# SMOOTH – Horizon Scan

- Digital Onboarding: Emerging Technologies and Challenges

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# Purpose of the Horizon Scan

Identify and analyze: Trends, technologies, challenges, and opportunities in digital onboarding for public services, with an emphasis on marginalized communities.

Focus: Public sector onboarding processes within a 5-year timeframe

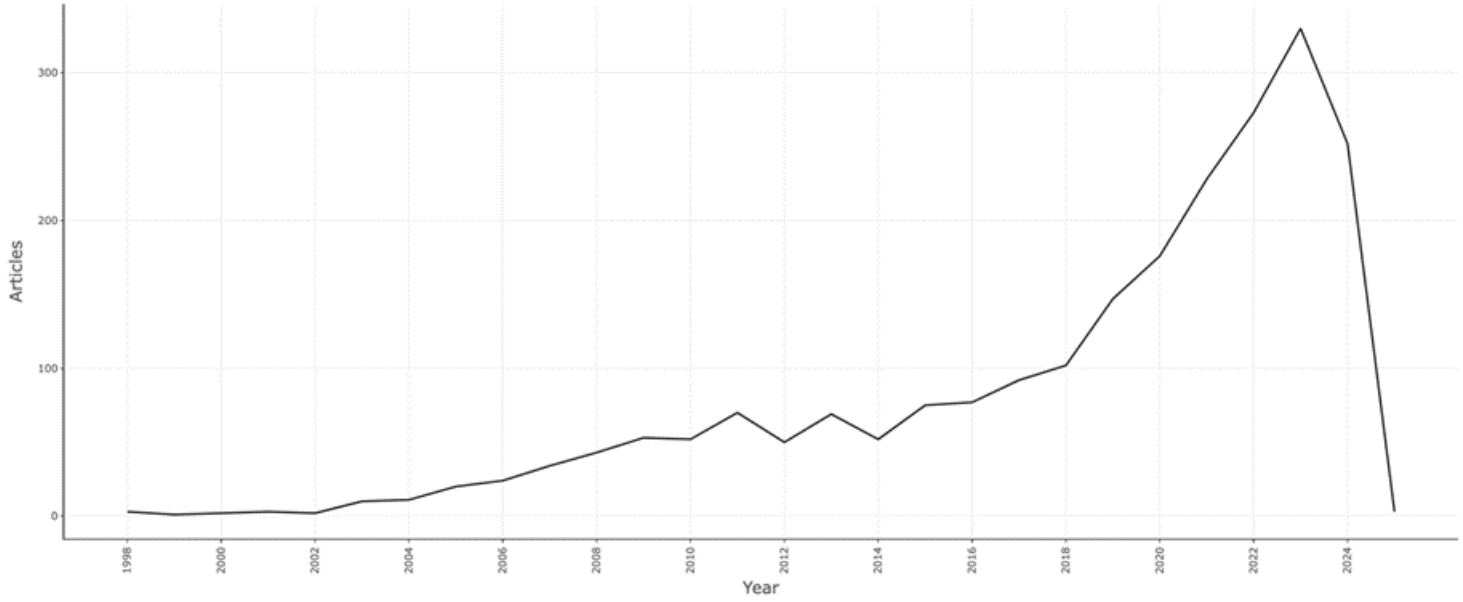
Importance: Equity reasons and addressing marginalization

# Objectives and Scope

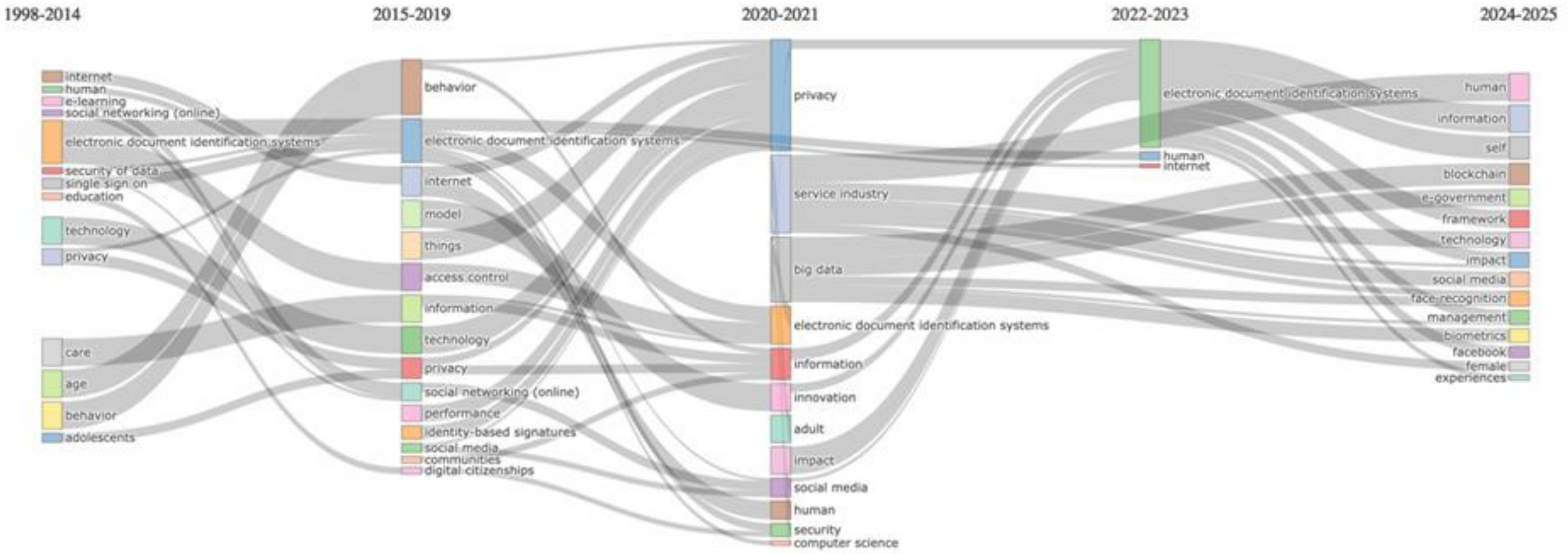
- Identify signals: Anticipate future developments in digital onboarding technologies and platforms
- Focus: Public sector platforms to promote equity
- Goal: Facilitate the creation of secure, privacy-preserving digital ID for citizens
- (Presentation in two parts: 1) observations on the state of the field 2) the substance)

# Structured assessment

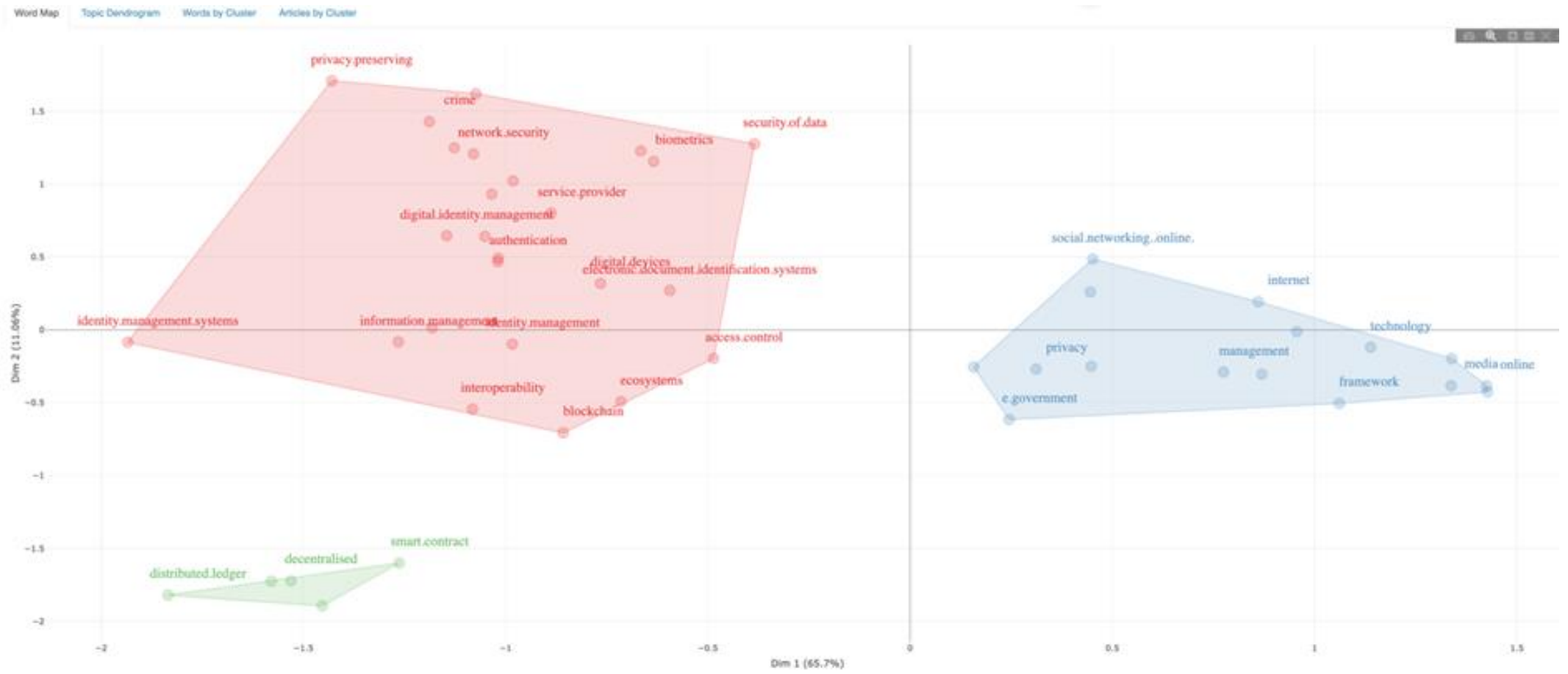
- 1547 docs between 1998-2024 (*digital identit*)
- 514 conference papers
- 814 articles.
- 42 books
- 195 book chapters
- 10.07% are international collaborations.
- Av cite per doc: 6.746



# The evolution of the field

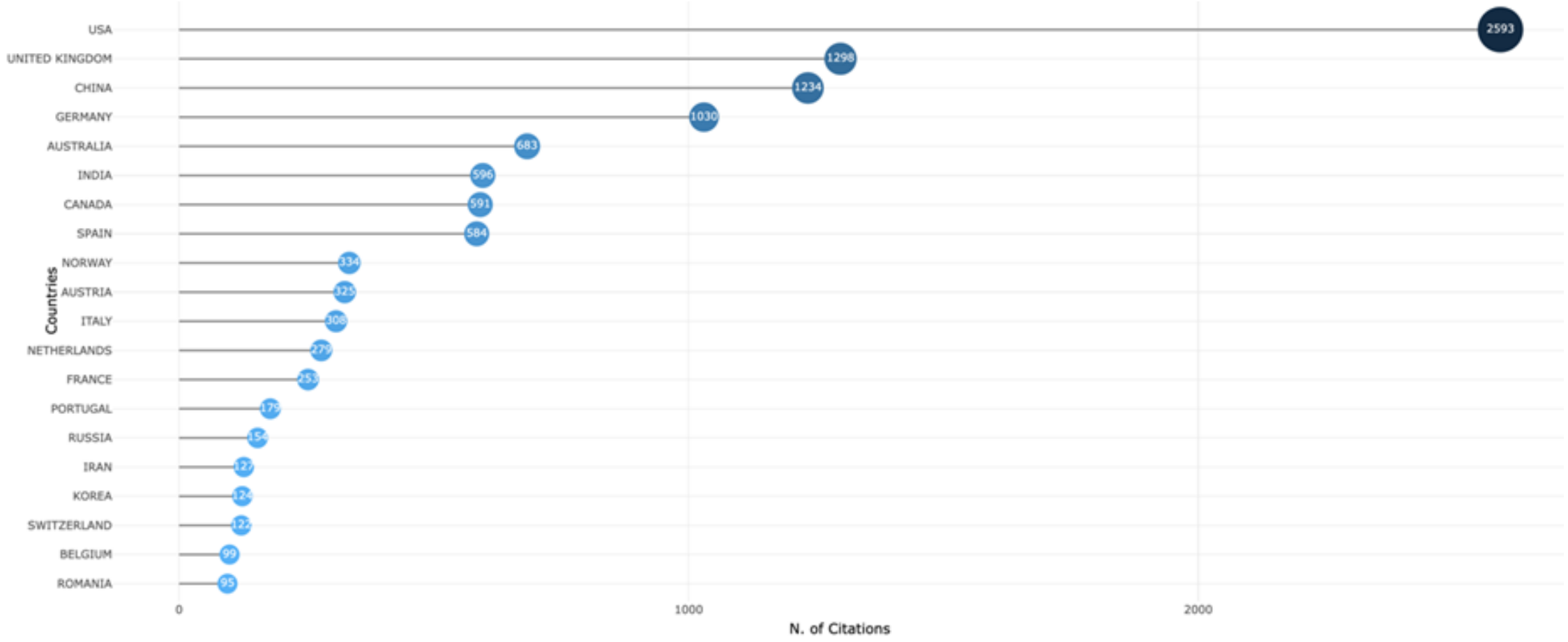


# Theme cluster



# Disciplinary horizon scan – where are collaborations taking place?

# Doc production by country.



# Key takeaways

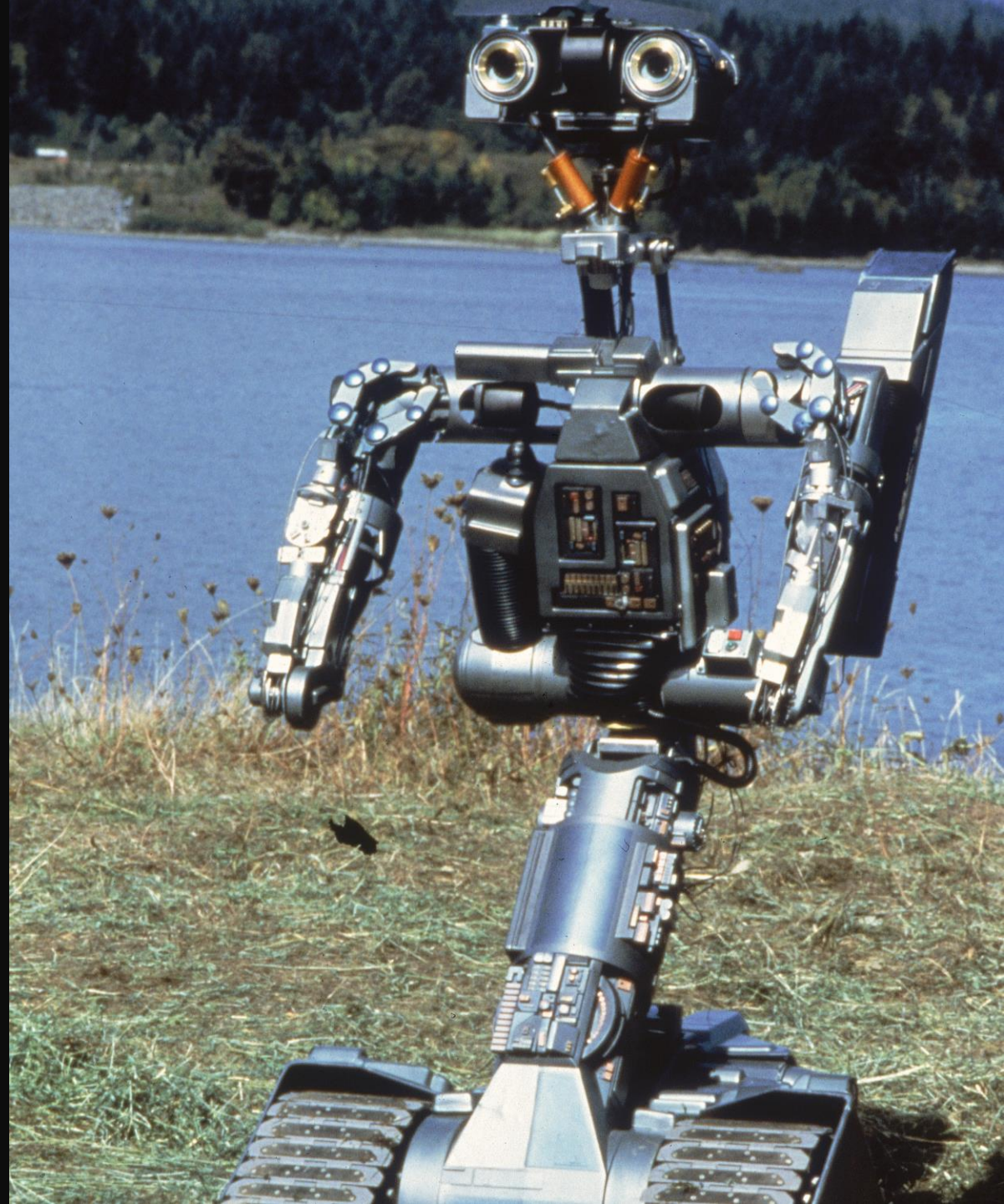
- Surprisingly low incidence of international collaboration.
- Much of the Middle East / former Soviet bloc and African nations missing from the research intensity list.
- Strong concentration by country / university / individual scholars. (? Research groups in tech concerns / high end government agencies)
- Interesting question about whether private sector / government led by university researchers or other way?

# Substance: Key Themes

- Technological focus: Rapid advancements in (machine learning applications) AI and blockchain
- Environmental consensus: Strong signals related to climate impact
- Legal and regulatory signals: Emerging from government work on digital identity and internet regulation
- Social considerations: Access, privacy, and societal impact

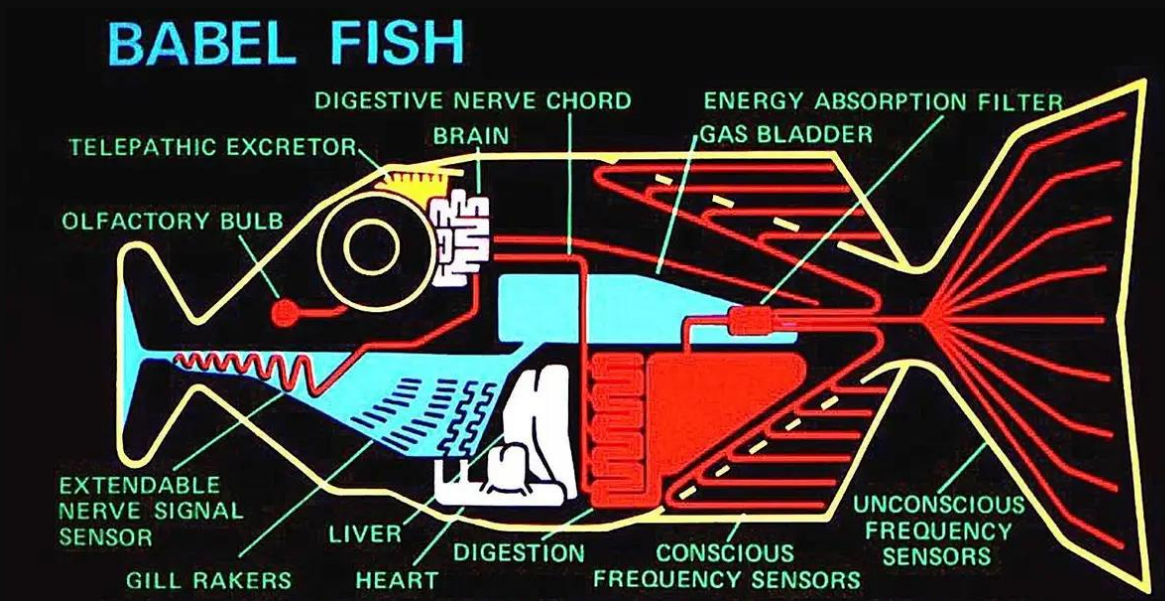
# Trend lines

- Dominance by commercial developers / VC-Angel money, rather than government initiative (changed model in govt).
- Important as commercial are leading the onboarding /adoption / risk perception.
- Understanding and regulation has been/continues to be slow.



# Trend lines 2

- Education/adoption a large barrier.
- ‘Immutability’ and option for a plan b if breached = considerations.
- Ultimately bifurcated questions of trust (technical security / and sentiment).
- And of extraterritoriality and legal recourse.



# Summary – the public policy problematic.

- Digital onboarding technologies offer potential to improve access and efficiency (for M comm and wider)
- Adoption depends on policy, technology, security, and public acceptance (particularly where distrust may exist)
- Addressing challenges like privacy, security, and accessibility is crucial
- Continuous horizon scanning is necessary to adapt to emerging trends and technologies

# Technological Futures

- **Biometrics**
- Impact: ‘Immutable’ authentication, but privacy concerns
- Likelihood: Highly likely and widespread adoption via consumer devices, but not mandatory
- Vulnerabilities: **Security,** adoption, and accuracy

# Artificial Intelligence and Machine Learning

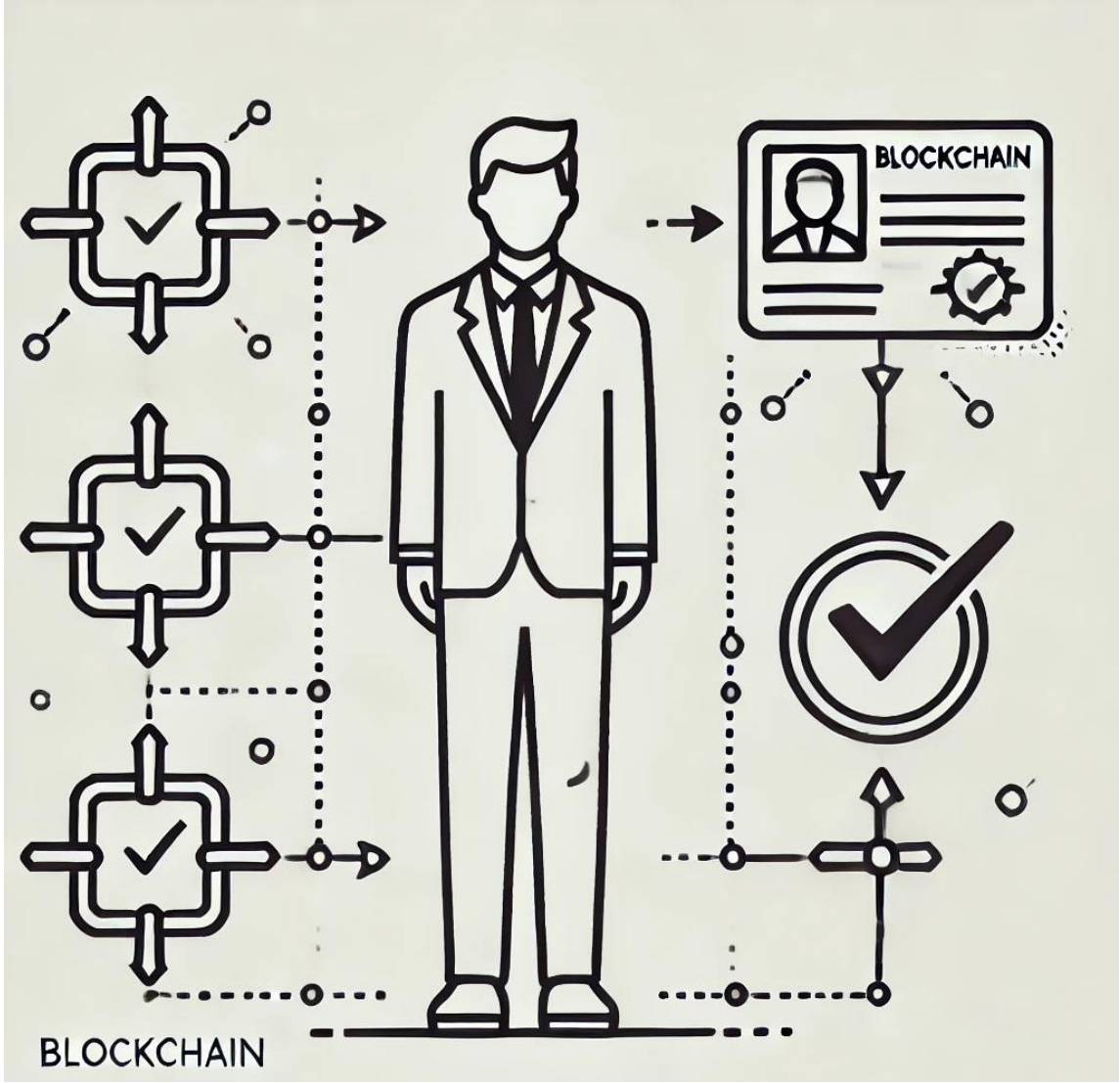
- Chatbots and Virtual Assistants
- Impact: Hyper-personalization and tailored onboarding experiences
- Likelihood: **High** due to commercial adoption and advancements
- Vulnerabilities: **Trust, accuracy**, and user experience

# DI Verification and NFC

- **Digital Identity Verification**
- Impact: Improved access and authentication
- Likelihood: High due to government initiatives
- Vulnerabilities: Data security and portability
- **NFC (Near Field Communication)**
- Impact: Streamlined identity verification
- Likelihood: High due to widespread adoption
- Vulnerabilities: Access, security, and data loss

# Distributed Ledger/Blockchain

- Impact: Privacy, self-custody, and control
- Likelihood: Likely, but adoption in public services uncertain
- Vulnerabilities: Education, access, and security

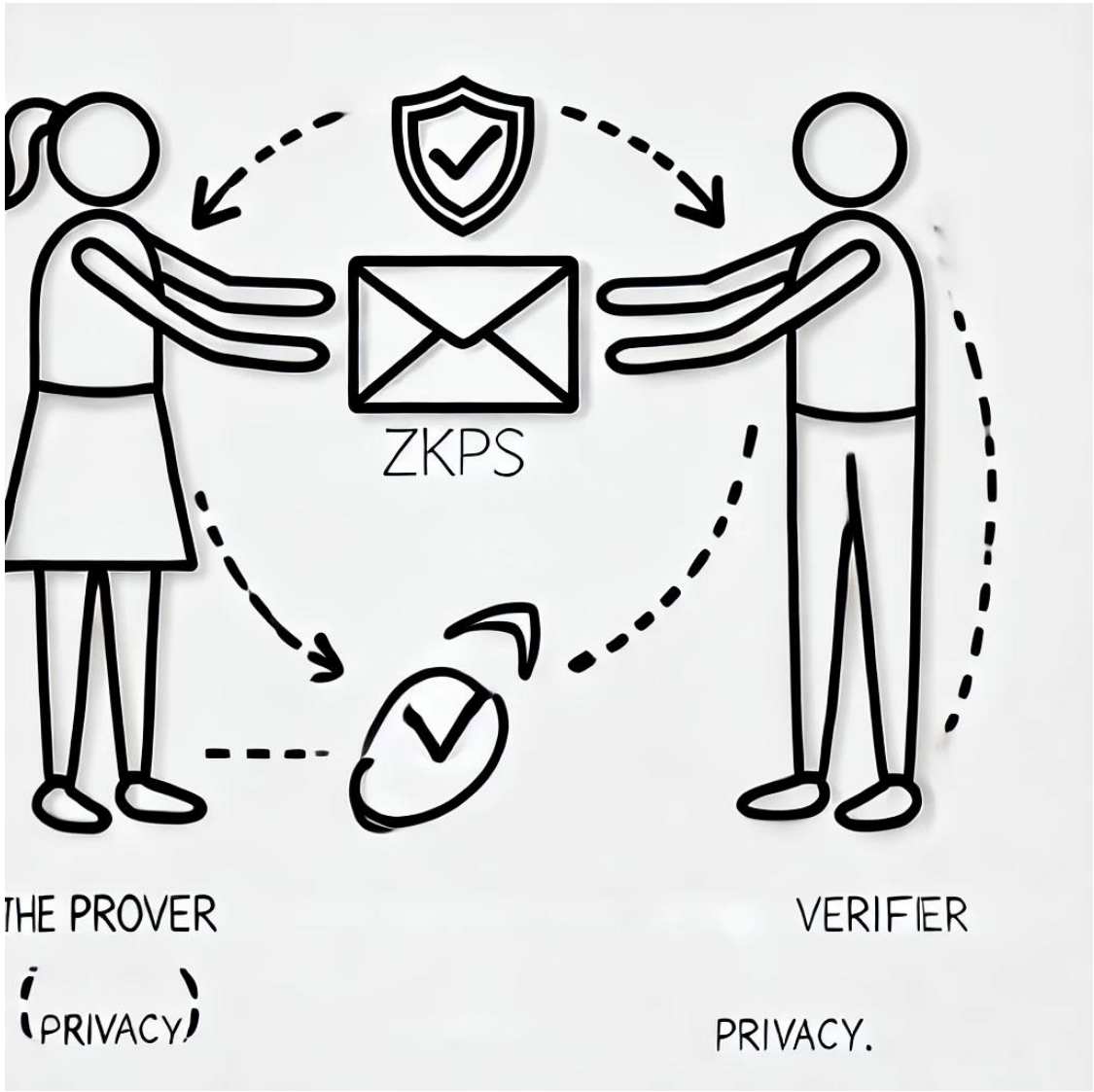


# Edge Computing and Integrated Platforms

- **Edge Computing**
- Impact: Real-time processing and enhanced privacy
- Likelihood: Likely due to existing implementations
- Vulnerabilities: Security, standardization, and user understanding
- **Integrated Platforms**
- Impact: Streamlined access and control
- Likelihood: High due to existing infrastructure
- Vulnerabilities: Single points of failure, innovation challenges, and user experience

# Zero-Knowledge Proofs (ZKPs)

- Impact: Improved privacy, data minimization
- Likelihood: **Low** due to implementation and compliance challenges
- Vulnerabilities: Public understanding, implementation, and environmental impact



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