PDP4E

Methods and Tools for GDPR Compliance through

Privacy and Data Protection 4 Engineering

Rendez-vous de la
Recherche et de
l'**E**nseignement de la
Sécurité des
Systèmes
Informatiques
2019

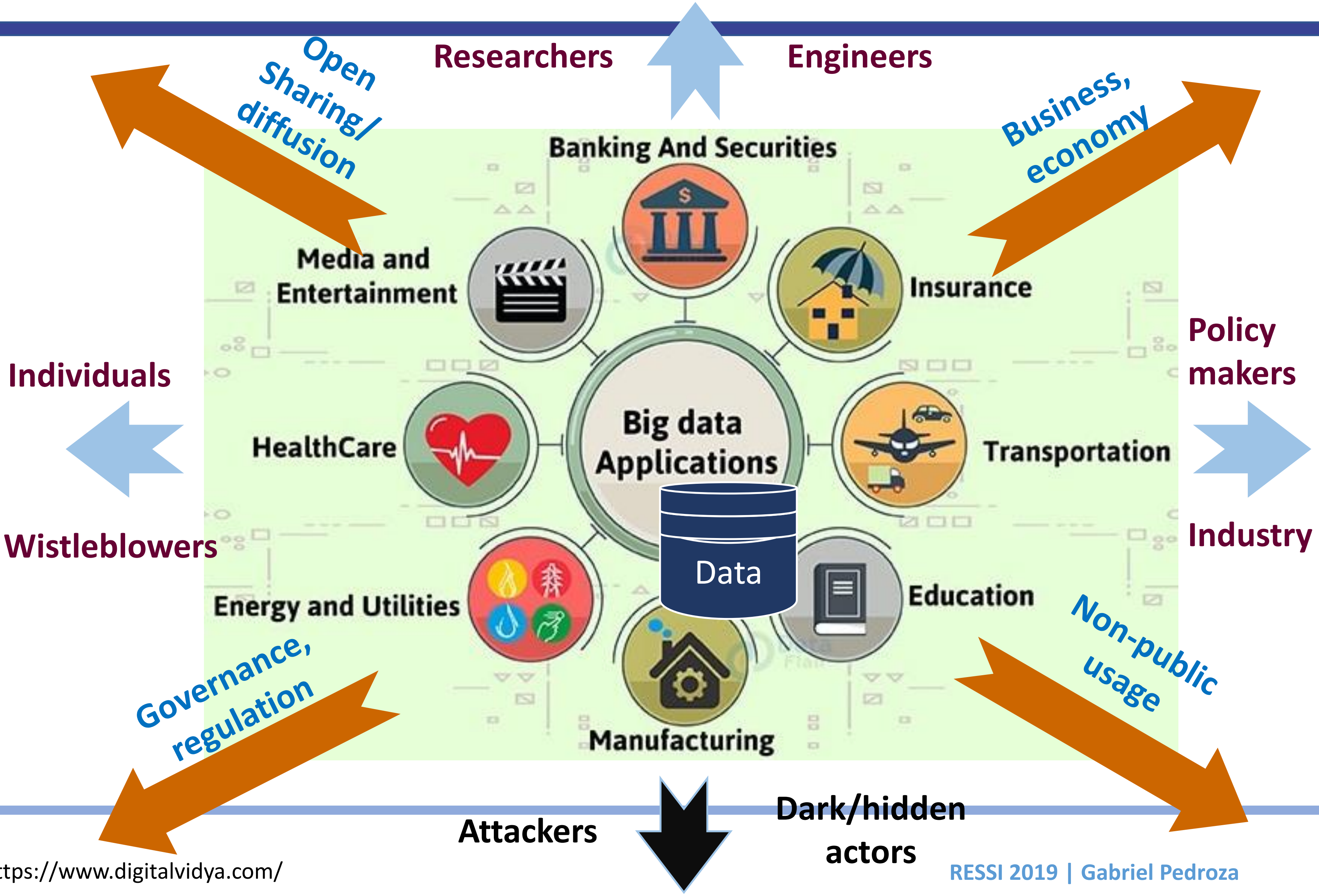
GDR Sécurité Informatique

PDP4E PROJECT

Addressing the stakes of data protection from systems specifications to software

2019/05/17

Stakes Of Privacy And Data Protection In A Nutshell



Researchers

Engineers

Open Sharing/ diffusion

Business, economy

Individuals

Wistleblowers

Policy makers

Industry

Governance, regulation

Non-public usage

Attackers

Dark/hidden actors

Image borrowed from https://www.digitalvidya.com/

Stakes Of Privacy And Data Protection In A Nutshell

Former background

- Networked,distributed applications, and storage

- Almost no enforcing policy nor rules for business or industry
- Almost no obligation for stakeholders
- Almost no rights for individuals

Transition factors

- Growing markets and business based upon data
- Growing usage of information related to individuals
- Increasing computing power (HW)
- Inference algorithms (Data mining, Artificial Intelligence)
- Emerging regulations

Evolution stakes

- Keep a suitable balance between needs
- Keep compliance with regulations
- Support stakeholders in the process (lawyers, engineers, developers)
- Generate evidence of systems’ properties (compliance, trustiness)

PDP4E

Categories Of Concerns And Impacts

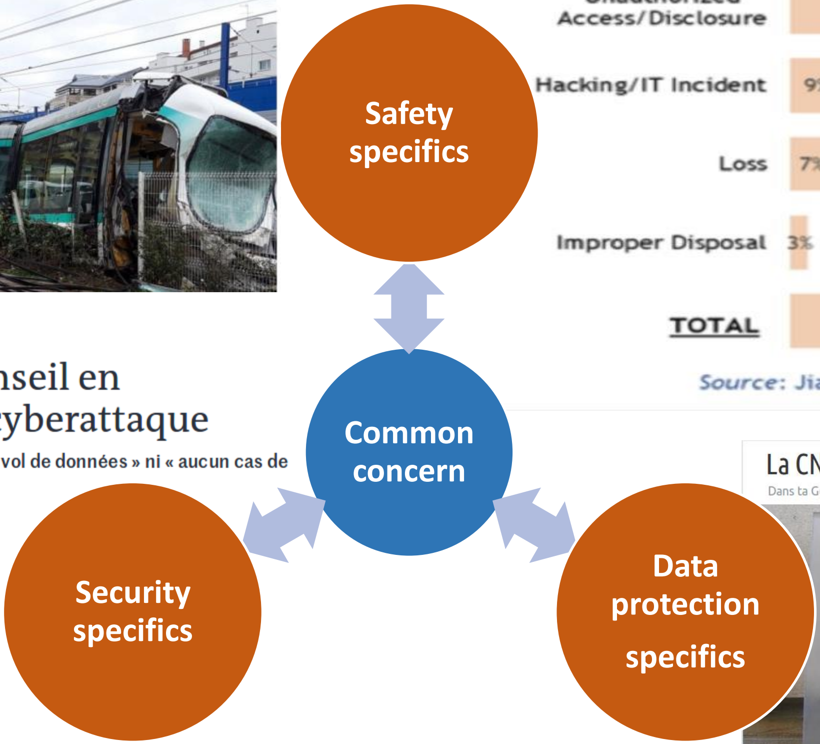
Accident de tramway à Issy-les-Moulineaux : les travaux vont prendre plusieurs jours

> Île-de-France & Oise › Hauts-de-Seine | **G.B. et J.Va.** | 12 février 2019, 11h59 | MAJ : 12 février 2019, 13h02 | 2

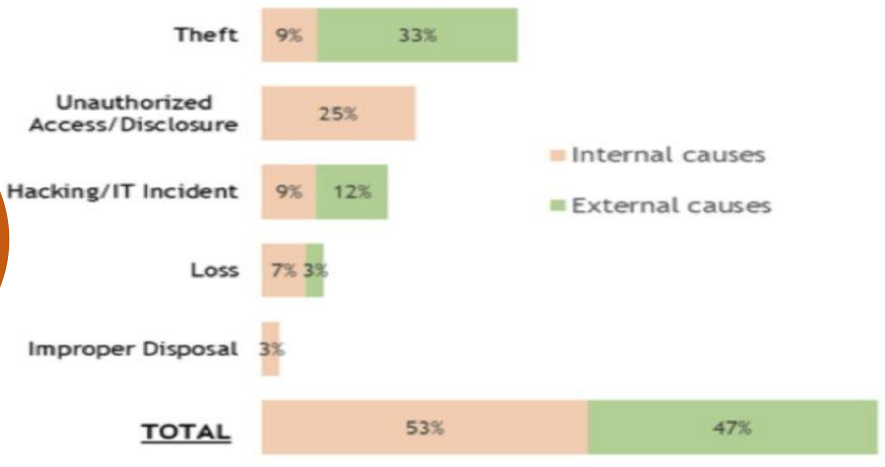
Altran, géant français du conseil en technologie, victime d'une cyberattaque

Altran a assuré que l'attaque n'avait donné lieu à « aucun vol de données » ni « aucun cas de propagation de l'incident à des clients ».

Publié le 28 janvier 2019 à 20h58 - Mis à jour le 28 janvier 2019 à 20h58



Protected Health Information Breach Causes



Source: Jiang & Bai JAMA Internal Medicine 2018

La CNIL inflige une amende de 50 millions d'euros à Google

Dans ta Google 21

Airbus a détecté un « incident de cybersécurité » dans sa division d'avions commerciaux

Cette intrusion a « entraîné un accès non autorisé aux données de l'entreprise », affirme Airbus, mais n'a eu « aucun impact » sur ses opérations commerciales.

Le Monde avec AFP et Reuters • Publié aujourd'hui à 21h40, mis à jour à 21h40

Synthetic State Of The Art

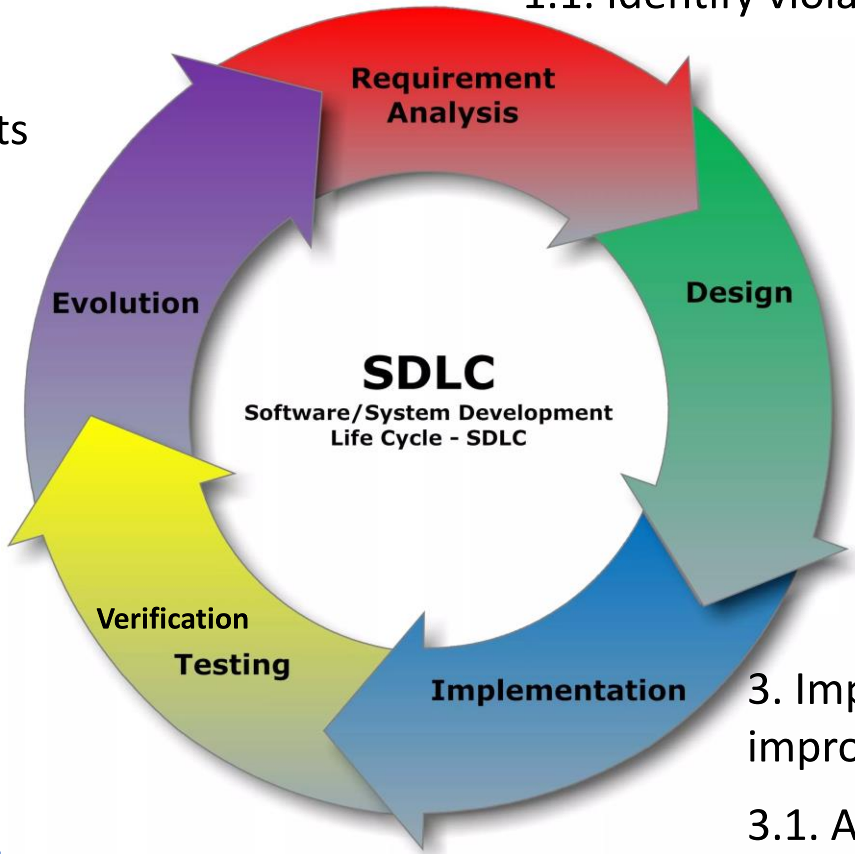
- **STANDARDS AND REGULATIONS**
  - General Data Protection Regulation (GDPR)
  - Technical international standards:
    - ISO 29100: Privacy framework
    - ISO 27550: Privacy engineering
    - ISO 27552: Requirements and guidelines
- **METHODS TO ACHIEVE PRIVACY & DATA PROTECTION by design**
  - PROPAN: for requirements elicitation
  - PRIPARE: for iterative (agile) design
  - LINDDUN: design guided by risks
- **ALGORITHMS, TECHNIQUES FOR PRIVACY & DATA PROTECTION**
  - Minimization
  - Fragmentation
  - Pseudonymisation
  - Analysis of architectural models and transformation

Proposals and Positioning

- Scheme of the proposed solutions and positioning w.r.t. typical SDLC.

1. Identify violated/concerned reqs.

1.1. Identify violated/concerned properties



2. Trace concerned reqs. to the architecture

2.1. Improve architectural elements

3. Implement architectural improvements

3.1. Adapt code

4. Trace and validate properties

4.1. Verify code

5. Propagate results to requirements

https://www.testingexcellence.com/software-development-life-cycle-sdlc-phases/

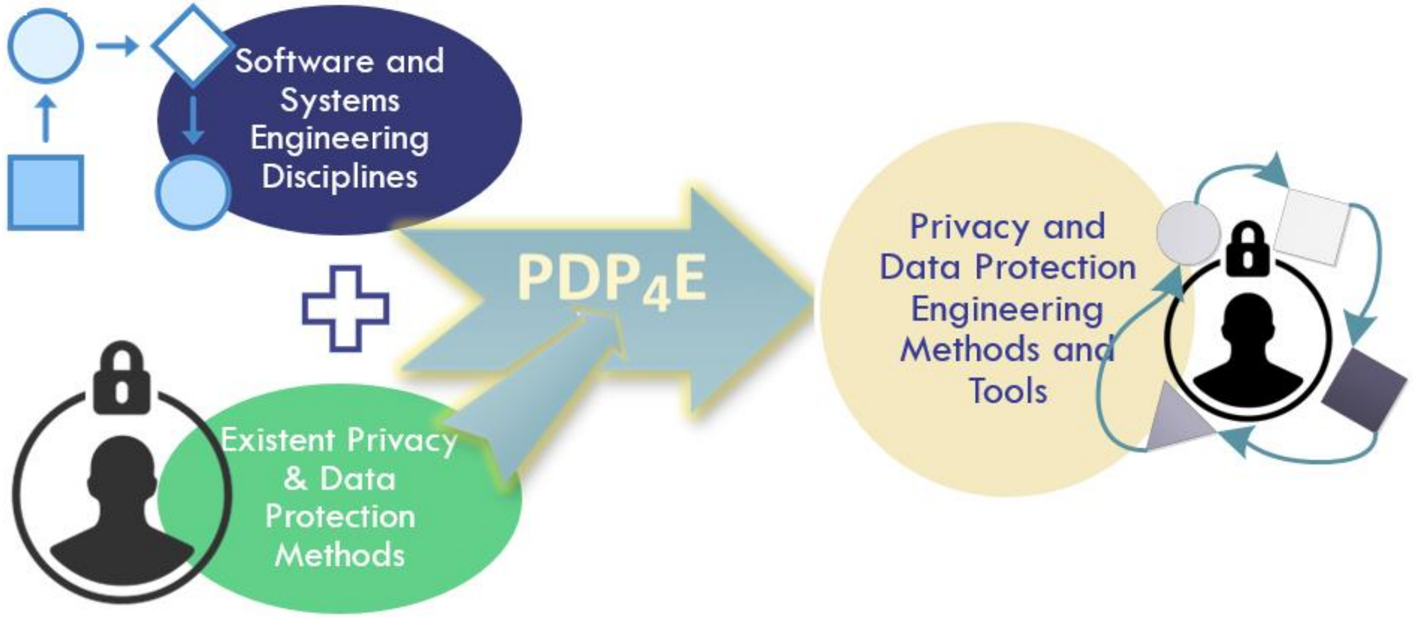
Formal Framework For Privacy Related Properties Verification

- **Formal languages and semantics for:**
  - Systems modeling:
    - Data flows
    - Stakeholders
    - Storage units
    - Processing units
  - Expressing properties to verify:
    - Unlinkability, Unidentifiability, Repudiation, Undetectability, Undisclosure of information, Awareness, Compliance
  - Conducting verification of properties:
    - Semantics
    - Algorithms
  - For executable parts of systems:
    - Verification of properties on code
    - Extension of Frama-C
    - Extension of SecureFlow

Developed in the scope of a PhD (J. Signoles, G. Pedroza, T. Antignac)

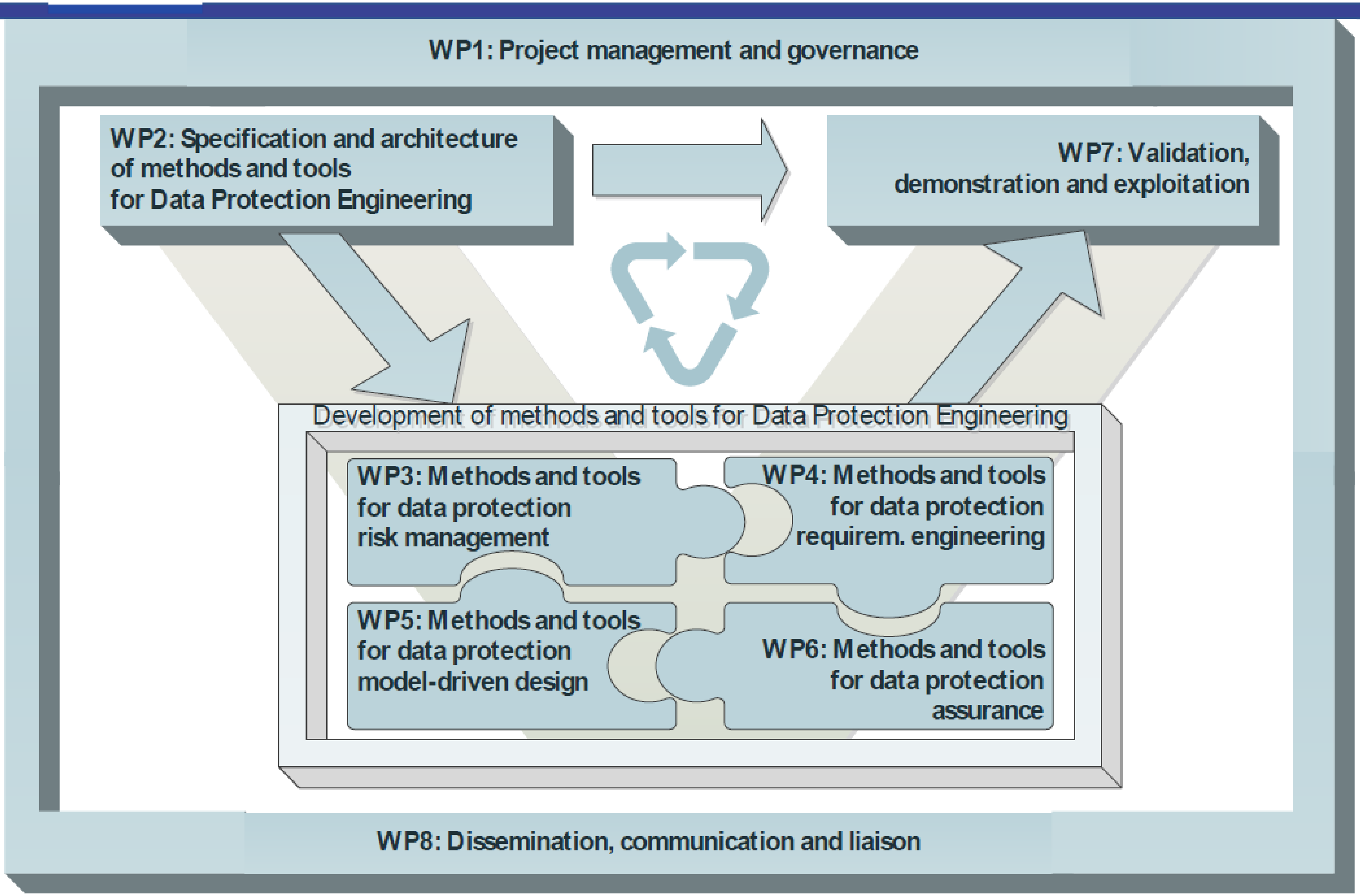
PDP4E: EC-H2020 PROJECT

1. *Methods and tools for Privacy-by-design*
2. *Leverage existent knowhow on data protection for engineers*
3. *Spread the adoption of data protection practice in time and space*
4. *Demonstrate readiness for GDPR compliance: pilots for the automotive and smart grid domains*


Software and Systems Engineering Disciplines
Existent Privacy & Data Protection Methods
PDP4E
Privacy and Data Protection Engineering Methods and Tools

https://www.pdp4e-project.eu/

PDP4E Work Packages



WP1: Project management and governance

WP2: Specification and architecture of methods and tools for Data Protection Engineering

WP7: Validation, demonstration and exploitation

Development of methods and tools for Data Protection Engineering

WP3: Methods and tools for data protection risk management

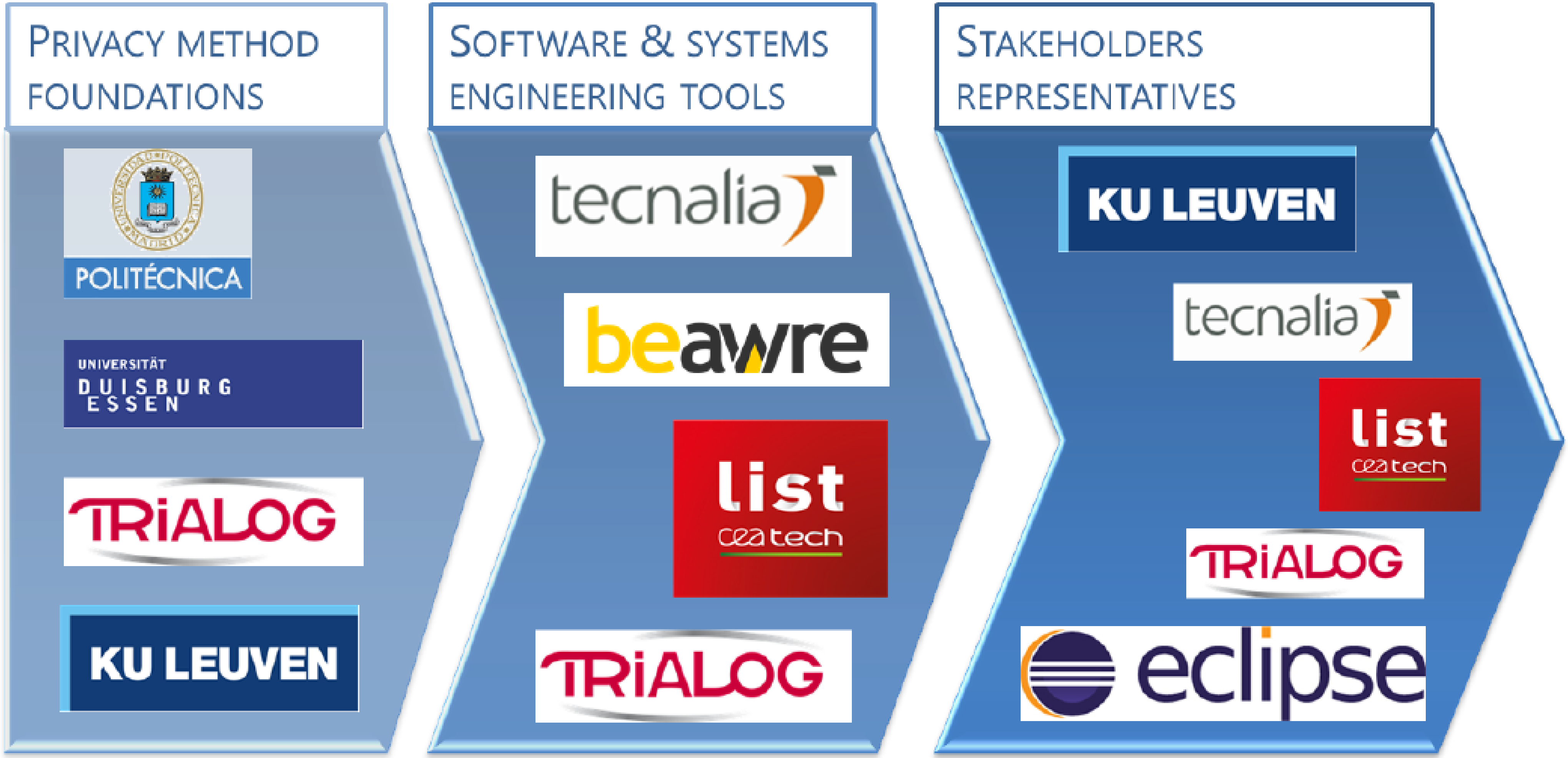
WP4: Methods and tools for data protection requirem. engineering

WP5: Methods and tools for data protection model-driven design

WP6: Methods and tools for data protection assurance

WP8: Dissemination, communication and liaison

PDP4E Consortium



PRIVACY METHOD FOUNDATIONS

- POLITÉCNICA
- UNIVERSITÄT DUISBURG ESSEN
- TRIALOG
- KU LEUVEN

SOFTWARE & SYSTEMS ENGINEERING TOOLS

- tecnalia
- beawre
- list ceatech
- TRIALOG

STAKEHOLDERS REPRESENTATIVES

- KU LEUVEN
- tecnalia
- list ceatech
- TRIALOG
- eclipse

For more information, visit:
www.pdp4e-project.org

Thank you for your attention

Questions?

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