ENCRYPTing Europe towards Secure and Federated Data Use

Date: Tuesday 17th June 2025
Location: Stratos Vassilikos Hotel, Athens, Greece

Funded by the Horizon Europe Framework Programme of the European Union under Grant Agreement nº 101070670.

ENCRYPT Facts and Figures

- **Project Short Name:** ENCRYPT
- **Grand Agreement ID**: 101070670
- **HORIZON-CL3-2021-CS-01-04** - Scalable privacy-preserving technologies for cross-border federated computation in EU involving personal data
- **Funding Scheme:** Research and Innovation Action (RIA)
- **Total Funding:** 4,392,540 €
- **Duration:** 36 Months (July 2022 – June 2025)
- **Consortium:** 14 partners, 8 countries
  - ✓ 1 start-up (TRUSTUP)
  - ✓ 3 x SMEs (EXUS, 8BELLS, DBC)
  - ✓ 2 x Enterprises (ENG, EPIBANK)
  - ✓ 8 Research Institutes (CERTH, AUTH, UNIMAN, TIU, CEA, UNINA, GUF, UMC-Mainz)

- **Coordinator:** EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS (EXUS AI Labs) - Greece

ENCRYPT Consortium

MANCHESTER 1824
The University of Manchester

TILBURG UNIVERSITY
Understanding Society

JOHANNES GUTENBERG UNIVERSITÄT MAINZ

GOETHE UNIVERSITÄT FRANKFURT AM MAIN

cea

ARISTOTLE UNIVERSITY OF THESSALONIKI

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

EXUS

ENGINEERING
THE DIGITAL TRANSFORMATION COMPANY

DBC EUROPE S.A.

TrustUP

EIGHTBELLS
Independent Research & Consultancy

UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II

ΤΡΑΠΕΖΑ ΗΠΕΙΡΟΥ

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ENCRYPT Consortium

Consortium Partners	Short Name	Country
1. EXUS SOFTWARE MONOPROSOPI ETAIRIA PERIORISMENIS EVTHINIS	EXUS	Greece
2. ENGINEERING - INGEGNERIA INFORMATICA SPA	ENG	Italy
3. ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	CERTH	Greece
4. EIGHT BELLS LTD	8BELLS	Cyprus
5. COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	CEA	France
6. TRUST UP SRL	TRUSTUP	Italy
7. ARISTOTELIO PANEPISTIMIO THESSALONIKIS	AUTH	Greece
8. DBC EUROPE	DBC	Belgium
9. TILBURG UNIVERSITY- UNIVERSITEIT VAN TILBURG	TiU	Netherlands
10. UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II	UNINA	Italy
11. SYNETAIRISTIKI TRAPEZA IPEIROU SYN.P.E.	EPIBANK	Greece
12. JOHANN WOLFGANG GOETHE-UNIVERSITAET FRANKFURT AM MAIN	GUF	Germany
13. UNIVERSITAETSMEDIZIN DER JOHANNES GUTENBERG-UNIVERSITAET MAINZ	UMC-Mainz	Germany
14. THE UNIVERSITY OF MANCHESTER	UNIMAN	United Kingdom

1 x Start up

3 x SMEs

8 x Research Institutes & Universities

2 x Enterprises

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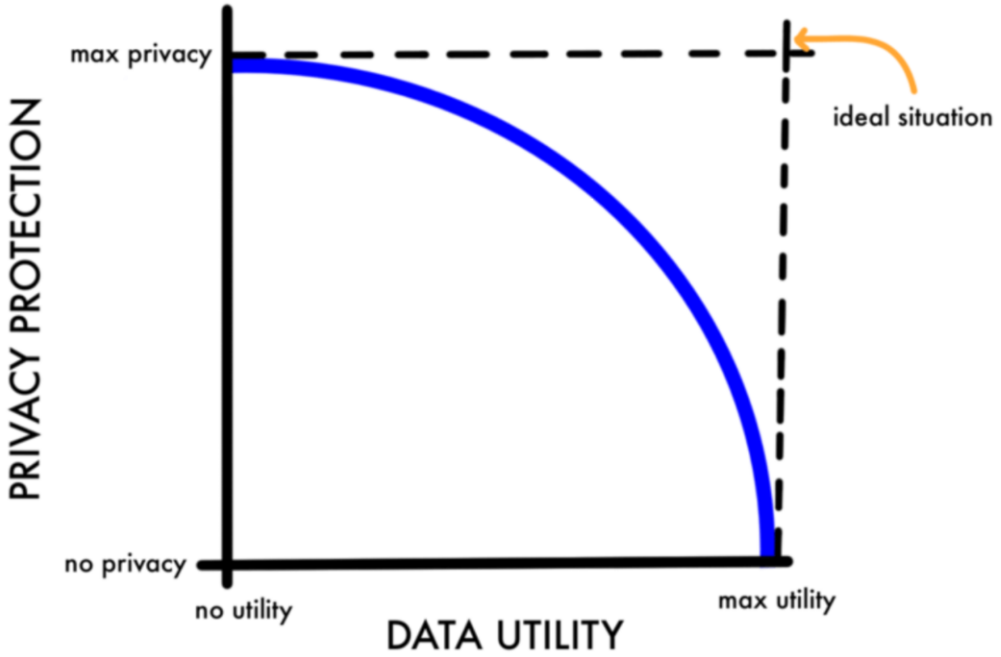
Challenges and ENCRYPT Vision

- Vast amounts of data in new fields related to Industry, Health and research
  - ✓ Sensitive data are present
  - ✓ researchers and service providers working with personal data need process them in a privacy-preserving way,
  - ✓ Existing PP technologies (HE, MPC, TEE or DP) suitable for small-scale level
  - ✓ Trade-offs between max privacy and efficiency



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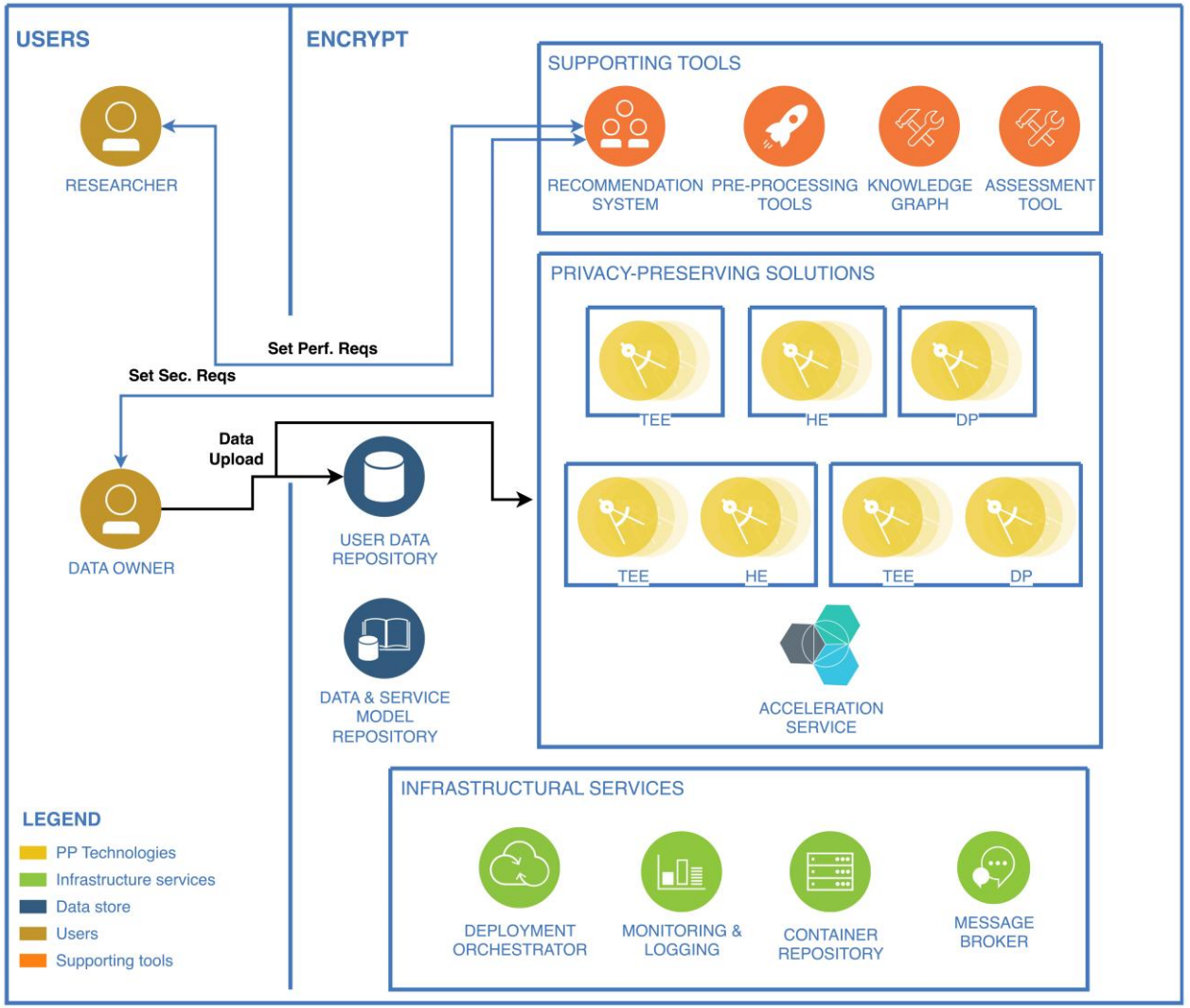
Challenges and ENCRYPT Vision

- ENCRYPT will deliver a scalable, practical, adaptable privacy-preserving framework facilitating the GDPR-compliant processing of such data stored in federated cross-border data spaces by exploiting
  - State-of-art PP computations technologies
  - State-of-art supportive technologies, including a recommendations system and a methodological framework to assess the level of privacy and impact to the organization
  - Validation in internal and external Use cases in real-world systems

ENCRYPT Key Technologies and results

- **Privacy –Preserving Computation Solutions**
  - ✓ Fully Homomorphic Encryption (FHE)
  - ✓ Trusted Execution Environment (TEE)
  - ✓ Differential Privacy (DP)
  - ✓ Combined HE+TEE, HE+DP
  - ✓ Acceleration Service

- **Privacy –Supporting Tools**
  - ✓ Advanced data-preprocessing
  - ✓ Knowledge Graphs
  - ✓ Methodological Framework for privacy risk assessment
  - ✓ AI–powered Recommendation system
  - ✓ Front-end and back-end services



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ENCRYPT High Level Objectives

1. To **improve the applicability** and **performance** of PP technologies towards GDPR compliant, cross-border federated processing of personal and other sensitive data, developing a **toolset of scalable, practical, and reliable PP technologies**

2. To **improve the user-friendliness** of PP technologies facilitating the identification, understanding, selection, and adoption of PP technologies **by all actors**

3. To foster, and inherently support **interoperability for PP processing of similar data** types across organisations, and across sectors.

4. To promote GDPR-compliant common **European Data Spaces** and facilitate the **exchange of CTI**, liaising with relevant initiatives and projects with a focus on standardization

5. To ensure the **applicability** of the developed solutions, **co-designing them with end-users**, and validating them in **realistic use cases** including federated data infrastructures with personal data

6. To **strengthen the ecosystem** of open-source developers and researchers of privacy-preserving solutions disseminating, and exploiting open-source project results, as well as upskilling researchers.

ENCRYPT Validation Phases

1st phase: In Lab Validations

2nd phase: Encrypt 3 x Use cases

3d phase: External Validation

4rd phase: External Validation

1 **[M17-M27]**

2 **[M24-M32]**

3 **[M24-M32]**

4 **[M24-M32]**

EU projects

ENCRYPT Use Cases

- **Health Domain**: supported by the Hospital Clinic of UNINA validating PP technologies on Patients Data in different use case scenarios
- **Cyber Threat Intelligence (CTI) Domain**: supported by CERTH as service provider/data processor, and EXUS, DBC, 8BELLS as data owners and end-users
- **Fintech Domain**: supported by EXUS as the service provider/data processor, EPIBANK as the data steward, and their customers as the data owners
- **External validation:** MIRACUM federated health data infrastructure. Sharing healthcare data from different university hospitals and joint research. GUF and AMC-MAINZ, participating in the MIRACUM consortium, are also participating in ENCRYPT

Conclusion: Shaping the Future of Data Privacy

- Summary of ENCRYPT's Impact
  - ✓Advanced Privacy-Preserving Technologies for data protection
  - ✓Real-world applications in finance, healthcare, and cybersecurity
- Key Takeaways
  - ✓Importance of integrating diverse technologies for comprehensive security
  - ✓The role of user-centric design in enhancing accessibility and usability
- Future Outlook
  - ✓Continued innovation to address emerging challenges
  - ✓Potential to influence future standards in data privacy and security
- Final Thoughts
  - ✓ENCRYPT's contribution to a more secure digital environment
  - ✓Encouragement for ongoing collaboration and adoption of privacy-preserving practices

Contact us

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