

Past, Present & Future of

Battlefield Forensics

What is Battlefield Forensics in the contemporary world and what would a future framework look like?

Time frame: 2023 – 2026

Lead: Rikke RIETVELD,

PhD Project in collaboration with Cranfield University, Danish Defence and NATO.

Funded by Cranfield University and NATO DAT-POW. Supported by Danish Defence (SOCOM).



DANISH DEFENCE



The Past

PAST:
Pre-2003



PRESENT:
2003-2023



FUTURE:
Beyond 2023



HISTORICAL WARS & SCIENCE:

- Trace Battlefield Forensics Evolution? When did it begin? Why?

BATTLEFIELD EVIDENCE:

- Explore its historical significance.

The Present



Methods and Technologies:

- Explore contemporary battlefield forensics.
- Access current practices in NATO
- Contrast civilian and military applications.
- Evaluate emerging technologies, strategic initiatives and geo-political trends.

Modern Battlefield Definition:

- Define modern battlefield parameters.
- Who are the key actors?
- Key disciplines?
- Analyse the impact on forensic investigations and military operations.

The Future

FUTURE:
Beyond 2023

PAST:
PRE-2003



PRESENT:
2003-2023



Future Assessments:

- Emerging technologies and warfare tactics.
- Extract key-insights to support NATO's concept development

Evolution of Forensic Framework:

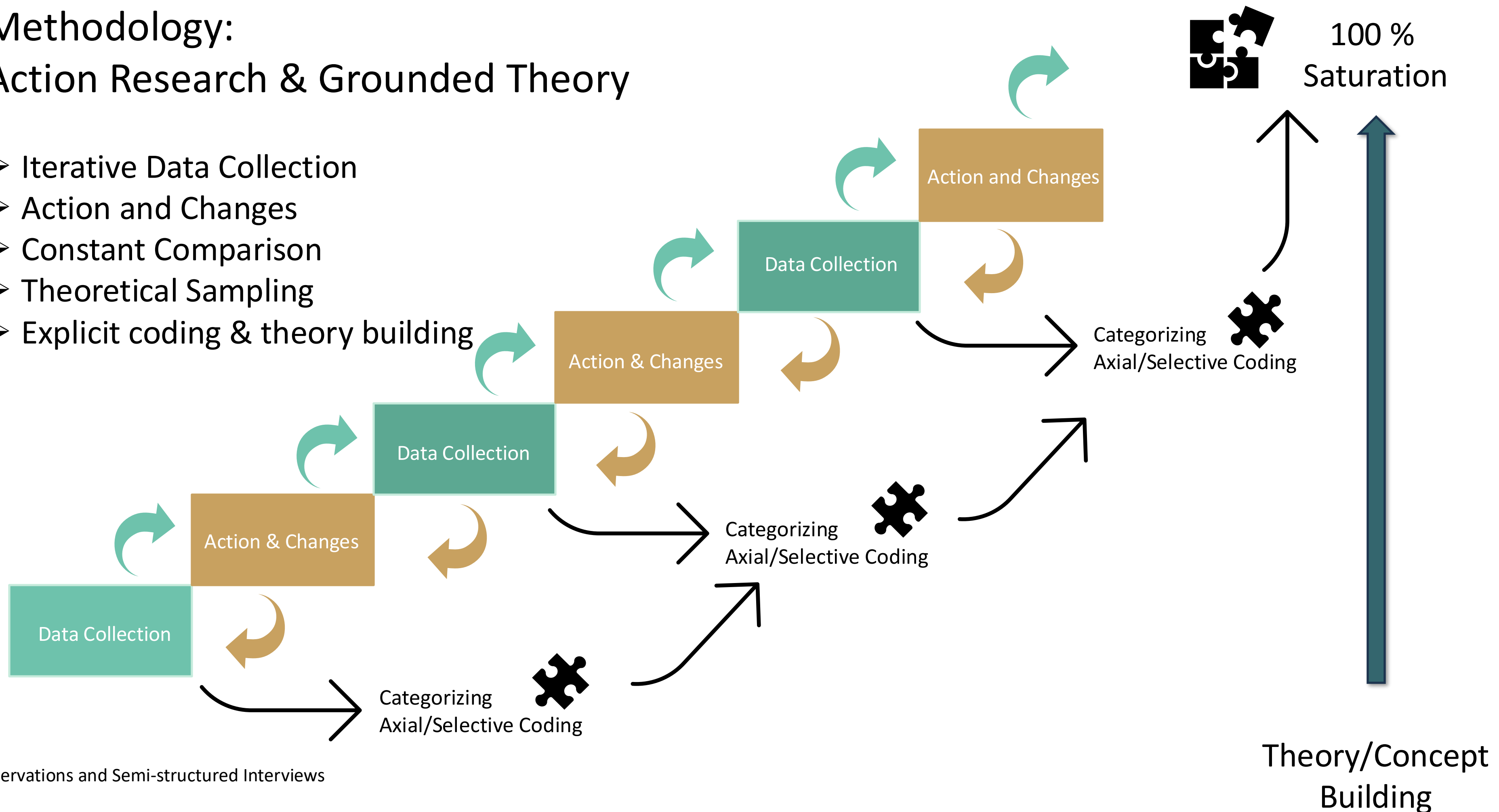
- Response to emerging technologies and limited resources.
- Adaptation to changing warfare tactics.
- Collaboration between CIV-MIL-GOV

Defining Battlefield Forensics:

- Comprehensive definition for Battlefield Forensics

Methodology: Action Research & Grounded Theory

- Iterative Data Collection
- Action and Changes
- Constant Comparison
- Theoretical Sampling
- Explicit coding & theory building



Observations and Semi-structured Interviews

Why is this research needed?

WHY?

- LACK OF RECOURSES / WORKING IN STOWE PIPES
- INCREASING COMPLEXITY OF THE BATTLEFIELD AND RAPID ADVANCEMENTS IN SCIENCE & TECHNOLOGY -> KNOWLEDGE GAP
- UNTAPPED POTENTIAL OF COLLECTED EXPLOITATBLE MATERIAL RESULTS IN LOSS OF VALUABLE INTELLIGENCE AND EVIDENCE
- BRIDGE THE GAP -> CIVILIAN AND MILITARY FORENSIC UNDERSTANDING & COLLABORATION
- EXISTING NATO DOCTRINE -> NOT FIT FOR PURPOSE
- NEED FOR A "BATTLEFIELD FORENSIC" FRAMEWORK?

UKRAINE

Ukraine, Moldova | DG ECHO-funded humanitarian assistance update



"Ukraine's Prosecutor have logged over **126,000 war crime** cases according to Yuriy Belousov, Head of War Crimes Unit in Ukraines Prosecutors Office." -REUTERS 16 APR 24.

"The International Committee of the Red Cross (ICRC) is seeking to clarify the fate of **23,000 persons** whose families have no news of them, either because they have been captured, killed, or because they lost contact after fleeing their homes." - ICRC 19 FEB 24

"**Human trafficking**, which was already on the **increase** because of the country's worsening economic conditions and resultant labour emigration, has been further exacerbated by the war waged by Russia in Ukraine".- Global Organized Crime Index, 2023.

"...every precedent suggests that, especially if the threat is not addressed proactively and imaginatively, when the current war ends, Ukraine's battlefields could and will become the new **arsenal of anarchy, arming everyone** from insurgents in Africa to gangsters in the streets of Europe."- Global Initiative- 2023

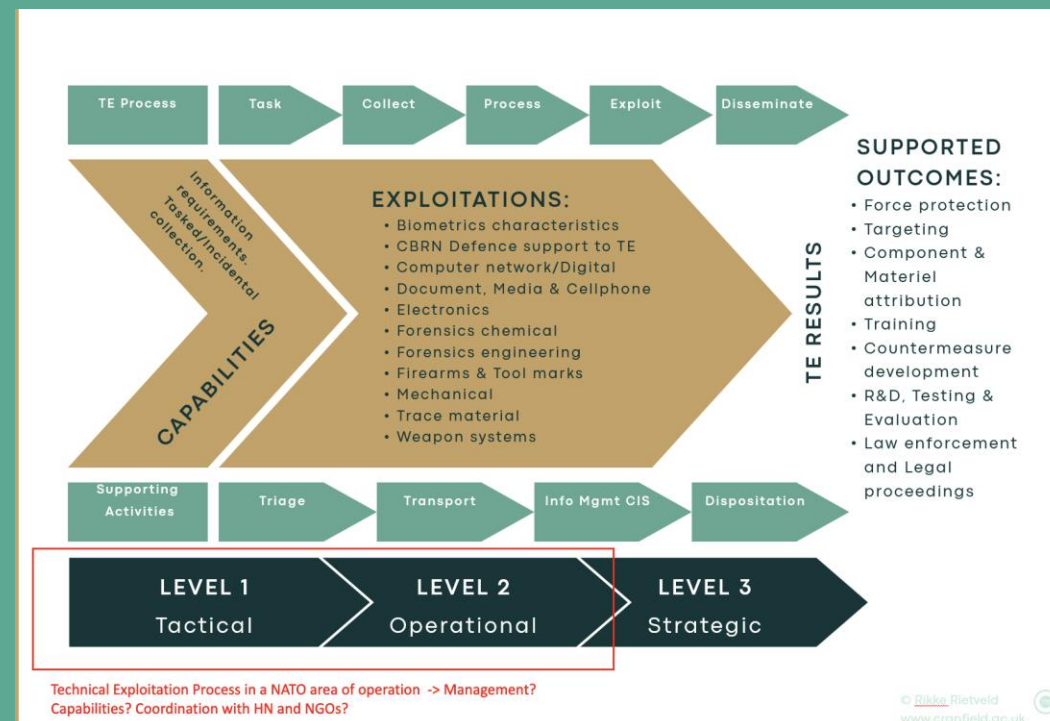
"The dud rate of Russian munitions is between 10 and 30 percent, with cluster munitions reaching 40%. In 2022 Russia alone fired around 11 million artillery rounds, which might amount to **over 2 million UXO on the territory of Ukraine** left from artillery shells in 2022 only." GLOBSEC 2024

"461 humanitarian partners in Ukraine, including 236 international NGO's, 112 National NGOs" Source: CSIS

Working with NATO

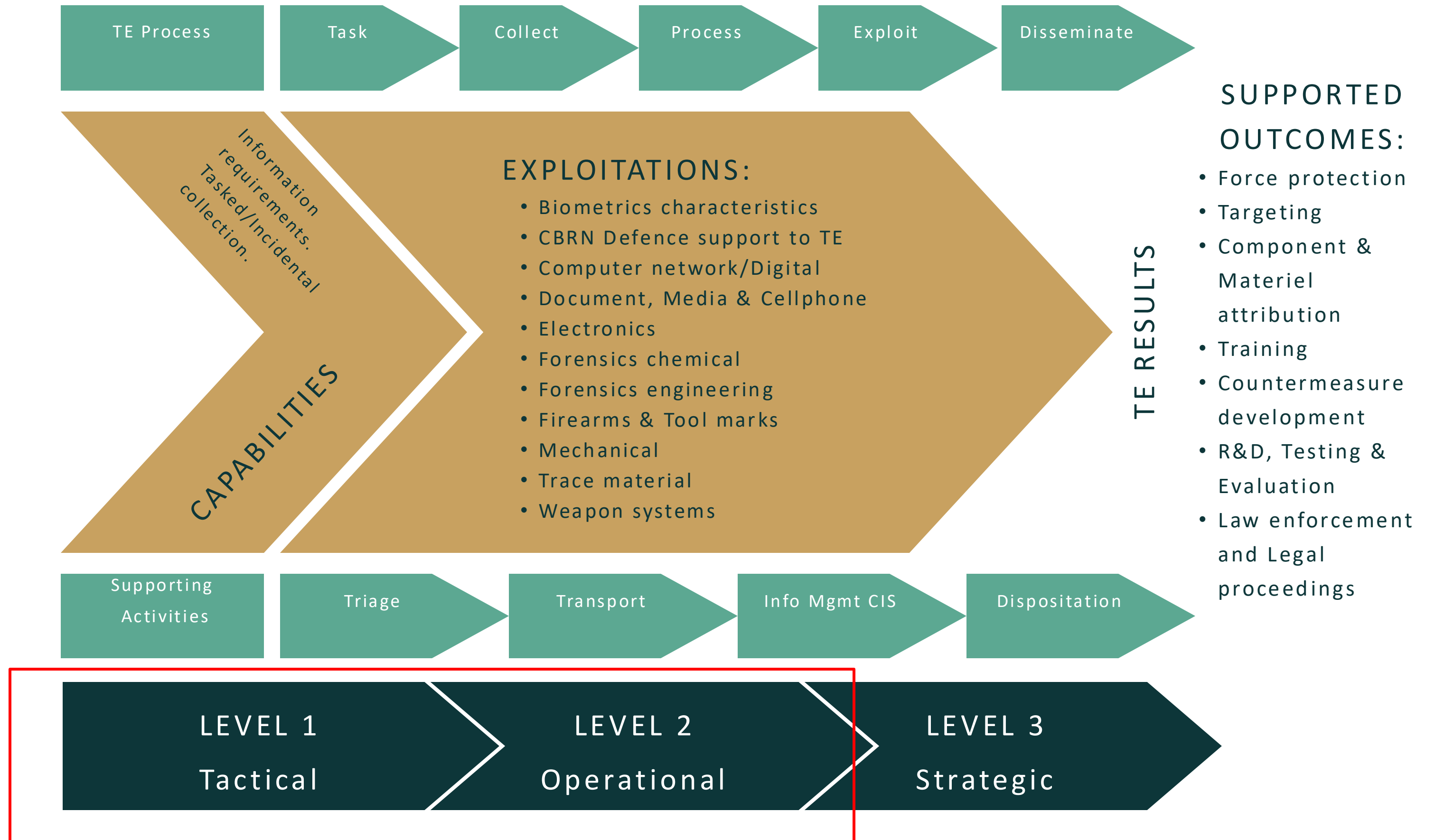
as a Case Study

Provide a real-world framework in which to test current NATO doctrine and concepts within TECHNICAL EXPLOITATION & BATTLEFIELD EVIDENCE and to gauge their degree of implementation in the NATO Force Structure, Operational Planning and coordination with Host Nations.



Source: Multinational Corps Northeast, Szczecin, Poland.

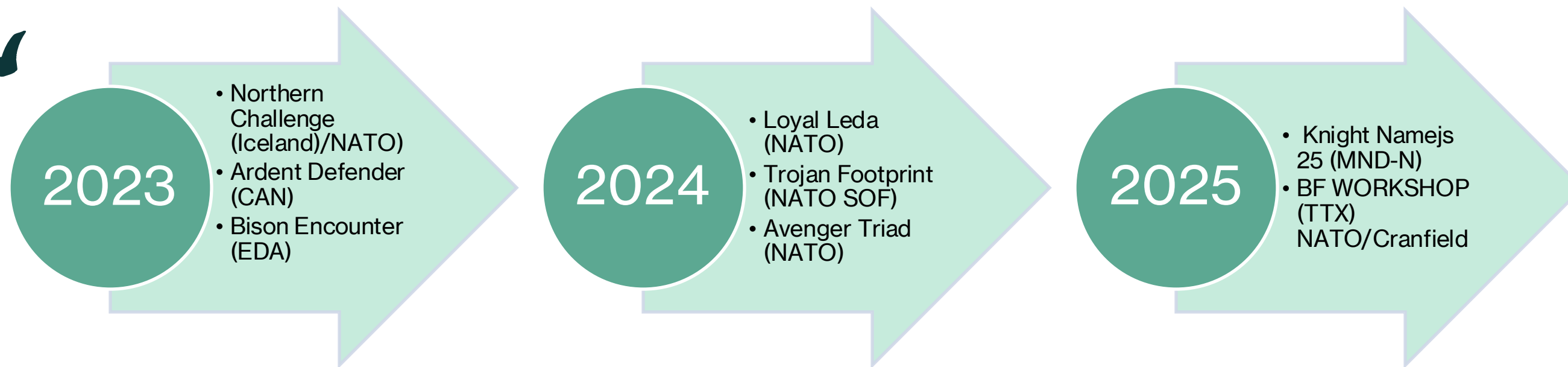
NATO as a Case-study



Technical Exploitation Process in a NATO area of operation -> Management?
Capabilities? Coordination with HN and NGOs?



Exercise Observation, Implementation & Testing



- 
- | | |
|--|---|
| <ul style="list-style-type: none">• Current Technical Exploitation Framework• Staff Function's Responsibilities for TE• Technical Exploitation Coordination Cell (TECC) – Capabilities, Operations, and Management of the TE process | <ul style="list-style-type: none">• Technical Exploitation Laboratory Level 2• Technical Exploitation Collection (Level 1)• Collected Exploitable Material (CEM) Flow• Managing TE Results• Harmonisation with HN |
|--|---|



Findings and Output so far...



KNOWLEDGE GAP:

- BATTLEFIELD COMPLEXITY AND FORENSIC TECHNOLOGY ADVANCEMENTS.
- LIMITED REALIZATION OF FORENSIC SCIENCE POTENTIAL IN WARFARE.

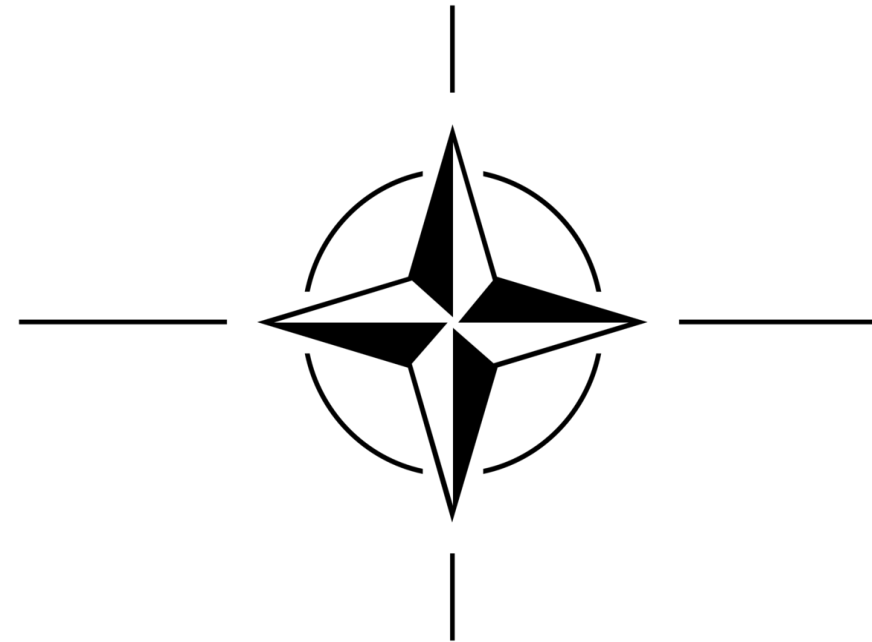


LIMITED UNDERSTANDING:

- TECHNICAL EXPLOITATION & BATTLEFIELD EVIDENCE?
- CAPABILITY GAP
- LEGAL FRAMEWORK MISSING
- NATIONAL CAVEATS?



WHAT IS THE PURPOSE?
WHAT IS COLLECTED?
BY WHOM?
WHO OWNS IT?
HOW DO WE SHARE IT?



UNTAPPED POTENTIAL:

- LOSS OF VALUABLE INTELLIGENCE AND EVIDENCE.
- NEED FOR OPTIMIZATION OF COLLECTED EXPLOITABLE MATERIAL (CEM).
- CEM --> BATTLEFIELD EVIDENCE



Output

- RECOMMENDATIONS TO COM
- TE CONCEPT OF EMPLOYMENT
- TE EXERCISE INPUT
 - TE ANNEX OPERATIONAL ORDER
 - TE INJECTS



DOCTRINE DEFICIENCY:

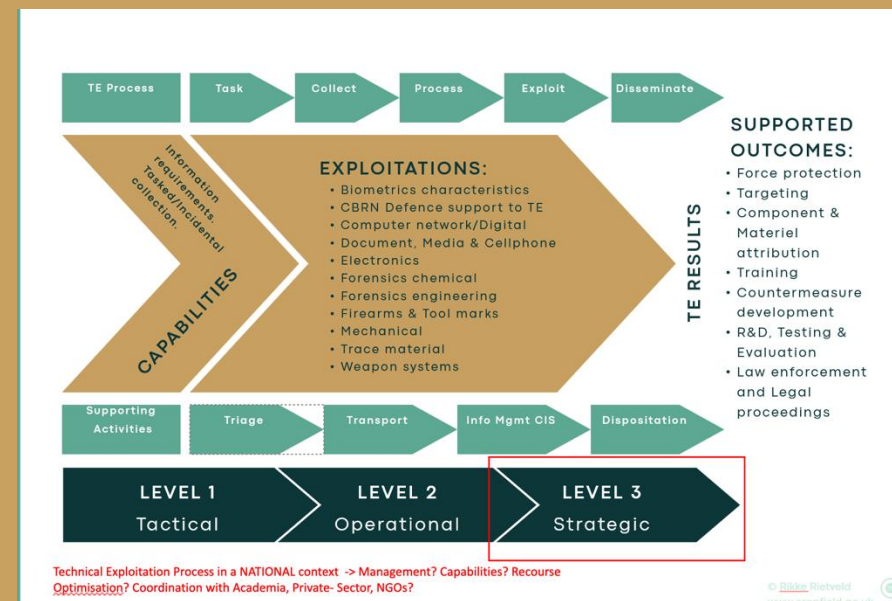
- NATO TACTICAL DOCTRINE NOT FIT-FOR-PURPOSE
- NEEDS TO BE INCORPORATED IN COM INTENT and OPORD
- REQUIREMENT FOR OPTIMISED COOPERATION (HN, CIV, IND, AC)



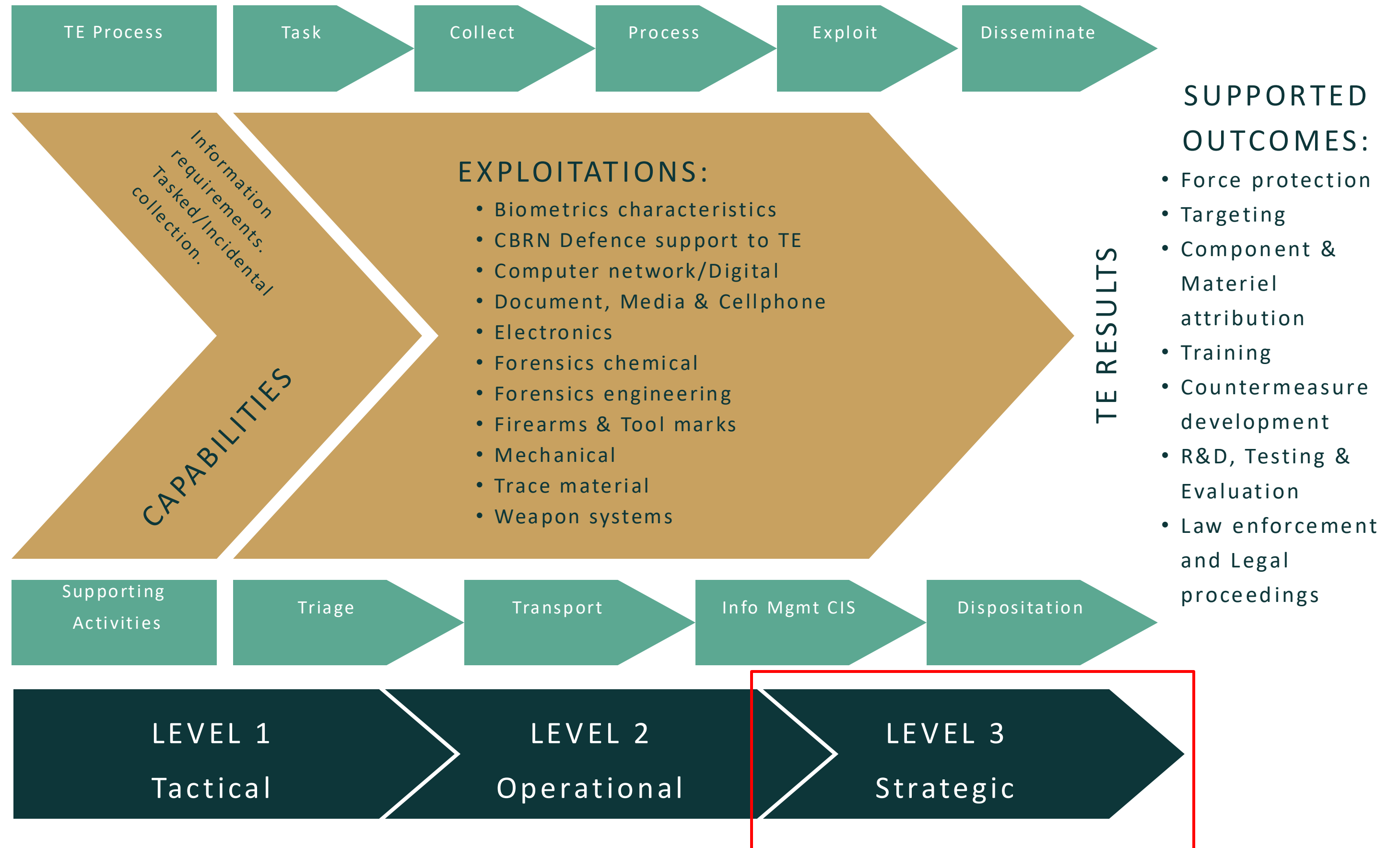
Case Study

DANISH DEFENCE

Using Denmark a case study to explore how both Denmark and other smaller or isolated nations could benefit from a Battlefield Forensic Framework. This framework would involve sharing resources and fostering collaborations across functional and interagency lines. Furthermore, the identified capabilities within this framework could also be applied to a national emergency response plan in the event of crises or disasters.



Denmark as a Case-study



Technical Exploitation Process in a NATIONAL context -> Management? Capabilities? Recourse
Optimisation? Coordination with Academia, Private- Sector, NGOs?

- Enhanced Coordination
- Efficient Recourse Utilization
- Rapid Response
- Comprehensive Data Collection
- Strengthened National Security
- Capacity Building
- International Cooperation
- Crisis Management Readiness
- Improved Victim Identification
- Legal Support

MIL: TECHNICAL EXPLOITATION CAPABILITES			
<p>BIOMETRIC</p> <ul style="list-style-type: none">  Iris  Voice  DNA  Fingerprints 	<p>CBRN DEFENCE</p> <ul style="list-style-type: none">  Chemical  Biological  Radiological / Nuclear 	<p>CHEMICAL</p> <ul style="list-style-type: none">  Explosives  Narcotics  Chemical signatures 	<p>DIGITAL NETWORK</p> <ul style="list-style-type: none">  Computer data  Data repositories  Networks & servers
<p>DOCUMENT</p> <ul style="list-style-type: none">  Communication  Hard copy files  Publications  Identification 	<p>FIREARM & TOOL</p> <ul style="list-style-type: none">  Firearms  Ammunition  Tool marks 	<p>ELECTRONIC</p> <ul style="list-style-type: none">  Electric connections  Signals  Operating modes  Data links 	<p>ENGINEERING</p> <ul style="list-style-type: none">  Enemy buildings  Enemy facilities  Infrastructure
<p>MECHANICAL</p> <ul style="list-style-type: none">  Components  Switches  Configurations 	<p>MEDIA</p> <ul style="list-style-type: none">  Cell phones  Digital data  Videos & photos  Electronic files 	<p>TRACE MATERIAL</p> <ul style="list-style-type: none">  Geological & manufactures residues  Biological residue 	<p>WEAPON SYSTEMS</p> <ul style="list-style-type: none">  Aircraft  Missile systems  Personal weapons  IEDs  UAVs



DNK LVL 3?

- Recommendation to national procedures and planning processes.
- Examples of Forensic Resources in Denmark which could support a national LVL 3 and theatre LVL2/1.

1) Efterretningsregimentet
(Army Intelligence)

2) Ingeniørregimentet
(Engineer Regiment)

3) Militær Politiet
(Military Police) /
Forsvarets Auditør Korps
(Military Prosecution Service)

4) SOKOM
(Special Operation Command)

5) Nationalt Forsvarsteknologisk Center

6) Forsvarsakademiet
(Danish Defence College)

7) Rigspolitiet
Police Intelligence and CSI

8) Forsvarets Efterretningstjeneste (Defence
Intelligence Service) /
Center for Cybersikkerhed
(Centre for Cyber Security)

9) Beredsskabstyrelsen (Danish Emergency
Management Agency)

10) FMI: Forsvarets Kemiske Laboratorium
(Defence Chemical Lab) + Cyber Division:
Battle Lab.

11) DAR – Sikkerhed & Ballistik

12) Flyvevåbnet (IMINT EXPL)
Danish Airforce

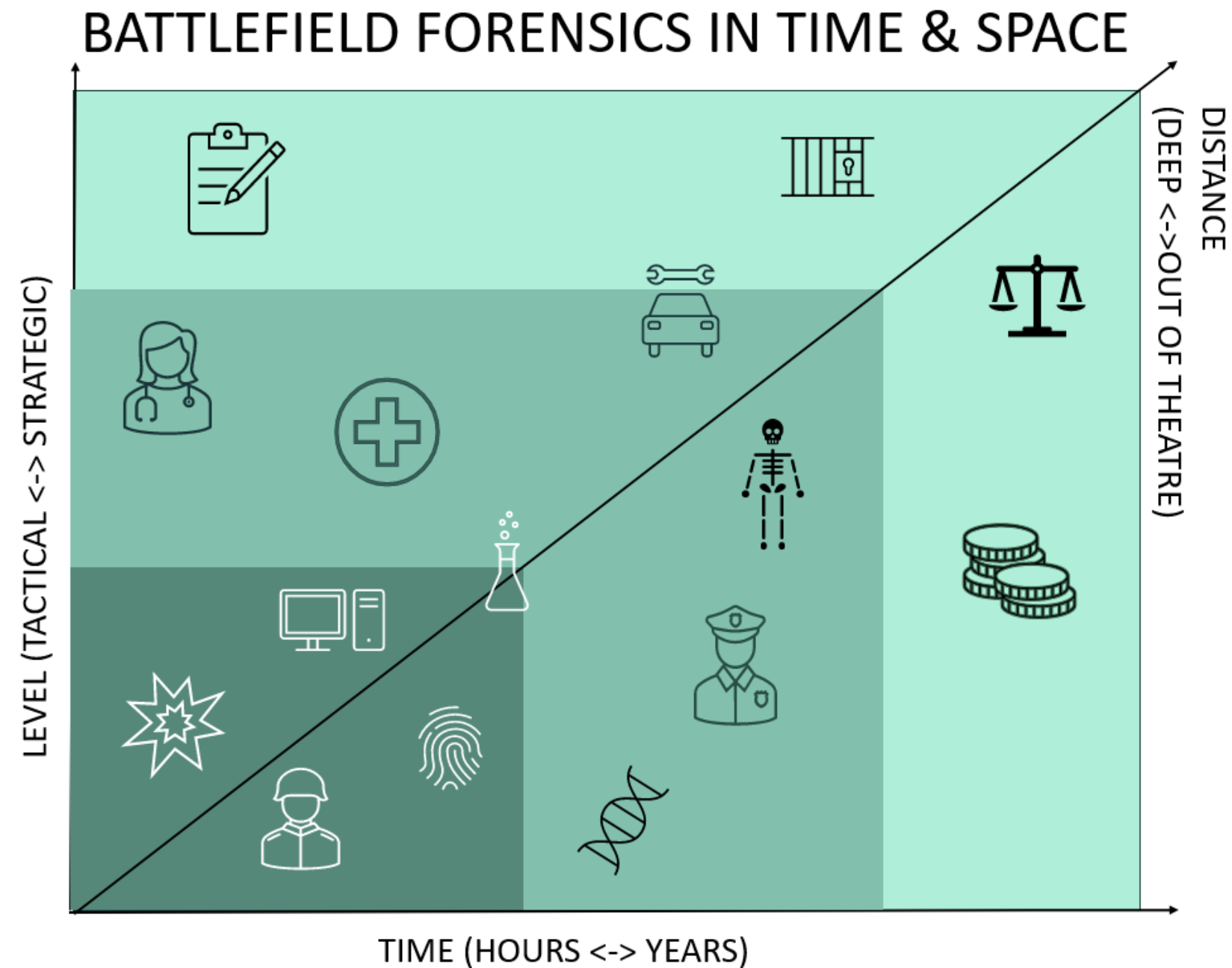
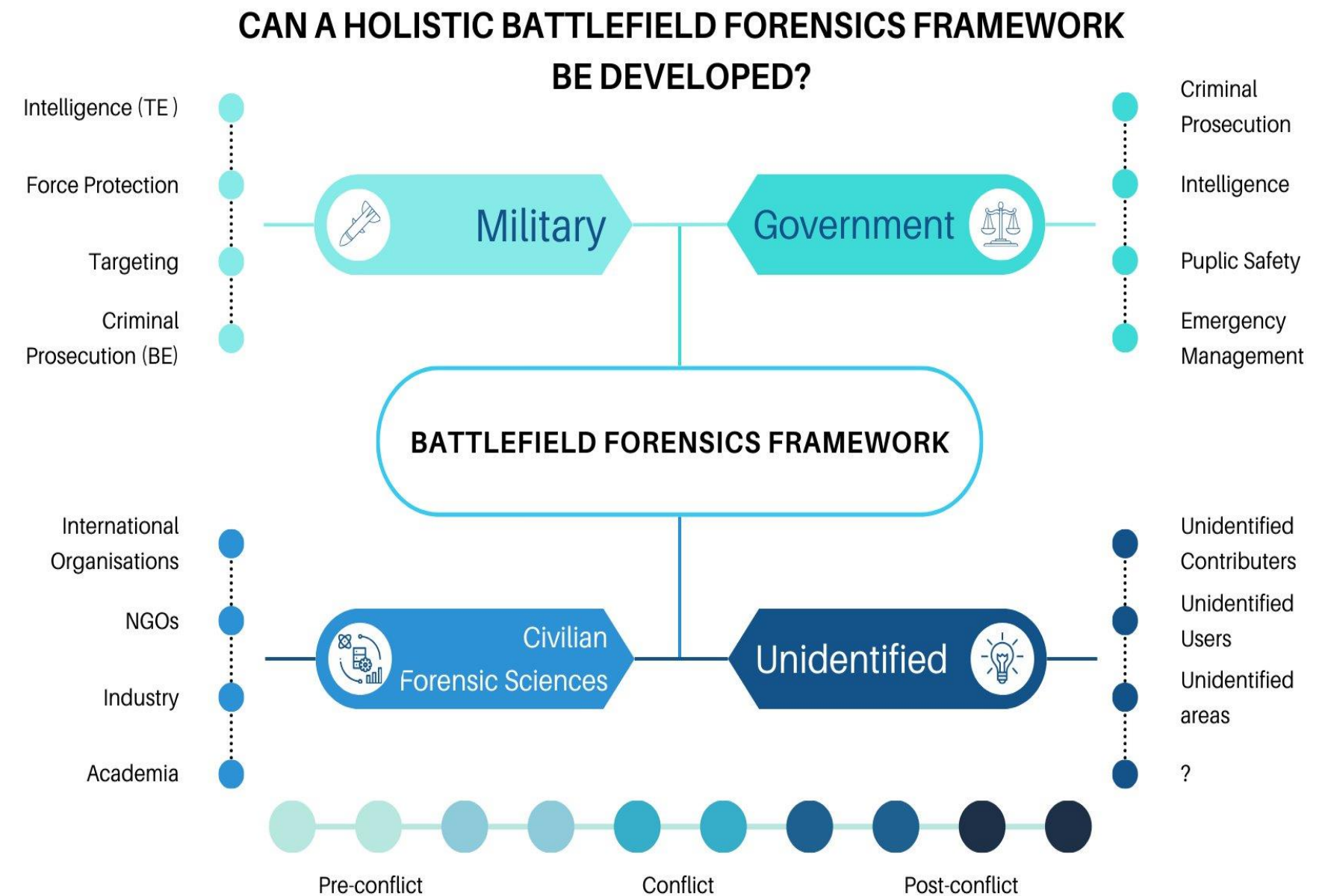
13) Føringsstøtteregimentet (Command
Support Regiment)

14) UAS Test Center Danmark

**What is the legal
framework?**



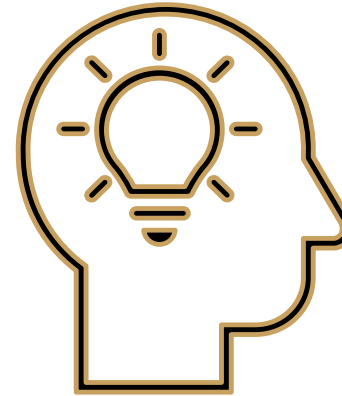
Battlefield Forensics Framework



Help and Support



HOW ARE YOU CONTRIBUTING TO
BATTLEFIELD FORENSICS?



WHAT CHALLENGES ARE YOU
DEALING WITH?



WHAT FORENSIC STRATEGIES DO
YOUR GOVERNMENT AND MILITARY
HAVE OR NOT HAVE IN PLACE?



SOLUTIONS AND COLLABORATIONS?



"Battlefield Forensics must be recognised as a multifaceted and unique scientific discipline. To foster cross-functional cooperation, I recommend exploring the establishment of a NATO Battlefield Forensics Center of Excellence." Rikke Rietveld

*"The **Military Personnel Identification (MPI) Project** is a 3-year initiative, launching in 2024. The aim of this project is to empower and equip military organizations with the necessary forensic expertise and systemic processes required to ensure the **identification of their missing and deceased combatants** and to provide relevant information to their families".* ICRC 2024



www.cranfield.ac.uk

Thank you!

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APRIL 2024

Let's connect!

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DSpace

<https://dspace.org/>

Past, present, and future of battlefield forensics - Presentation

Rietveld, Rikke

2024-05-08

The NATO Cooperative Cyber Defence Centre of Excellence

<https://ccdcoe.org/library/publications/report-on-the-conference-on-the-law-applicable-to-the-use-of-biometrics-by-armed-forces-tallinn-7th-8th-of-may-2024/>

Rietveld R. (2024) Past, present, and future of battlefield forensics - Presentation. Presented at: Conference in the Law Applicable to the use of Biometrics by Armed Forces, 7-8 May 2024, Tallinn, Estonia