Trust Technologies: Game Changer for Privacy and Security

19 September 2023

Dr Mark van Staalduinen

Dutch Blockchain Coalition

About me

- **Micro-bio**
  - Driven by innovation and fascinated by criminals
  - TNO 2007 – 2019: Dark Web programme in 2013
  - Singapore expatriation January 2016 – December 2019
  - INTERPOL seconded Cybercrime Expert 2017 – December 2019
  - Part-time position at Nanyang Technological University of Singapore (NTU) 2020 - 2022

Dr M. van Staalduinen, innovation manager for Dark Web, cybercrime and cyber security at the Netherlands Organisation for Applied Scientific Research, said the WannaCry ransomware shows the vulnerability of society. ST PHOTO: LIM YAOHUI

- **CFLW Cyber Strategies**
  - Founded November 2019 the Netherlands
  - Tech-startup, TNO spin-out (5y partnership 2022 – 2027)
  - Dark Web and Crypto-asset Intelligence Services
  - Significant growth since Q3 2021, now 13 colleagues

- **Dutch Blockchain Coalition lead Trust and Safety**
  - Program lead since April 2022

Trust and Safety Agenda

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Pillar 1: Safety in Blockchain

Security measures against abuse and fraud in crypto-assets and blockchain

Pillar 2: Safety with Blockchain

Trust technologies for a safe and reliable digital society

Detailed agenda items!

https://www.dutchblockchaincoalition.org/toepassingsgebieden/veiligheid

Trust technologies for a safe and reliable digital society

Next level awareness and adoption through practical applications (Implementation)

- Develop a communication strategy for practical and operational security applications with trust technologies to stimulate adoption by underlining that security and privacy can go hand in hand.
- Develop capacity building programs for policy and decision makers to understand the potential and technology readiness of trust technologies.
- Develop joint initiatives for data sharing with trust technologies by responsible authorities and data owners.

Test cases to discover full potential and limitations (Innovation)

- Test more advanced use cases to discover the limits of new and existing trust technologies, without holding back the deployment potential.
- Test approaches to make it easy and explainable to choose and deploy trust technologies to drive adoption by application engineers.
- Test collaborative features and drive interoperability to make sharing and analytics on encrypted data more relevant and acceptable.

Deep understanding into large scale opportunities and risks (Research)

- Study the approach to have trust technologies implemented by default, as security and privacy are fundamental rights.
- Study the large-scale use of trust technologies with massive amounts of data and large number of users for security and privacy proofs.
- Study next generation trust technologies capable of processing images, signals, and fuzzy inputs.

Contributing organisations

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OPENBAAR MINISTERIE
ABN·AMRO
TNO
21 ANALYTICS
HSD securitydelta.nl
LINKSIGHT
POLITIE
LedgerLeopard
RosemanLabs PRIVACY BY DESIGN
IKNAIO Cryptoasset Analytics
GPersoon
ICTU
Belastingdienst
compleye Making compliance (almost) fun!
GUARDIAN 360°
KISMET
COMPLEXITY SCIENCE HUB VIENNA
BOSA
SUSTAINABLE RESCUE FOUNDATION
leap The Innovation Agency
Ministerie van Buitenlandse Zaken
UNIBRIGHT
ECP
CFLW Cyber Strategies

Digital Trust Initiative

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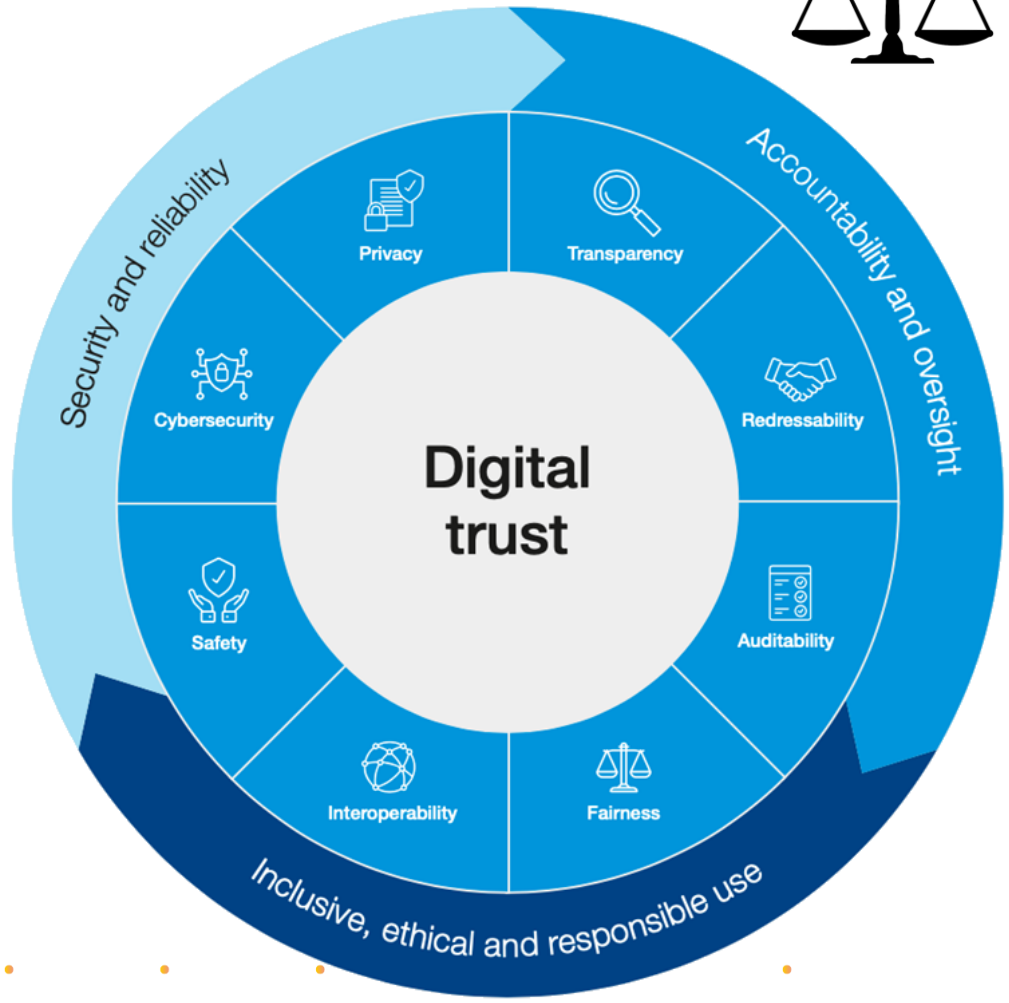
Digital trust is individuals' expectation that digital technologies and services – and the organizations providing them – will protect all stakeholders' interests and uphold societal expectations and values.

WORLD ECONOMIC FORUM



With contributions by KPMG Netherlands, PWC and Accenture research fellow partners of World Economic Forum

https://initiatives.weforum.org/digital-trust/framework

Trust Technology Research Approach

NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

PARADIGM

Perturbation | Cryptography | Decentralisation | Trustworthy Computing

FOUNDATIONAL RESEARCH

Differential Privacy | SSE | FHE | MPC & PSI | FL | Blockchain | Digital ID | TEE | Verifiable Compute | Digital Forensic | Fair, Non-Hallucination, Robust & Explainable AI

TRUST TECHNOLOGIES

PP-Tech | Web 3.0 | **Trusted Digital ID** | **Trusted ML** | **AI Testing**

Trusted Analysis | **Trusted Applications** | **Trusted Compute** | **Trusted Accreditation**

DE WERELD VAN PETS

- Bloom filter
- Differential Privacy
- Secure Set Intersection
- Homomorphic Encryption
- Secret Sharing
- Zero Knowledge Proof
- Federated learning
- Synthetic data

Ik zoek iemand maar ik vertel je niet
naar wie ik op zoek ben

Vraag wat je wilt maar ik maak mijn antwoorden
onnauwkeurig zodat jij niets méér kunt achterhalen

We hebben allebei een geheime lijst maar kunnen er
toch achter komen wie op beide lijsten voorkomt

Je kunt de data niet inzien maar je kunt er
toch berekeningen mee uitvoeren

We hebben allemaal een stukje van het totaal, kunnen daarop berekeningen
doen maar pas als we samenwerken is het resultaat zichtbaar

Ik kan bewijzen dat ik iets heb zonder dat ik het
aan je hoef te laten zien

Je mag even langskomen om te leren van mijn data
maar je mag de data niet meenemen

Je krijgt data die lijkt op het origineel,
maar die volledig verzonnen is

Use Cases

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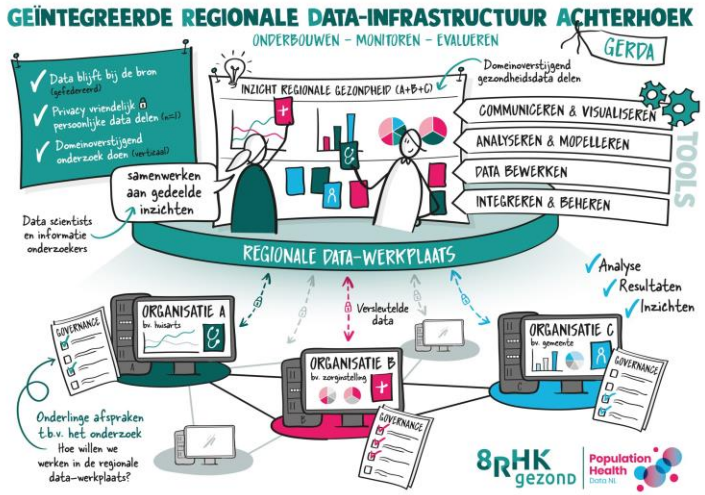
Existing

- Counter Money Laundering Measures using MPC by TMNL, Banks, TNO, CWI
- **GERDA**: GEintegreerde Regionale Data-infrastructuur Achterhoek by Linksight, care partners Achterhoek
- Data-delen voor armoede aanpak (ouderen, energie) om burgers te identificeren die recht hebben op financiele compensaties, maar deze nog niet hebben gevonden of waarvoor de regeling te complex is. TNO, SVB, etc.
- And many more

https://tno-pet-explorer.online/



New

- Democratizing threat intelligence sharing with decentralized trust technologies with Connect2Trust, Roseman Labs, Guardian360
- Co-pilot: Generative AI Supported Digital Forensic Investigations with JenV, NFI, CFLW
- Cooperation with community of Centrum Informatiebeveiliging en Privacybescherming (CIP)
- Samenwerking Singapore Digital Trust Center Fact-finding Missie in October

Next steps

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Towards our digital society with Trust by Design

Approach

- Raise awareness about Digital Trust and the potential of Trust Tech as a game changer
- Encourage collaboration on Trust by Design by connecting, networking and scheduling Trust on the right agendas
- Accelerate development of practical use cases for urgent and societal challenges

Contact

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