technologies of Foresight in Europe (EFMN)

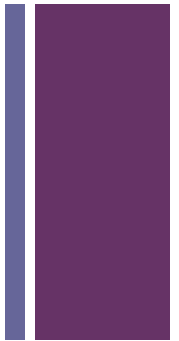
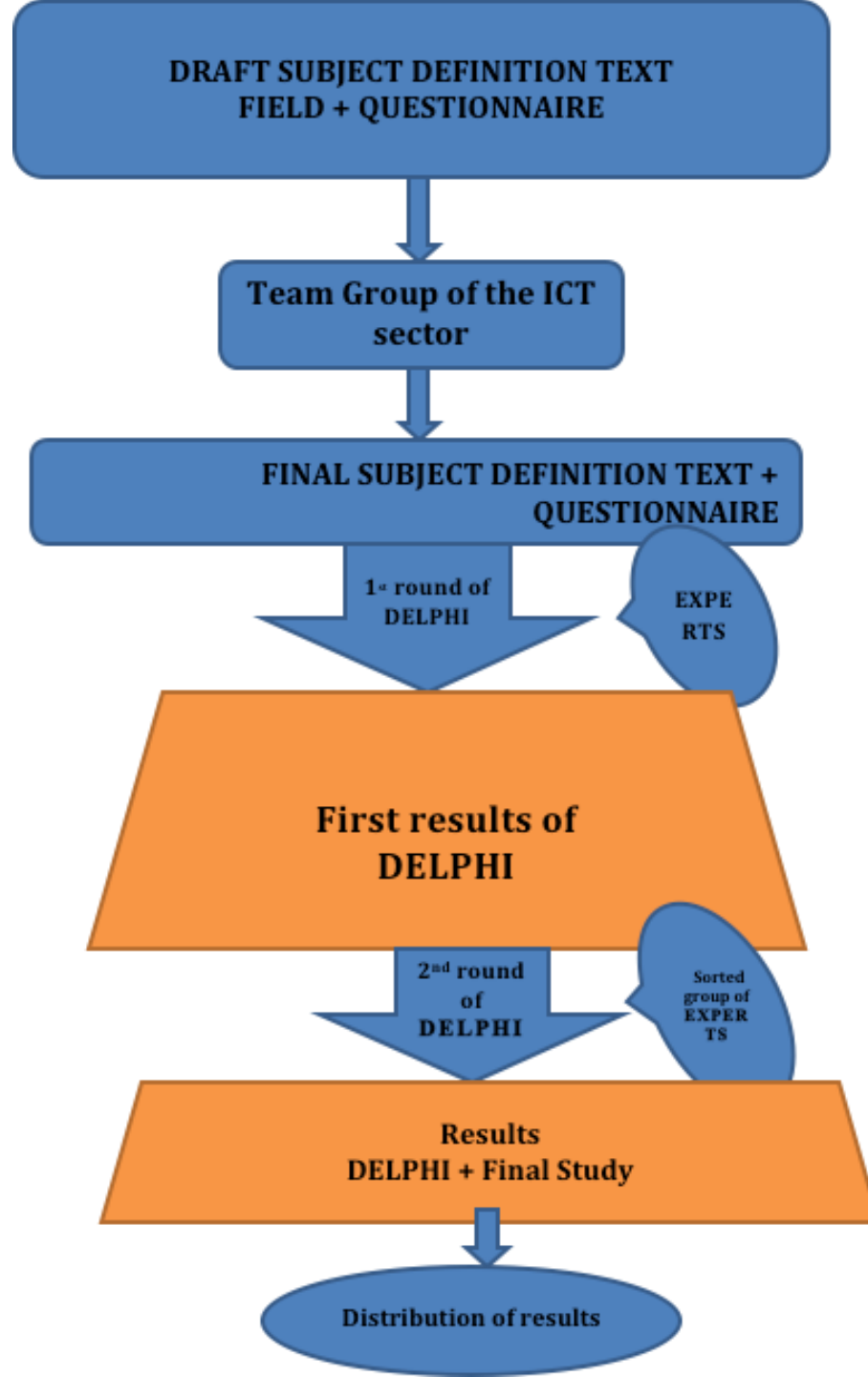


# DELPHI technique



## ■ Delphi

- a research methodology widely used in a wide range of disciplines
- obtains the maximum possible consensus of a pre-selected group of experts on a topic,
  - by providing them with a series of consecutive questionnaires.





# Components of ICT.

Source: searchcio.techtarget.com





# 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)







# Delphi Research Questionnaire (1/2)



## 1. Methodology

- Internet based research Delphi

## 2. Research Period

- Phase 1: July-August 2020
- Phase 2: September-October 2020

## 3. Interviews conducted

1. 1st Phase:  $n_1 = 48$   
(Percentage of answers: 81.25 %)
2. 2nd Phase:  $n_2 = 39$   
(Percentage of answers: ??.?? %)



# Delphi Research Questionnaire (2/2)



## 4. Selection of experts

- Representatives from:

- business,
- academic community,
- public bodies

invited to participate in the research,

- based on their specialization and experience in ICT

<b>Business</b>	<b><math>n_1 = 14</math></b>	<b><math>n_2 = 12</math></b>
<b>Academics</b>	<b><math>n_1 = 20</math></b>	<b><math>n_2 = 17</math></b>
<b>Public bodies</b>	<b><math>n_1 = 14</math></b>	<b><math>n_2 = 10</math></b>



# Delphi statement catalog (1/3)



- The sector encompasses a diverse range of roles and skills.
- The questionnaire includes specific questions concerning the identification of gaps in ICT skills on 2 categories and 13 sectors:
  - Horizontal Sectors
  - Vertical Sectors

**How important do you think  
the statement is?**

**(1 = not important; 2 = hardly important;  
3 = important; 4 = quite important;  
5 = totally important)**



# Delphi statement catalog (2/3)



## Horizontal Sectors:

1. **Programming**
2. **Device, Network and Cloud Infrastructure**
3. **Cyber Security**
4. **ICT Business Change**
5. **Artificial Intelligence**
6. **Data Science**
7. **Web Services**



# Delphi statement catalog (3/3)



## Vertical Sectors:

8. **E-learning**
9. **E-health care**
10. **E-government**
11. **E-payments**
12. **E-culture/tourism**
13. **Generating IT ancillary/soft/moderate skills**



# Methodology

## (1/4)



- In order to perform the first round, an extensive qualitative research was made such as:
  - literature review,
  - exploratory interviews with experts of the ICT field
  - and pilot studies.
- One of the advantages of the Delphi process is that it can be iterated in a continuous manner until consensus has been achieved.
- In the first round, the Delphi participants were provided with closed-ended, 5-point Likert scale questions in order to elicit the level of agreement with a series of statements regarding the relative importance of the various aspects of digital skills in ICT.



# Methodology

## (2/4)



- Participants were asked to rate the categorised responses from Round 1 on a scale of 1 to 5, with:
  - 1 = Not important;
  - 2 = Hardly important;
  - 3 = Important;
  - 4 = Quite important;
  - 5 = Totally important.
- The returned data of the first round were used for the statistical analysis.



# Methodology

## (3/4)



- The major statistics used in Delphi studies are measures of
  - central tendency
  - and level of dispersionwhich are:
  - the standard deviation
  - and inter-quartile rangerespectively.
- Concerning the Delphi rounds, it is necessary to justify the degree of importance and consensus before making interpretation.
- Consensus on a topic can be decided if a certain percentage of the votes falls within a prescribed range.
- The group response median value and the inter quartile range distribution are usually referred as the reference for the degree of importance and consensus





# Methodology

## (4/4)



- The analysis of consensus data of the experts was done based on:
  - median,
  - inter quartile range
  - and quartile deviationon the data of Round 1 and 2.
- After the definition of the median value, inter quartile range and quartile deviations, the subsequent analysis technique is to classify the items according to the consensus level and importance level.



# Table: Consensus and importance levels



<b>Quartile deviation (QD)</b>	<b>Level of consensus</b>	<b>Median</b>	<b>Level of importance</b>
<b>Less or equal to 0.5 (<math>QD \leq 0.5</math>)</b>	<b>High</b>	<b>More than or equal to 4 (<math>M \geq 4</math>)</b>	<b>High</b>
<b>More than 0.5 and less than or equal to 1.0 (<math>0.5 &lt; QD \leq 1.0</math>)</b>	<b>Moderate/Low</b>	<b>More than or equal to 4 (<math>M \geq 4</math>)</b>	<b>High</b>
<b>More than 0.5 and less than or equal to 1.0 (<math>0.5 &lt; QD \leq 1</math>)</b>	<b>Moderate/Low</b>	<b>Less than 4 (<math>M &lt; 4</math>)</b>	<b>Low</b>
<b>Less or equal to 0.5 (<math>QD \leq 0.5</math>)</b>	<b>High</b>	<b>Less than 4 (<math>M &lt; 4</math>)</b>	<b>Low</b>



# Table: Description of the classifications

	Highly Accepted	$M \geq 4, QD \leq 0.5$	Keeping
	Moderately Accepted	$M \geq 4, 0.5 < QD \leq 1$	Keeping
	Moderately Phased out	$M < 4, 0.5 < QD \leq 1$	Keeping
	Highly Phased out	$M < 4, QD \leq 0.5$	Discarding



# Structure of Foresight Study (1/2)



- **CHAPTER 1: A GLIMPSE AT THE WORLDWIDE LANDSCAPE OF ICTs**
  - ICT & European Union
  - THE DIGITAL SKILLS GAP IN EUROPE
  
- **CHAPTER 2: GREECE and ICTs**
  - ICT JOB MARKET IN GREECE
  - MISMATCH PRIORITY OCCUPATIONS FOR GREECE
  - DIRECTION FORECAST FOR GREECE
  - NEW DEMANDS NEW SKILLS



# Structure of Foresight Study (2/2)



- **CHAPTER 3: CYPRUS and ICTs**
  - IT Talent Shortage
  - Skills Gaps a Barrier to Digital Transformation
  - IT Services Trends
  - Building A Digital Future and Future Outlook
  
- **CHAPTER 4: BULGARIA and ICTs**
  - Prospects
  - Business Process Outsourcing
  - The future
  
- **CHAPTER 5: RESULTS OF RESEARCH**



# Conclusion – Completion Plan



Next steps:

- **CHAPTER 5: RESULTS OF RESEARCH (October 2020)**
- **Multiplier Event: Dissemination of Results (November 2020)**



Thank you!

