



H2020 MAGNETO Project Overview

Coordinator: Dr. Konstantinos Demestichas (ICCS)

cdemest@cn.ntua.gr





Presentation Overview

- Motivation, Vision & Objectives
- Concept & Approach
- Project Structure
- Status Overview & Main Achievements
- Main Challenges & Remedy Measures
- Two-year Outlook



H2020 MAGNETO Project ID

- **Call:** [SEC-12-FCT-2017](#)
 - Technologies for prevention, investigation, and mitigation in the context of fight against crime and terrorism
- **Grant Agreement Number:** 786629
- **Coordinator:** Dr. Konstantinos Demestichas (ICCS, Greece)
- **Partners:** 23 partners - 11 LEAs and practitioners - 11 European countries
- **Duration:** May 2018 – April 2021 (36 months)
- **Funding type:** H2020 Research & Innovation Action
- **Budget:** 5.3 M€
- **Effort:** 650 Person-months
- **Web:** <http://www.magneto-h2020.eu>



**H2020 MAGNETO
Project Consortium**





Main Motivation
General Context

Soft Targets (>50% of the last 20 years)

Terrorism

interlinked
cross-border
challenges

Cybercrime

Organized Crime

Cyber-enabled crime
Cyber-attacks
CaaS
Propaganda

>5000 OCGs



Main Motivation
Key Trends

- **Recurrent patterns** of criminal activity
 - Even 'lone wolves' do not usually strike out of nowhere
 - Risk assessment in **public spaces**
- Link together large numbers of different **data streams**
- Adoption of **new technologies** by criminals such as Social Media platforms and Internet of Things
- Experience on the Darknet suggests that a **new generation** of criminals and inter-criminal relationships has emerged

End-user Motivation & Expectations

Key Goals for LEAs

Develop a correlation engine that allows the development of hypotheses to take decisions in the prevention and investigation of organized crime



Reinforcement of the preventive police

Real-time and predictive information

More ability to handle high volumes of information ("big data")

Automate the information entry to spend more time on the analysis

Debug the processes of collecting information

Increase the "situational awareness" at the time of committing the crime

Improve information to citizens

End-user Motivation & Expectations

Deployment Context

- **New technologies to prevent crime**
 - Increase in the capabilities of the police
 - A less invasive method for citizens
 - Ethical and privacy challenges
- **Facing the challenges posed by large, heterogeneous and fragmented massive volumes of data, which the Police must analyse**

End-user Motivation & Expectations

Added value of the Project

- Possibility of identifying the same regions or patterns of interest (tattoos, logos, colours ...) of a set of video images
- Possibility of processing low quality images to high quality / definition
- System will allow
 - Interchange and interoperability of data
 - Fast processing of large amounts of data, identifying unexpected correlations
 - Identify the relationships between different groups involved in criminal activities
- Project will train the Police to begin an investigation immediately after being notified of the first signs of criminal activities, acting in real time

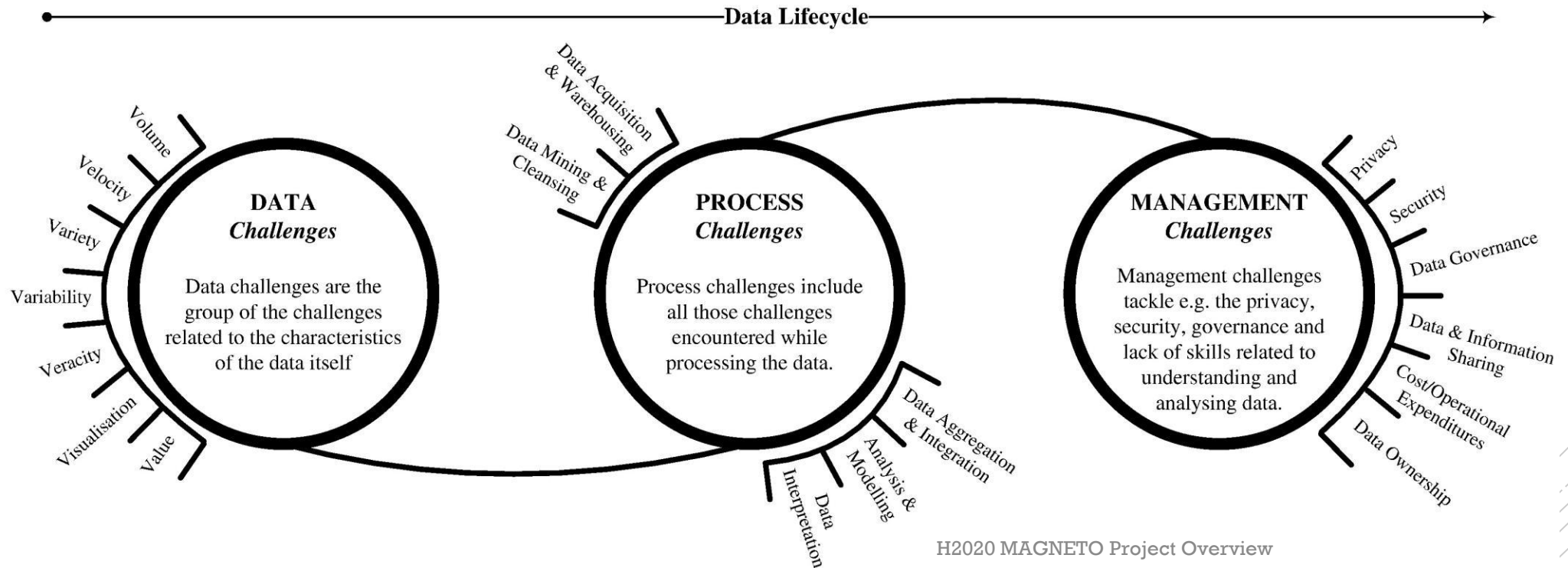
End-user Motivation & Expectations

Expected Impact (by LEAs)

- Improved investigation capacity with the best tools to help in the daily work of the police
- The crimes will be solved more quickly, reducing:
 - Social anguish
 - Investigation costs
 - Impact on victims and relatives
- Better identification and prevention of criminal activities, especially terrorist efforts

Vision

- Revolutionize the capacity of LEAs to deal with extreme **volumes and diversity** of data in order to streamline crime **prevention and investigation**



Concept &
Approach
Unite and Fuse



- Video
- Audio
- Databases
- Reports
- OSINT
- ...

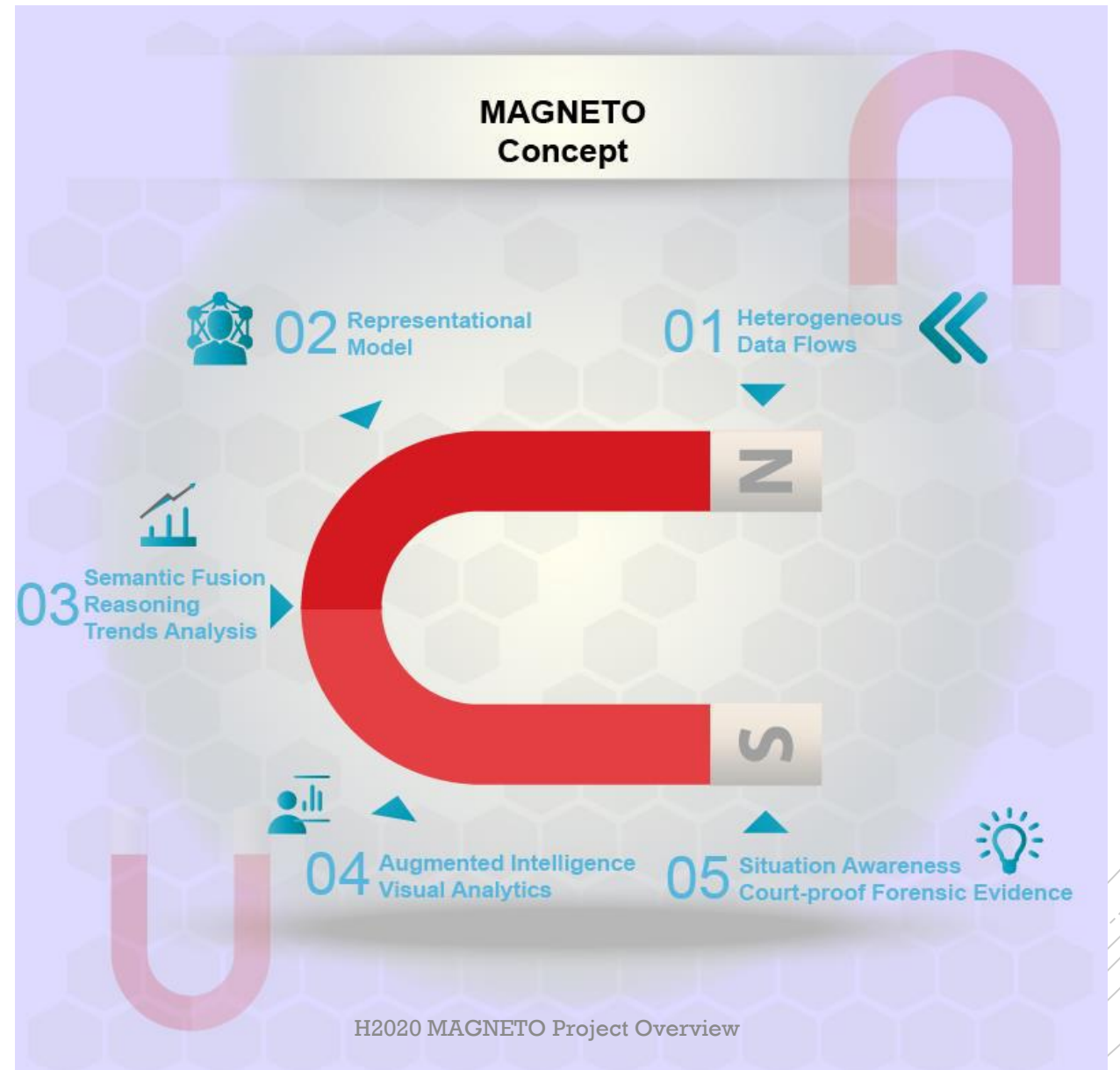
Common
Representational
Model

Concept & Approach

From **Data** to **Knowledge** to
Conclusions to **Situation**
Awareness

“ The isolated information and investigation systems available today **will evolve into** interoperable, scalable, modular, dynamically adaptable and highly intelligent systems, in order to better meet with the demanding LEAs' operations

14/06/19



Objectives

Strategic (Scientific & Technical) Objectives

- ST-1: Common representational model
- ST-2: Comprehensive framework interoperability
- ST-3: Semantic information fusion and reasoning tools
- ST-4: User-oriented HMIs
- ST-5: Demonstration and evaluation
- ST-6: Training activities
- ST-7: Transfer of knowledge and experiences

Operational Objectives

- O-1: Catch up with the ever-increasing challenges of organized crime and terrorist groups
- O-2: Streamlined and efficient crime investigation management
- O-3: Improved prevention of well-organized crimes
- O-4: Compliance with the legal, ethical, procedural and court-acceptance guidelines

Business Objectives

- B-1: Increase the competitiveness of European industries and SMEs
- B-2: Reduce the operational costs for LEAs
- B-3: Continuity and sustainability of the project
- B-4: Strategic lead in terms of interoperability
- B-5: Project innovations to reach adjacent markets

Exploitable Products / Results

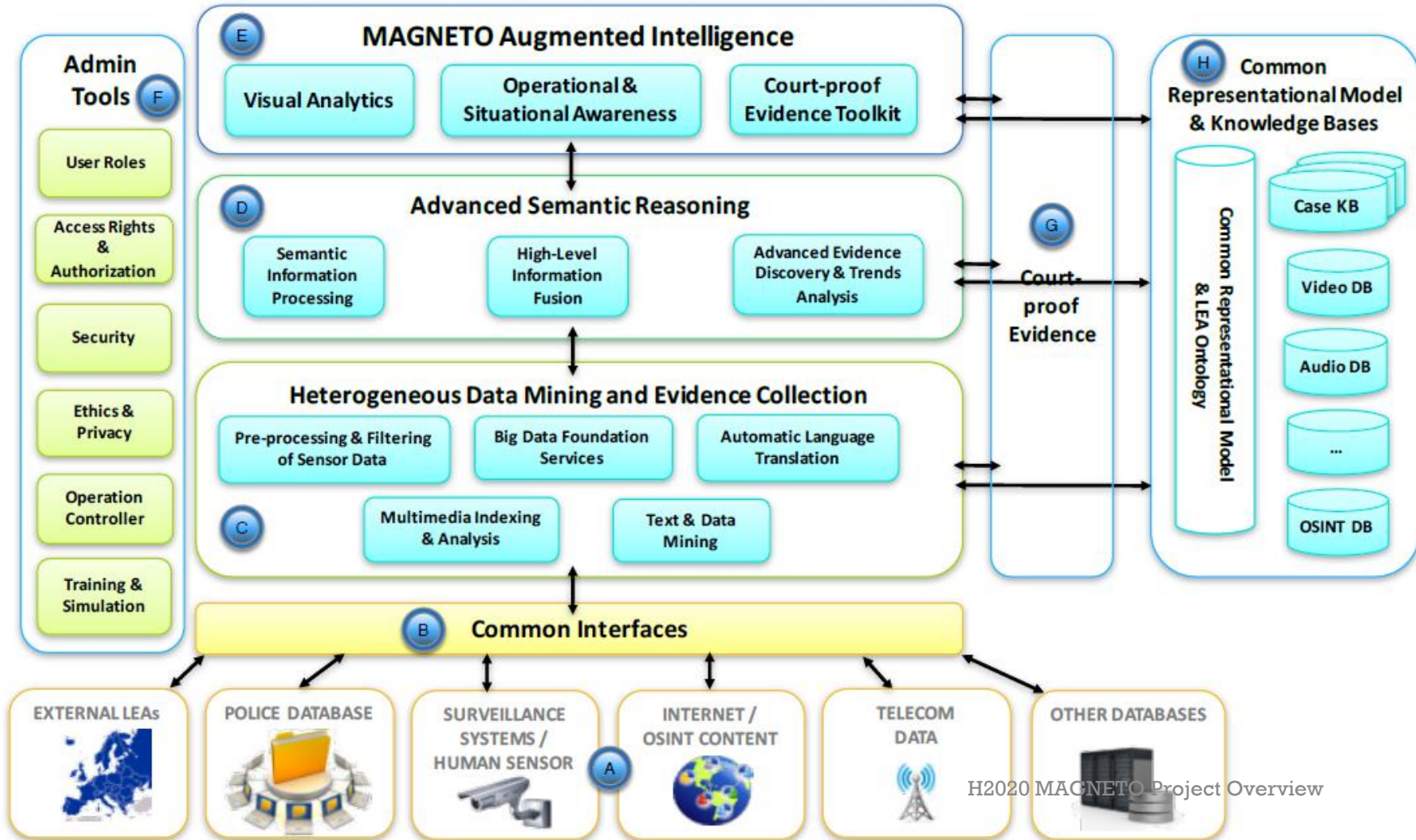
No	Acro- nym	Title	Purpose	Main relative objective
R1	ECP	Evidence collection platform	Realize heterogeneous data mining and multimedia content indexing making it available for further processing	ST-2
R2	SRM	Sophisticated representational model	Represent knowledge in an open, standardized manner to unlock the discovery of relations and enable interoperability	ST-1
R3	ACE	Advanced correlation engine	Facilitate automatic discovery of new, unsuspected relations within large datasets	ST-3
R4	TPE	Threat prediction engine by semantic reasoning	Enable trends analysis and threat level assessment	ST-3
R5	AIT	Augmented intelligence tools	Deliver immersive and interactive HMIs that enhance situation awareness	ST-4
R6	RTF	Results transferability framework	Facilitate knowledge transfer between LEAs and EU-wide uptake	ST-7
R7	LEAF	Legal and ethical assessment framework	Examine the impact of MAGNETO from a legal and ethical perspective and ensure compliance to ethical standards and legislation	O-4
R8	TRC	Training curricula for the use of MAGNETO tools	Compose innovative curricula and conduct training to allow efficient use of MAGNETO tools	ST-8



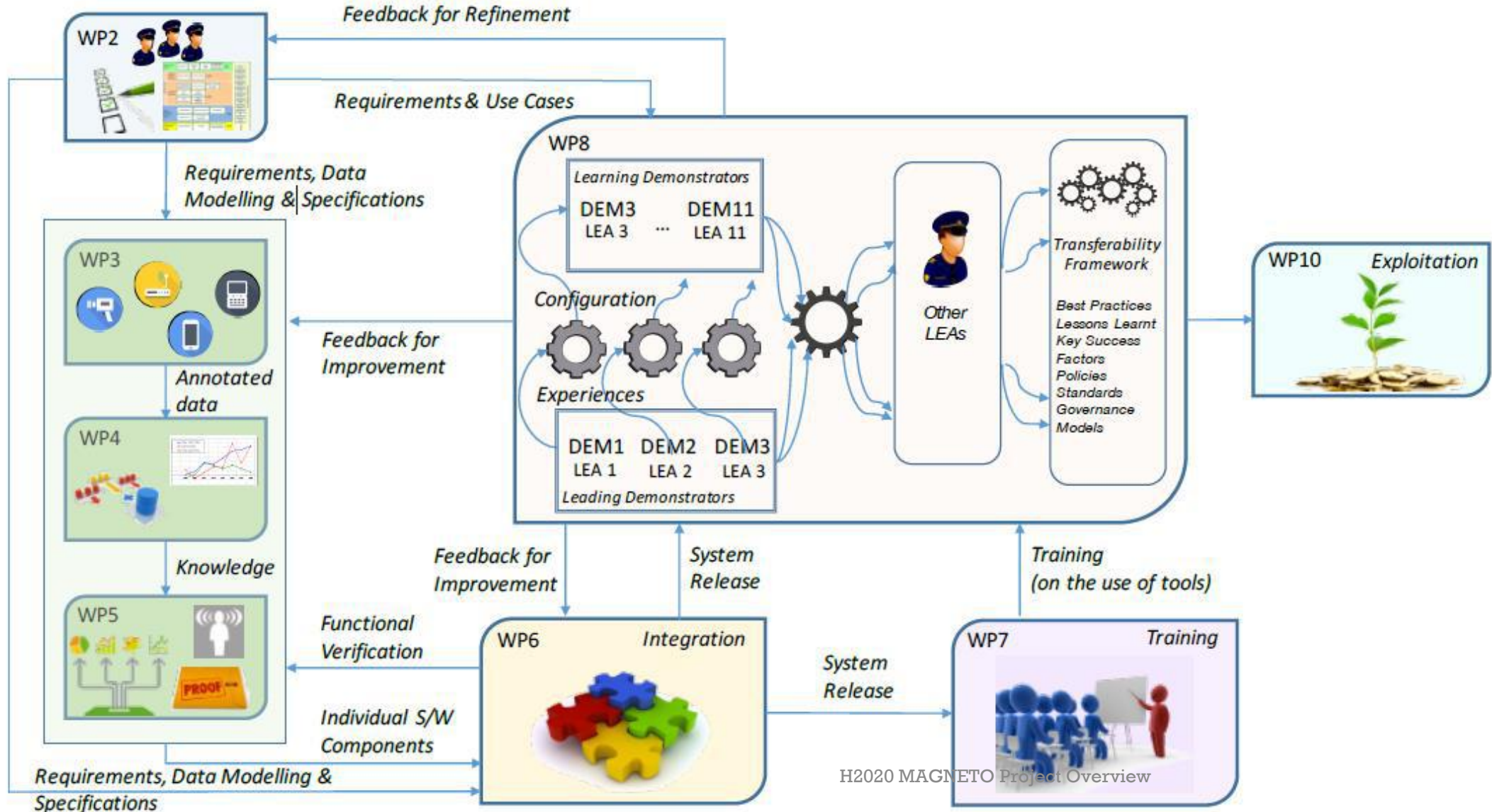
Concept & Approach Main Technologies

- **Heterogeneous data analysis**
 - multimedia indexing
 - text and data mining
 - Big Data technologies
- **Knowledge Representation & Semantic Reasoning**
 - anticipation and prediction of future trends
 - amplification of utility and value of available data
 - improvement of LEAs' knowledge capabilities
 - discovery of relations and correlations
- **Augmented Intelligence**
 - enhancement (rather than replacement) of the thought process of human operators
 - intelligent human-machine interfaces

Architectural Approach

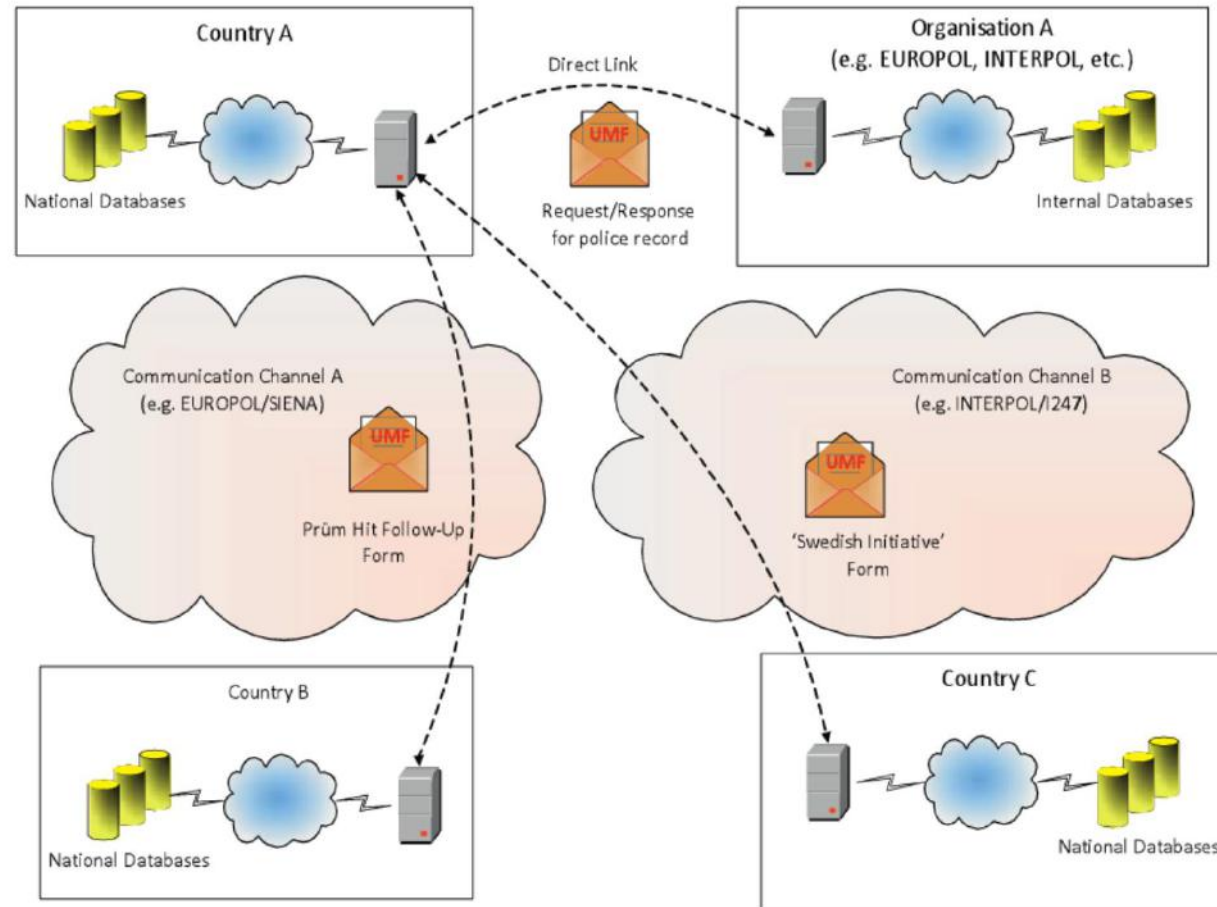


Methodological Approach



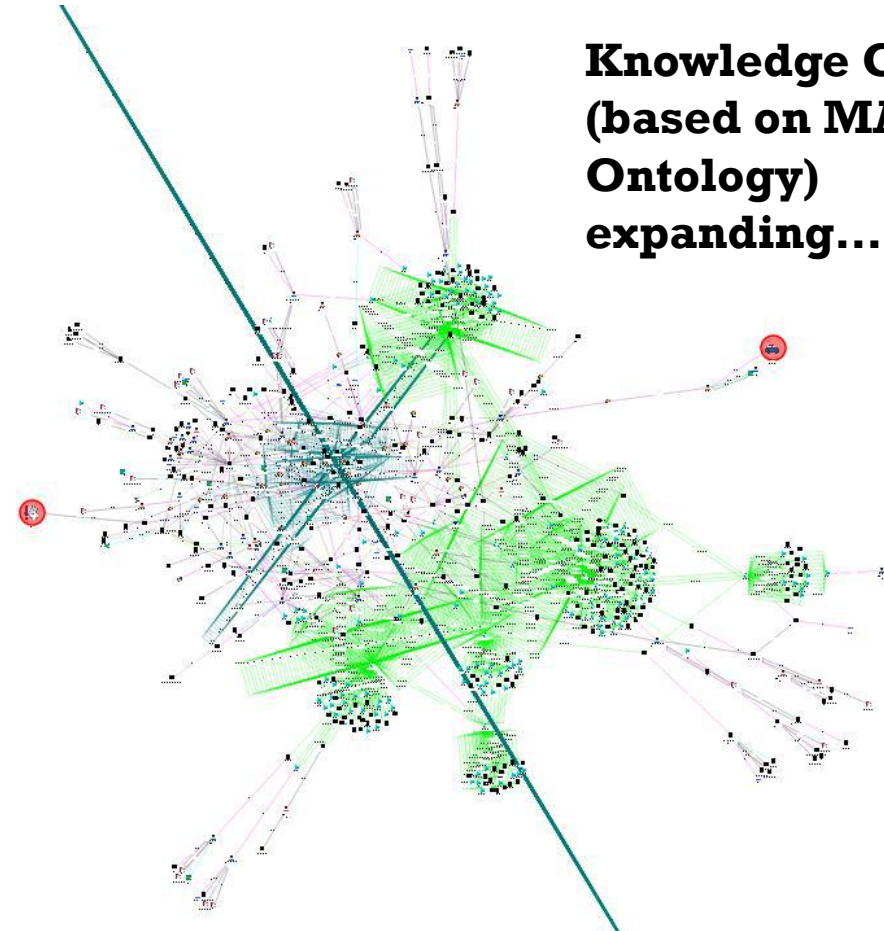
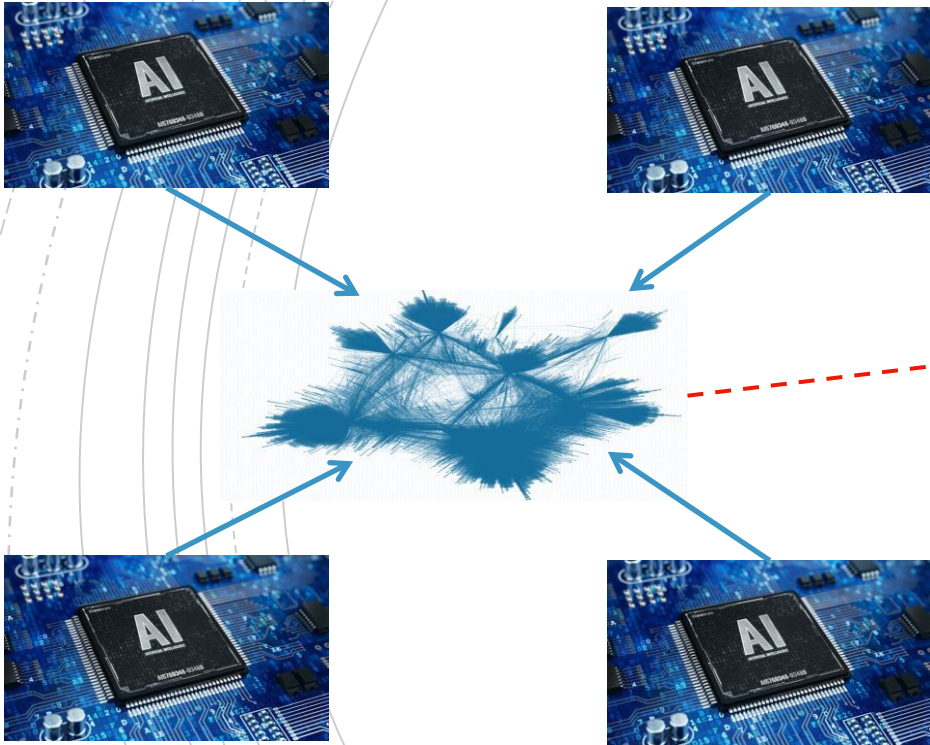
Concept & Approach

Evolving from data exchange to knowledge sharing



Concept & Approach: Evolving from data exchange to knowledge sharing

**Different LEAs - different systems but
same (machine-readable) knowledge**



**Knowledge Graph
(based on MAGNETO
Ontology)
expanding...**

MAGNETO-based AI

What can a LEA system
learn?

- Integrate the information of fragmented and individual data flows into dynamic and extensible knowledge bases by means of an Ontology and Semantic technologies (e.g. stochastic modelling)

Applicability Use Case Categories



Crime against persons and property



Economic organised crime



Prevention and investigation of terrorist attacks



Parallel illegal economic circuits of organized crime



Identity crime

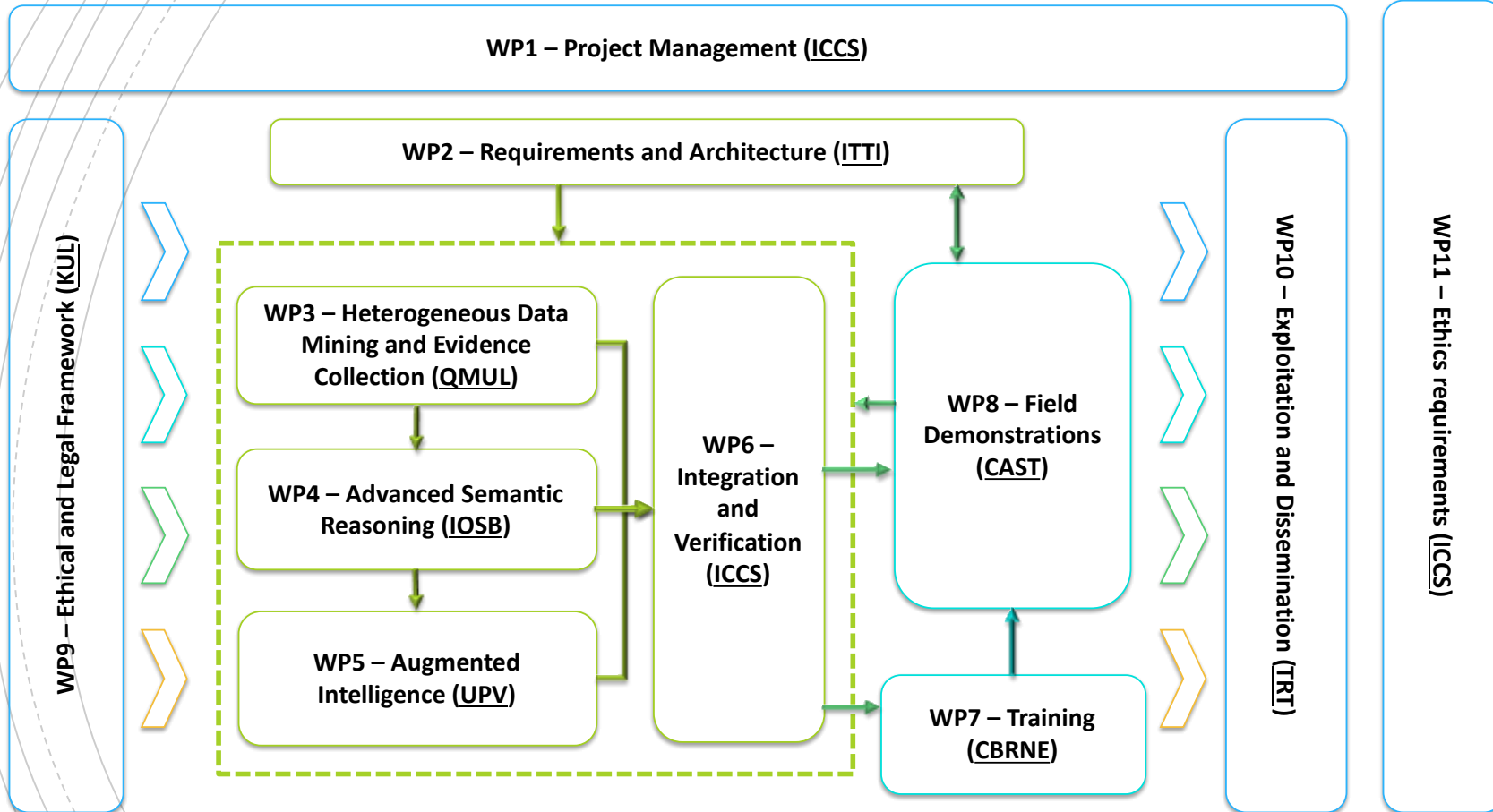
Benefits

Assist LEA's personnel

- Improved investigation capabilities
- Crimes solved more rapidly, reducing societal distress, investigative costs, and the impact on victims and their relatives
- Prevention of more terrorist endeavours
- LEA officers provided with better tools on their (specialized) daily work
- Better identification and understanding of criminal activities

Structure of Work

Work-packages



MILESTONES



MS2: System design ready

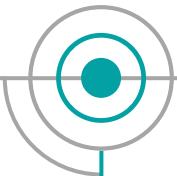
1. Use Cases & Requirements
2. Initial System Architecture

MS4: MAGNETO Platform R1.0

1. WP2 & WP3 complete
2. Semantic and Augmented Intelligence tools

May 2018:
Project Start

M2



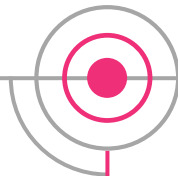
1. Project Handbook
2. Dissemination Plan & Material

MS1: Project Prepared



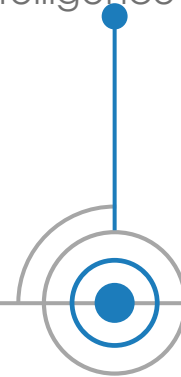
M5

M11



1. MAGNETO Platform R0.5
2. Integration Environment

MS3: MAGNETO Platform R0.5

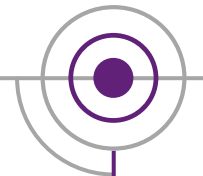


M18

1. Sustainability
2. Ethics & Legal

MS5: Interim Exploitation Strategy & Ethics Assessment

M20



MILESTONES



MS7: MAGNETO Platform R2.0

1. WP5 complete
2. Final MAGNETO Platform

Final Review & Final Event

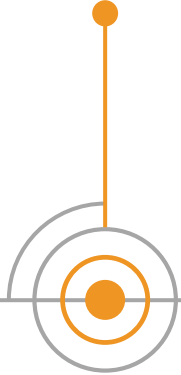
1. Lessons Learnt
2. Impact Assessment

M24



1. WP4 complete
2. Training Material published

MS6: MAGNETO Platform R1.5



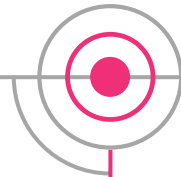
M29



MS7: MAGNETO Platform R2.0

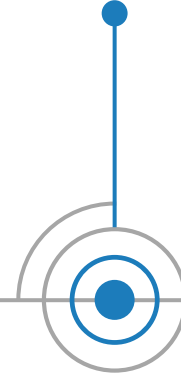
1. WP5 complete
2. Final MAGNETO Platform

M36



1. Final Results - Business Plan
2. Final Legal & Ethics Assessment

Action Complete



M38



Final Review & Final Event

1. Lessons Learnt
2. Impact Assessment

2022+



1. Community
2. Follow-ups with early adopters

Sustainability

Acknowledgment



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Thank You

More Questions?

