Designing Robustness and Resilience in Digital Investigation Laboratories

By

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Designing Robustness and Resilience in Digital Investigations

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Overview

- What triggered the research?
- How did we do it?
- Key findings & recommendations
- Europol’s EC3 – ‘Walking the walk’
- Q & A

Challenges…

- **Complex and changing requirements, and rapid technological advancements**
- **Increasing volume, scope and sophistication of cybercrime & global scope – CaaS**
- **Criminal abuse of legitimate services providing anonymity and privacy**
- **…**

Challenges...

- Attribution
- Access to and admissibility of electronic evidence
- Cross-border cooperation
- Acquiring and retaining skills and expertise
- Staff turnover and 'knowledge drain'
- ...

Taking a step back...

- **How can LE conduct digital investigations effectively and efficiently?**

- **In LE, what is the role of robustness and resilience when it comes to digital investigations?**

- **What are the key elements in the context of a digital investigation framework design that can withstand changes but also adapt in a controlled/planned manner?**

Some definitions…

- Resilience – long-term capacity to adapt to change and new risk environments, and develop within certain boundaries

- Approach to addressing unexpected events but also a practice that aims at actively monitoring relevant factors and managing any deviations

- Includes monitoring, situational awareness and forward-looking analysis as key practices

Some definitions…

- Robustness – the ability resist change

- Important to ensure that the basic principles of police work are maintained while adapting to a changing environment

- Not all that can be done should be done (?)

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Objectives

- Surveying and analysing the current state of robustness and resilience practices

- Extracting key elements of robustness and resilience

- Describing how to include these elements when designing digital investigation capabilities

Approach

- **Literature research**
- **Structured online survey – 35 closed and open questions – 72 recipients (LEAs), 21 responses ~ 29% response rate**
- **Stakeholder interviews**

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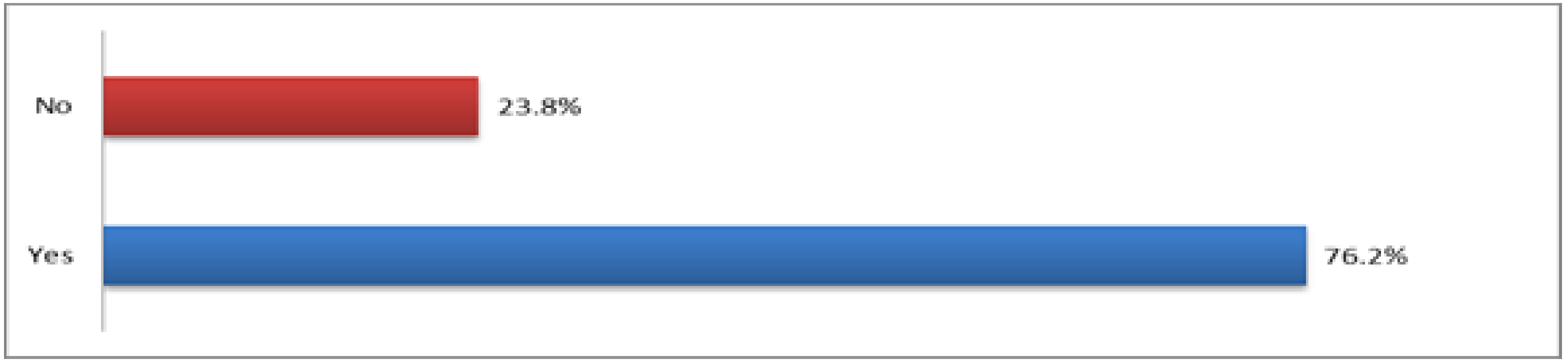
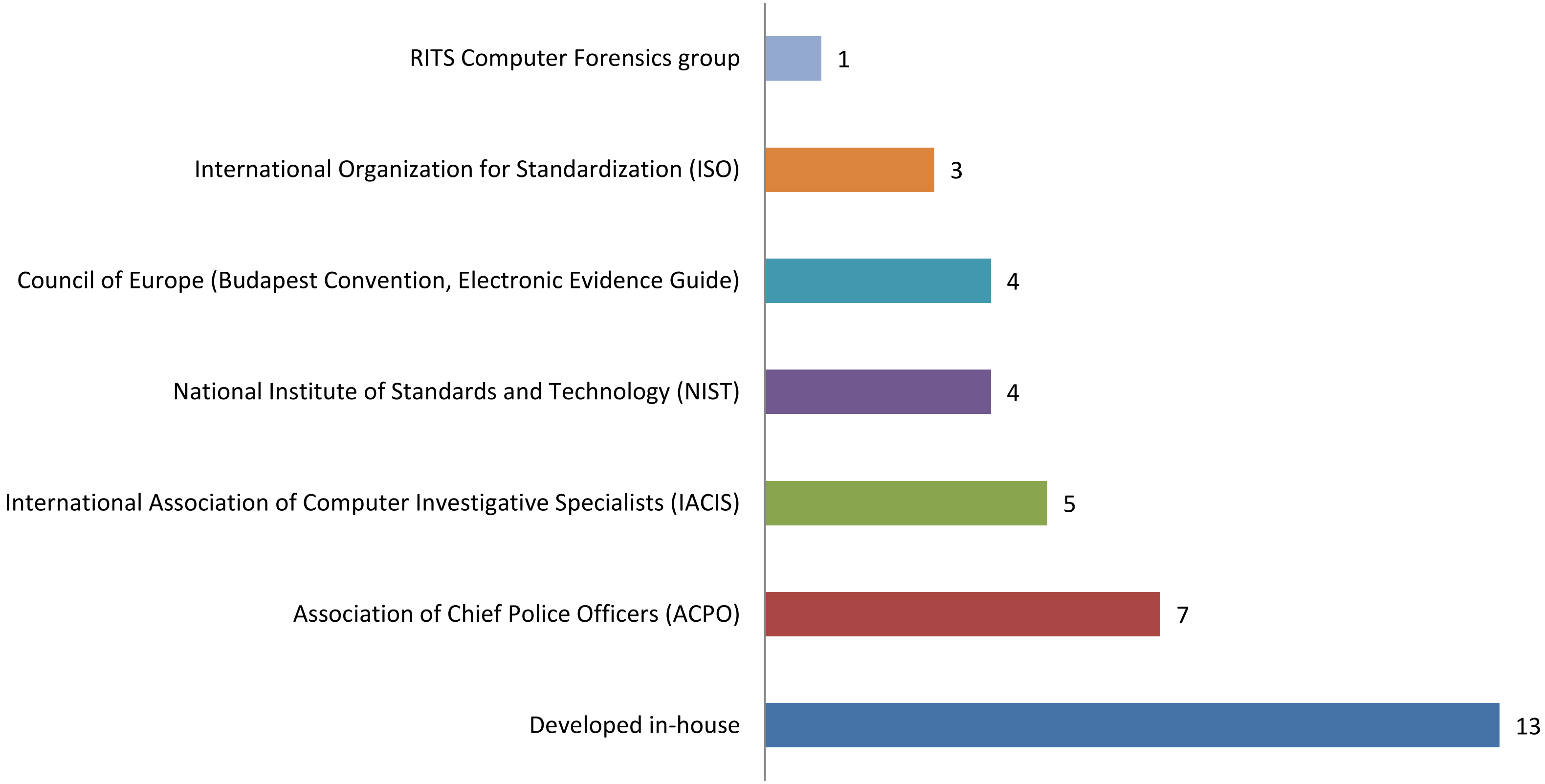
Key findings & Recommendations

Does your agency have a digital forensics strategy?



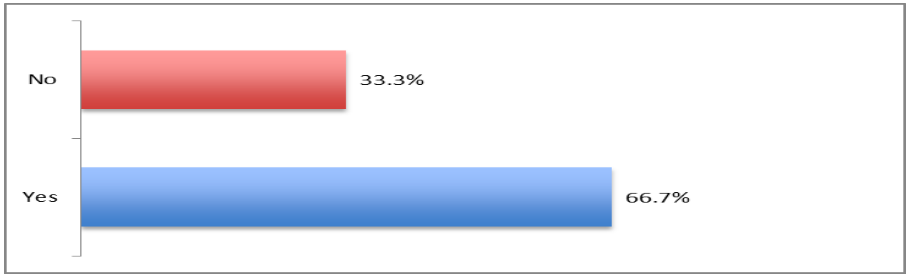
Key findings & Recommendations

Main standards or guidelines used in digital forensics?

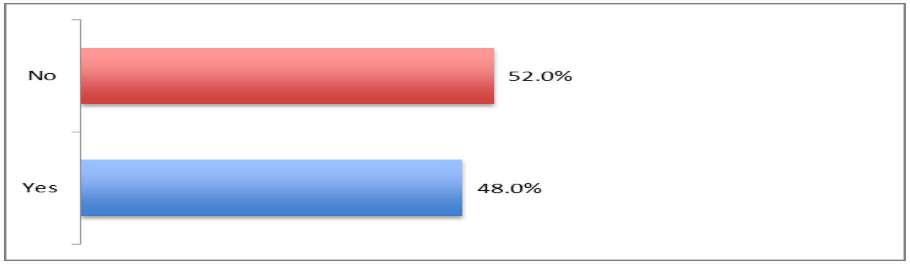


Key findings & Recommendations

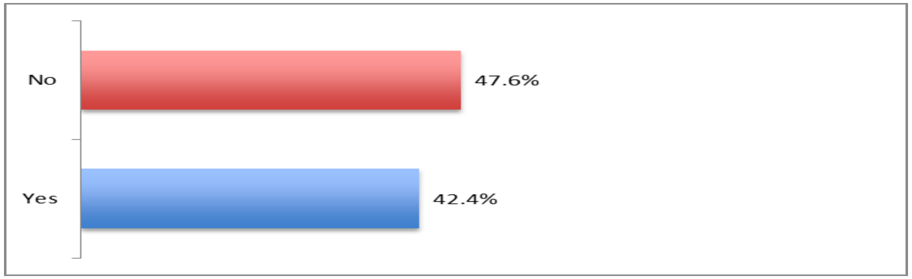
Training and Education



Continuous digital forensics education/training plan in place?



Use of e-learning to train digital forensics staff?



Personal development portfolio for staff?

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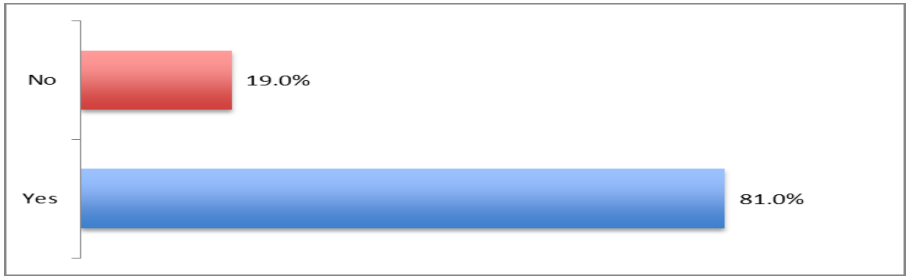
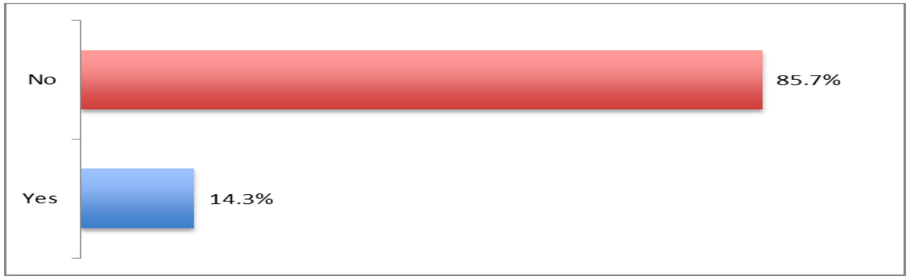
Key findings & Recommendations

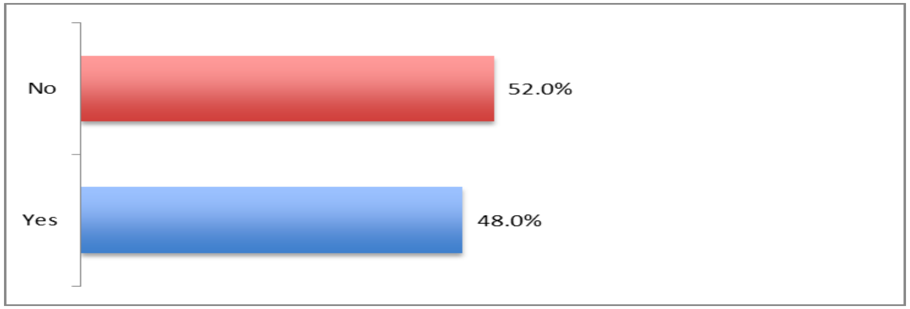
Training and Education (cont'd)



Mentoring system in place?



Hand-over between outgoing and incoming digital forensics staff?



Further education and training considered during performance evaluations?

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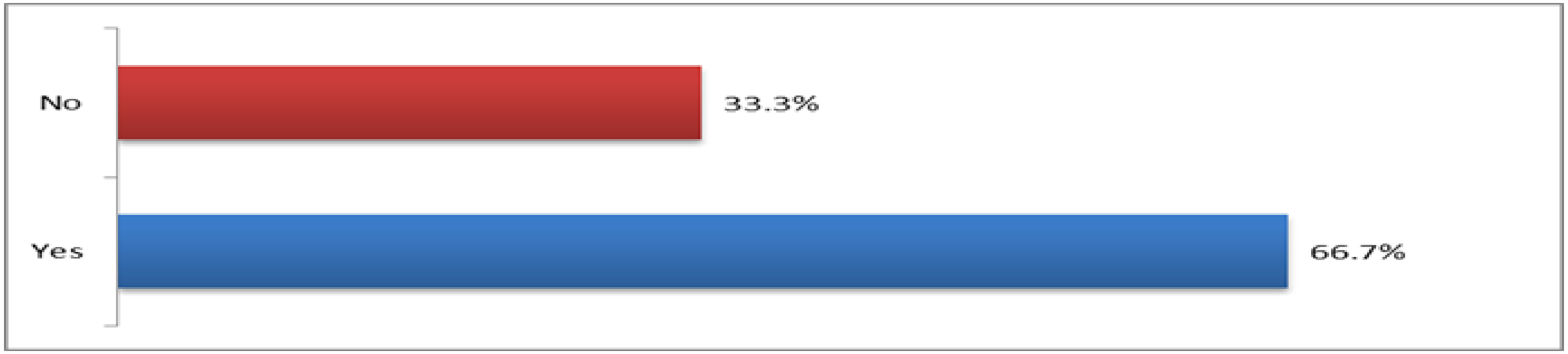
Key findings & Recommendations

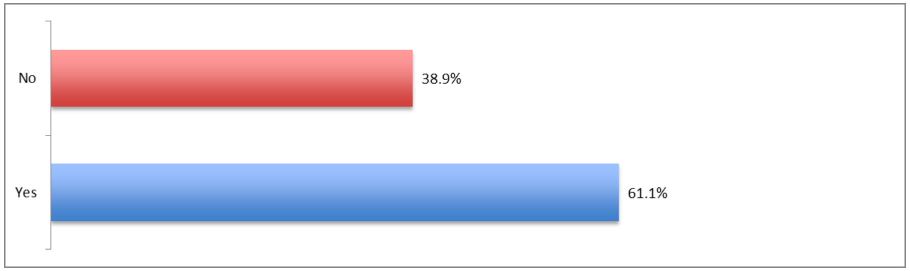
Do you use a reporting standard (incidents, case description, final reports, etc.)?



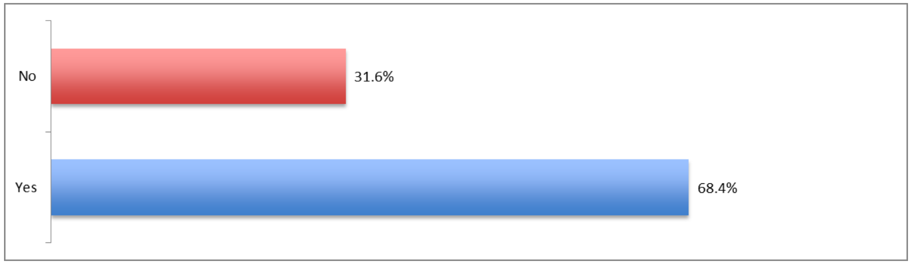
Key findings & Recommendations

Tool Support

Do you use standardized digital forensics tools?

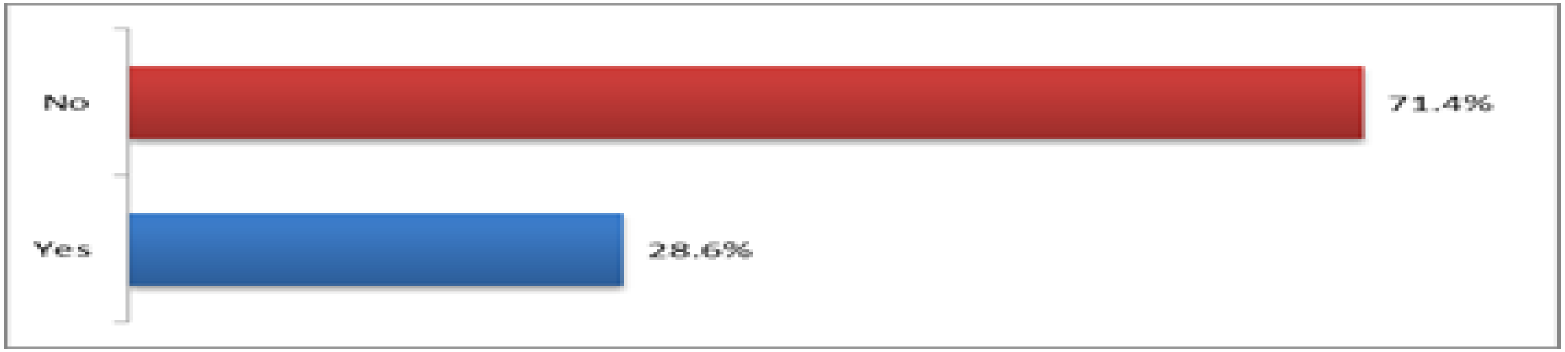


Do you use open-source digital forensics tools?



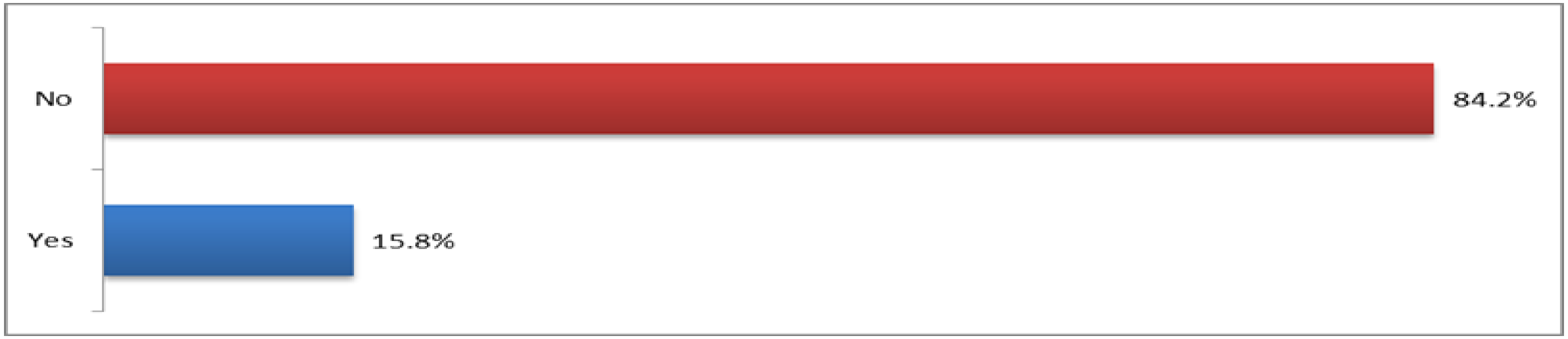
Key findings & Recommendations

Do you have a Quality Management System in place?



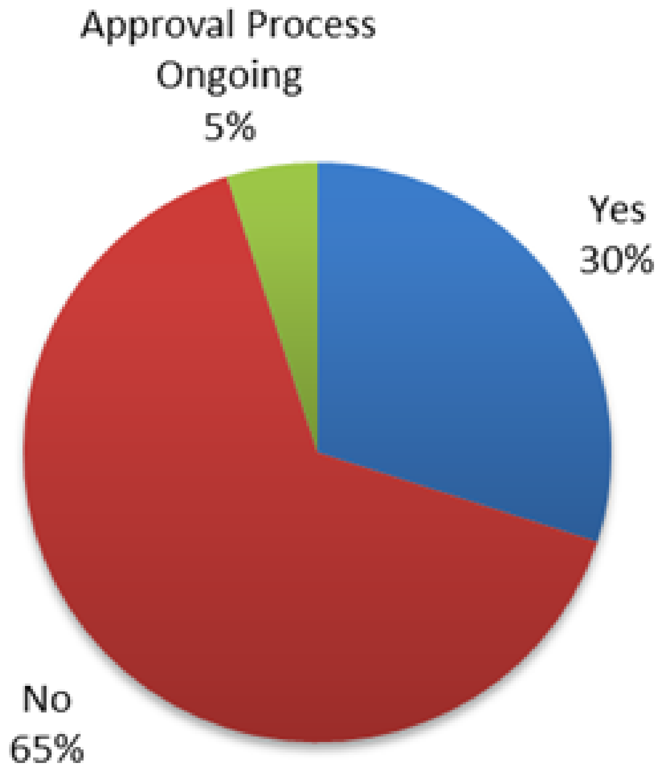
Key findings & Recommendations

Do you have a Knowledge Management Program in place?



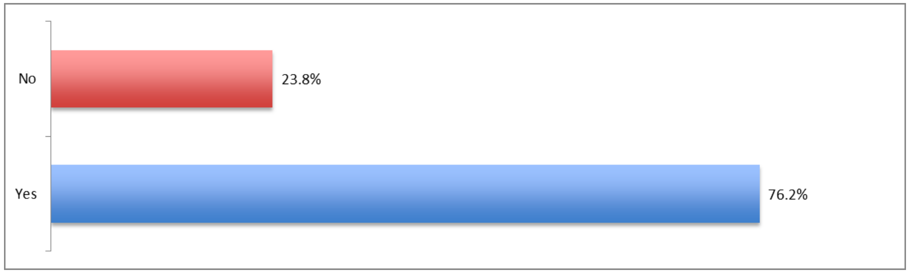
Key findings & Recommendations

Are the digital forensics software tools that your agency uses 'court-approved'?

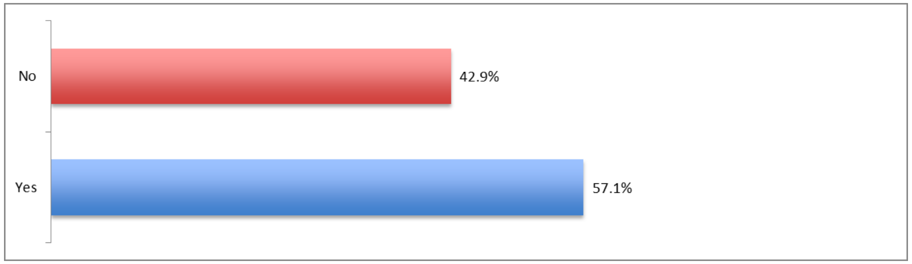


Key findings & Recommendations

Co-operation and PPPs



Co-operation with academia?



Co-operation with the private sector?

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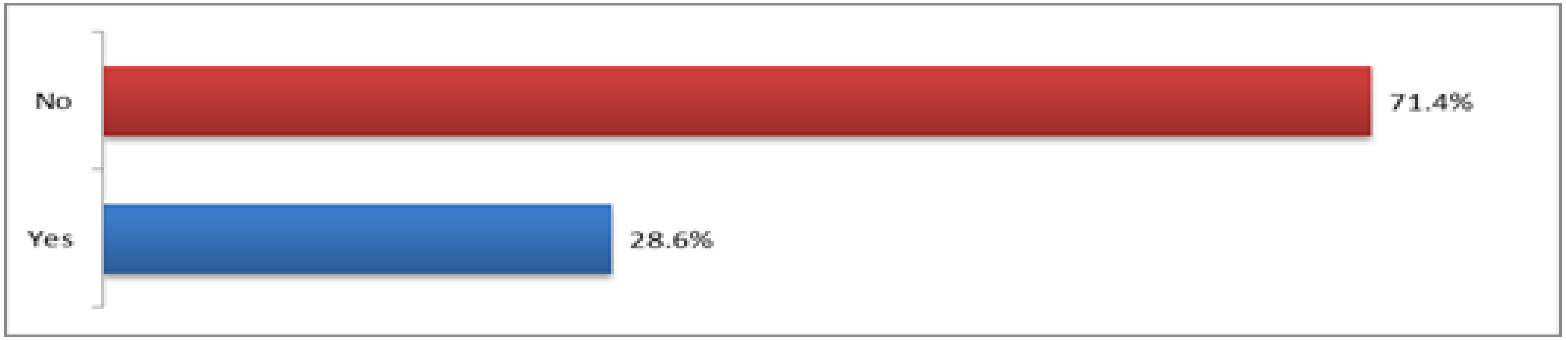
Key findings & Recommendations

Do you have a digital forensics R&D unit?



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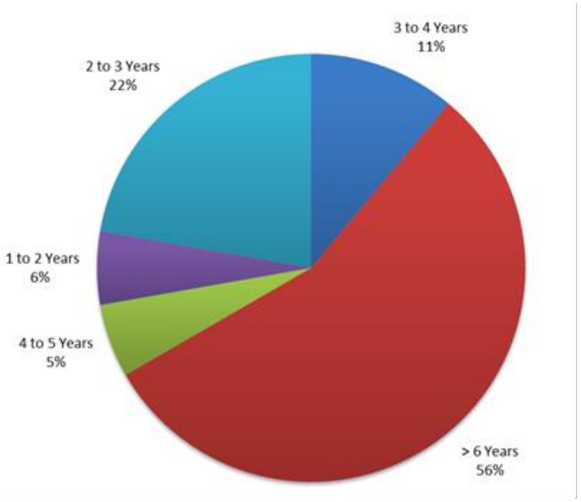
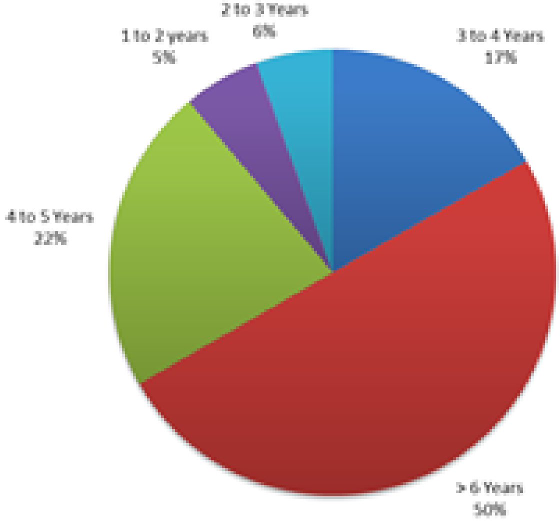
Key findings & Recommendations

Average staff turnover



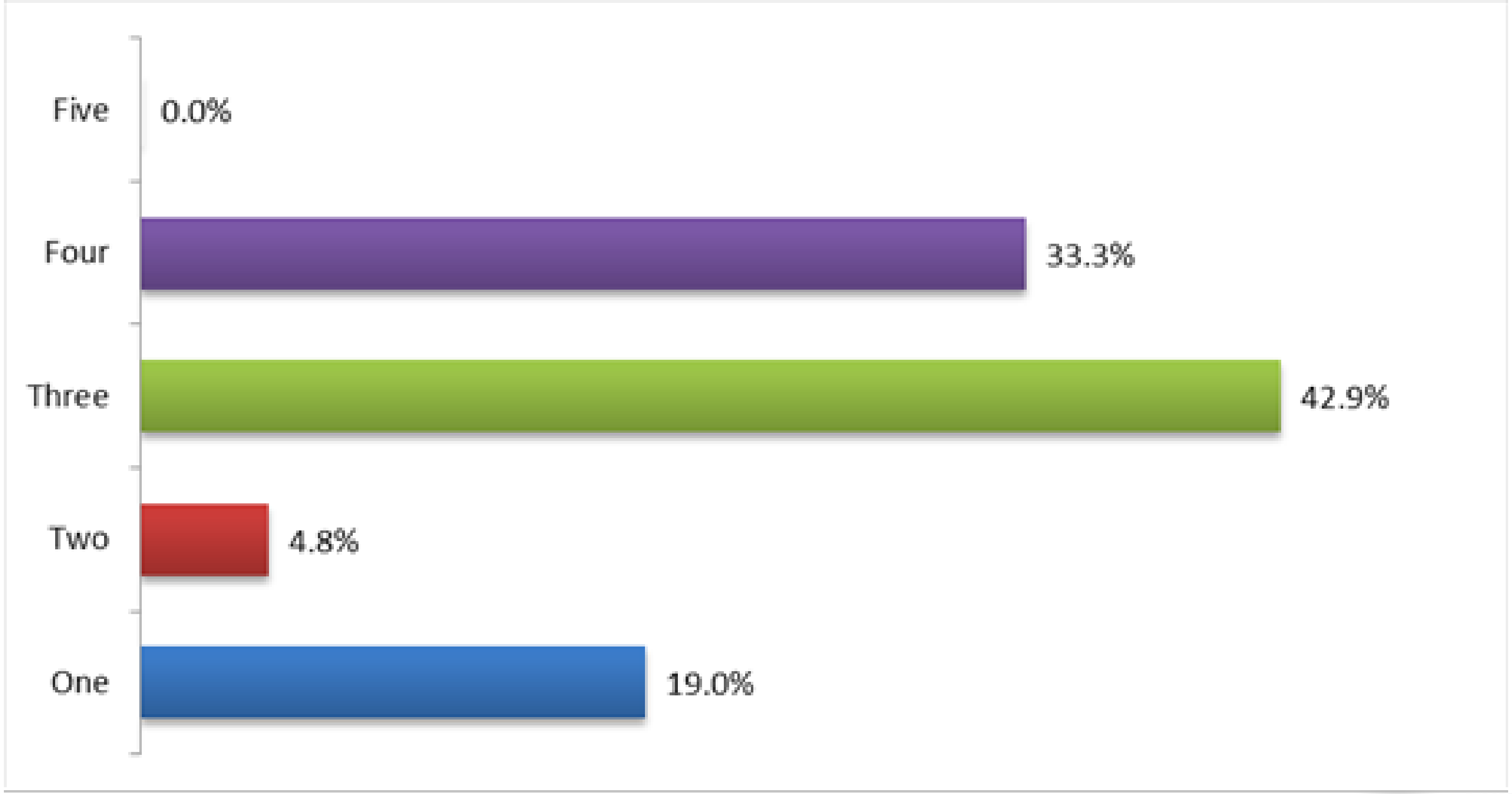
Digital forensic examiners



Digital forensic investigators

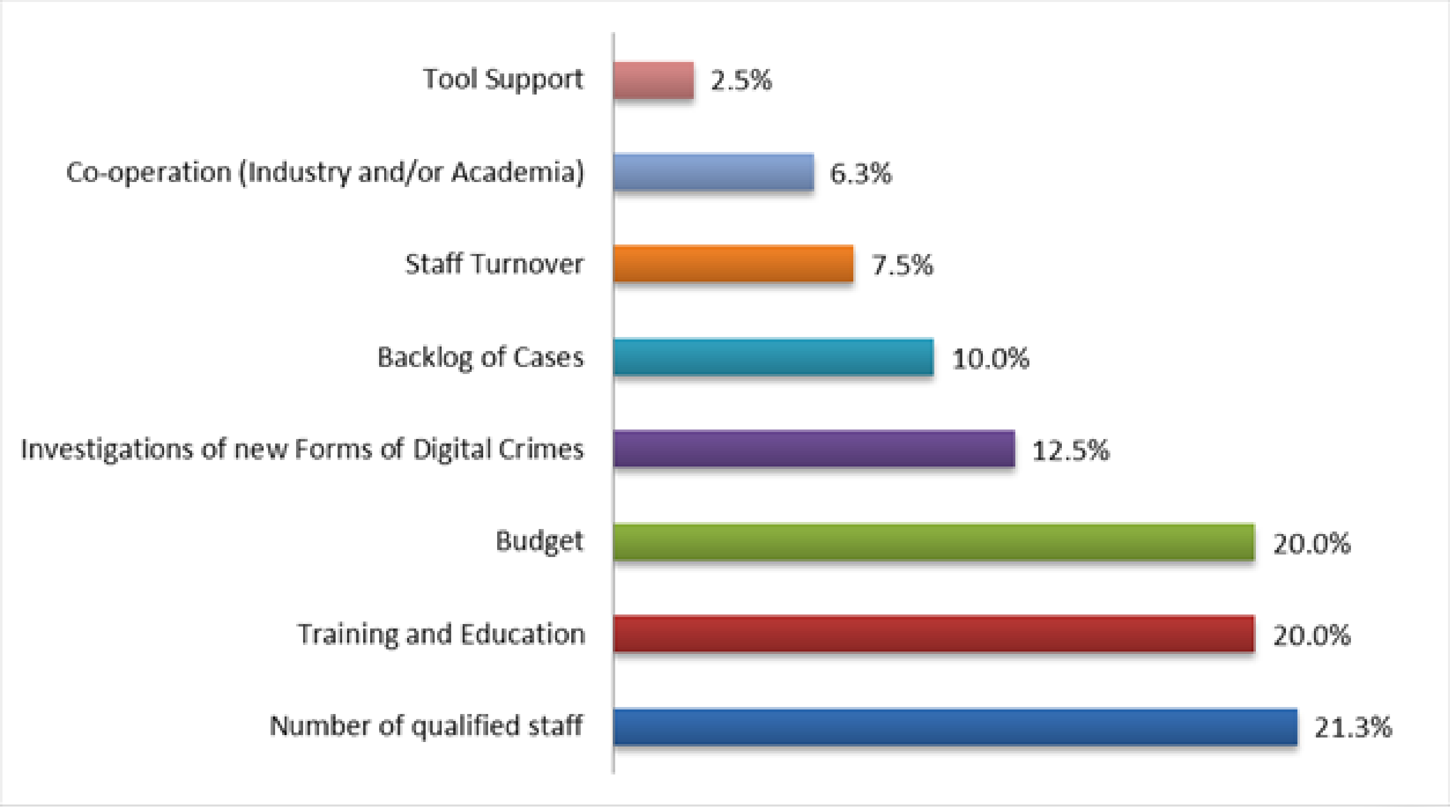
Key findings & Recommendations

How would you rate your agency's robustness and resilience? (1 – Lowest 5 – Highest)



Key findings & Recommendations

Greatest challenges in conducting digital investigations?



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Key findings & Recommendations

Strategic Level

- Digital Forensics Strategy
- Standardization
- Forensic Discipline
- Continuous Education and Training
- Research and Development
- Co-operation

Operational Level

- Standardization
- Continuous Education and Training
- Research and Development
- Co-operation
- Human Resources

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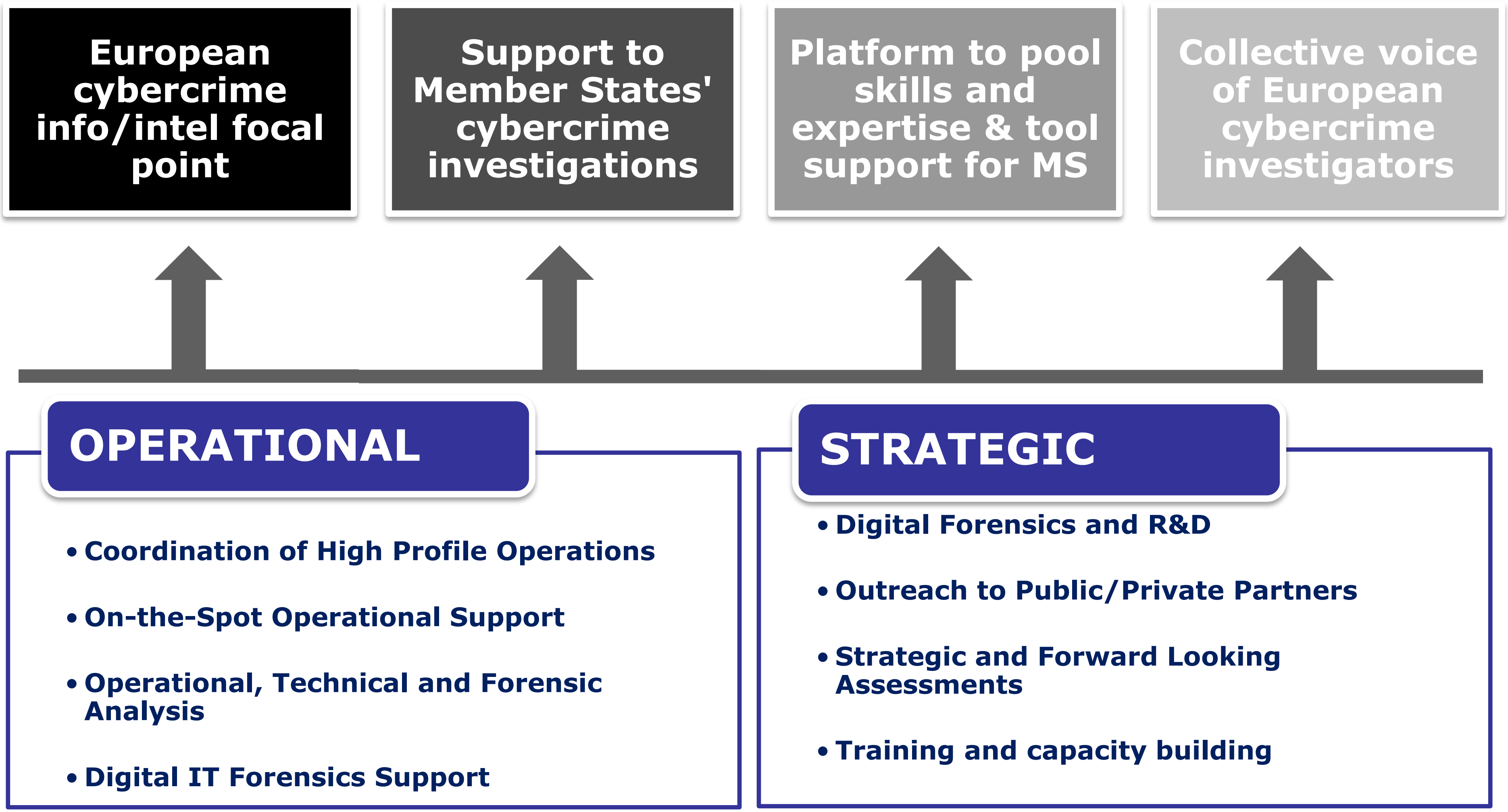
Future Research

- Development of additional KPIs
- Digital forensics framework

EC3 – Who We Are and What We Do

European Cybercrime Centre

EC3 Core Services



European cybercrime info/intel focal point

Support to Member States' cybercrime investigations

Platform to pool skills and expertise & tool support for MS

Collective voice of European cybercrime investigators

OPERATIONAL

- Coordination of High Profile Operations
- On-the-Spot Operational Support
- Operational, Technical and Forensic Analysis
- Digital IT Forensics Support

STRATEGIC

- Digital Forensics and R&D
- Outreach to Public/Private Partners
- Strategic and Forward Looking Assessments
- Training and capacity building

EC3 Intelligence/Knowledge Products

CYBER-INTEL

- **Cyber Bits**
  - **Trends**: Modus operandi, tool or technique used by cyber criminals. Emerging patterns and crime series.
  - **Knowledge**: Offer guidance and raise awareness.
  - **Technology**: Technical developments having impact law enforcement work.
  - **Tools:** Presentation of tailored tools to support operational activities.
- **OSINT Dashboard**
- **Strategic Assessments of Operations**

STRATEGY

- **iOCTA**
- **Project 2020: Scenarios for the Future of Cybercrime**
- **Police Ransomware Threat Assessment, Review of Criminal Forums, etc.**
- **Strategic Assessments of Operations (e.g. Onymous)**
- **Quantitative Quarterly Report on Cybercrime, CC Dependencies Map**
- **ICANN Guide for Dummies, Assessment of Bitcoin, Top 10 External Cyber Threats, etc.**

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EC3 Projects, Products and Services

- **Taxonomy and business case for the exchange of information/intelligence between LE and CERTs**

- **Anonymized cross-matching solution**

- **Design of standardized EU-wide training and capacity building measures (ECTEG, UCD, CEPOL,…) – Training Competency Framework**

- **Prevention and awareness**

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EC3 Projects, Products and Services

- Active stakeholder management, cross-domain and cross-disciplinary (e.g. EC3AAN)
- EC3 Training Courses (Avila, Selm)
- Position papers on legislative issues
- Research and Development
- Malware analysis, Decryption, …

Thank you

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