



EU-Eastern Europe and Central Asia Gateway on ICT Research and Development

Overview of the national ICT R&D priorities – results of the Consultation workshop

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EU-EECA ICT Cluster is the joint effort of three FP7-ICT support actions (ISTOK-SOYUZ, SCUBE-ICT, EXTEND) to strengthen the collaboration in ICT research between European Union and Eastern Europe and Central Asia (EECA) countries

Content

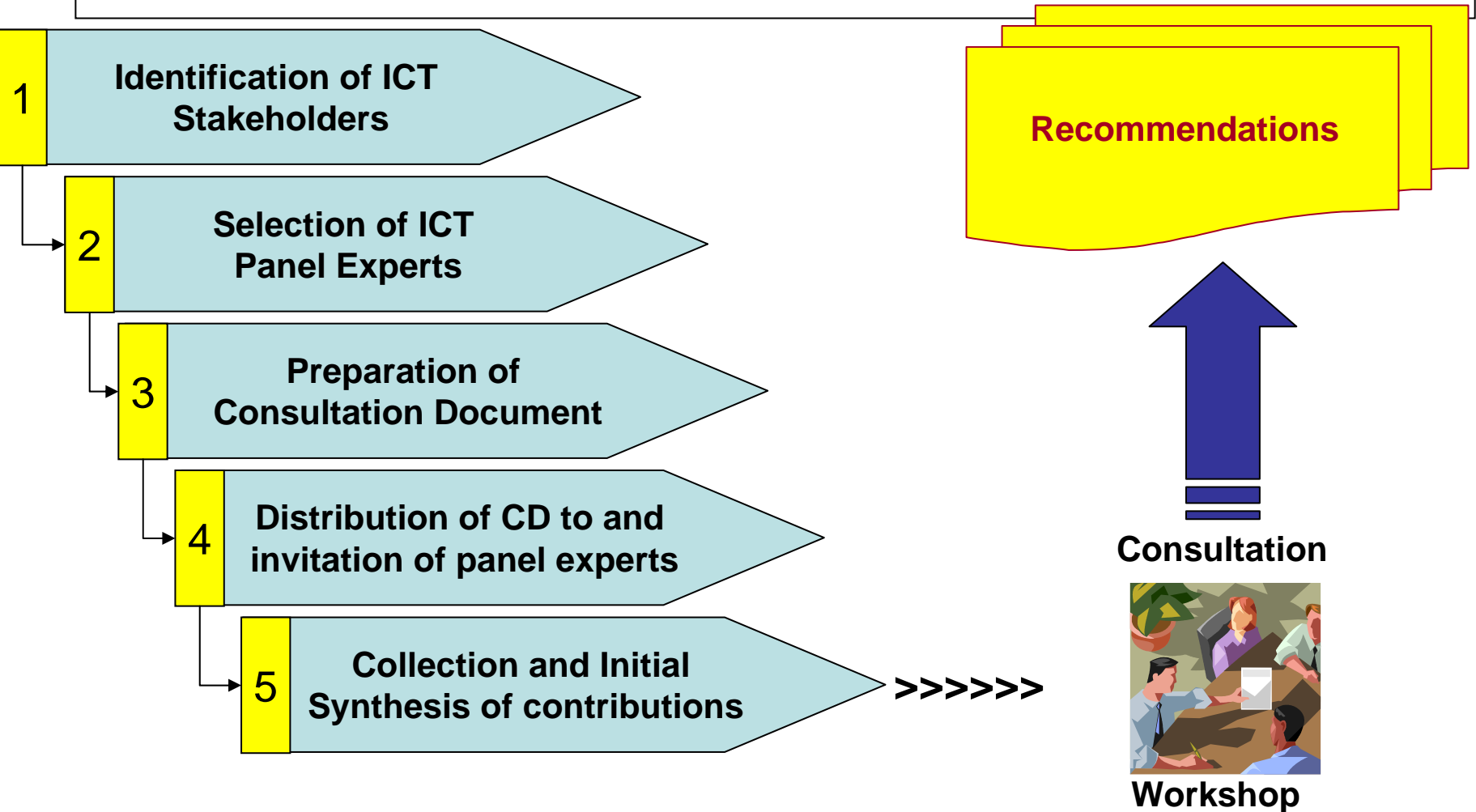
- Consultations' Objectives
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- Consultation Document
- Consultation workshop
- Scoring method
- Respondents
- Prioritizing the current R&D fields in Belarus
- The current ICT R&D fields and priorities in Belarus
- Estimation of the future ICT R&D priorities in Belarus
- Final list of Belarus ICT Priorities for cooperation with EC in 2011-2015
- Final list of EECA ICT Priorities for cooperation with EC in 2011-2015

The Consultations' Objectives

- The key objective of the consultations is to obtain feedback from ICT stakeholders in order to identify research priorities that:
 - reflect the actual Belarus research capacities and potential,
 - meet the technological / industrial trends, and
 - and address real socio-economic needs.
- The research priorities are the main element for:
 - for the development of recommendations for shaping ICT research co-operation between the EU, Eastern Europe and the Southern Caucasus for the period 2010-2015.

The recommendations will provide valuable input for the shaping of future annual FP7 ICT work programmes and calls for proposals.

The Consultation Process



The Consultation Document

Structure of Consultation Document

Section 1	Purpose of the Consultation
Section 2	The ICT R&D Environment in Belarus <ul style="list-style-type: none">– The National ICT Sector and its Governance in Belarus– Trends in the National ICT Sector and in National ICT Policy Objectives– R&D ICT Co-operation with the EU and foreign countries
Section 3	Integration of the EECA countries in the European ICT R&D Environment
Section 5	Scoping Questionnaire
Section 6	How to provide your contribution
Section 7	ANNEX – ICT in FP7

The Scoping Questionnaire

- **Goal 1:**
 - *identify the current research fields and priorities of the country, based on the initial mapping of the ICT research environment.*
- **Goal 2:**
 - *identify the future ICT research priorities in the country for the period 2010-2015, based on sound justification. Moreover, for research priority, to define specific research objectives and proposed areas of research.*

Solingen, V., Berghout, E., "The Goal/Question/Metric Method: A Practical Guide for Quality Improvement of Software Development", London: McGraw Hill

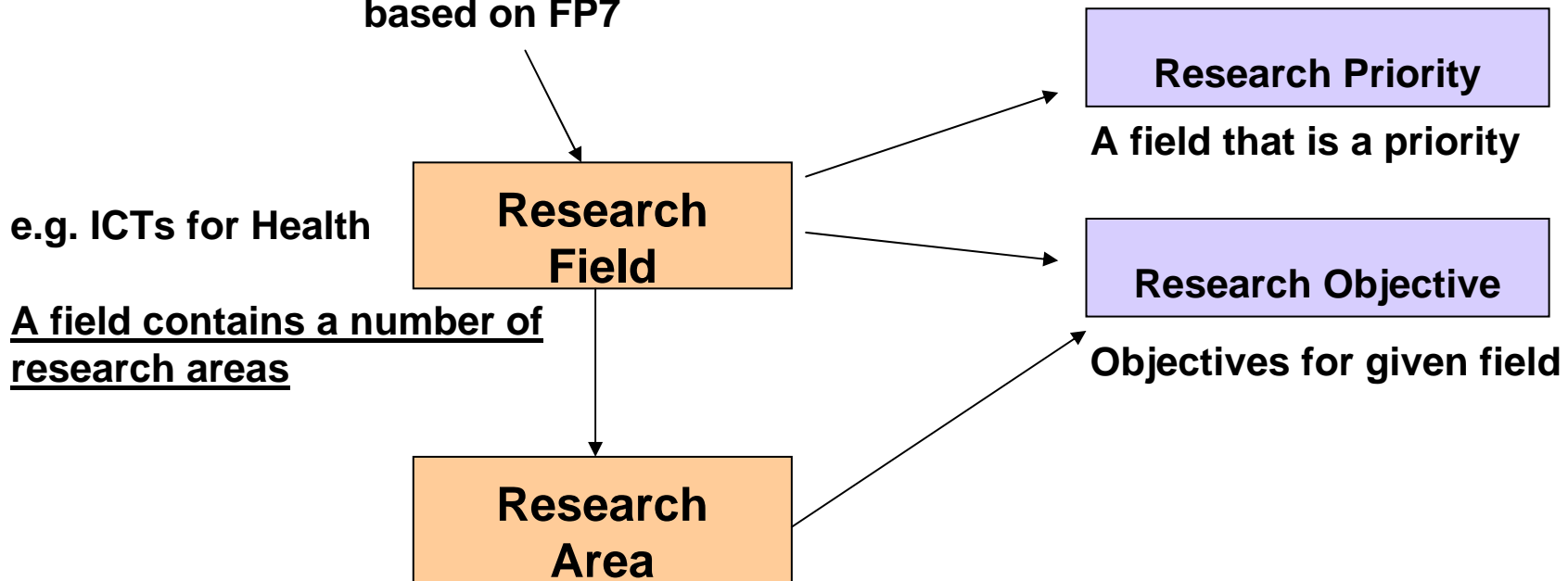
Questionnaire Sections

RATIONALISING THE
CURRENT ICT
RESEARCH FIELDS
IN BELARUS

DEFINING BELARUS ICT
RESEARCH PRIORITIES
FOR THE PERIOD
2010-2015

Consultation Terminology

Taxonomy has been created
based on FP7



e.g. personalised health services
Research in a specific research area, implements
a given research objective

The Consultation Workshop

- **Aim:**
 - To engage local stakeholders in the formulation of recommendations for strengthening EC-EECA cooperation in the ICT domain
- **Objectives of workshops:**
 - to rank the **TOP 5 to 10** ICT research priorities of BELARUS following an exercise of evaluation with criteria (scoring method)
 - to identify specific objectives and areas of research for each priority

The Consultation Workshop cont'd

When the integrated list of priorities presented (👍)

- We ask the experts to evaluate them against **specific criteria**
- Then we identify the **top 10 priorities**
- For these, we also summarize the key relevant **objectives** (identified in the consultation doc), verify and update them
- We ask them to identify **specific areas of research per priority**

The Scoring Method

- **Objective:** derive the key R&D priorities of the country
- **Criteria:**
 - *Importance/attractiveness*
 - Social importance
 - Economic importance
 - Strategic importance
 - Research and Technological Opportunities
 - *Feasibility/readiness*
 - Application capacity
 - Research and Technological Capacity

The Scoring Card

Tick up to two most relevant sub-criteria

Assign an overall mark for the criterion

5=extremely relevant, 4=very relevant, 3=somewhat relevant, 2=not so relevant, 1=not relevant

Social Impact			Research & Technological Opportunities	FEASIBILITY	
				Application Capacity <i>(absorption potential of application sectors)</i>	Research & Technology Capacity <i>(production potential of R&D)</i>
Impact on the quality of life	Importance for GDP	Priority ranks high on the political agenda	Potential of the research priority to produce new technologies	Absorption capacity in public administration	Current quality of human resources
Ability to improve key public services (e.g. health, education, safety etc.)	Importance for exports	Positive impact on other national strategies (e.g. on economic development.)	Probability of scientific innovations	Absorption capacity in Small and Medium Sized Enterprises	Capacity of the necessary research infrastructure <i>e.g. ✓</i>
Ability to meet needs of specific social groups (e.g. third age, youth, persons with disabilities)			Probability of creating new application possibilities	High demand in relevant application sector(s)	Current state-of-the art of the research field
Impact on the creation of job opportunities			Probability of involvement in international cooperation	Impact on the competitiveness of the application sector(s)	Level of education in related fields
Score: _____	Score: _____	Score: _____	Score: _____	Score: _____	Score: _____

Provided documents

- the “Consultation Document – Belarus” (including Questionnaire)
- ICT Workprogramme 2009-2010,
- the National ICT sector and Policy Appraisal Report for Belarus (www.eeca-ict.eu)

Who were the respondents

30 stakeholders filled in the questionnaire, of which

- 1 from public bodies,**
- 10 from universities,**
- 11 from R&D institutions, including 9 from the National Academy of Sciences,**
- 5 from technological parks and associations (NGOs),**
- 1 ICT industry**
- 2 from SMEs.**

Group 1: RATIONALISING THE CURRENT ICT R&D FIELDS IN BELARUS

- **Q1. To what extent does the overview of the current ICT R&D environment presented in the Section 2 reflect the actual situation in Belarus? Please suggest how this overview can be improved.**
- **Q2. Please indicate and prioritise all ICT R&D fields that are currently^[1] carried out in Belarus.**
- **Q3. What are the main factors for selecting the top current ICT R&D fields (e.g. fields that have been graded with “1” in question 2)? Please grade each factor per field as follows:**
- **Q4. Which ICT R&D fields among those with the highest priority (graded with 1 or 2) as indicated in question 2 are well established* in BELARUS? Please provide necessary evidence.**
- **^[1] “currently” refers to fields in which there is related research activity within the country within the past 5 years.**

Group 2: **DEFINING BELARUS' ICT RESEARCH & DEVELOPMENT PRIORITIES FOR THE PERIOD 2010-2015**

- Q5. According to your answer in the previous question (Q4), which of the current ICT R&D fields with strong establishment should be maintained and further developed in the future?
- Q6. Besides the aforementioned well established ICT areas and considering the ICT industry trends, which ICT R&D fields have a high future potential to support the *ICT industry in Belarus*?
- Q7. Considering the particular needs and structure of your local economy, which ICT R&D fields have a high future potential to support the development of the private sector and in particular the **small and medium sized enterprises (SMEs)**?
- Q8. Which ICT R&D fields have a high future potential in supporting the effectiveness of **public administration** and meeting actual development/modernisation needs of the **public sector**?
- Q9. Which ICT R&D fields have a high future potential in meeting **key social needs*** in Belarus?
- Q10. What other future ICT R&D opportunities (**beyond the ICT R&D** fields' classification in question 2) do you believe Belarus should exploit in the period 2010-2015? (Indicate only opportunities that have not been addressed in previous answers)
- Q11. Based on your previous answers, which should be the top 5 ICT R&D priorities for Belarus in the period 2010-2015?
- Q12. For each ICT R&D priority identified above, please propose up to 3 R&D objectives and recommended R&D areas (per objective). See the example provided below.

Prioritizing the current R&D fields in Belarus against the ICT WP2009-2010

NOTE: (1) high priority (2) medium priority

Id.	ICT R&D Fields	Current grading	Id.	ICT R&D Fields	Current grading
1	<i>Pervasive and Trustworthy Network and Service Infrastructure</i>		4.1	Digital libraries and digital preservation	2
1.1	The Network of the Future	2	4.2	Technology-Enhanced Learning	3
1.2	Internet of Services, Software & virtualisation	2	4.3	Intelligent information management	2
1.3	Internet of Things and enterprise environments	3	5	<i>Towards sustainable and personalised healthcare</i>	
1.4	Trustworthy ICT	2	5.1	Personal Health Systems	1
1.5	Networked Media & 3D Internet	3	5.2	ICT for Patient Safety	1
1.6	Future Internet Experimental Facility & Experimentally-driven Research	2	5.3	Virtual Physiological Human	3
2	<i>Cognitive Systems, Interaction, Robotics</i>		5.4	International Cooperation on Virtual Physiological Human	3
2.1	Cognitive Systems and Robotics	1	6	<i>ICE for Mobility, Env'l Sust. & Energy Efficiency</i>	
2.2	Language Based Interaction	2	6.1	ICT for Safety and Energy Efficiency in Mobility	3
3	<i>Components, systems, engineering</i>		6.2	ICT for Mobility of the Future	2
3.1	Nanoelectronics Technology	2	6.3	ICT for Energy Efficiency	2
3.2	Design of Semiconductor Components and Electronic-based Miniaturised	2			

The current ICT R&D fields in Belarus (1)

	FP7 Challenges	Number of Experts	Average Score
1	<i>Pervasive and Trustworthy Network and Service Infrastructure</i>		
1.1	The Network of the Future	20	2,43
1.2	Internet of Services, Software & Virtualization	25	1,64
1.3	Internet of Things and enterprise environments	25	2,17
1.4	Trustworthy ICT	25	1,88
1.5	Networked Media & 3D Internet	24	2,54
1.6	Future Internet Experimental Facility & Experimentally-driven Research	23	2,48
2	<i>Cognitive Systems, Interaction, Robotics</i>		
2.1	Cognitive Systems and Robotics	22	2,00
2.2	Language Based Interaction	25	2,16

TOP-9 current ICT priority R&D fields in Belarus: general estimation (1>av.score<2)

	FP7 areas	Av. Score
3.6	Computing Systems	1,62
1.2	Internet of Services, Software & Virtualization	1,64
4.1	Digital libraries and digital preservation	1,71
3.2	Design of Semiconductor Components and Electronic-based Miniaturized Systems	1,82
5.1	Personal Health Systems	1,83
3.1	Nanoelectronics Technology	1,83
1.4	Trustworthy ICT	1,88
2.1	Cognitive Systems and Robotics	2,00
5.2	ICT for Patient Safety	2,00

7 Under-priority ICT R&D fields in Belarus (2,0 < av. score < 2,1)

3.7	Photonics	2,06
3.9	Microsystems and Smart Miniaturized Systems	2,04
4.2	Technology-Enhanced Learning	2,08
6.2	ICT for Mobility of the Future	2,10
6.3	ICT for Energy Efficiency	2,10
6.4	ICT for Environmental Services & Climate Change Adaptation	2,06
7.3	ICT for Governance and Policy Modeling	2,05

Selecting Criteria:

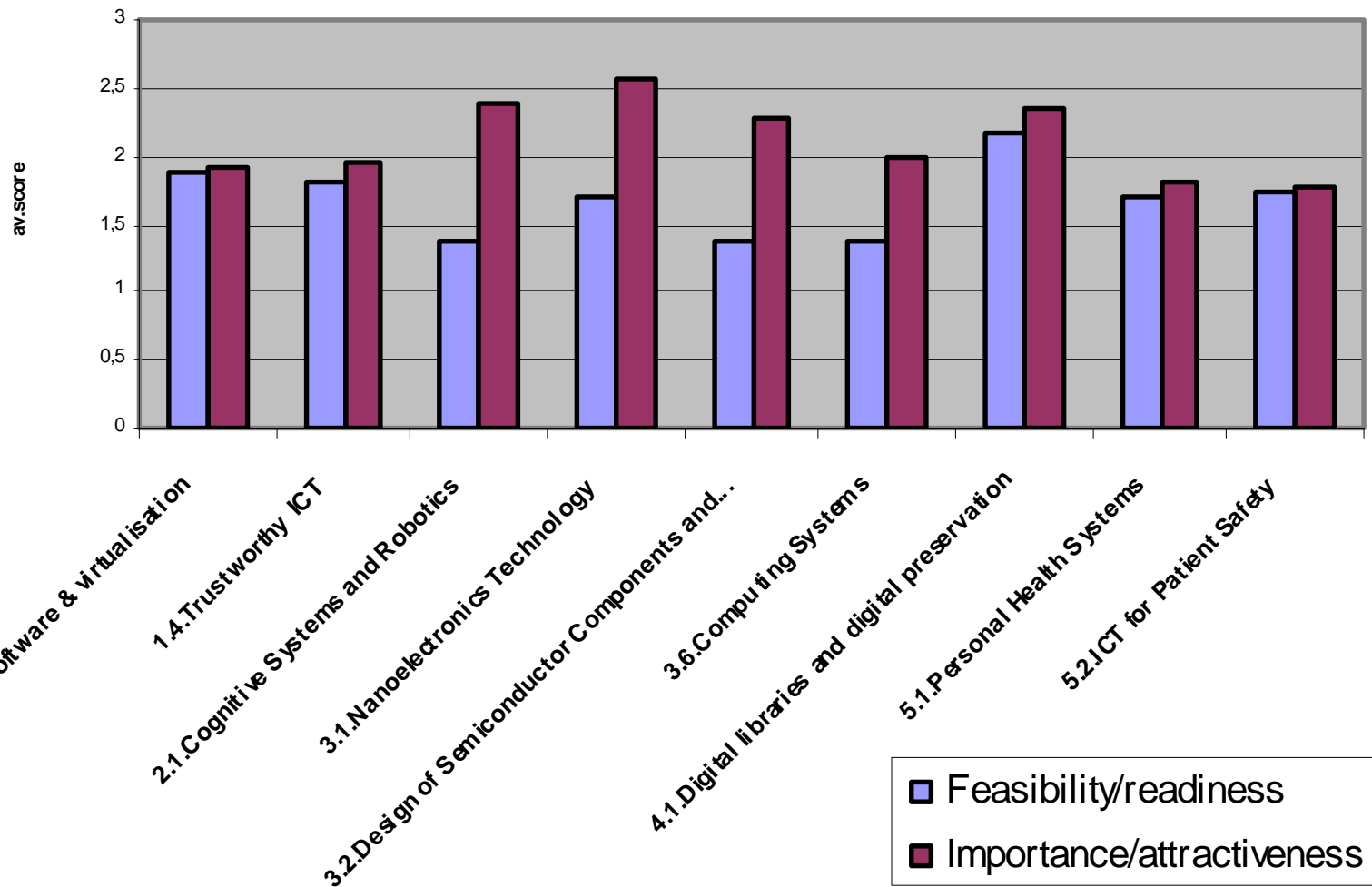
Feasibility/Readiness

- Research & Technological Potential
- Application Potential

Importance/Attractiveness

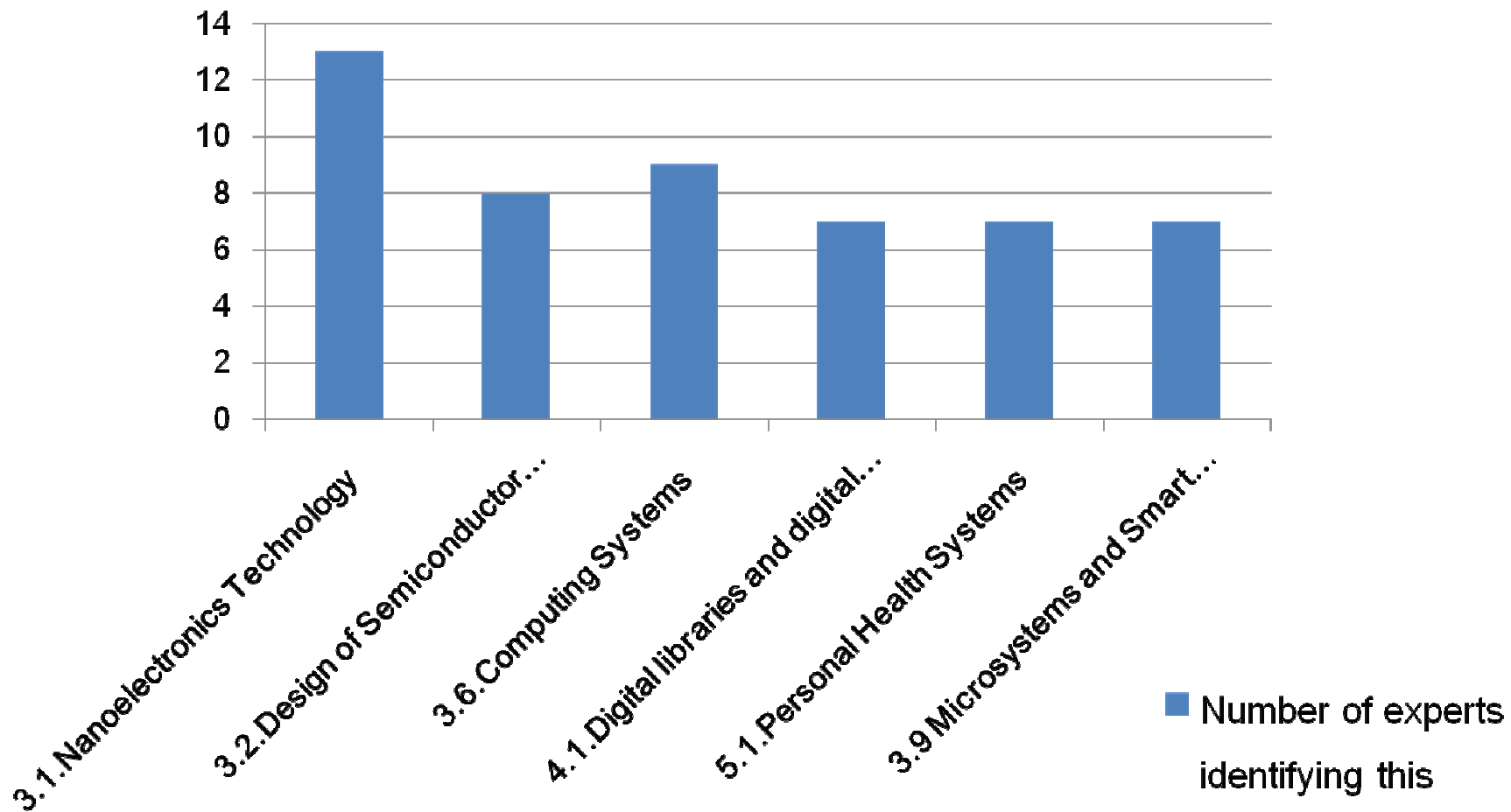
- Economic Impact
- Social Impact
- Strategic Impact

TOP-9 current ICT priority R&D fields: by set of criteria

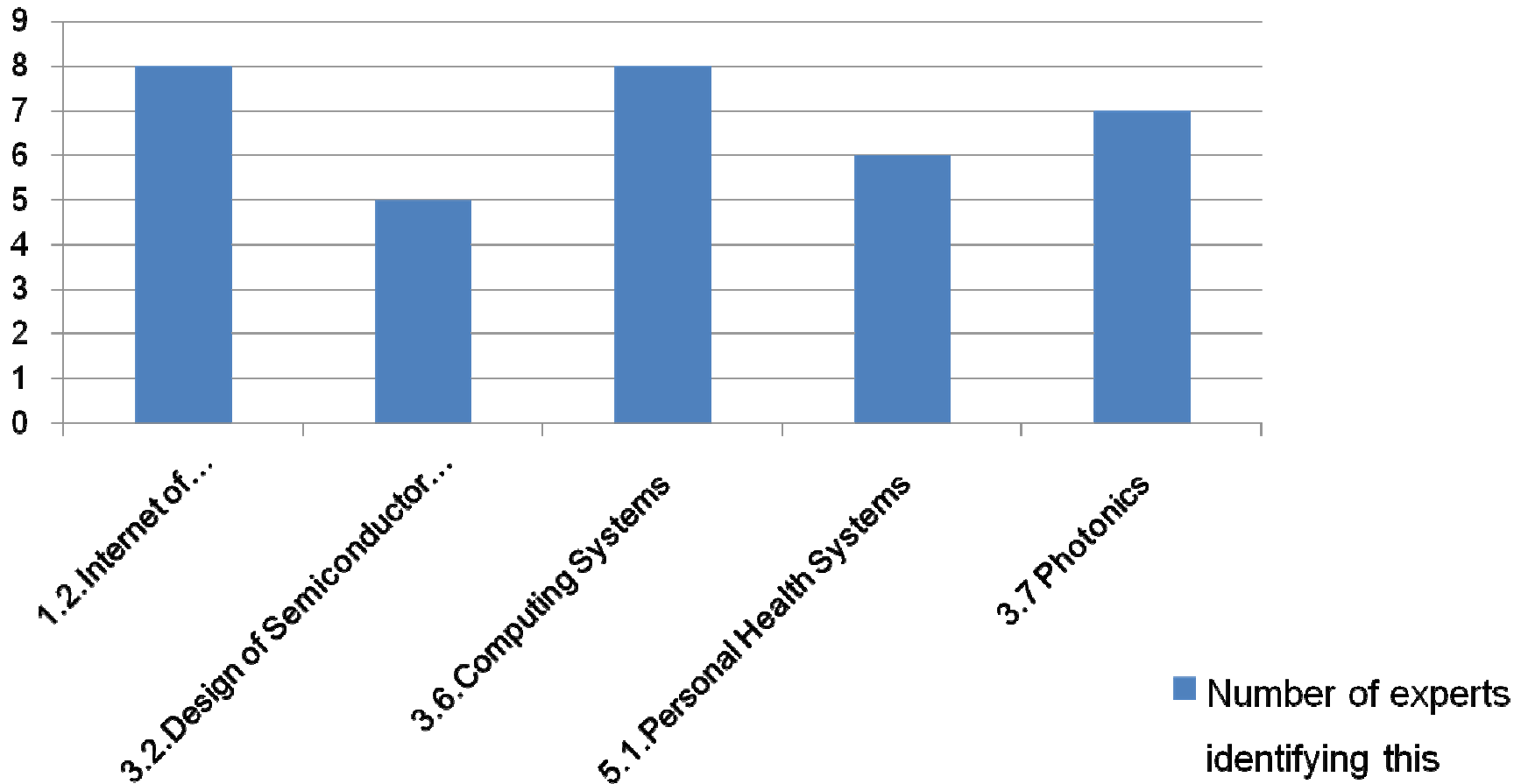


From the current state to the future

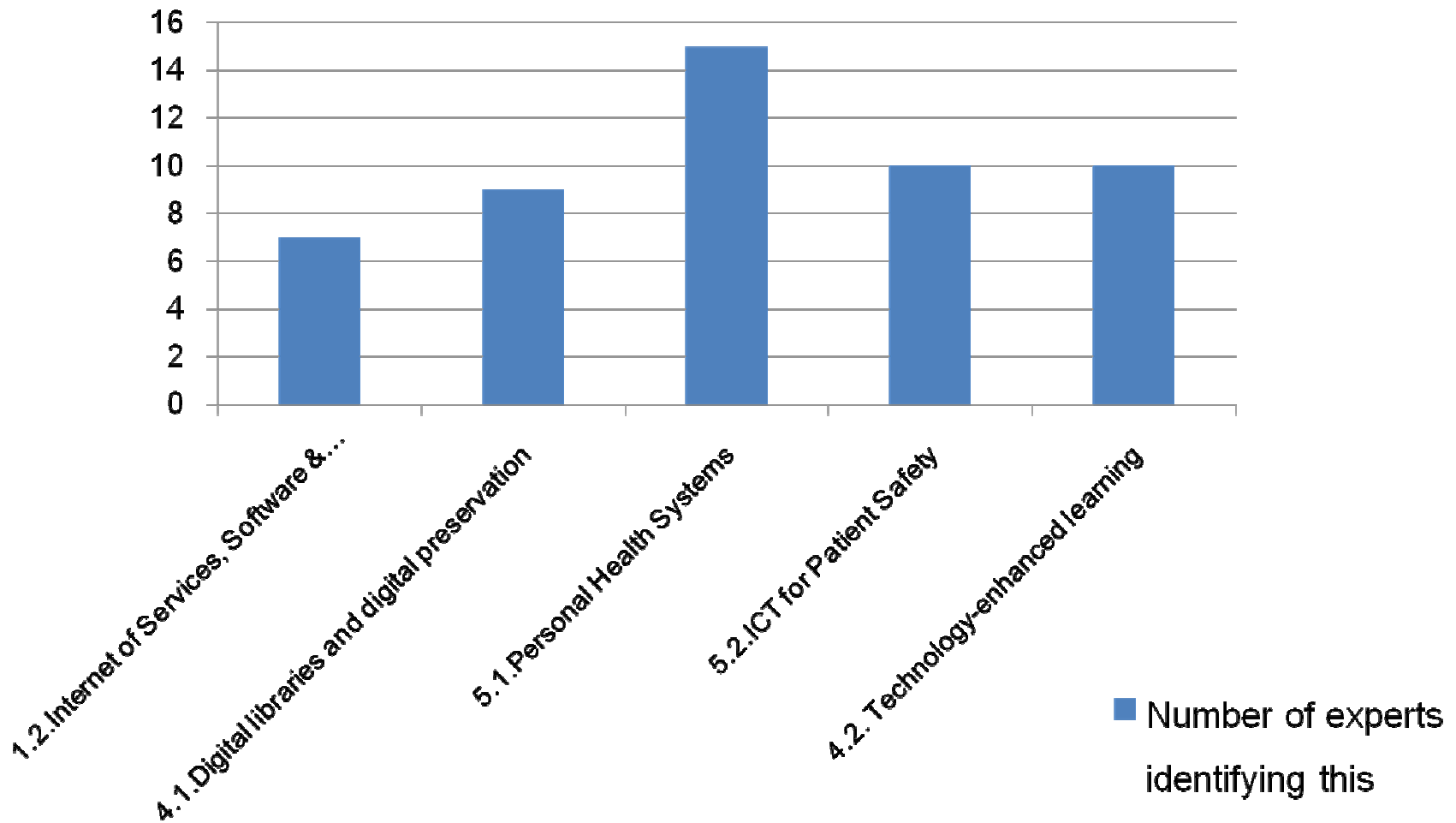
TOP-6 R&D fields with a highest future potential to support the **ICT industry**



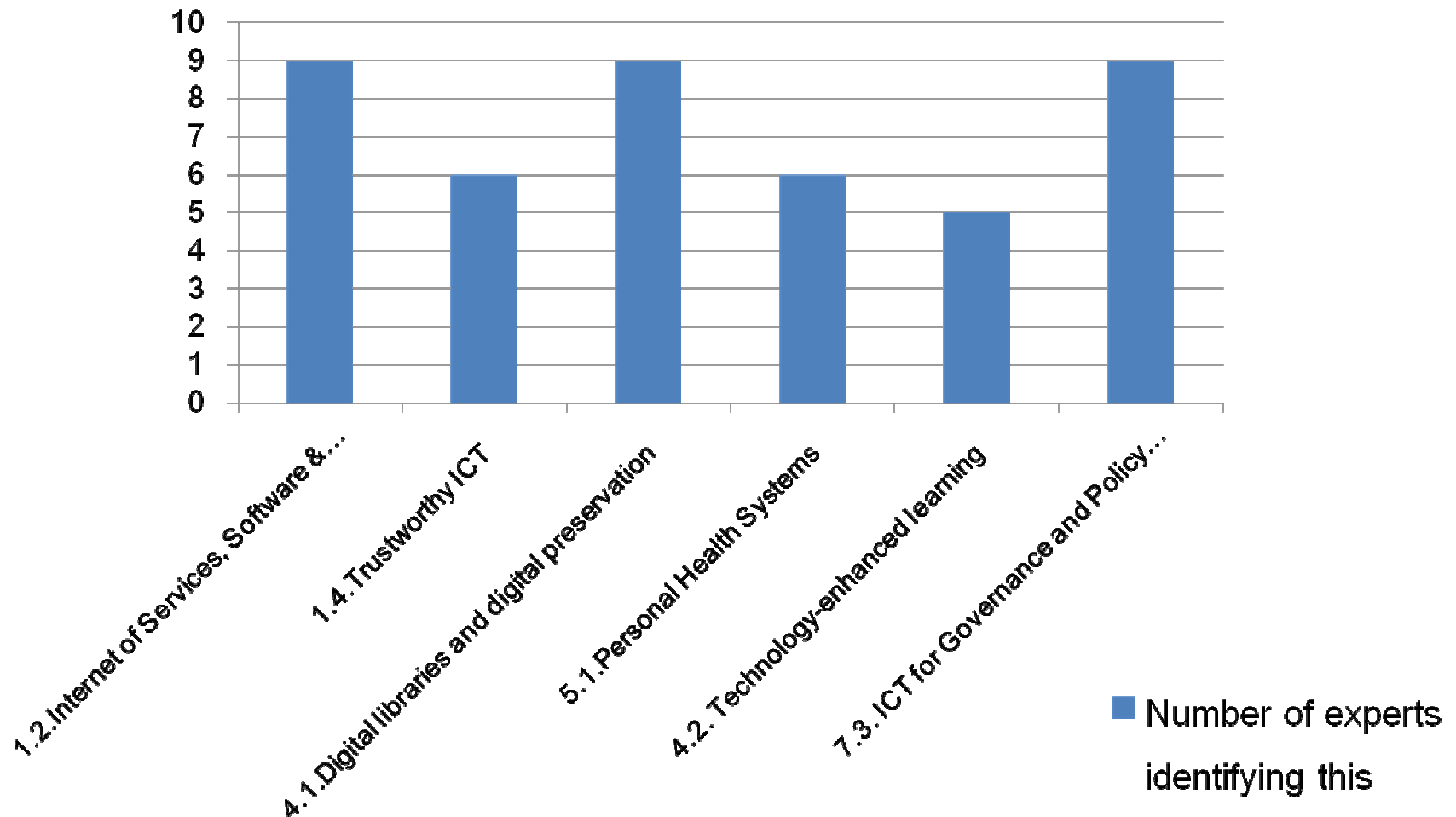
TOP-5 R&D fields with a highest future potential to support private sector including SMEs



TOP-5 R&D fields having a future potential in meeting key **society needs**



TOP-6 current R&D fields having a future potential in supporting the effectiveness of **public administration** and meeting the development needs of the **public sector**



Most frequently proposed future ICT R&D opportunities **beyond the FP7 ICT fields**

- **ICT for remote sensing of the Earth**
- **Digital cartography and GIS**
- **Real-time computing systems for technology processes control**
- **ICT for Space**
- **GRID technologies**
- **Medical information systems**

Top-8 R&D priorities for 2010-2015 in Belarus

	FP7 areas
3.6	Computing Systems
5.1	Personal Health Systems
1.2	Internet of Services, Software & Virtualization
3.1	Nanoelectronics Technology
7.3	ICT for Governance and Policy Modeling
2.1	Cognitive Systems and Robotics
4.1	Digital libraries and digital preservation
5.2	ICT for Patient Safety
Components, systems, engineering	
Towards sustainable and personalized healthcare	

Let's compare

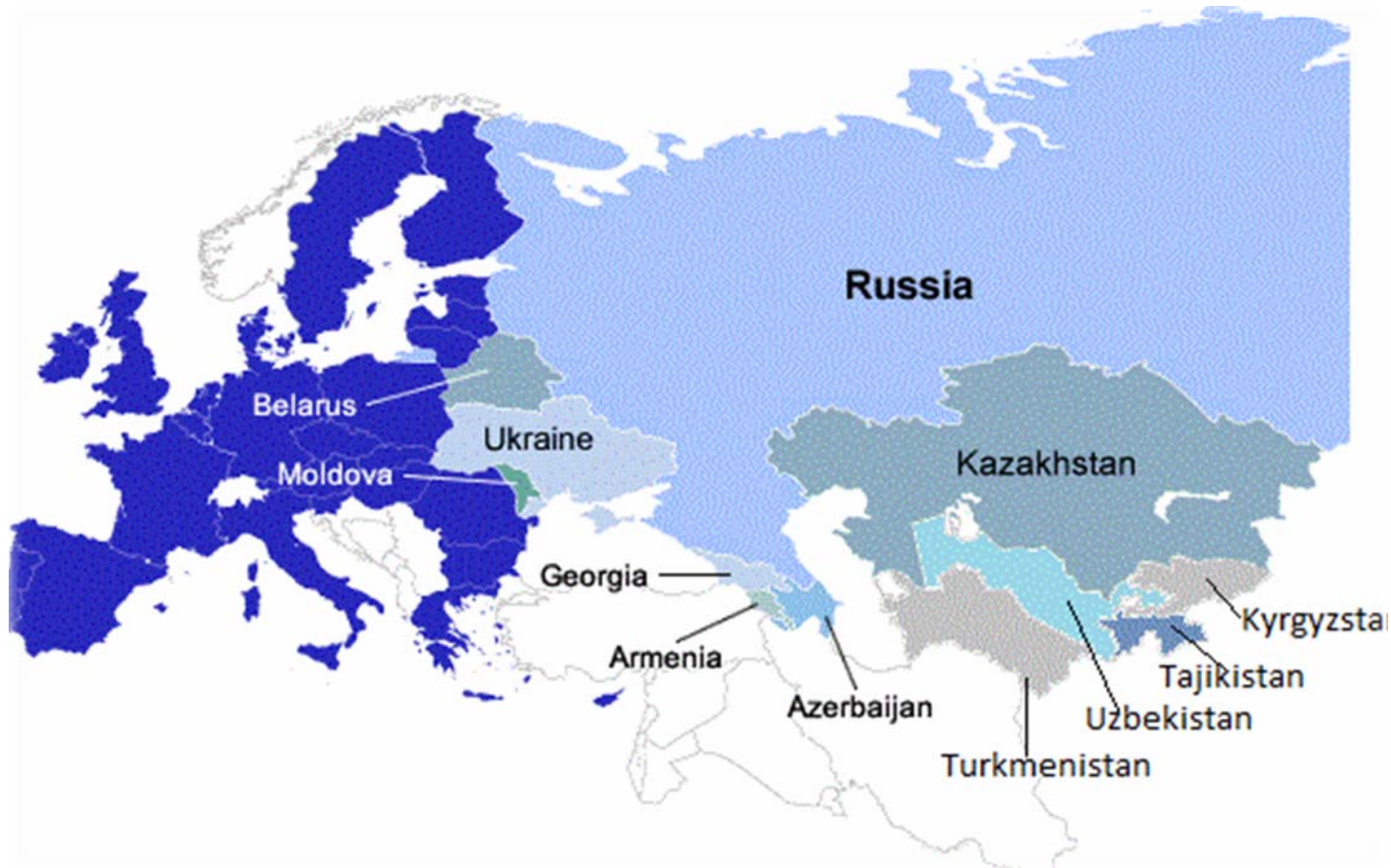
Current priorities
Computing Systems
Internet of Services, Software & Virtualization
Digital libraries and digital preservation
Design of Semiconductor Components and Electronic-based Miniaturized Systems
Personal Health Systems
Nanoelectronics Technology
Trustworthy ICT
Cognitive Systems and Robotics
ICT for Patient Safety

2010-2015 priorities
Computing Systems
Personal Health Systems
Internet of Services, Software & Virtualization
Nanoelectronics Technology
ICT for Governance and Policy Modeling
Cognitive Systems and Robotics
Digital libraries and digital preservation
ICT for Patient Safety

Final list of Belarus ICT Priorities for cooperation with EC in 2010-2015

- 3.1 Nanoelectronics Technology**
 - 3.6 Computing Systems**
 - 1.2 Internet of Services, Software & Virtualization**
 - 2.1 Cognitive Systems and Robotics**
 - 4.1 Digital libraries and digital preservation**
 - 5.2 ICT for Patient Safety**
 - 5.1 Personal Health Systems**
 - 7.3 ICT for Governance and Policy Modeling**
-
- 3.2 Design of Semiconductor Components and Electronic-based Miniaturised Systems**
 - 3.7 Photonics**

Целевые страны ЕЕСА кластера



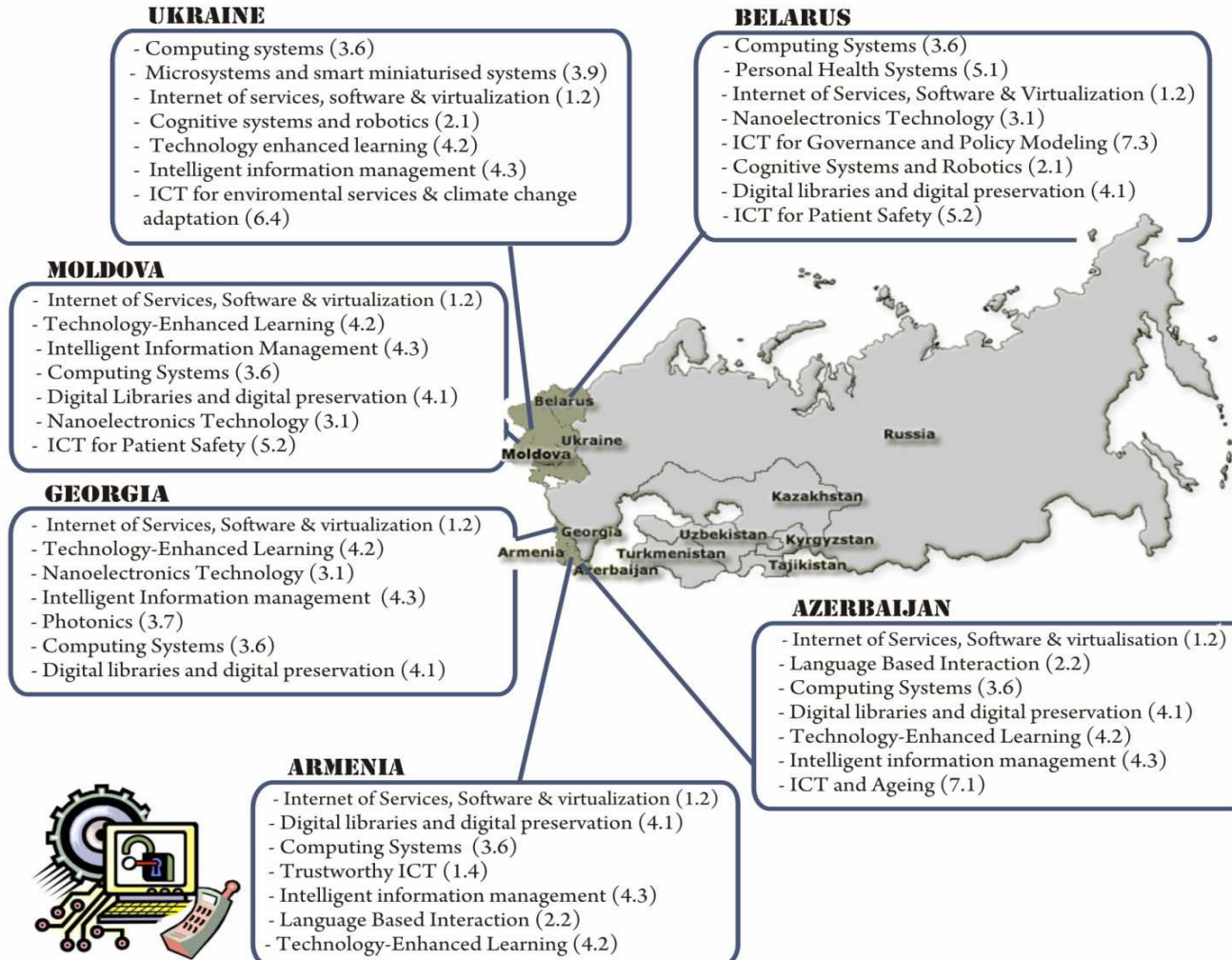
The ICT priorities for 2010-2015 identified by the ICT experts from six

countries

	Belarus	Ukraine	Azerbaijan	Moldova	Armenia	Georgia
Date of organizing Consultation Workshop ICT R&D fields	11.03.2010	31.03.2010	22.04.2010	18.05.2010	03.06.2010	01.07.2010
Cognitive Systems and Robotics						
Computing Systems						
Design of Semiconductor Components and Electronic-based Miniaturised Systems						
Digital libraries and digital preservation						
ICT and Ageing						
ICT for Governance and Policy Modeling						
ICT for Patient Safety						
ICT for enviromental services						
Intelligent information management						
Internet of Services, Software & Virtualization						
Nanoelectronics Technology						
Microsystems and smart miniaturised systems						
Personal Health Systems						
Photonics						
Language Based Interaction						
Technology-Enhanced Learning						
Trustworthy ICT						

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ICT Research Priorities for EU-EECA Cooperation in 2010-2015



ICT Research Priorities for EU-EECA Cooperation in 2010-2015

UKRAINE

- Computing systems (3.6)
- Microsystems and smart miniaturised systems (3.9)
- Internet of services, software & virtualization (1.2)
- Cognitive systems and robotics (2.1)
- Technology enhanced learning (4.2)
- Intelligent information management (4.3)
- ICT for environmental services & climate change adaptation (6.4)

BELARUS

- Computing Systems (3.6)
- Personal Health Systems (5.1)
- Internet of Services, Software & Virtualization (1.2)
- Nanoelectronics Technology (3.1)
- ICT for Governance and Policy Modeling (7.3)
- Cognitive Systems and Robotics (2.1)
- Digital libraries and digital preservation (4.1)
- ICT for Patient Safety (5.2)



- Photonics (3.7)
- Design of Semiconductor Components and Electronic-based Miniaturised Systems (3.2)

ICT Research Priorities for EU-EECA Cooperation in 2010-2015

ARMENIA

- Internet of Services, Software & virtualization (1.2)
- Digital libraries and digital preservation (4.1)
- Computing Systems (3.6)
- Trustworthy ICT (1.4)
- Intelligent information management (4.3)
- Language Based Interaction (2.2)
- Technology-Enhanced Learning (4.2)

AZERBAIJAN

- Internet of Services, Software & virtualisation (1.2)
- Language Based Interaction (2.2)
- Computing Systems (3.6)
- Digital libraries and digital preservation (4.1)
- Technology-Enhanced Learning (4.2)
- Intelligent information management (4.3)
- ICT and Ageing (7.1)

ICT Research Priorities for EU-EECA Cooperation in 2010-2015

GEORGIA

- Internet of Services, Software & virtualization (1.2)
- Technology-Enhanced Learning (4.2)
- Nanoelectronics Technology (3.1)
- Intelligent Information management (4.3)
- Photonics (3.7)
- Computing Systems (3.6)
- Digital libraries and digital preservation (4.1)

MOLDOVA

- Internet of Services, Software & virtualization (1.2)
- Technology-Enhanced Learning (4.2)
- Intelligent Information Management (4.3)
- Computing Systems (3.6)
- Digital Libraries and digital preservation (4.1)
- Nanoelectronics Technology (3.1)
- ICT for Patient Safety (5.2)

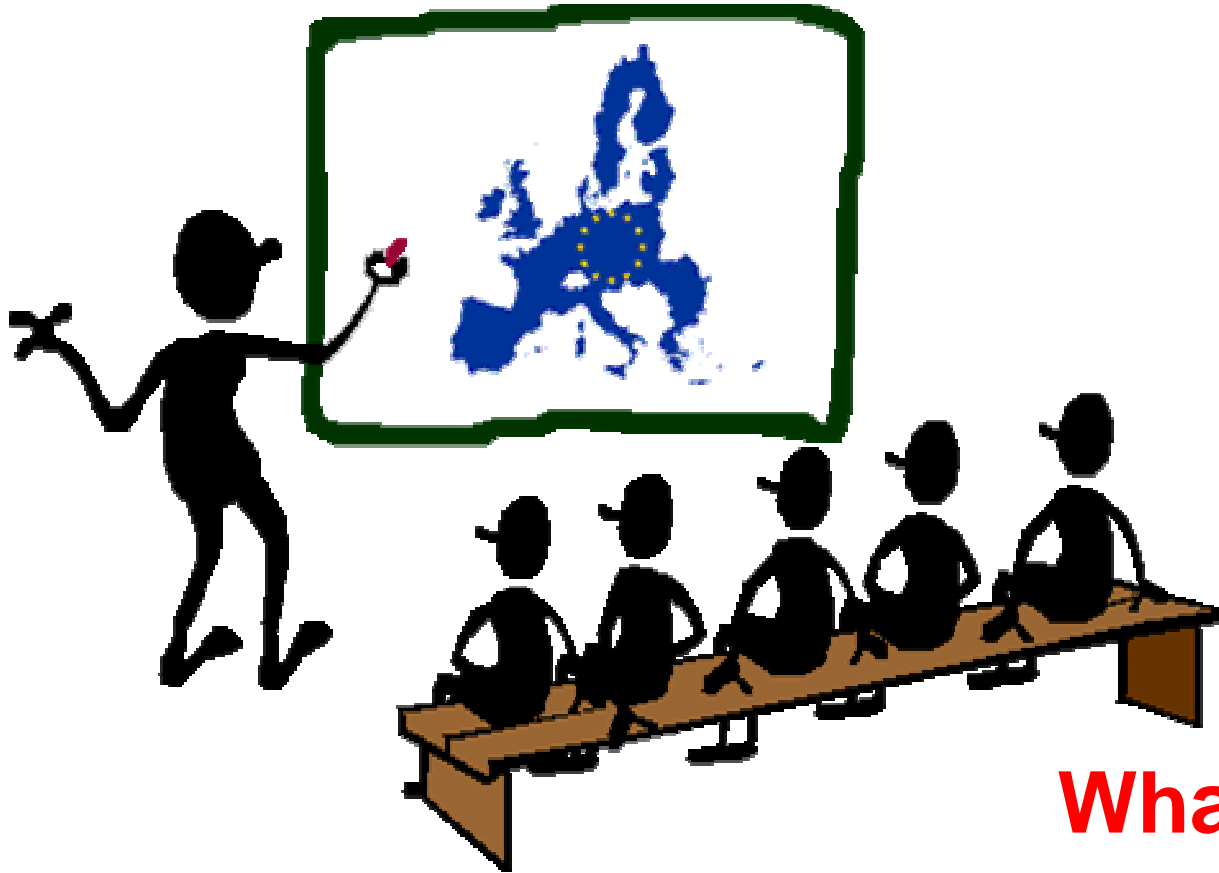
ICT Research Priorities for EU-EECA Cooperation in 2010-2015

Russia

- Nanoelectronics
- Network of the Future
- Embedded Systems Design
- GRID and Cloud Computing
- Digital Libraries
- ICT for Health

Kazakhstan

- Personal Health System
- Governance and Participation Toolbox
- Digital Libraries and Digital Preservation
- Telecommunication
- E-learning



What can we do to increase cooperation



EU-Eastern Europe and Central Asia Gateway on ICT Research and Development

Thank you for your attention!

Let's start the discussion! 😊

БелИСА

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