Roadmap for e-identities (and e-signatures)

Description and state of the art	
Definition	An *e-Identity* or *Electronic Identity* is a means for people to prove electronically that they are who they say they are and thus gain access to benefits or services provided by government authorities, banks or other companies[155]. One form of Electronic Identification (eID) is an electronic identification card (eIC), which is a physical identity card that can be used for online and offline personal identification or authentication. The eIC is a smartcard in **ID-1 format of** a regular bank card, with identity information printed on the surface (such as personal details and a photograph) and in an embedded RFID microchip, similar to that in biometric passports. The chip stores the information printed on the card (such as the holder's name and date of birth) and the holder's biometric photo. It may also store the holder's fingerprints. The card may be used for online authentication, such as for age verification or for e-government applications. An electronic signature, provided by a private company, may also be stored on the chip. Apart from online authentication, an eIC may also provide users the option to sign electronic documents with a digital signature (e-signature)[156].
Addressed societal /business or public sector need	Societal Need: Digitization
Existing solutions /applications /services	Electronic identity cards in many European Countries (e.g. in Estonia for logging into bank accounts, as pre-paid public transport ticket, for digital signatures, for i-voting, for assessing government databases to check medical records, taxes, for picking up e-prescriptions)[157]

Main actors regarding R&D of this technology	• IBM Research Gmbh • University of Birmingham • Universität Stuttgart • Aalborg Universitet • Danmarks Tekniske Universitet • Katholieke Universiteit Leuven • Norsk Regnesentral Stiftelse • Technische Universitaet Darmstadt • Technische Universiteit Eindhoven • University Of Cambridge	
Current research activities	ABC4Trust, ELUTE, FutureID, GUIDE, HIGHTRUSTWALLET, HYDRA, ICONN, NeMeCo, NOVEL TRANSALDOLASES, PERCY, SENSE, SWIFT, TURBINE, VADER, VAMPIRE, VIRTUALVIALS	
Impact assessment	**Public sector modernization:** • Degree of Resources (Capital, Personnel, Infrastructure Utilization • Efficiency/productivity • Cross-organization cooperation • Quality of services provided **Public sector as an Innovation Driver:** • Equity & Inclusiveness • Privacy & Security • ICT Infrastructure • e-Security	
Necessary activities (in or for the public sector)		
Potential use cases	• e-Identities for citizens (also for refugees and migrants) • Pan-European electronic-identity authentication system • Use digital IDs in European processes	
Technological challenges	• Interoperability challenges (multiple identity schemes applied on a per-sector/per-country basis – multitude of standards used and lack of a commonly accepted one.	
Necessary activities (in or for the public sector)		
Development of a specific training necessary	🟩	For the actual usage of e-identity systems no training is needed. The selection and implementation of these systems has to be done by experts.

Advanced or adapted ICT infrastructure needed	Open task	The public organizations need the e-ID infrastructure itself and also e.g. the cards for the citizens.
Change of (public sector internal) processes necessary	Open task	Yes, the public sector processes (like authorization processes to online services) have to be adapted to the usage of e-identity systems.
Promotion / information of stakeholders necessary	🟩	No promotion/information of stakeholders necessary.
Need to deal with cyber security issues	Open task	Security is also a matter of concern. Data breaches are on the rise as with e-identity systems more activities move online.[158] Current data protection systems might not be appropriate to face increasingly sophisticated techniques to steal data and identities in the electronic world.[158] However, the Regulation (EU) N°910/2014 on electronic identification and trust services for electronic transactions in the internal market (eIDAS Regulation) adopted by the co-legislators on 23 July 2014 provides a regulatory environment to enable secure and seamless electronic interactions between businesses, citizens and public authorities.[159]
New or modified legislative	🟩	In many European countries e-identity systems are already up and running. The European Union has published and implemented the eIDAS regulation (electronic identification and trust services for electronic transactions in the internal market).[159]

framework or regulations necessary		
Development of a common standard necessary	🟩	The ENISA paper discusses concrete standardisation activities associated with electronic IDs and trust service providers, providing an overview of standards developed under the mandate m460 from the European Commission and others, related to eIDAS Regulation.[160]
Need for a more economical solution	**Open task**	High costs of the eID infrastructure itself and organisational costs (card issuance and cardholder enrolment).
Dealing with challenges		
2	**Open task**	Civil rights groups feel threatened by a perceived invasion of their private life by public authorities due to the introduction of e-identity cards.[158]
Societal issues	🟩	No issues identified in this area.
Health issues	🟩	Not issues identified in this area.
Public acceptance	?	Some experts thought that there will be some issues with public acceptance and at the same time other workshop participants felt that an issue with public acceptance will not be likely. Still the acceptance of the public is not naturally given and often depends on the used technology itself and also on the general trust in government and institutions in the different countries. The public also has little knowledge about the usage of electronic identities and one of the main concerns is the protection from privacy invasions and identity theft.[161]