



# The way towards Digital Government

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# Overview

## Part.1

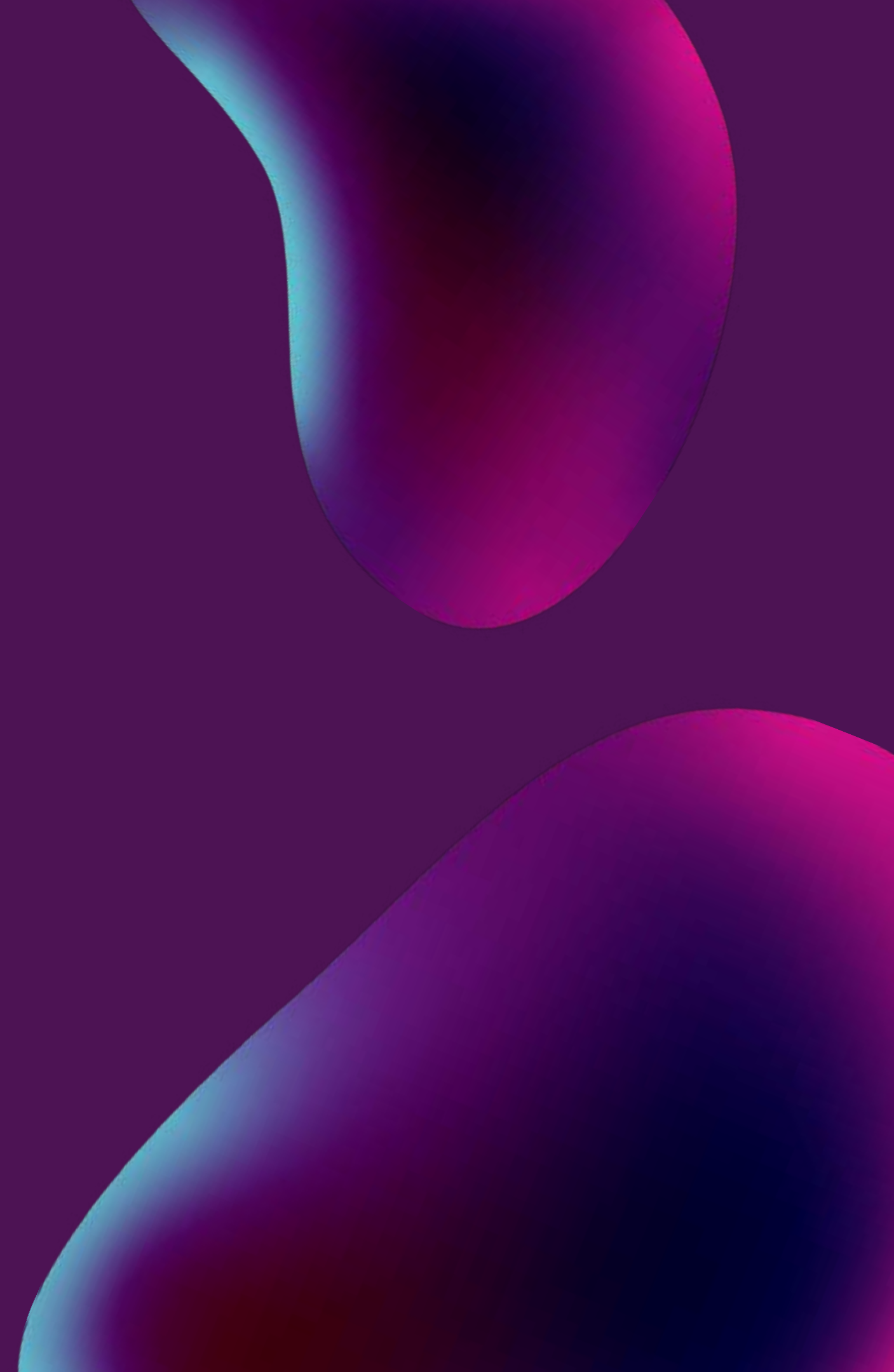
High-level architecture of a fully integrated Public Service Governance Infrastructure

## Part.2

Data sharing, security (e.g. blockchain supported smart cards), privacy and trust on both levels (organisational and user);

01

High-level architecture of a fully  
integrated Public Service Governance  
Infrastructure



# Form of a Country

## Peopeware

- How are the people embodying the country organised?
- Administrative setup, business processes
- Organisational entities and their roles

## Software

- The obvious bureaucratic automation
- But also email servers, sensor networks etc.

## Hardware

- The physical artefacts supporting the first two
- Cold rooms, cables and servers
- Physical office building

**Vision:** A holistic model of a country allowing to explore complex relationships spanning disciplines





# Limitations

- There are many architectures in public sector but few (if any) with a similar scope
- There is no literature to refer to for lessons learned
- Enterprise architecture does not help much
  - EA is usually focused on information systems, rather than the enterprise per se
  - Value generation in public sector is much different

# Things we Want to Improve Through Integrated Public Service Governance

## Efficiency

- Fast execution of core process/improved service delivery
- Simplification of procedures
- Reduced paper work
- Reduced communication cost

## Transparency

- Comprehensive & Reliable information delivery
- Easy access to information

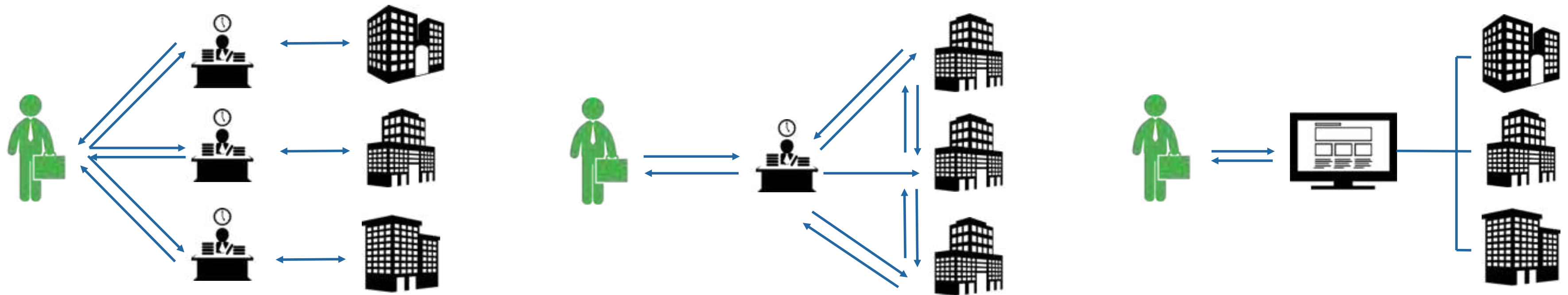
## Interactivity

- Improved interaction (with internal actors, actors belonging to other related organizations, beneficiaries, citizens, enterprises)

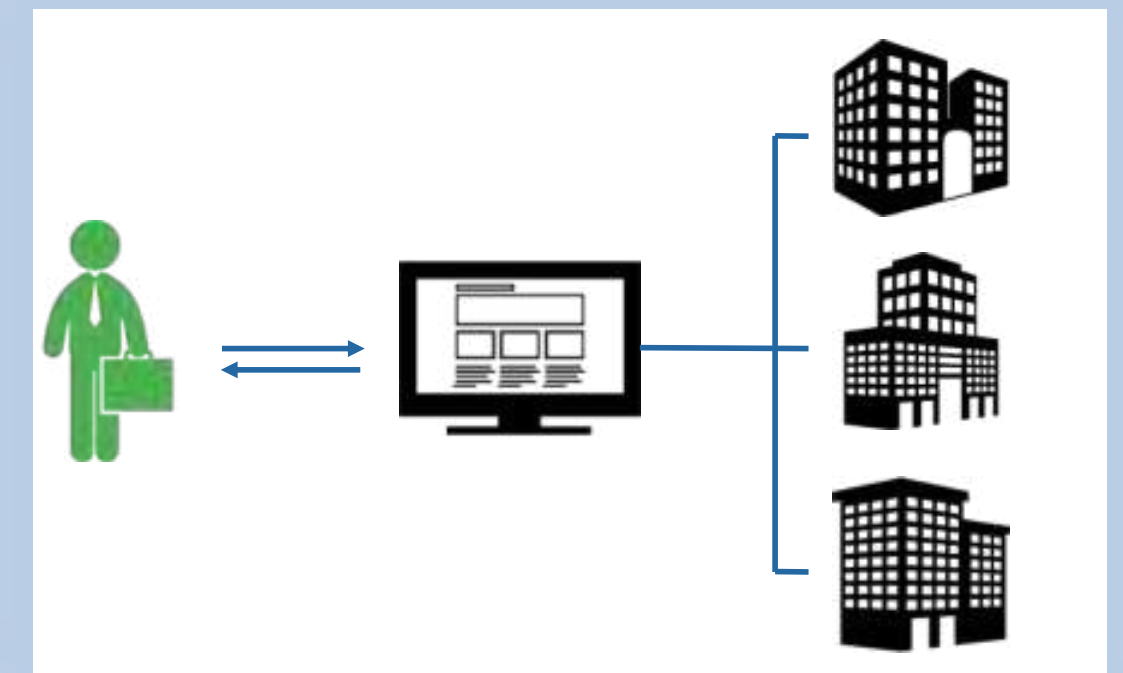
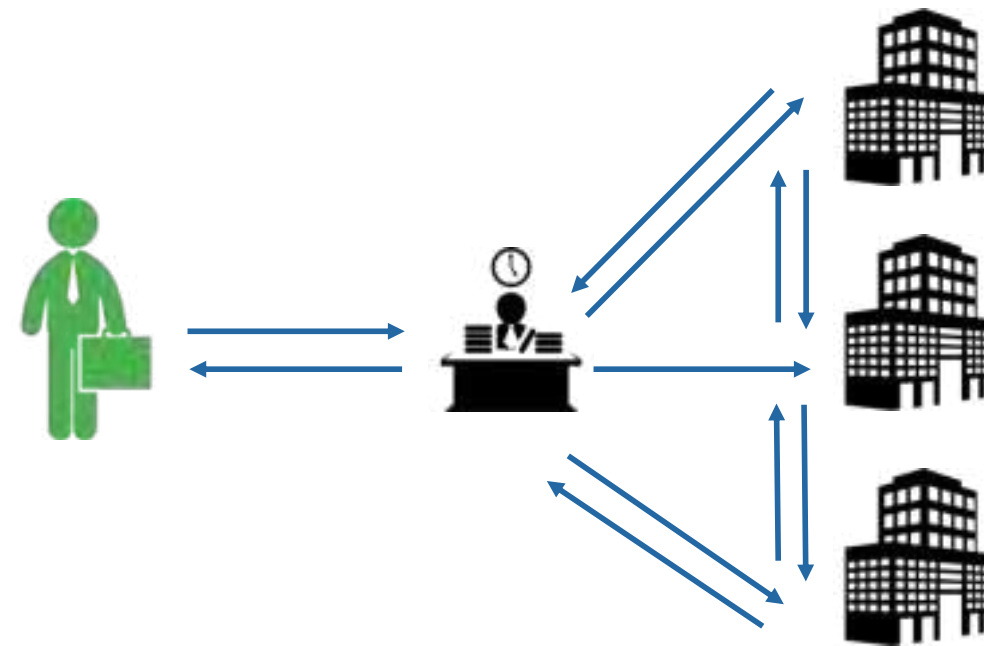
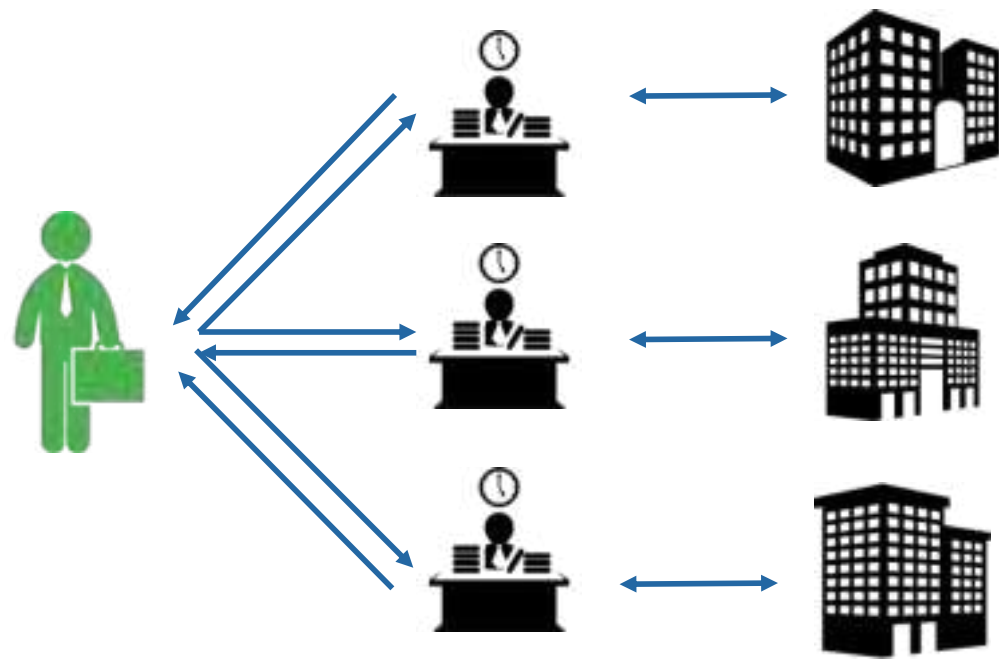
## Decision support

- Improved planning and decision-making
- Better Monitoring and control

# e-Governance Models



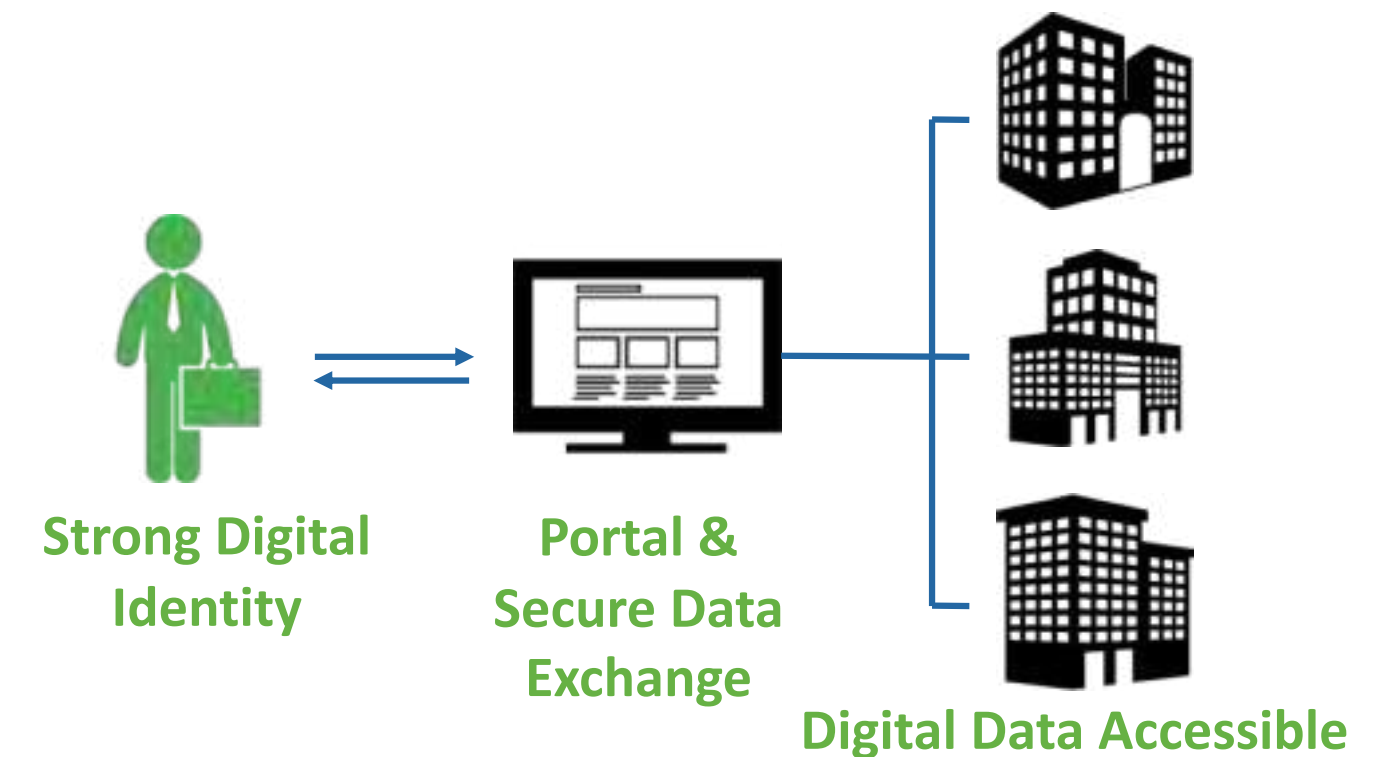
# e-Governance Models





# Key Principles

- Unique numeric identifiers for citizens, businesses, real estate, land parcels, etc.
- Unique numeric identifiers are used across the government for all transactions
- Once only. Citizens never have to provide the same information twice.
- No duplicated data in the databases
- Central registry of databases metadata and online services
- Clear data ownership
- Data is owned by the citizen
- Each authority is responsible for own database quality



# Trust & Security Challenges

- Mixture of digital and analog elements
- Roles and responsibilities in the government
- Technical measures
- Behaviour of officials
- Awareness of the citizens



# Interoperability Governance

- Identifying and selecting standards and specifications
- Identifying candidate standards and specifications based upon specific needs and requirements;
- Assessing candidate standards and specifications using standardised, transparent, fair and non-discriminatory methods;
- Implementing the standards and specifications according to plans and practical guidelines;
- Monitoring compliance with the standards and specifications;
- Managing change with appropriate procedures;
- Documenting standards and specifications, in open catalogues, using a standardised description.



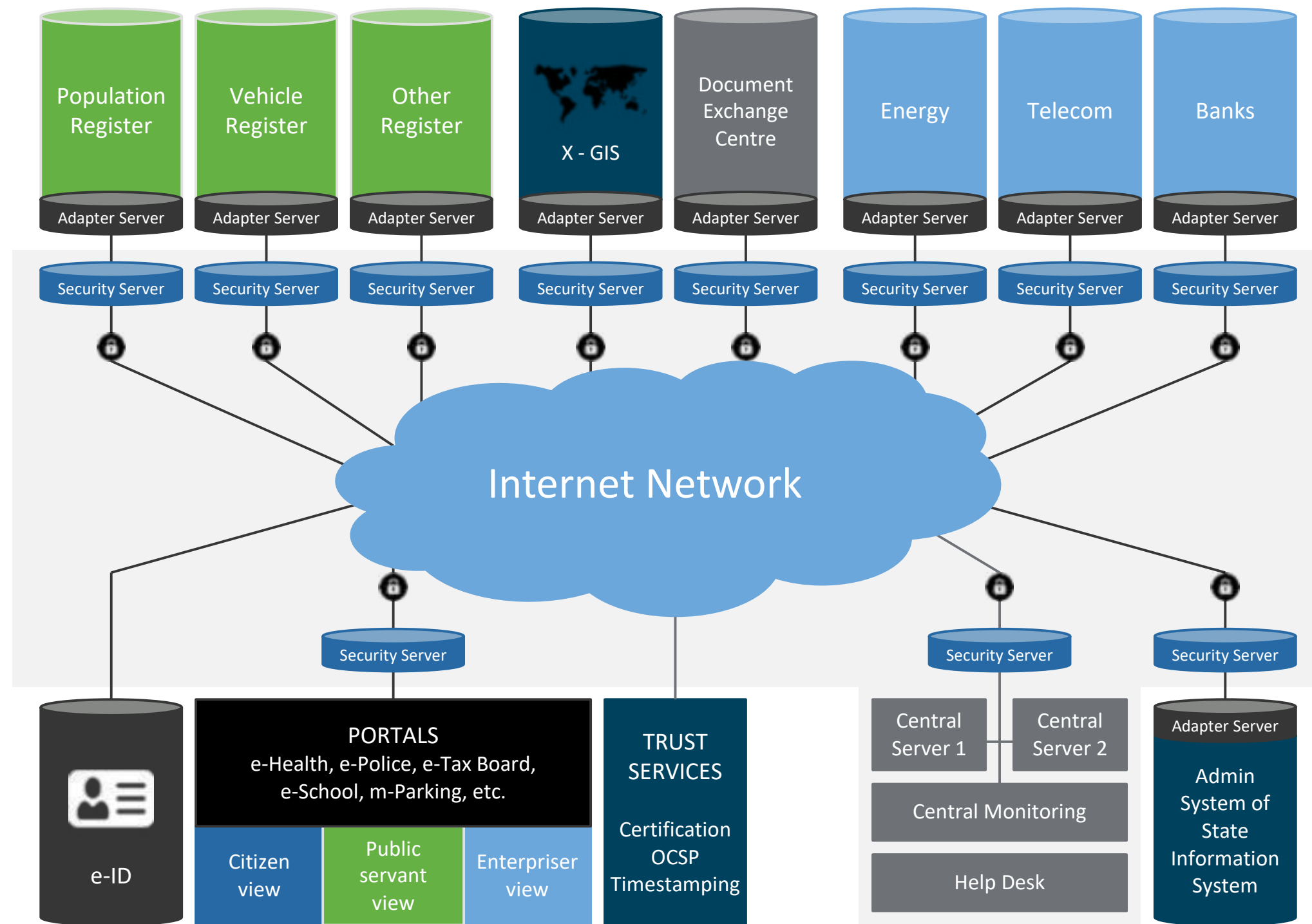
# Interoperability Agreements

- Formal arrangements for cooperation through interoperability agreements.
- Standards, specifications, legislation at EU or national level or via bilateral and multilateral agreements.
- Agreements to address operational matters. For example, memoranda of understanding (MoUs), service level agreements (SLAs), support/escalation procedures and contact details, referring, if necessary, to underlying agreements at semantic and technical levels.



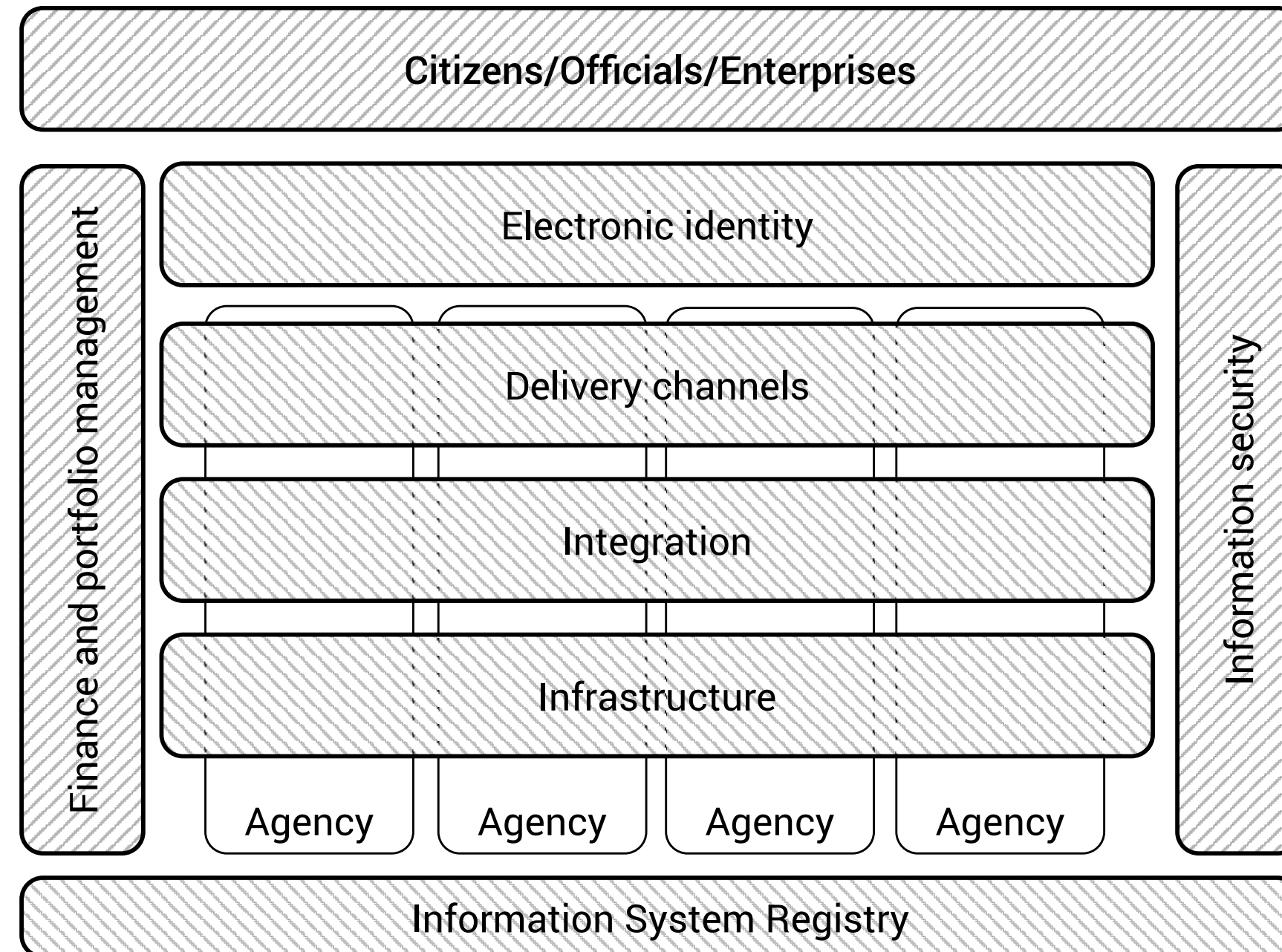


# High-level Architecture



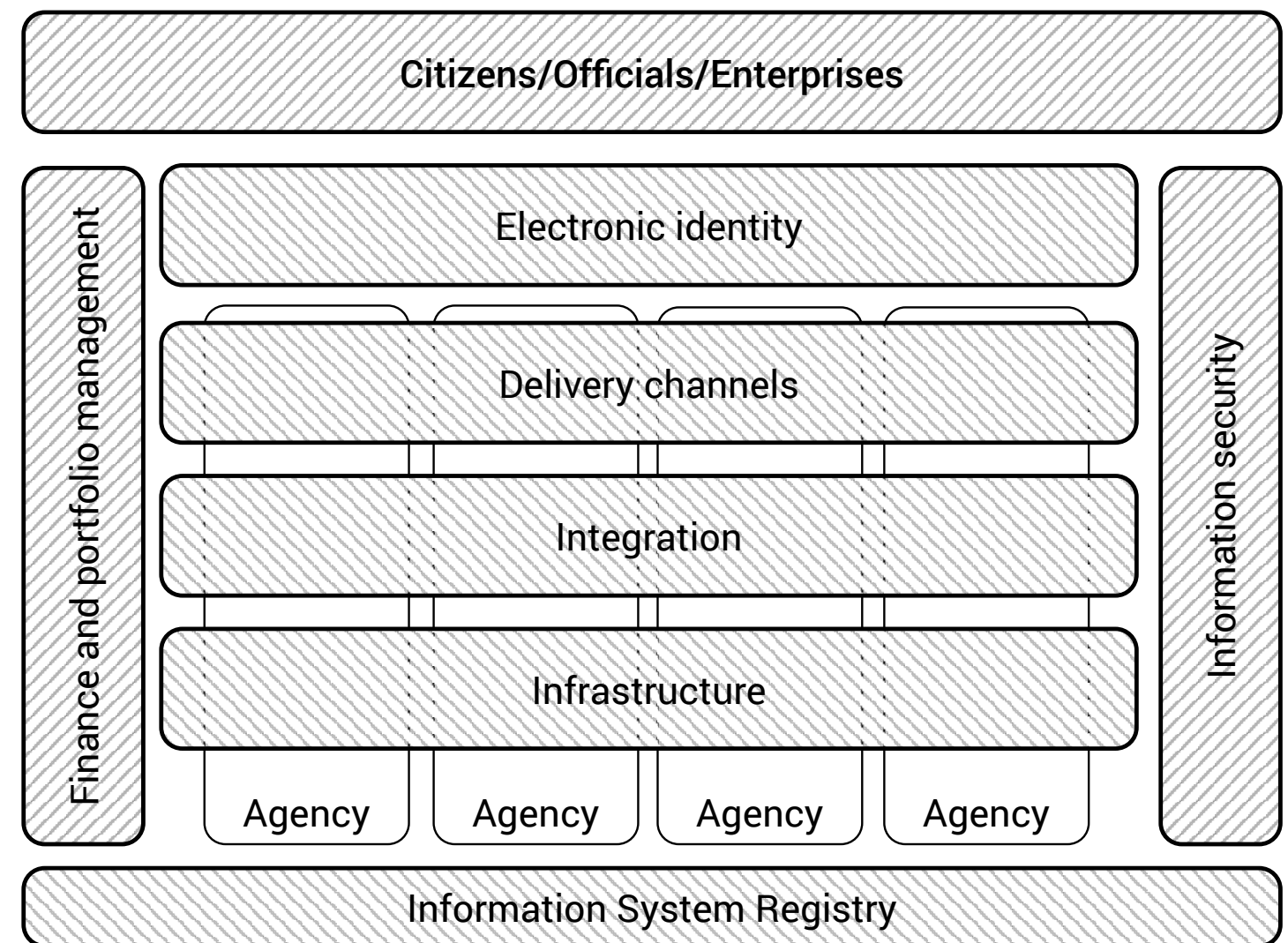
# Suggested Digital Infrastructure

(Based on Estonia's Model)



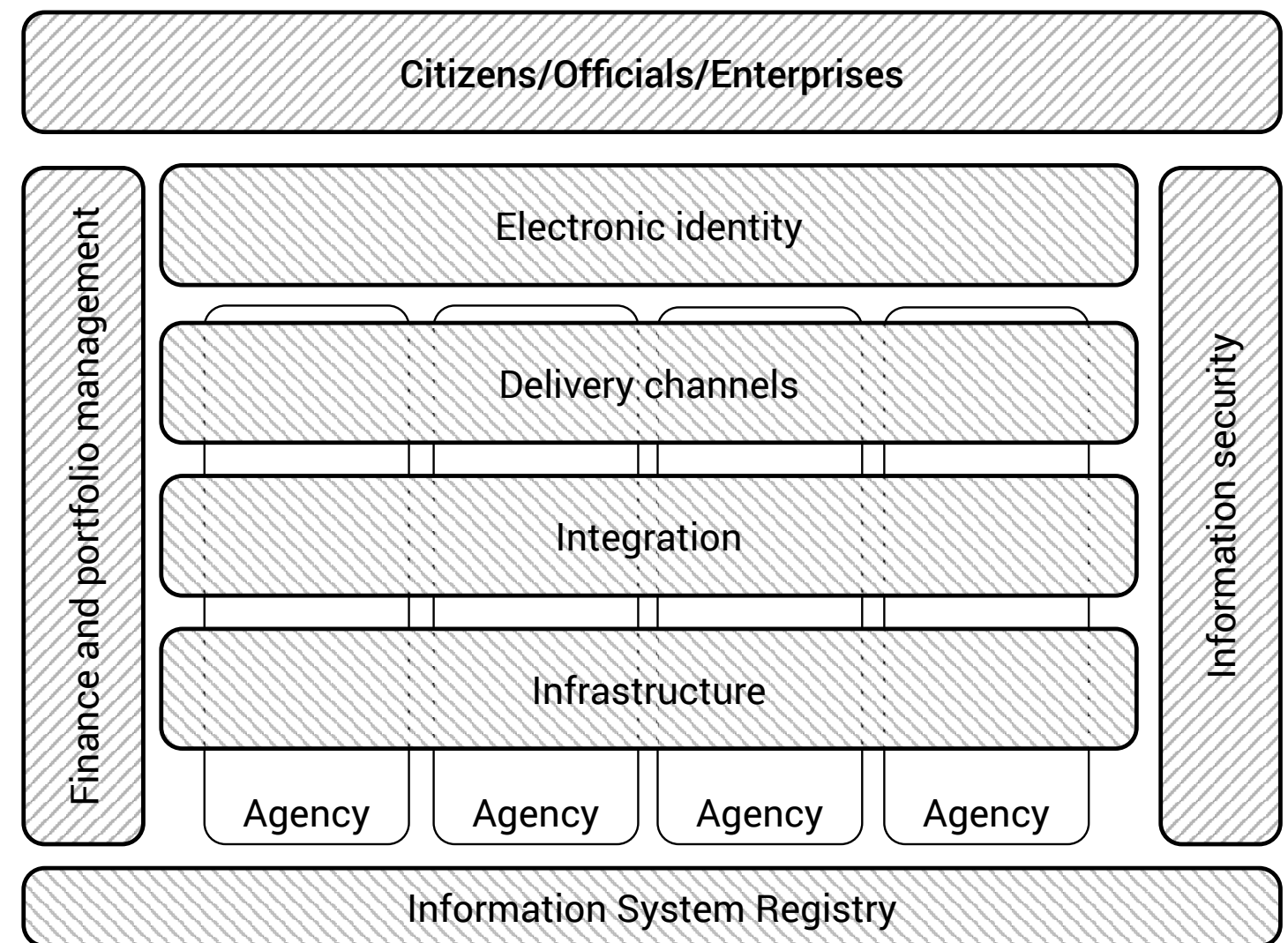
# Electronic Identity

- The certificates live on a chip (smart card or SIM)
- Digital signature legally equivalent to a physical one



# Delivery Channels

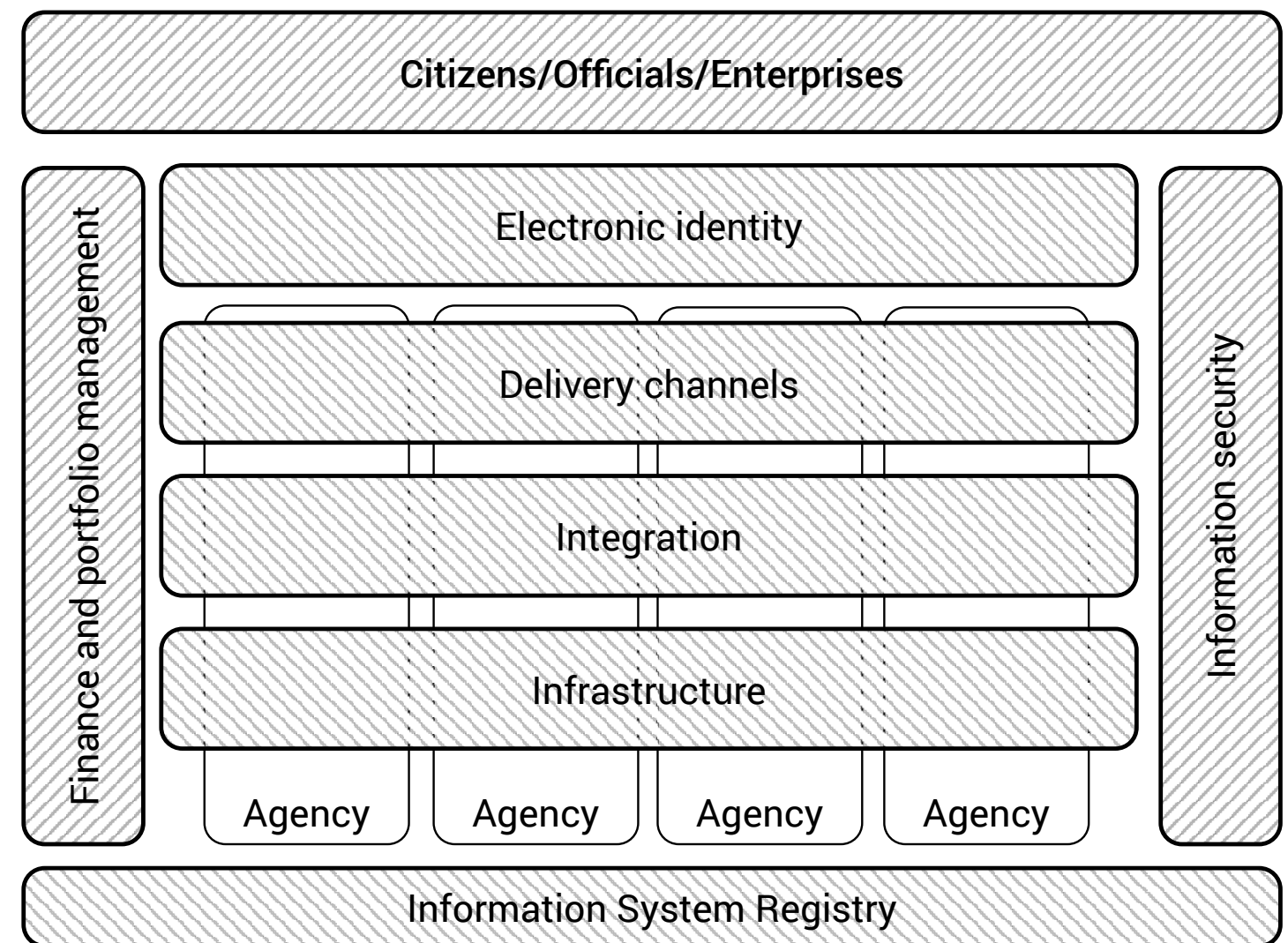
- Central service portal providing access to hundreds of services
- Supply and demand, make citizens think like customers
- Seamless service interoperability





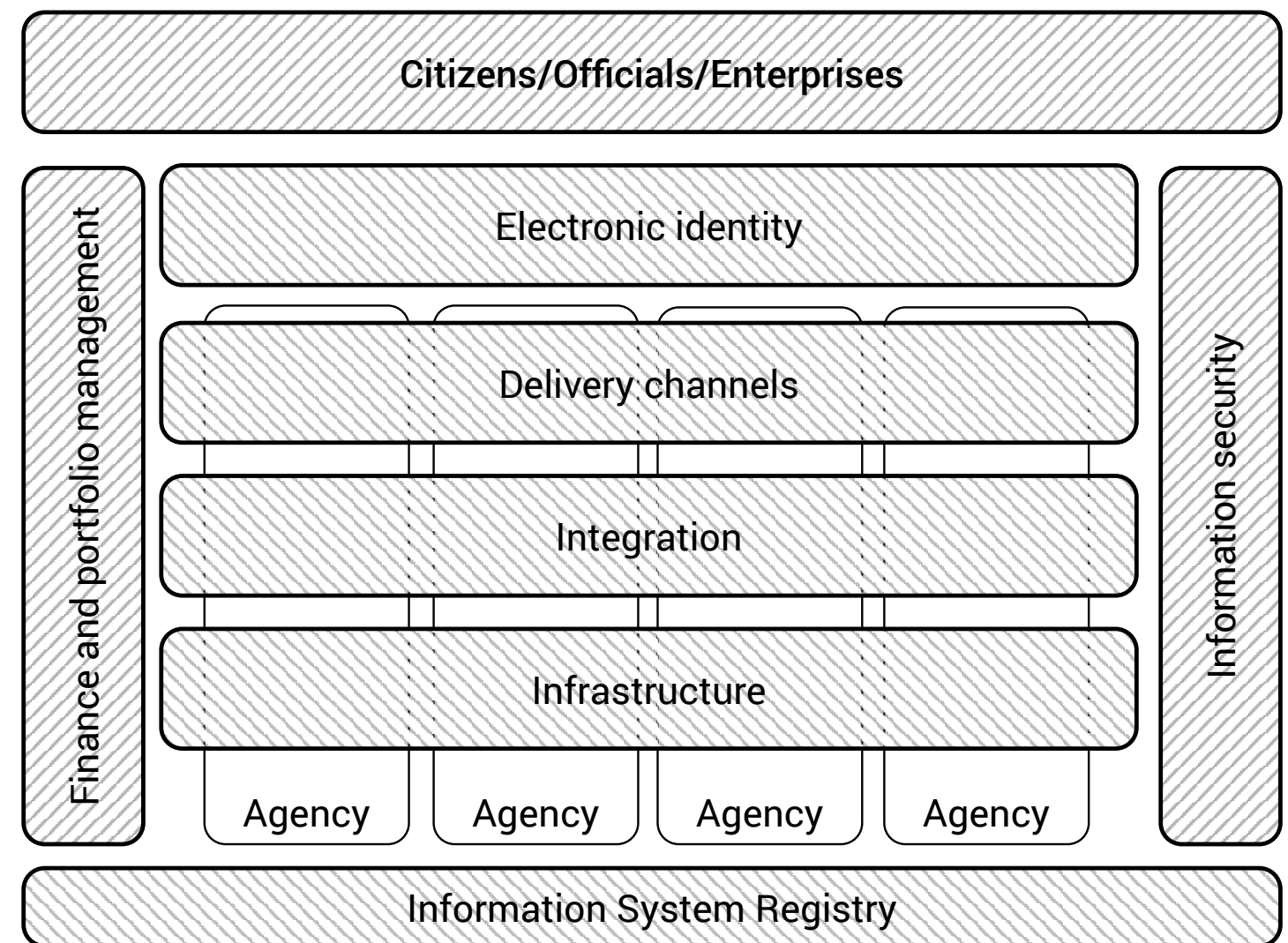
# Integration

- All communications are peer to peer
- No central authority with access to traffic
- No central development/operations bottleneck



# Infrastructure

- Government Cloud featuring
  - Private cloud
  - Public cloud
- Platform as a Service (PaaS)
- Security infrastructure and scalability plan



A close-up photograph of a red binder tab with the word "Limitations" written vertically in white, bold, sans-serif font. The tab is part of a binder with other colored tabs (green, white) visible. The background is slightly blurred.

# Limitations

- Shift from building software to supporting an ecosystem. it matters very little what your software does if people don't use it
- People expect systems that work together seamlessly. From Google to IFTTT, from fitness to financial industries, companies expose meaningful APIs. Why not the government?

# Mitigation Strategy

- Talk to people, all of this constitutes a massive mind-shift. It takes time and effort to bring about
- Build a flexible and secure platform for providing services to the citizen
- Move from open data to integral open APIs. Open data must change and become part of solution rather than being part of the problem
- Cloud is not a strict prerequisite but helps drive the change in thinking
- From singular UI to a flexible multitude of UX. Not only mobile but third party integrations, mashups etc.
- Move from opaque blocks of functionality to well-defined manageable services. This makes it so much easier to catalogue, understand and measure
- Invest into data protection, audit and fraud detection,
- Treat open data as an API. Documentation, testing routines, SLAs etc.





5 min Q&A

Data Sharing, Security  
Privacy and Trust

# The Benefits of Secure Data Sharing



## Private Sector

**Trust** – Organizations can better protect their users and brands online

**Manage risk** – Get online credentials right with your identity.

**Efficiency** – Lower barriers to customer enrollment, increased productivity & decreased costs

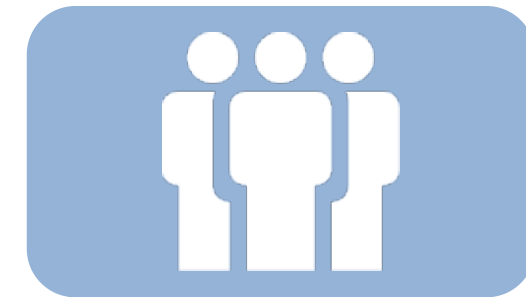
**Invest in the future** – It's the baseline for innovation



## Government

**Public safety** – Stronger identity credentials and requirements reduce cybercrime

**Economic growth** – Spur innovation to create and grow new businesses opportunities while streamlining transactions



## Individuals

**Convenience** – Faster online access with fewer passwords to manage

**Privacy** – Limited information collected & transmitted during online transactions

**Security** – Better authentication practices prevent unauthorized transactions

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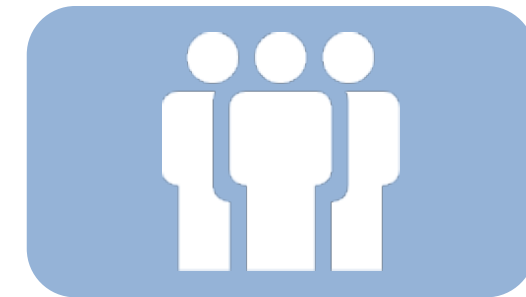
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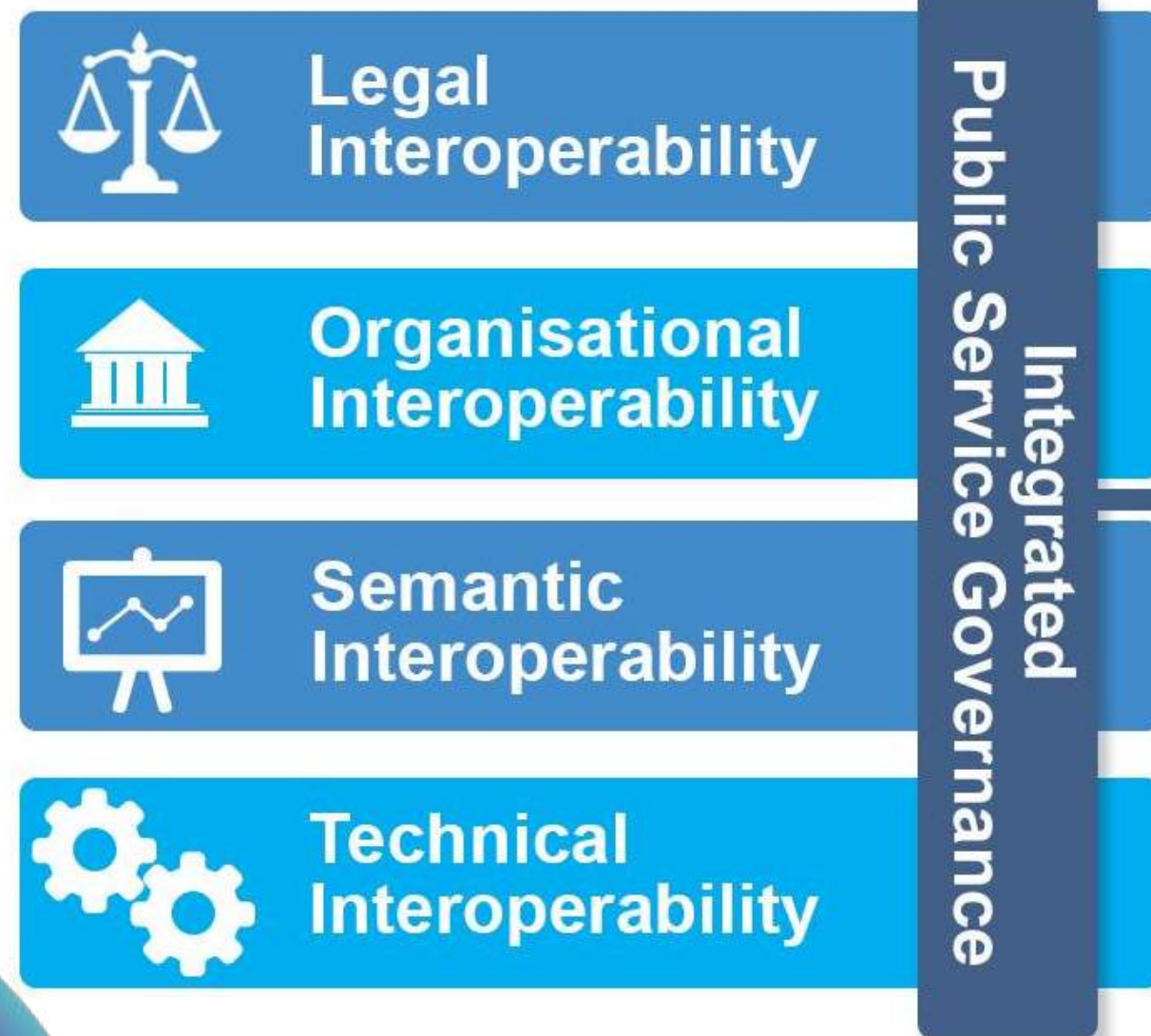
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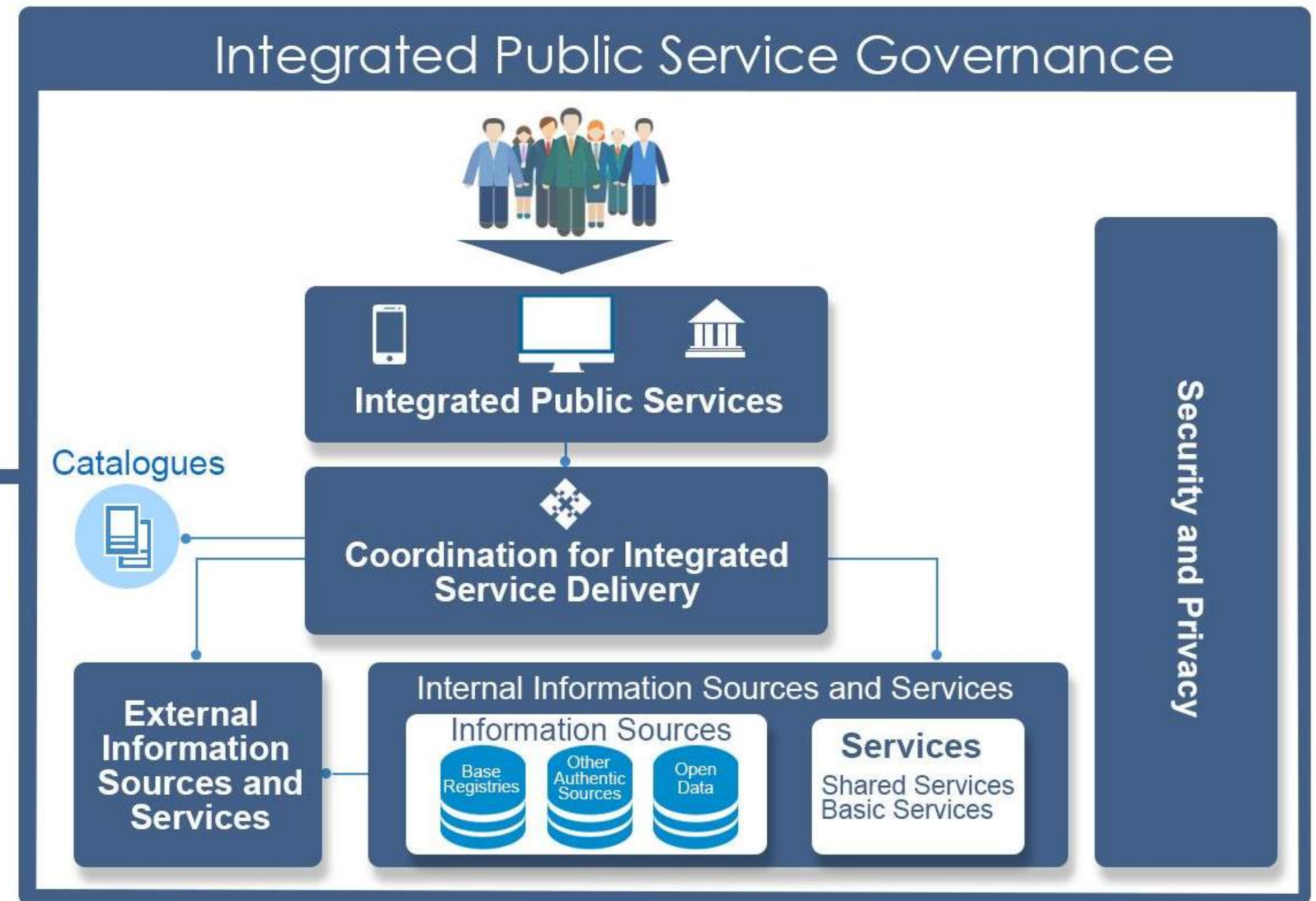


# Digital Government Infrastructure

## Interoperability Governance



Public Service Governance  
Integrated



# Streamlining Citizen Access and Reducing Costs

## Vision:

- Protecting citizens and safeguarding borders is a priority for every country. A key factor is trusted identity.
- Deliver e-government services that streamline access for citizens and reduce operating costs.
- Increase citizen satisfaction levels by allowing citizens to access government programs from home or on the go, at any time of day.



## Enrollment and Issuance

- Enroll citizens, establish trusted identities and issue secure card-based or mobile-derived credentials.
- Create multipurpose e-IDs that can be used to access a variety of e-government services.



## Credential Management

- Manage privileges and re-issue lost or expired credentials.
- Deactivate lost, stolen or revoked credentials.



## Authentication

- Authentication tools and systems to validate a citizen's identity when they access services online or using mobile devices.
- Verify electronic transactions, encrypt digital communications and authenticate digital signatures.





# Application of Smart Cards

1. Payphones
2. Mobile Communications
3. Banking & Retail
4. Electronic Purse
5. Health Care
6. ID Verification & Access Control

**ID-card**  
since 2002

**Two certificates on the chip:**

- 1<sup>st</sup> for identification
- 2<sup>nd</sup> for digital signature

**1<sup>st</sup> national document**

Public e-services (e-Tax, e-Prescriptions etc)

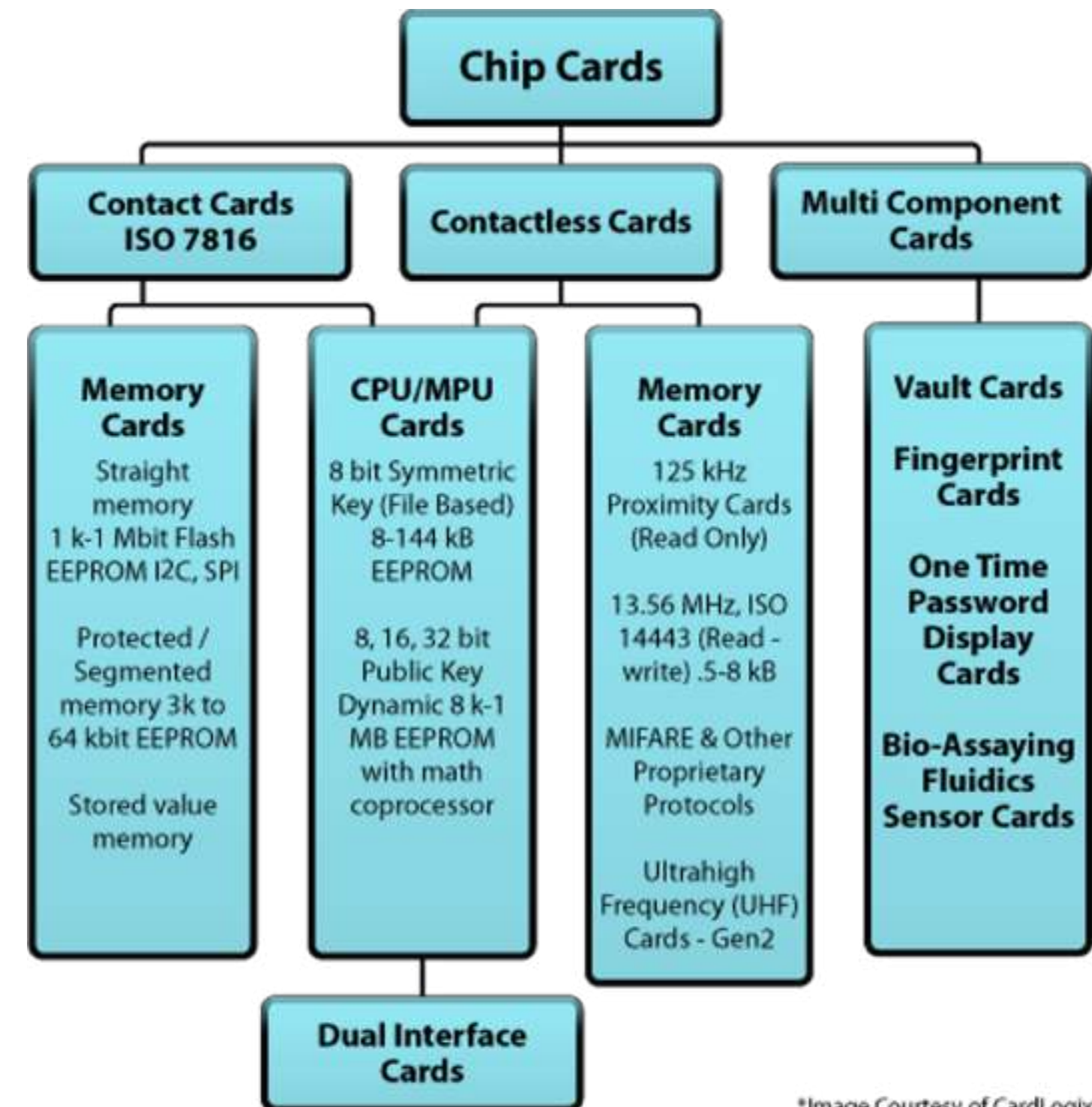
- Applying for driver license, social benefits
- E-elections
- Signing documents
- Accessing grades and curriculum @ school
- Bank transactions
- Register a new business
- Customer identification card, Bus ticket

## Significant trends for 2019 and 2020

- The device manufacturer segment (OEM) is expected to be very dynamic with a +7,5% boost
- The government and healthcare segment is also expected to grow fast in 2020 (+7,4%), driven by many ID programs around the world.
- Financial services will still grow by +6,3% in 2020 after a +24,4% increase in 2019.
- The **contactless interface** has become the leading choice for financial services and governments.



# Types of Smart cards





# The Benefits of Secure Data Sharing



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# Applications of Smart cards: e-IDs

- An electronic ID (e-ID) acts as a traditional means of identification, as a travel document, and finally, as a passkey to citizen's data.
- The public has become accustomed to computerized smart cards through their use in the banking system, and as a result, their reliability is no longer questioned.
- The e-ID card can be used for identification, but also authentication and electronic signature.



Electronic identification (eID) and Trust Services for my business

## eIDAS SOLUTIONS

Take advantage of cross-border business opportunities  
Increase efficiency & security of your business + improve user experience



### eSignature

expression in an electronic format of a person's agreement to the content of a document.

REDUCED COSTS AND TIME THROUGH STREAMLINED PROCESSES

MORE INNOVATIVE BUSINESS PROCESSES

CONVENIENCE FOR BUSINESS AND CUSTOMER



### Qualified Web Authentication Certificate

ensure your website is trustworthy and reliable.

INCREASED CONSUMER TRUST

HELPS AVOID FISHING, PROTECTING THE REPUTATION OF YOUR BUSINESS



### eTimestamp

electronic proof that a set of data existed at a specific time.

ENHANCED DOCUMENT TRACKING

GREATER ACCOUNTABILITY



### eID

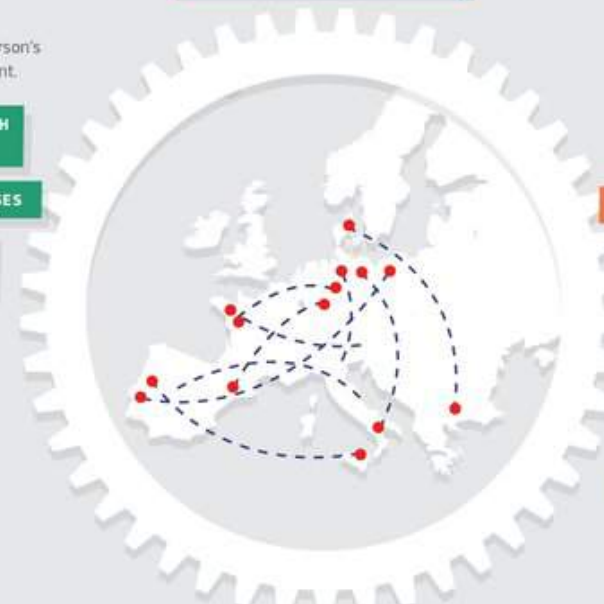
A way for businesses and consumers to prove their identity electronically.

EXPANSION OF CUSTOMER BASE

COST AND TIME SAVING

TRUST IN CROSS-BORDER TRANSACTIONS

CONVENIENCE FOR BUSINESS AND CUSTOMER



### Electronic Registered Delivery Service

protects against the risk of loss, theft, damage or alterations when sending documentation

REDUCED TIME AND COSTS IN DOCUMENT EXCHANGE

INCREASED EFFICIENCY AND TRUST

ENHANCED DOCUMENT TRACKING



### eSeal

guarantee both the origin and the integrity of a document.

REDUCED COSTS AND TIME THROUGH STREAMLINED PROCESSES

TRUST IN THE ORIGIN OF THE DOCUMENT



For more information, visit:  
<https://ec.europa.eu/digital-single-market/en/eidas-smes>

@eID\_EU #eidas4smes Digital Single Market



# Electronic Identification, Authentication and Trust Services (eIDAS)

eIDAS (electronic IDentification, Authentication and trust Services) is an EU regulation and a set of standards for electronic identification and trust services, for electronic transactions in the European Single Market



# Key Principles of eIDAS

- Cooperation between Member States
- Mandatory cross-border mutual recognition between Member States to access public
- Services, meaning that identifiers delivered by one Member State can be used and recognized in another Member State.
- Full autonomy to the private sector
- Interoperability framework

## Regulation UE 910 2014

### Qualified Trust Services

Electronic signature

- Certificates, issuing and validation
- Document preservation
- Server based signature

Electronic seal

- Certificates, issuing and validation
- Document preservation
- Server based signature

Timestamping

- Certificates, issuing and validation
- Evidence preservation

TLS Web Security

- Certificates, issuing and validation
- Server authentication
- Ciphred Transmission

Electronic Delivery

- Registered email
- eInvoice delivery





# The eIDAS Ecosystem

- Member States operate Nodes, that are linked to identity attributes providers. Citizens can use these attributes with Service Providers (entities providing services using ID), both in their country and in other Member States' public services.
- The citizens can use the services in a way that proves that the attribute they are providing is linked to an identity, without providing the whole of this identity, only the needed credentials for a specific purpose: the goal is that the identity speaks for us, and not about us.



# The Benefits of Interoperable and Recognised eID for the Different Actors

- Citizen (uses ID): Ease of use, cost saving, increased assurance, increased privacy, portability
- Public administration (set up): Cost saving, compliance, increase assurance
- Identity / Attribute providers (provide identity and attributes):  
New areas of application
- Service providers (offer services using ID): Cost saving, legal compliance, Increased security and assurance, Increase potential user base



# eIDAS: Trust Services

- Electronic signatures, including validation and preservation services
- Electronic seals, including validation and preservation services
- Time stamping
- Electronic registered delivery service
- Website authentication





SERVICES COVERED BY EIDAS REGULATION



EU REGULATION 910/2014



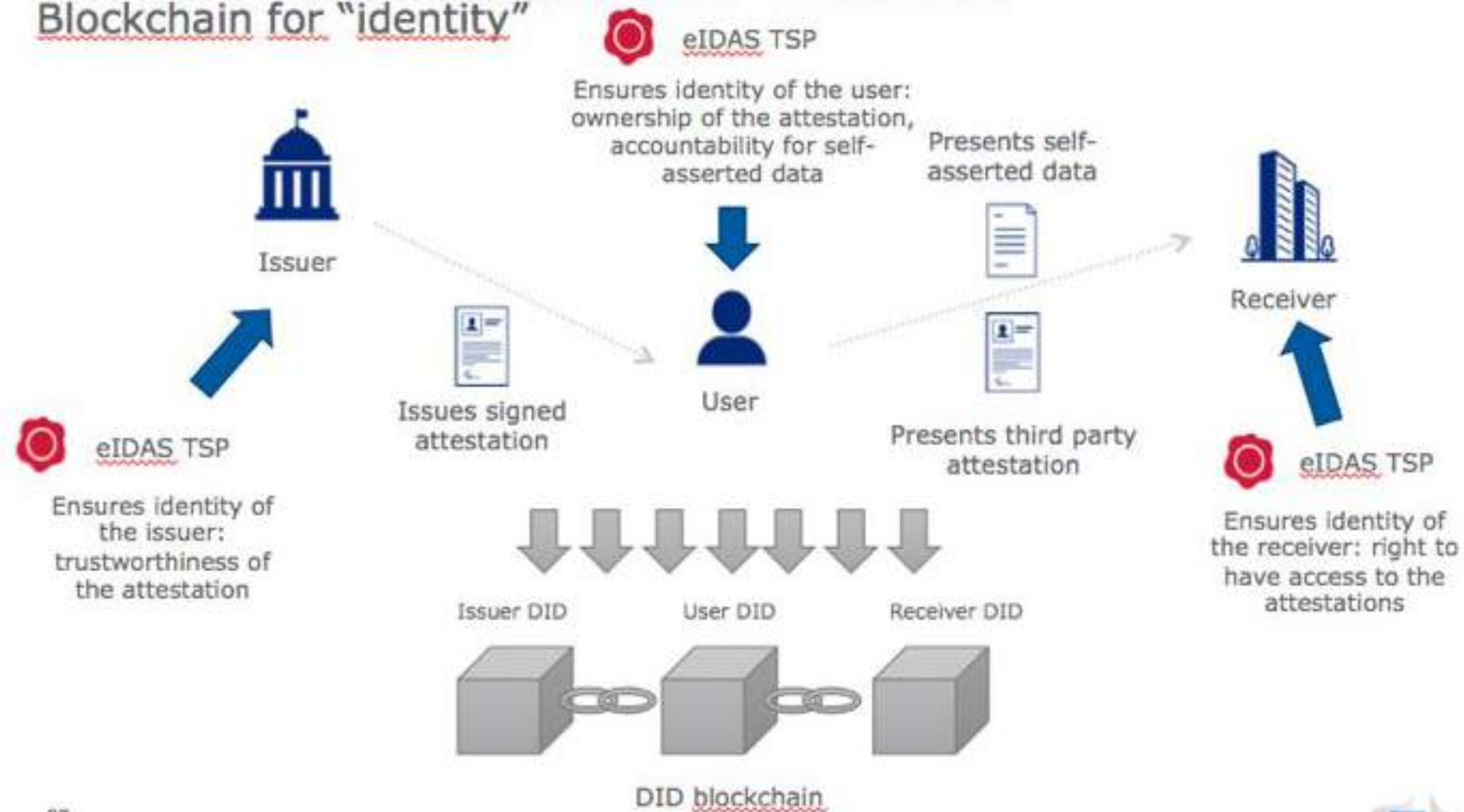
# eIDAS and Blockchain:

- Blockchain is basically data and hash. Under the eIDAS regulation, blockchain's data, stored in blocks, is an « electronic document », as « electronic document » is defined by the eIDAS regulation as any content stored in electronic form (article 35).
- As soon as you put some content as electronic document, you are under the eIDAS regulation: you don't need to be « eIDAS compliant », you are already under eIDAS. And if a content is signed, it is under eIDAS, however you sign it.



# eIDAS and Blockchain: Blockchain for “Identity”

How eIDAS Regulation is relevant to blockchain:  
Blockchain for “identity”



# Key Takeaways

- Governance frameworks DO NOT cover similar needs to those of EA so the architectural models should also differ.
- Need to implement an external trust framework between citizens, businesses and the government
- Ultimately the aim is to design a holistic solution that could cover most of the case in a Pan-European level. For this to happen we need to be broad enough to cover the needs of most of the countries despite their level of current technological maturity.
- Cloud-based systems as technical solutions present a number of risks that need to be mitigated on both national as well as international levels (e.g. security, privacy etc.)
- Find common ground between engineers, politicians and administrators but also banks and the government
- Most of these things happen anyway, the shift is difficult, small practical steps can be taken



# Conclusions

- “Digital” rather than “e”-government
  - It must not be a separate thing on top of “usual” practices and processes
  - Technology is only as useful as the business change it drives
- Holistic approach is required to
  - Understand success and failure
  - Drive change
- Benefits stem from the ecosystem not from individual systems
  - Building a website is simple, getting people to use it is not
  - For traction, all stakeholders must benefit



**CONCLUSION**

# Sources

- The Future Of Identity Is Self-Sovereign And Enabled By Blockchain: <http://www.businessworld.in/article/The-Future-Of-Identity-Is-Self-Sovereign-And-Enabled-By-Blockchain/29-10-2018-163096/>
- Trust Services and Electronic identification (eID): <https://ec.europa.eu/digital-single-market/en/trust-services-and-eid>
- Discover eIDAS: <https://ec.europa.eu/digital-single-market/en/discover-eidas>
- Self-sovereign identity: Unraveling the terminology: <https://www.ibm.com/blogs/blockchain/2018/06/self-sovereign-identity-unraveling-the-terminology/>
- MyData and blockchain lead to a smarter society: <https://www.sytyke.org/ilmiot/mydata-and-blockchain-lead-to-a-smarter-society/>
- GOV.UK Verify: a secure way to prove your identity online: <https://www.digidentity.eu/en/home/>
- Estonia ranks 9th in EU for digital economy: <https://balticword.eu/estonia-ranks-9th-in-eu-for-digital-economy/>
- Digital Identity for Everyone and Everything: <https://www.hackathon.io/75387>
- How Estonia is Pioneering the Digital Identity Space: <https://medium.com/metadium/how-estonia-is-pioneering-the-digital-identity-space-4008c709fbb8>



The background features several abstract, organic shapes in shades of purple and blue. A large, irregular shape is on the right side, and a smaller circle is positioned above the main text. The shapes have a gradient effect, transitioning from light blue to dark purple.

# Thank you!

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