COURAGE

CYBERCRIME and
CYBERTERRORISM
EUROPEAN RESEARCH
AGENDA

Consolidated Research Roadmap

Cagliari, May 2016

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http://www.courage-project.eu

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This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no **607949**

Consolidated Research Roadmap

- Convergence of three projects funded under FP7 security call 2013.2.5-1 aiming to define research agendas focused on cybercrime and cyberterrorism.

CAMINO

CYBER ROAD

COURAGE CYBERCRIME and CYBERTERRORISM EUROPEAN RESEARCH AGENDA

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Context

- In response to recommendations made at the joint first review meeting of the CAMINO, COURAGE and CyberROAD projects, held at the offices of the European Commission, Brussels on June 4th 2015
- The three consortia have undertaken to consolidate each of their respective outputs into a **single, unified and easily digestible research roadmap** that can be distilled to inform future works, related policies and funding initiatives that address the challenges being faced by society due to the proliferation of cybercrime and the threat of cyberterrorism.
- Here we present an initial draft of these topics across four interlinked dimensions **Technical**, **Human**, **Organisational** and **Regulatory**.
- The topics highlight a number of what we collectively consider to be priorities for future research and practice. We do not consider these topics to be comprehensive, but a reflection of the themes and subject areas that featured most prominently across the three projects.

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COURAGE Approach

- Develop a Cyber Crime and Cyber Terrorism (CC/CT) research agenda for the European Commission to significantly improve the security of citizens and critical infrastructures, and to support crime investigators towards enhancing
- This Research Agenda will identify the **major challenges**, reveal **research gaps**, and will identify and recommend detailed **practical research approaches** to address these gaps through strategies that are aligned to real-world needs.

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COURAGE

The COURAGE approach builds on three pillars,

- A user centric methodology, to identify gaps, challenges and barriers based on real-world needs and experiences;
  - Through consultation with more than 75 domain stakeholders and experts using a wideband 'Delphi' approach to unpack the tangible 'wants and needs' of society

- An analytical and semantic approach, to deliver a taxonomy and create a common understanding of the subject with all stakeholders; and
  - Through a comprehensive analysis of existing initiatives and research.

- A competitive and market oriented approach, to foster practical implementations of counter-measures using effective test and validation solutions.
  - To Identify tangible means to assess the impact and quality of activities occurring as a result of the research agenda and roadmap.

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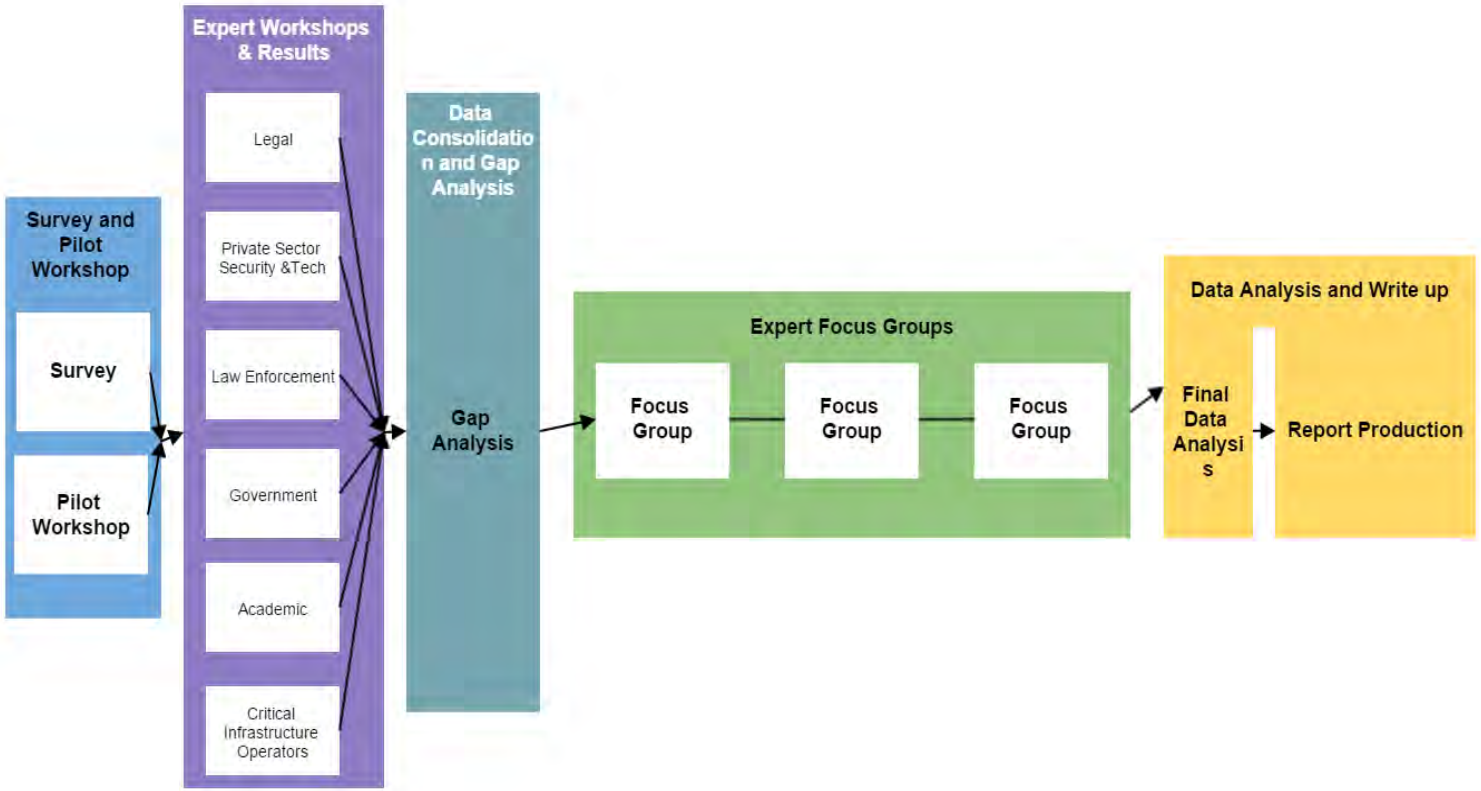
Requirement Elicitation Process



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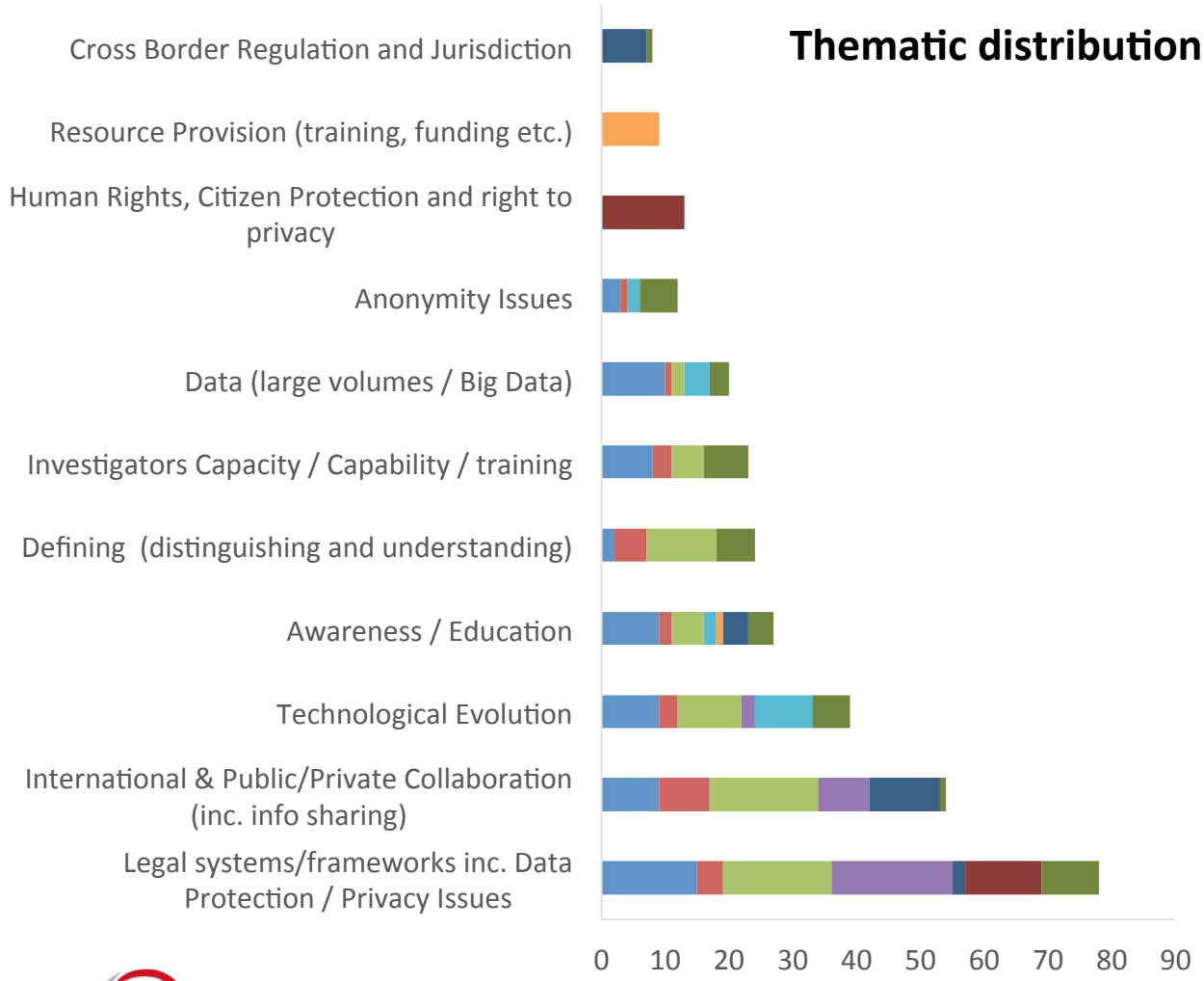
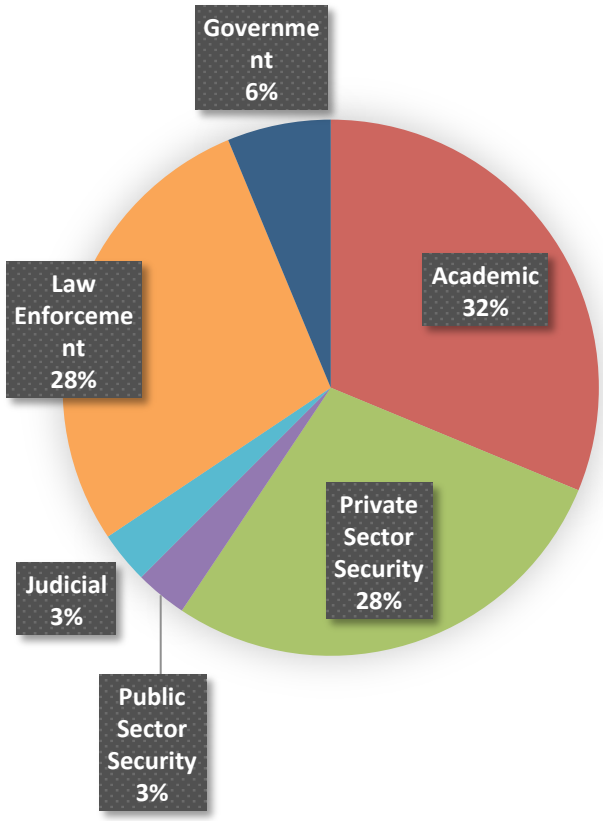
COURAGE Data



Thematic distribution and Representation



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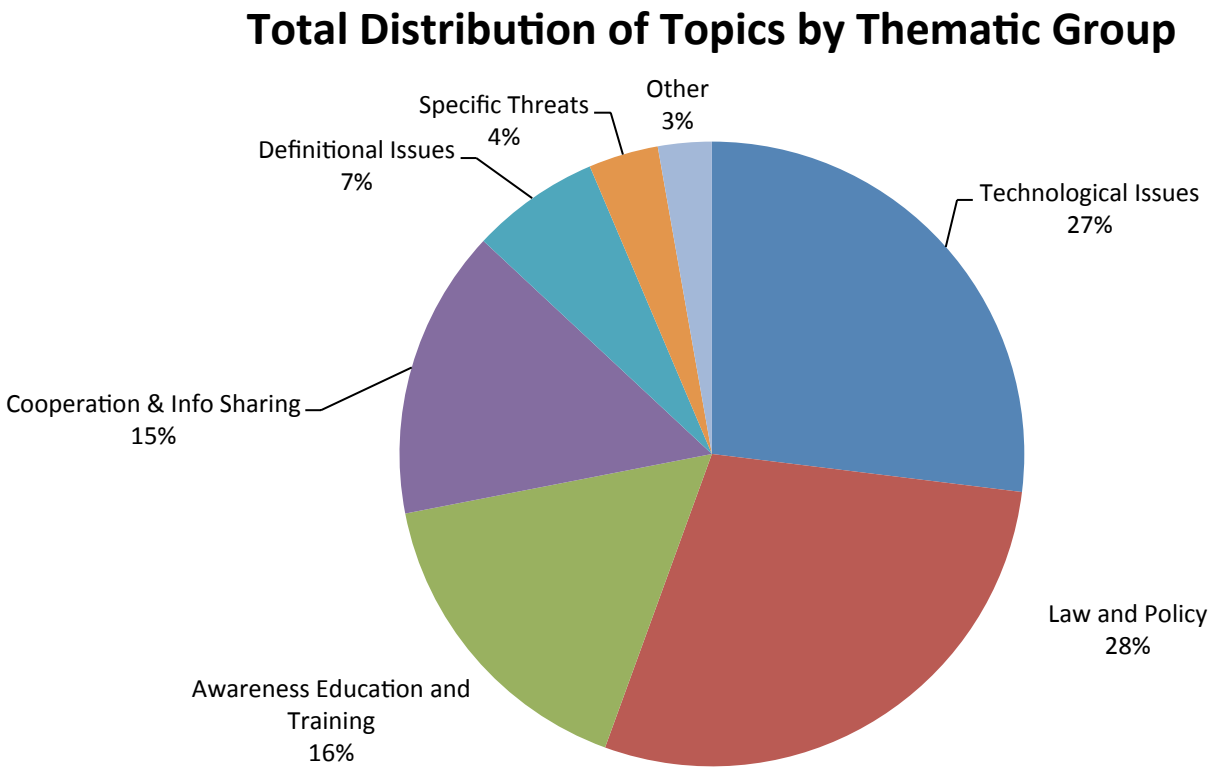

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Consolidation with Camino

Dimensions	Technical	Human	Organizational	Regulatory
Topics	Strengthening emerging tools for big data analysis and cloud forensics and security	Collective awareness and education for increased societal resilience to CC/CT threats	Adapting organisations to the cross-border nature of the Internet and cybercrime/terrorism	Dealing with different levels of legal frameworks for illegal content: questions of geolocation and jurisdiction
	Establishing metrics and framework for cyber security testing	New standards for private data minimisation, appropriate use and re-use of data and Privacy Enhancing Technologies	Creating user-friendly terminology, language and features to assure a better understanding of cyber security challenges	Electronic identity and trust services for data protection across borders
	Countering cyber crime affecting mobile and IoT devices	Definition, characteristics and behaviours of the offenders and victims in cybercrime	Promoting EU Institutional support to generic challenges and obstacles at the enterprise/company/ SME level including incentives for cyber insurance	Comprehensive legal system to fight against CC/CT

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Human Dimension: Awareness, Education and Training

- Focused on **increasing awareness and education levels at all levels**
- From **'grass roots'** initiatives and national teaching curricula, right through to improving the **availability and access to specialist skills** in Law Enforcement and the private sector.
- Considered a **key mitigation vector** for a broad array of vulnerabilities
- Importance only likely to increase given the way in which 'cyber' continues to extend traditional forms of criminality.
- Cited as important dimension across different stakeholder groups, and by agencies such as ENISA and Europol in annual threat assessments.

Human

Collective awareness and education for increased societal resilience to CC/CT threats

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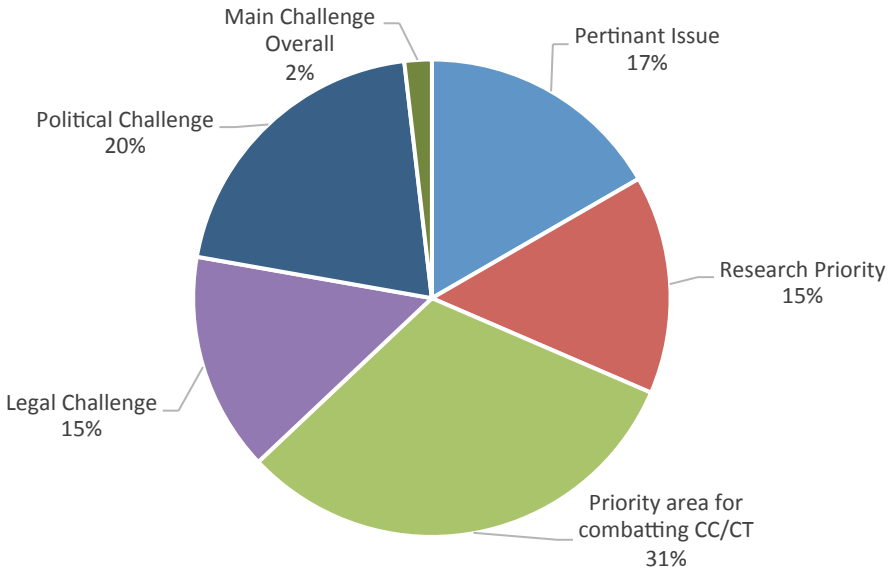
Organisational Dimension: Cross border Issues

- Cybercrime a truly 'borderless' phenomenon
- Created an environment where we are increasingly **reliant on mechanisms that facilitation cooperation**:
  - Between international authorities (i.e. across borders)
  - And the public and private sectors
- Key requirement to incentivise '**voluntary and proactive' cooperation** at both levels.
- Analysis of existing mechanisms for **effective practices and barriers** (MLAT etc.)
- Supporting the work of EC3
- Both within and (especially) beyond boundaries of the EU

Organizational

Adapting organisations to the cross-border nature of the Internet and cybercrime/terrorism



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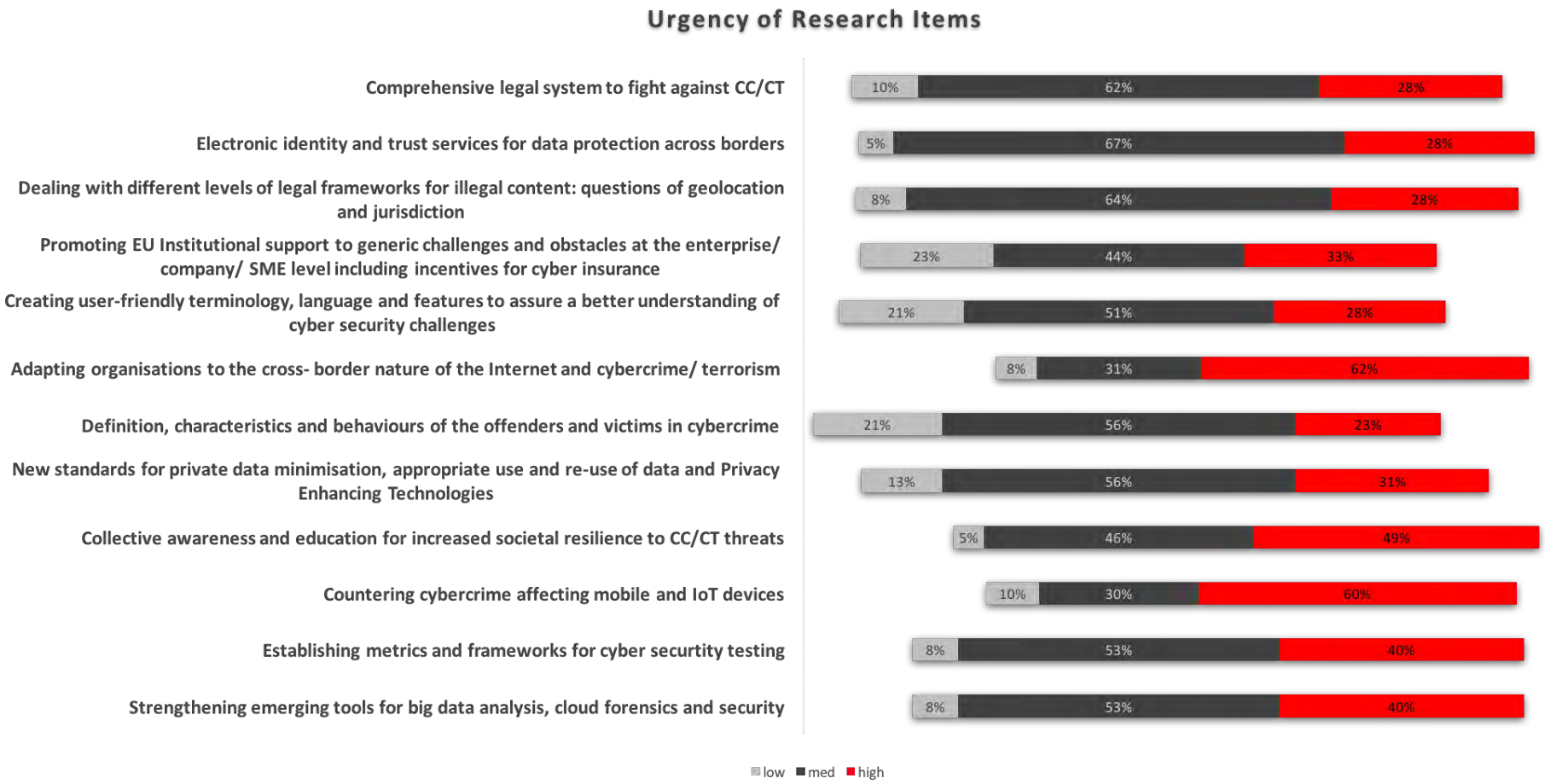
Workshop Results: Urgency



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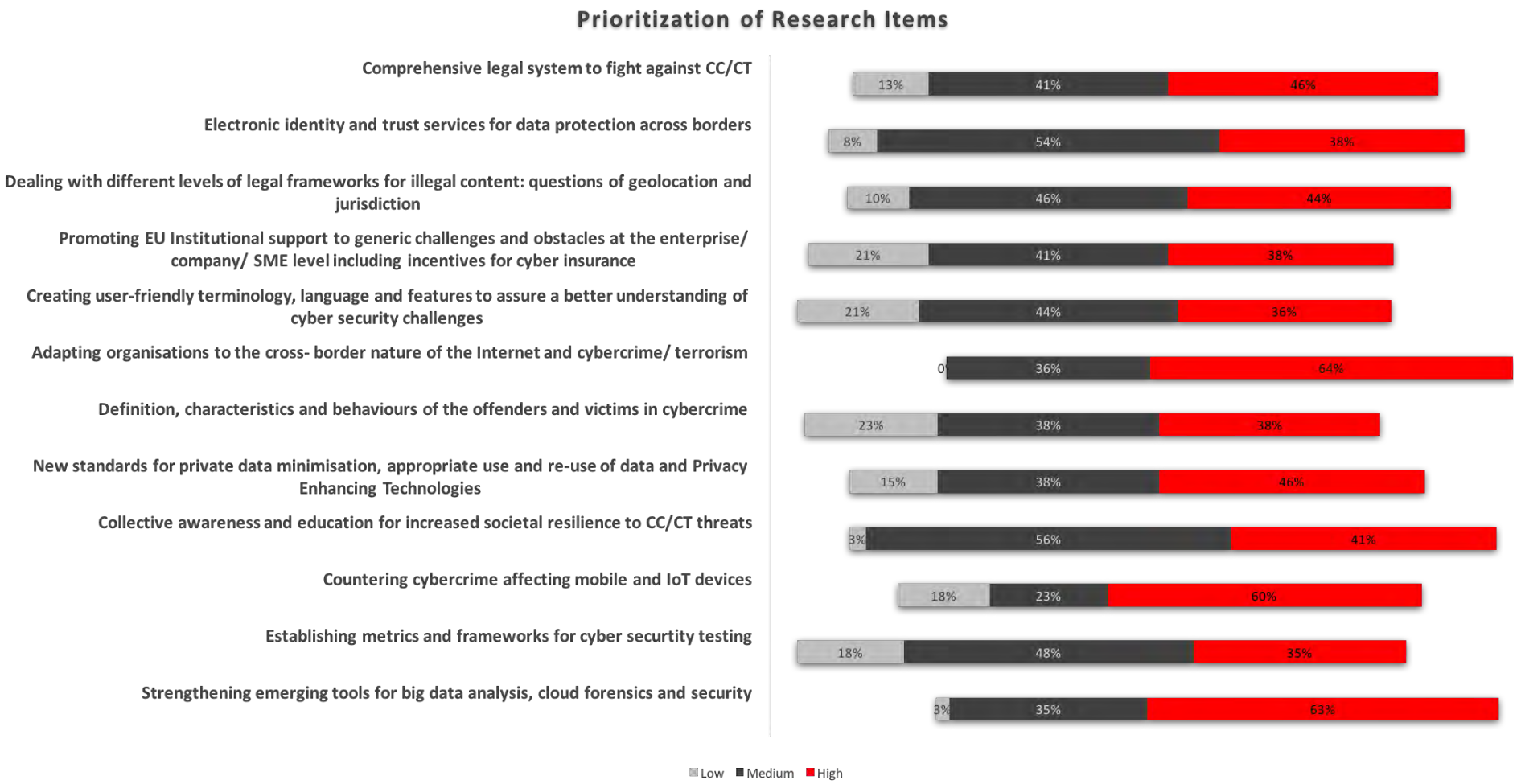
Workshop Results: Necessity



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Towards Consolidation with CyberRoad

Anti-malware Research
Authentication and Anonymization (cybercrime attribution)
Behavioural security and NO-PWD systems
Cryptography and Public-Key Infrastructures
Cybercrime and the Economy
Computer Forensics
Healthcare Systems
SCADA & CIP
Information Exchange
Law & Order
Networking
Cyber Threat Awareness
New objects and 'disappearing computing'
Social Resilience
SDCL & Architectures
Threat intelligence and Attack Detection
Trust chain & identity
Vulnerability Assessment

Regulatory	Organizational	Technical
Cybercrime and the Economy	Critical Infrastructure Protection	Authentication and Anonymization: Cybercrime Attribution

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Towards Consolidation with CyberRoad

Dimensions	Technical	Human	Organizational	Regulatory
Topics	[T1] Strengthening emerging tools for big data analysis and cloud forensics and security	[H1] Collective awareness and education for increased societal resilience to CC/CT threats	[O1] Adapting organisations to the cross-border nature of the Internet and cybercrime/terrorism	[R1] Dealing with different levels of legal frameworks for illegal content: questions of geolocation and jurisdiction
	[T2] Establishing metrics and framework for cyber security testing	[H2] New standards for private data minimisation, appropriate use and re-use of data and Privacy Enhancing Technologies	[O2] Creating user-friendly terminology, language and features to assure a better understanding of cyber security challenges	[R2] Electronic identity and trust services for data protection across borders
	[T3] Countering cyber crime affecting mobile and IoT devices	[H3] Definition, characteristics and behaviours of the offenders and victims in cybercrime	[O3] Promoting EU Institutional support to generic challenges and obstacles at the enterprise/ company/ SME level including incentives for cyber insurance	[R3] Comprehensive legal system to fight against CC/ CT
	[T4] Authentication and Anonymization: Issues of Cyber-attack Attribution		[O4] Critical Infrastructure Protection (SCADA Systems and Healthcare)	[R4] Cybercrime and the Economy

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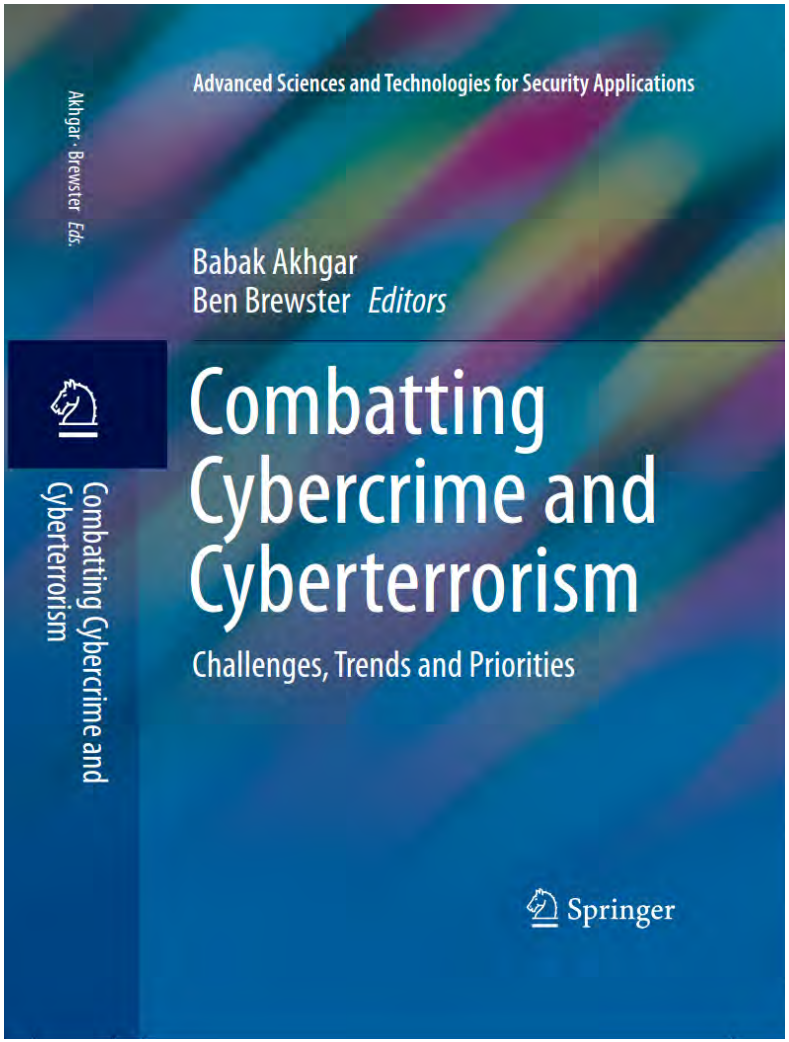
Springer Edited Collection

- Again, brings together the outputs of COURAGE, CyberRoad and CAMINO.
- In total, 16 chapters divided into four sections.
  - I: Approaching cybercrime / cyberterrorism research
  - II: Legal, ethical and privacy concerns
  - III: Technologies, scenarios and best practices
  - IV: Policy development and roadmaps for cybercrime / cyberterrorism research

- Will be available in time for the final project reviews in June 2016



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Sustainability through CyberConnector

ENGINEERING

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- CyberConnector is an online space open to private organisations, public administrations, CERTs, law-enforcement agencies and individuals to create, enhance and collective knowledge to improve cyber-security.
- Hosting different communities focusing on the fight against botnets, cyber-risks assessment, social vulnerability assessments and more, CyberConnector hosts communities focusing on the detection and mitigation of botnets, assessing cyber-risks, identifying needs in fighting cyber-terrorism and on-going collaborative European projects.

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To Join, visit CyberConnector.eu and click ‘Ask-for-an-Account’

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