

# Proper digitisation as a critical success factor for effective and efficient social protection



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# About me (°1961)

- education: law, ICT, ICT auditing, management, personal coaching
- professional activities
  - Crossroads Bank for Social Security
    - 1986-1991: originator as an advisor to the Minister of Social Affairs and the Prime Minister
    - since 1991: CEO
  - Data Protection Authority
    - 1991-2022: external member
  - Federal Ministry of ICT
    - 2000-2001: originator as an advisor to the Minister of ICT (ao conception of electronic identity card)
  - Smals (non for profit operational ICT association of public institutions of social security and health)
    - since 2004: CEO (ao originator of G-Cloud initiative)
  - eHealth platform
    - 2007-2008: originator as an advisor to the Minister of Public Health
    - since 2008: CEO
    - 2020-2021: enterprise architect of Belgian information systems to fight the COVID-19 pandemic (testing, tracing, vaccination) and contributor to development of components on EU and WHO level

# Setting the scene



***Question 1:  
what do socially  
insured people,  
employers and  
policy makers  
expect ?***

A hand is shown holding a crystal ball. Inside the crystal ball, several faces of people are visible, appearing as if they are being projected or reflected. The faces include a man in a hard hat, a man in a suit, and a woman. Four callout boxes, each with a pointer directed at the crystal ball, are arranged around it. The callout boxes contain the following text: 'Effective social protection' (top left), 'Fraud prevention & repression' (top right), 'High-quality, integrated health care' (bottom left), and 'Policy support' (bottom right).

**Effective  
social  
protection**

**Fraud  
prevention  
& repression**

**High-quality,  
integrated  
health care**

**Policy  
support**

**Benefits  
automatically  
granted**

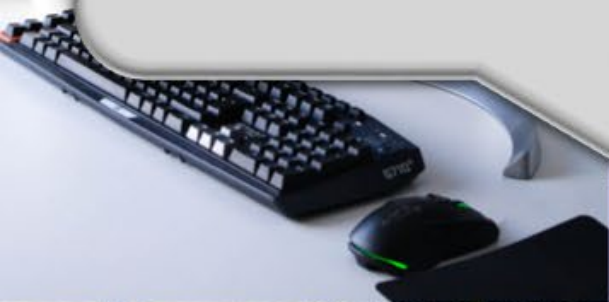
**Happy flow**



No digital divide



**Integrated  
services across  
institutions**







**Services delivered  
at the occasion of  
key life events**



**Minimal  
administrative  
burden and  
minimal cost**



**Self  
service**

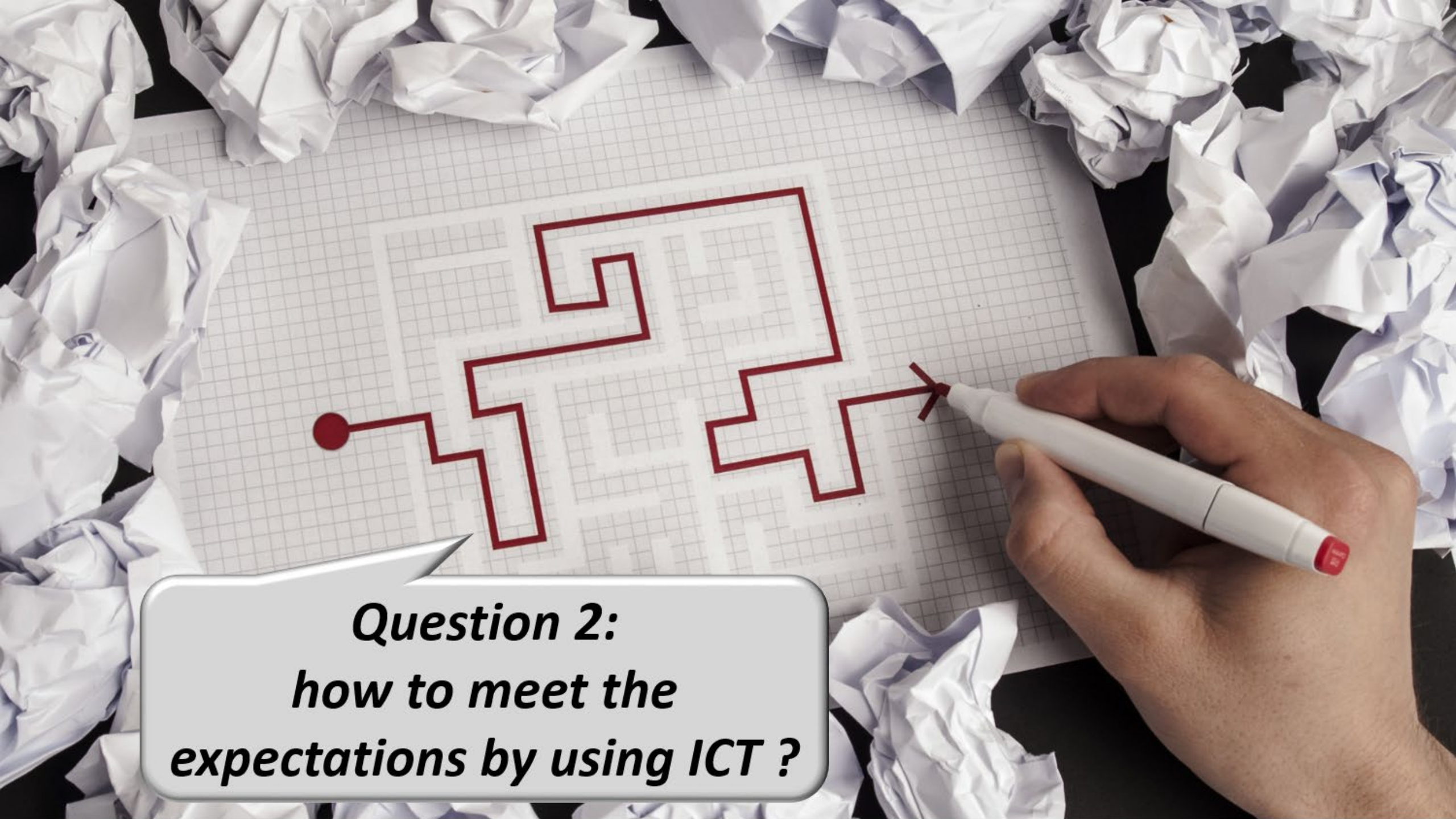


**No  
wrong  
door**

**Fair  
competition**

**Legal  
certainty**



A hand is shown drawing a red path through a maze on a sheet of graph paper. The maze is drawn on a grid, and the path starts from a red dot on the left and ends with an arrow pointing to the right. The graph paper is surrounded by many crumpled pieces of white paper, suggesting a process of trial and error or a search for a solution. The hand is holding a white marker with a red tip.

***Question 2:  
how to meet the  
expectations by using ICT ?***



**Common vision  
Co-operation**



**Only once  
collection of  
factual data**



**Multifunctional  
data use**





**Business process  
re-engineering**

A photograph showing a dark, textured surface, possibly a rock or mineral specimen, with a glowing green circular object in the center. A coin is placed below the glowing object for scale. The image is framed by wooden planks. A speech bubble in the top right corner contains the text "Authentic sources & data sharing".

**Authentic  
sources & data  
sharing**



**Security:  
confidentiality,  
availability,  
integrity**

**Risk management  
via multilayered  
measures**

**Access  
authorization  
& logging**




A young boy with a surprised expression, wearing a pink shirt and a grey vest, stands in a futuristic digital cityscape. He is holding an open book. The background is filled with binary code (0s and 1s) and glowing blue lines, suggesting a digital or data environment. In the foreground, there are three computer monitors displaying various digital content. A speech bubble on the right contains the text "Computer literacy".

Computer literacy

**Entrepreneur-  
ship**

**Corporate  
culture and  
teamwork**

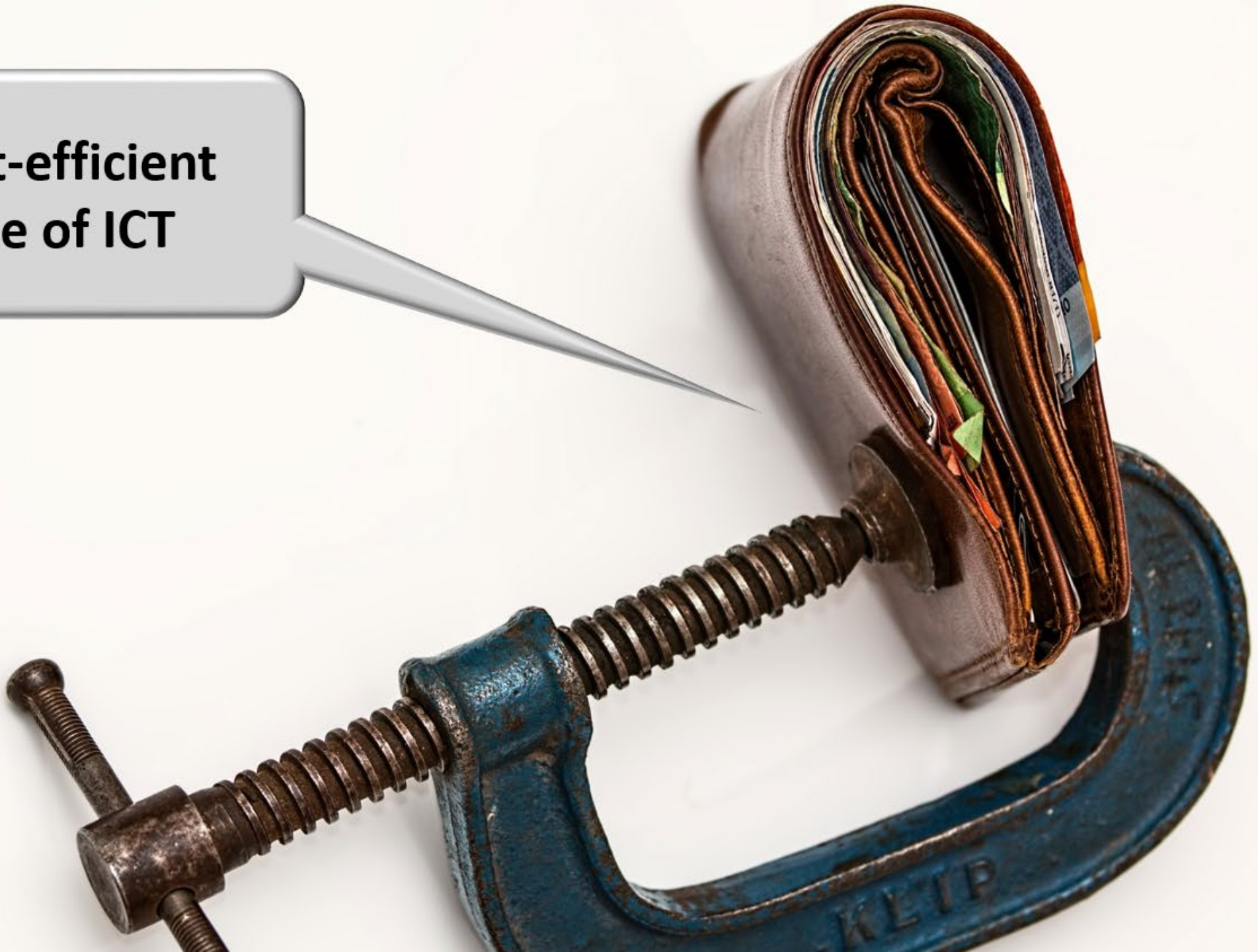


A photograph of an industrial facility at night, featuring several large, cylindrical storage tanks illuminated by warm lights. The tanks are arranged in a row, and the background shows a dark sky. A speech bubble is overlaid on the image, containing text.

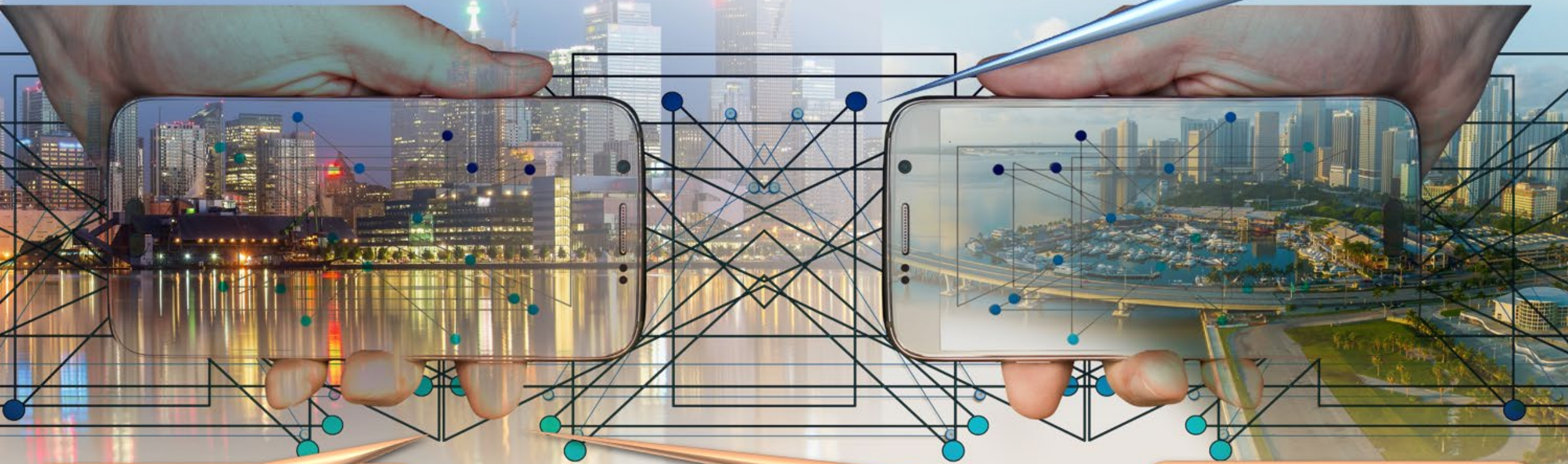
**Added value rather  
than existing legal  
competences**



**Cost-efficient  
use of ICT**



**Solid  
ICT architecture**



**Agile  
development**

**Continuous  
innovation**

**Reuse of  
components  
and services**

**API approach**





Service Oriented Architecture (SOA)  
REpresentational State Transfer (REST)

Plug & play



**Technology  
&  
policy watch**

**Mobile  
applications**



## Cloud computing

- cost reduction
- faster time to market





## Big data analysis for

- fraud prevention
- policy support
- detection of non-take up






## Artificial intelligence

- support of big data analysis
- virtual personal assistants
- machine learning



**Designate  
an institution  
as driving force**

A black and white image of a woman's face, split vertically down the middle. The left side shows her natural human features, while the right side is a dark, textured surface covered in glowing white binary code (0s and 1s). A white, stylized hand on the left points towards the human side, and a human hand on the right points towards the machine side. The background features faint, glowing circuit board patterns.

**Human  
skills**

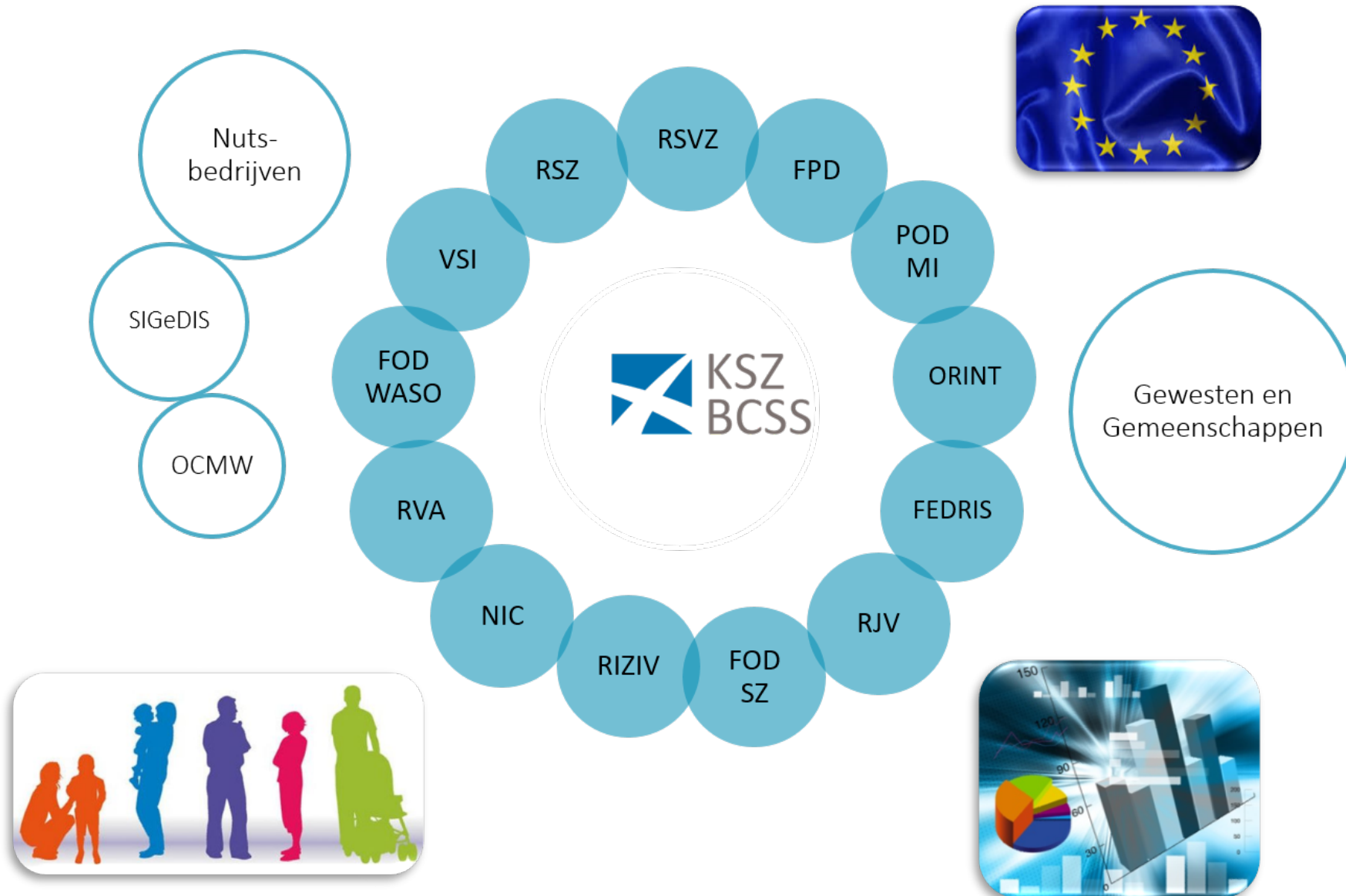
**Machine  
strength**

# Application in the Belgian social sector

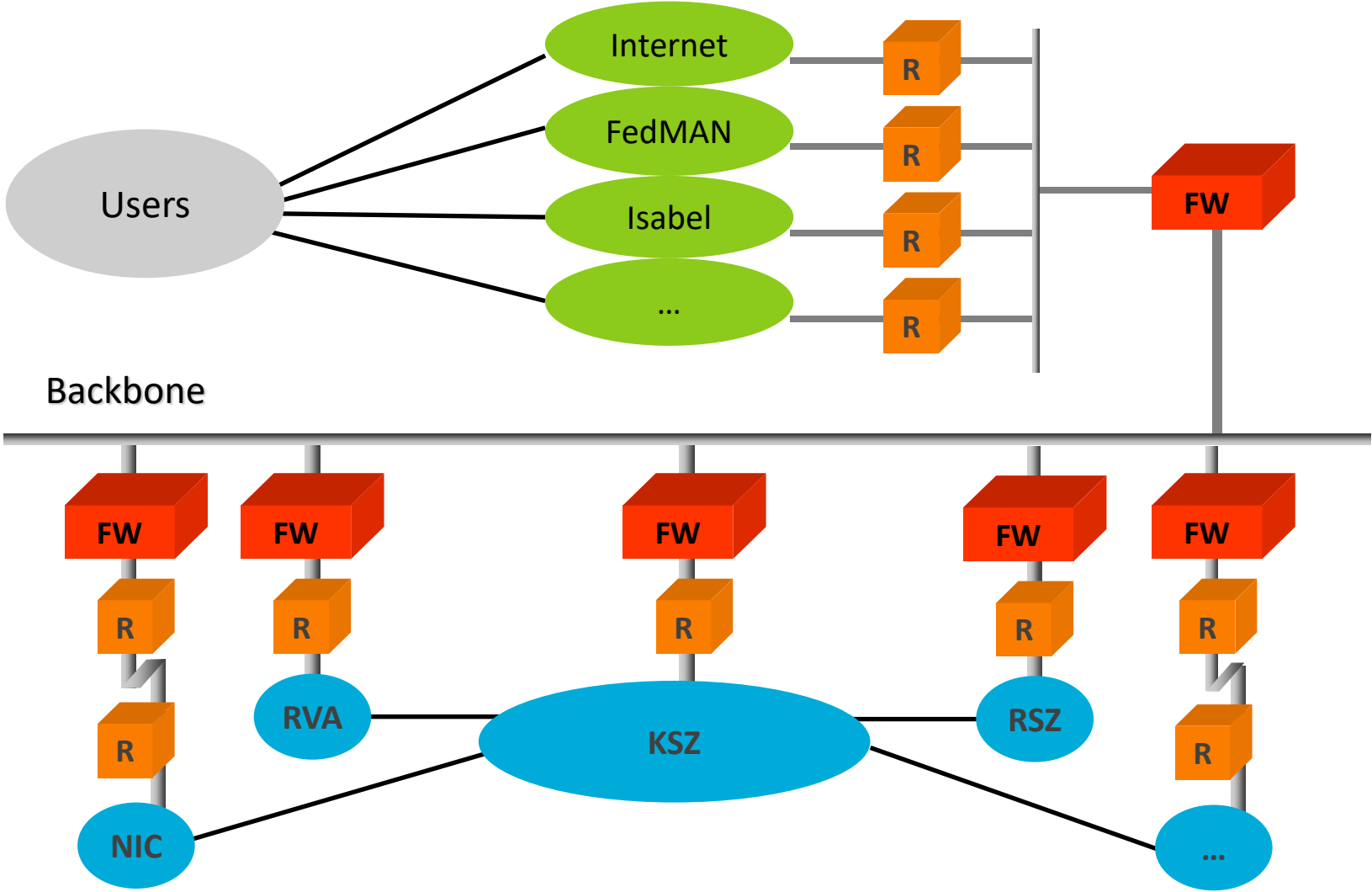
# Stakeholders of the Belgian social sector

- > 11,700,000 citizens
- > 230,000 employers
- about 3,000 public and private institutions (actors) at several levels (federal, regional, local) dealing with
  - collection of social security contributions
  - delivery of social security benefits
    - child benefits
    - unemployment benefits
    - benefits in case of incapacity for work
    - benefits for the disabled
    - re-imbusement of health care costs
    - holiday pay
    - old age pensions
    - guaranteed minimum income
  - delivery of supplementary social benefits
  - delivery of supplementary benefits based on the social security status of a person

# Kruispuntbank van de Sociale Zekerheid (KSZ)



# Crossroads Bank of Social Security (CBSS)



# Results

- no central data storage, but an agreed division of tasks between the actors within and outside the social sector with regard to collection, validation and management of information and with regard to electronic storage of information in authentic sources
- a network between all 3,000 social sector actors with a secure connection to the internet, the federal MAN, regional extranets, extranets between local authorities and the Belgian interbanking network
- a unique identification key
  - for every citizen
  - for every company
  - for every establishment of a company



# Results

- **220 electronic services for mutual information exchange** amongst actors in the social sector, defined after process optimization
  - nearly all direct or indirect (via citizens or companies) paper-based information exchange by > 800 paper forms between actors in the social sector has been abolished
  - in 2023, > 1,81 billion electronic messages were exchanged amongst actors in the social sector, which saved as many paper exchanges
- electronic services for **citizens**
  - **maximal automatic granting of benefits** based on electronic information exchange between actors in the social sector
  - **29 electronic services** via an integrated portal and/or mobile applications

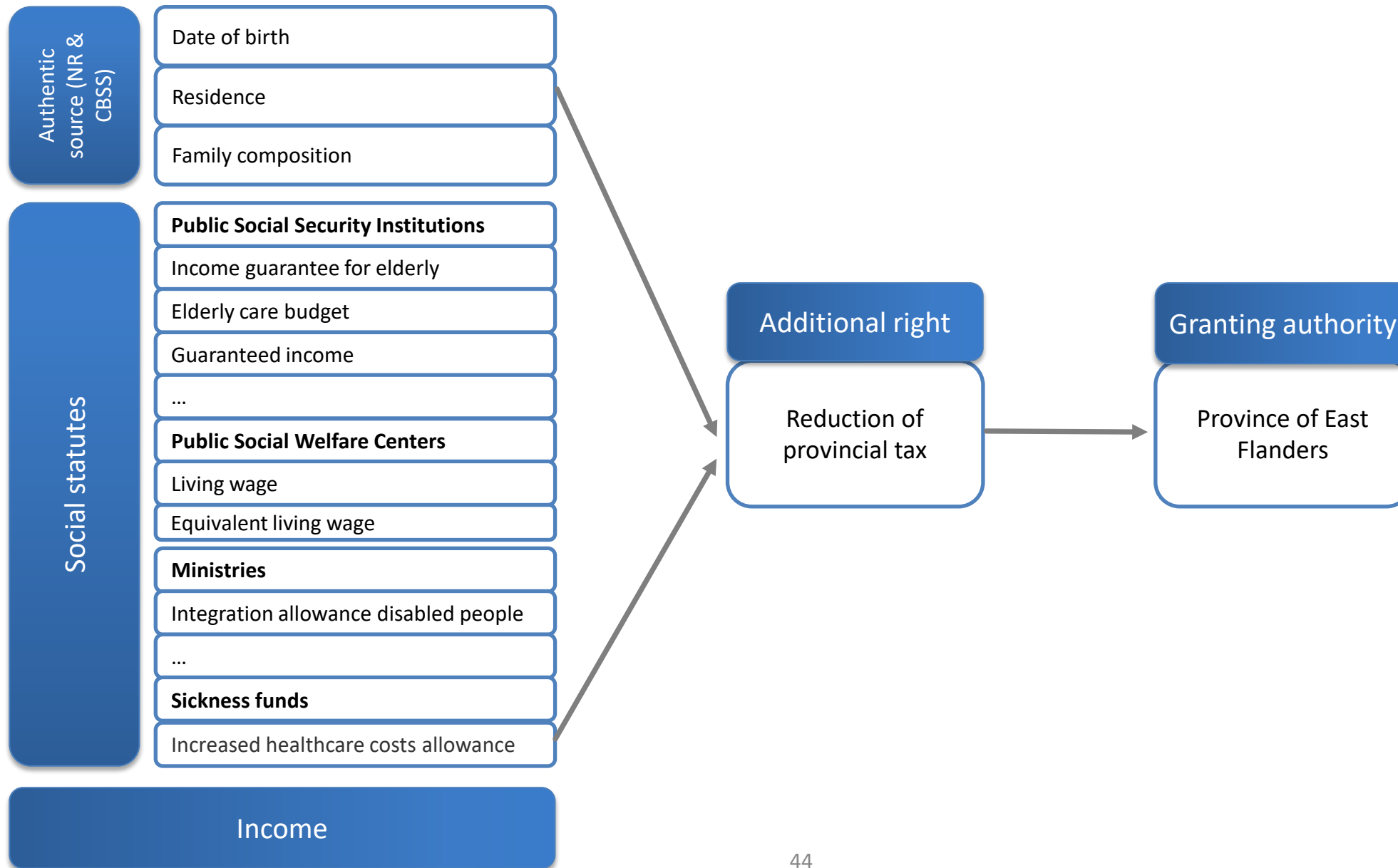
# Maximum automatic granting of additional rights

- 'social statute' for about 2 million citizens in Belgium
  - limited income
  - handicap, physical or mental disability
  - child with special needs
- citizens with social statute receive 'additional rights'
  - social rate for gas, electricity, water, telecom
  - public transport
  - housing
  - tax reduction, free waste collection
  - reduction for socio-cultural activities, sports
  - ...

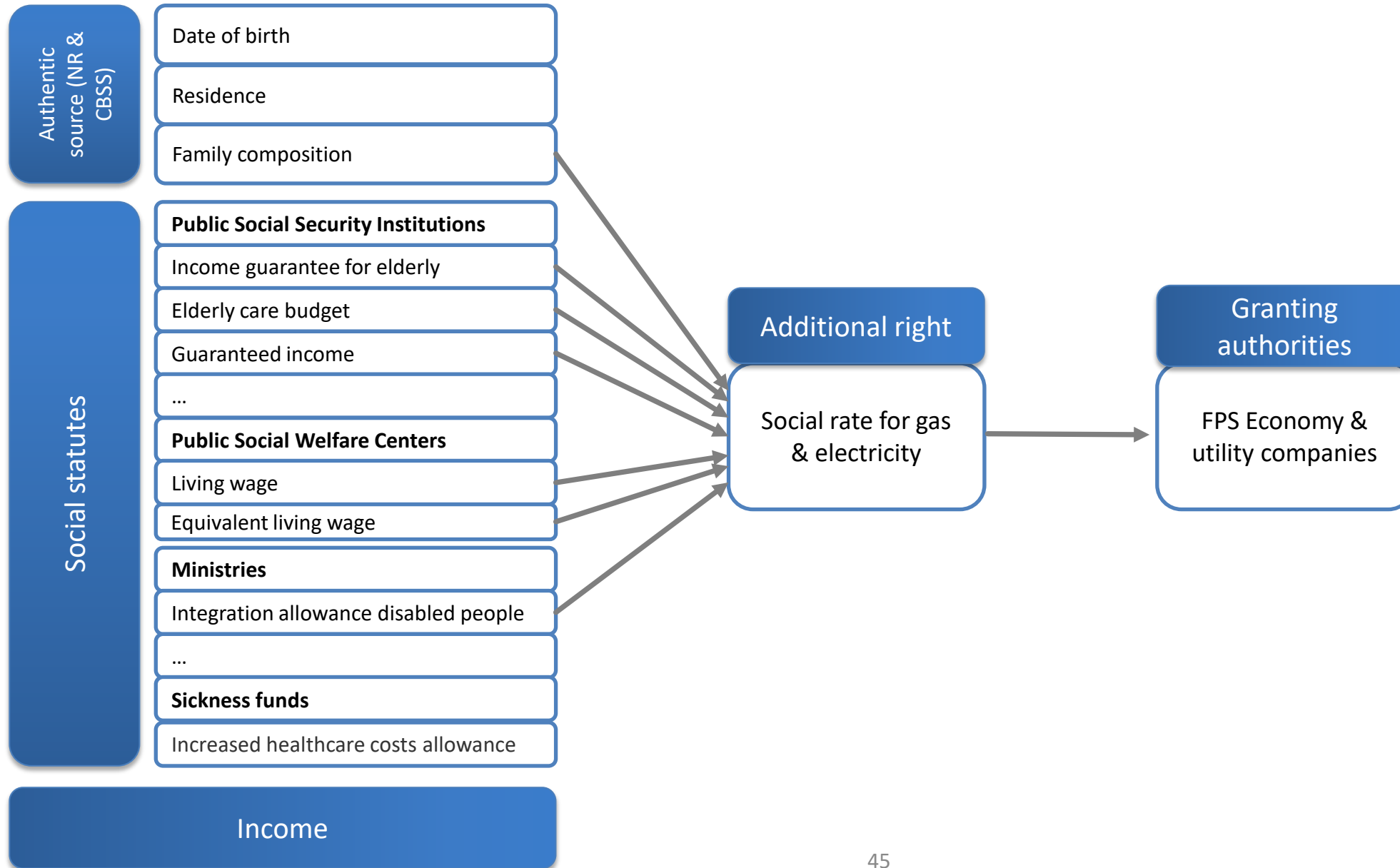
# Principles

- factual information available from one or more actor(s) is made available to other actors who, on that basis, automatically grant rights to the citizen without him/her having to submit an application for this
- standardized services to respond as much as possible to information requests and avoid/reduce multiple developments, both for the data providers (authentic sources) and for the entities granting benefits
- reduction in
  - the number of statutes used and their complexity
  - data exchanges
  - the number of administrative formalities and paper certificates requested from this vulnerable population group

# Lego brick philosophy



# Lego brick philosophy



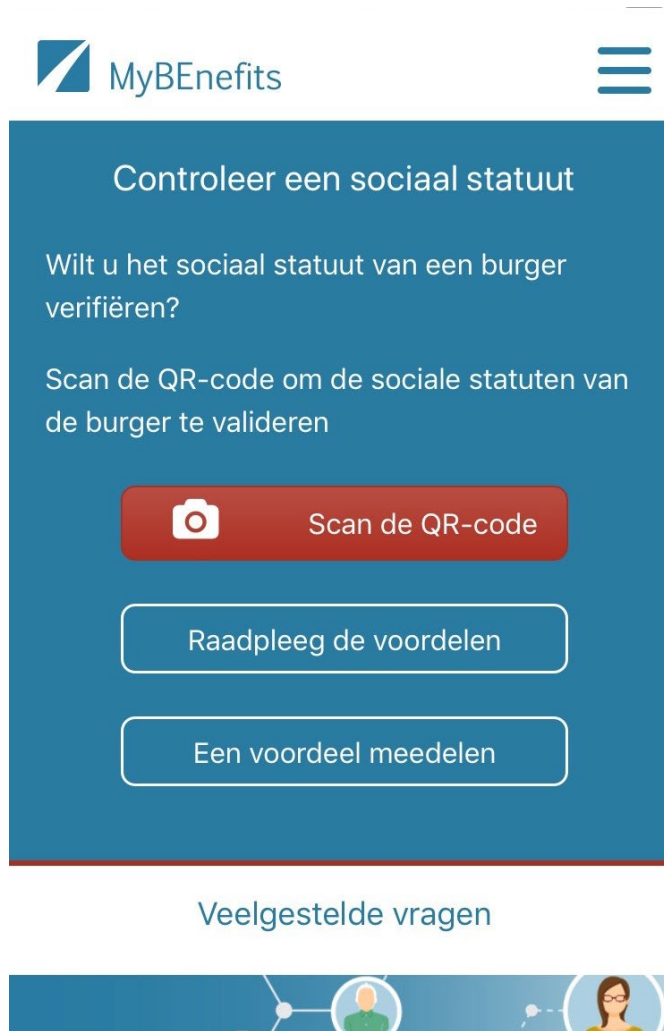
# MyBenefits

- mobile app & web application
- which allows citizens to consult and prove their social statuses on the date of the day itself in order to assert their rights with the various authorities that grant additional benefits
- which allows the awarding authority to verify the social statutes
  - actors who typically do not cooperate directly with the CBSS (e.g. sports, child care, museums, leisure centers, amusement parks, etc.)
  - actors who do not (yet) have an automatic data flow (e.g. pro bono legal assistance, municipal tax reduction, ...)
- which allows authorities granting additional benefits in the culture, sports and entertainment sector to report them, and citizens to consult them

# Citizen - consult & create code



# Professional - consult





# Professional - result





# Social security portal for citizens

Alle

Simulaties

Dossier consulteren

Internationaal

## ARTIST@WORK

Vraag een kunstenaarskaart, kunstenaarsvisum of zelfstandigheidsverklaring aan of werk je gegevens bij.

## BELGIË VERLATEN

Verlaat je België om elders te wonen, werken of studeren? Vind alles over jouw sociale zekerheid op de site 'België verlaten'.

## BEROEPSINSCHAKELINGSTIJD

Bereken de duur van je beroepsinschakelingstijd.

## BREAK@WORK

Bereken hoeveel loopbaanonderbreking, tijdskrediet of thematisch verlof je nog kan opnemen.

## CHECKINATWORK

Registreer en raadpleeg je aanwezigheid bij werken in onroerende staat.

## COMING2BELGIUM

Kom je in België wonen, werken of studeren? Vind alles over jouw sociale zekerheid op de site 'Coming2Belgium'.

## CONTROLEKAART TIJDELIJKE WERKLOOSHEID

Vul als tijdelijke werkloze je controlekaart in.

## CONTROLEKAART VOLLEDIGE WERKLOOSHEID

Vul als volledig werkloze je controlekaart in.

## DOSSIER LOOPBAANONDERBREKING EN TIJDSKREDIET

Raadpleeg je dossier loopbaanonderbreking en tijdskrediet.

## HORECA@WORK - 50DAYS

Ga na hoeveel dagen je gebruik kunt maken van een voordelige berekening van je socialezekerheidsbijdragen.

## INKOMENSGARANTIE-UITKERING

Bereken het bedrag van je inkomensgarantie-uitkering.

## INTERIM@WORK

Raadpleeg je uitzendarbeidsrelaties.

## MIJN VAKANTIEREKENING

Arbeider of kunstenaar met contract: raadpleeg je vakantierekening, beheer je rekeningnummer en download attesten.

## MIJN WERKLOOSHEIDSDOSSIER

Bekijk je werkloosheidsdossier.

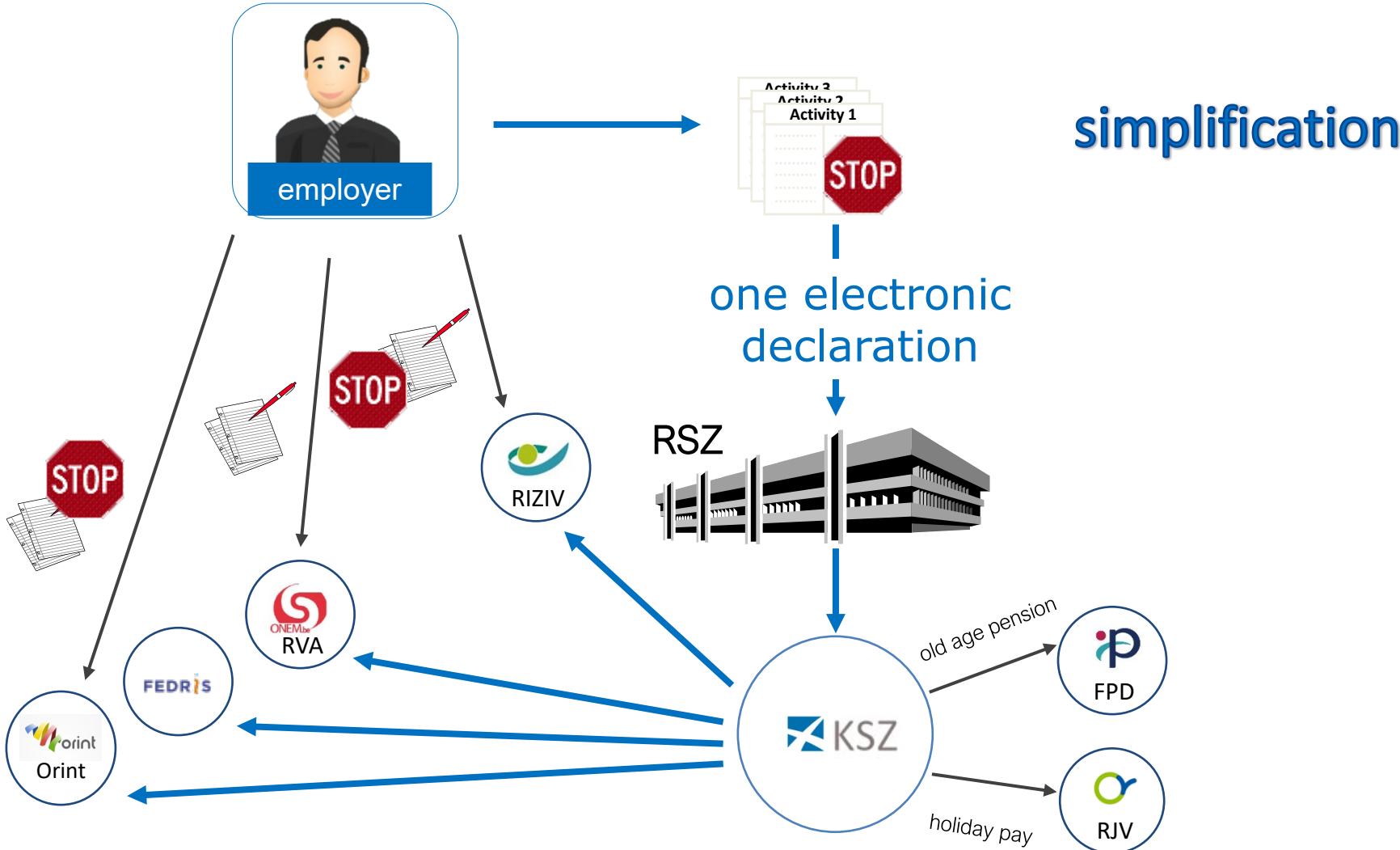
## MYBENEFITS

Toon zelf je sociale statuten aan. Raadpleeg de lijst van sociale voordelen en vul ze aan.

# Results

- more than **50 electronic services for employers**, either based on the electronic exchange of structured messages or via an integrated portal site
  - 50 social security declaration forms for employers have been abolished
  - in the remaining 30 (electronic) declaration forms the number of headings has on average been reduced to a third of the previous number
  - **declarations are limited to 3 events**
    - immediate declaration of recruitment and discharge (only electronically)
    - quarterly declaration of salary and working time (only electronically)
    - occurrence of a social risk (electronically or on paper)
  - in 2023, more than 45 million electronic declarations were made by all 230,000 employers, 98 % of which from application to application

# Quartely declaration salary & working time



# Declaration of social risks

- types of social risks
  - child benefits
  - incapacity for work ((labour) accident, (occupational) disease, ...)
  - unemployment
  - old age pension
- 3 possible moments of declaration
  - start of the social risk
  - recurrence or continuation of the social risk
  - end of the social risk
- structure of the declaration
  - identification data
  - if necessary, salary and working time data not yet declared via a quarterly declaration (mini-declaration)
  - specific data concerning the social risk

# Results

- an **integrated portal site** and mobile applications containing
  - electronic transactions for citizens, employers and professionals
  - simulation environments
  - information about the entire social security system
  - harmonized instructions and information model relating to all electronic transactions
  - a personal page for each citizen, each company and each professional
- an **integrated multimodal contact centre** supported by a customer relationship management tool
- a **data warehouse containing statistical information** with regard to the labour market and all branches of social security

# Distributed information servers

- information servers
  - directory of data subjects at the KSZ
  - basic identification data of citizens at the National Register and the complementary KSZ Register
  - basic identification data of companies at the Company Register
  - employers directory (WGR) at the RSZ
  - work force register at the RSZ
  - salary and working time database at the RSZ
  - database of contribution certificates
- services offered
  - interactive consultation
  - batch consultation
  - automatic communication of updates



# Pre-processed messages

- pre-processed messages
  - beginning/end of labour contract, beginning/end of self-employed activity
  - contribution certificates medical care (employees, self-employed, beneficiaries of social security allowances)
  - unemployment benefits
  - benefits in case of career break
  - benefits in case of incapacity for work ((labour) accident, (occupational) disease)
  - reimbursement of health care costs
  - child benefits
  - old age pensions
  - holiday pay
  - benefits for the disabled
  - guaranteed minimum income – social welfare
  - derived rights (e.g. tax reduction/exemption, free public transport, ...)
  - migrant workers
  - ...
- services offered
  - interactive consultation
  - batch consultation
  - automatic communication of messages

# Useful tool: the reference directory

- reference directory
  - directory of available services/information
    - which information/services are available at any actor depending on the capacity in which a person/company is registered at each actor
  - directory of authorized users and applications
    - list of users and applications
    - definition of authentication means and rules
    - definition of authorization profiles: which kind of information/service can be accessed, in what situation and for what period of time depending on in which capacity the person/company is registered with the actor that accesses the information/service
  - directory of data subjects
    - which persons/companies have personal files at which actors for which periods of time, and in which capacity they are registered
  - subscription table
    - which users/applications want to automatically receive what information/services in which situations for which persons/companies in which capacity

# Common vision on information management

- information is being modelled
  - in such a way that the model fits in as closely as possible with the real world
  - in order to allow multifunctional use of information
- information is collected from citizens and companies only once by the public sector as a whole
  - via a channel chosen by the citizens and the companies
  - preferably from application to application
  - and with the possibility of quality control by the supplier before the transmission of the information
- the collected information is validated once
  - according to established task sharing criteria
  - by the actor that is most entitled to it or by the actor which has the greatest interest in correctly validating it

# Common vision on information management

- a task sharing model is established indicating which actor stores which information as an authentic source, manages the information and maintains it at the disposal of the authorized users
- information can be flexibly assembled according to ever changing legal concepts
- every actor has to report probable errors of information to the actor that is designated to validate the information
- every actor that has to validate information according to the agreed task sharing model, has to examine the reported probable errors, to correct them when necessary and to communicate the correct information to every known interested actor
- once collected and validated, information is stored, managed and exchanged electronically to avoid transcribing and re-entering it manually

# Common vision on information management

- electronic information exchange can be initiated by
  - the actor that disposes of information
  - the actor that needs information
  - the organisation that manages the interoperability framework
- electronic information exchanges take place on the base of a functional and technical interoperability framework that evolves permanently but gradually according to open market standards, and is independent from the methods of information exchange
- available information is used for
  - the automatic granting of benefits
  - prefilling when collecting information

# Common vision on information security

- security, availability, integrity and confidentiality of information is ensured by integrated structural, institutional, organizational, HR, technical and other security measures according to agreed policies
- personal information is only used for purposes compatible with the purposes of the collection of the information
- personal information is only accessible to authorized actors and users according to business needs, legislative or policy requirements
- the access authorization to personal information is granted by an Information Security Committee, designated by Parliament, after having checked whether the access conditions are met
- the access authorizations are public

# Common vision on information security

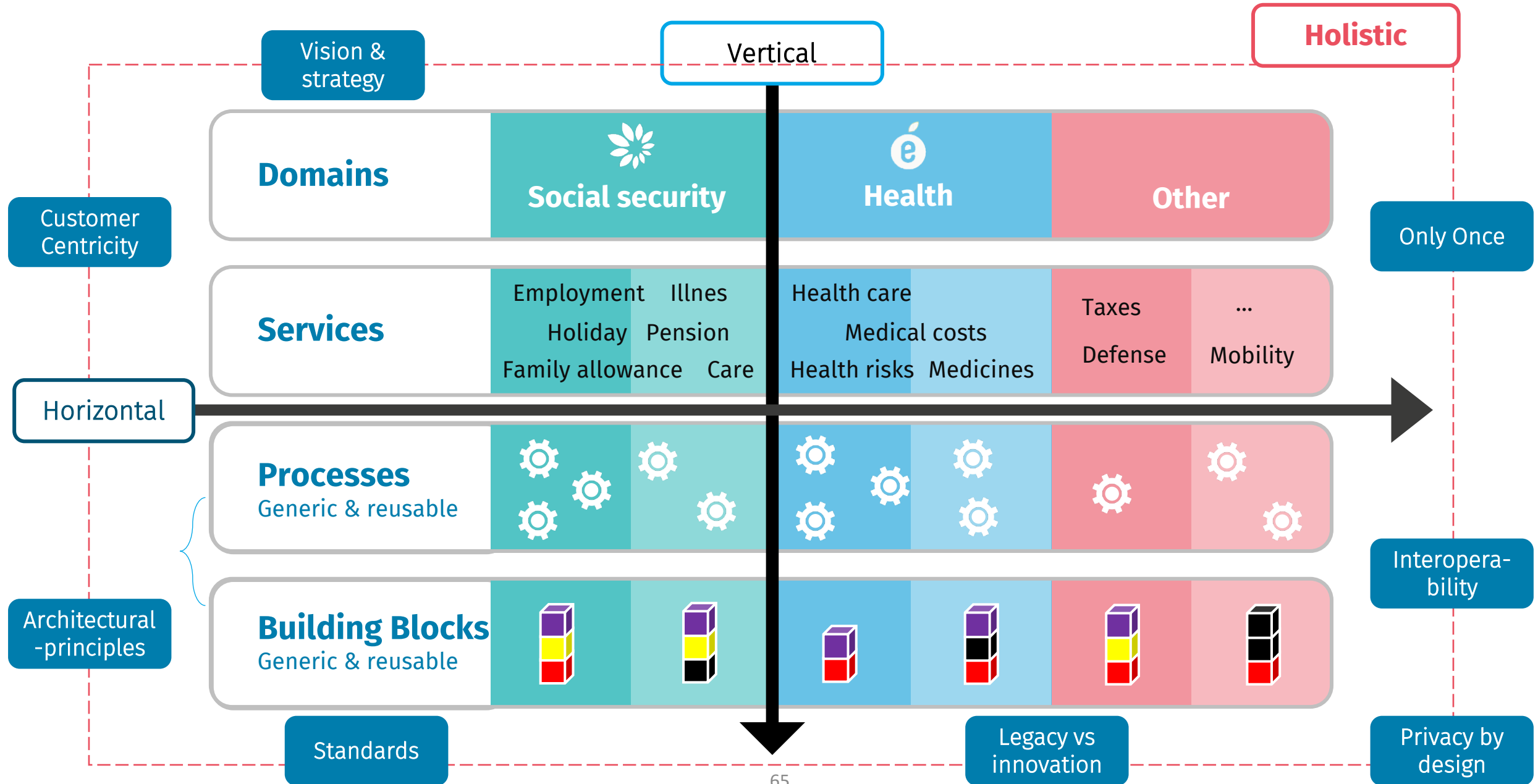
- every actual electronic exchange of personal information has to pass an independent trusted third party and is preventively checked on compliance with the existing access authorizations by that trusted third party
- every actual electronic exchange of personal information is logged, to be able to trace possible abuse afterwards
- every time information is used to take a decision, the information used is communicated to the person concerned together with the decision
- every person has right to access and correct his/her own personal data
- every actor in the social sector disposes of an information security officer with an advisory, stimulating, documentary and control task

# Useful legislative changes

- legal translation of
  - the common vision on information management
  - the common vision on information security and privacy protection
  - the obligation to use unique identification keys
- creation of a public institution (KSZ) that acts as a driving force
  - mission and tasks
  - governance
  - financing principles
- creation of a control committee on information security and privacy protection
- probative value of electronic information storage and exchange
- punishment of abuse of the system
- gradually, coordination or harmonisation of basic legal concepts
- gradually, adaptation of business processes set out in the law



# Enterprise architecture on national level: framework



# Advantages

- gains in efficiency
  - in terms of cost: services are delivered at a lower total cost due to
    - a unique information collection using a common information model and administrative instructions
    - a lesser need to re-encoding of information by stimulating electronic information exchange
    - a drastic reduction of the number of contacts between actors in the social sector on the one hand and companies or citizens on the other
    - a functional task sharing concerning information management, information validation and application development
    - a minimal administrative burden
  - according to a study of the Belgian Planning Bureau, rationalization of the information exchange processes between the employers and the social sector implies an annual saving of administrative costs of about 1.7 billion € a year for the companies

# Advantages

- gains in efficiency
  - in terms of quantity: more services are delivered
    - services are available at any time, from anywhere and from several devices
    - services are delivered in an integrated way according to the logic of the customer
  - in terms of speed: the services are delivered in less time
    - benefits can be allocated quicker because information is available faster
    - waiting and travel time is reduced
    - companies and citizens can directly interact with the competent actors in the social sector with real time feedback

# Advantages

- gains in effectiveness: better social protection
  - in terms of quality: same services at same total cost in same time, but to a higher quality standard
  - in terms of type of services: new types of services, e.g.
    - push system: automated granting of benefits
    - active search of non-take-up using data warehousing techniques
    - controlled management of own personal information
    - personalized simulation environments
- better support of social policy
- more efficient combating of fraud

# International perspective

# Let's not reinvent the wheel, but work together

- share and reuse existing assets
  - common vision on information management and information security
  - data modelling
  - business processes
  - software components and API's
  - procurement and licences
  - infrastructure
- align and collaborate
  - promote and rely on mature business concepts
  - enforce proven semantic, technical and security standards
  - share knowledge and techniques
  - exchange good practices
  - co-creation with all actors involved

# Some basic international requirements

- correct identification of every entity (citizens, companies, organisations, ...)
- correct routing of information request/provision
- privacy and information security management
  - user and access management
  - end-to-end encryption
- interoperability standards
  - technical
  - semantic

# Service Oriented Architecture (SOA)

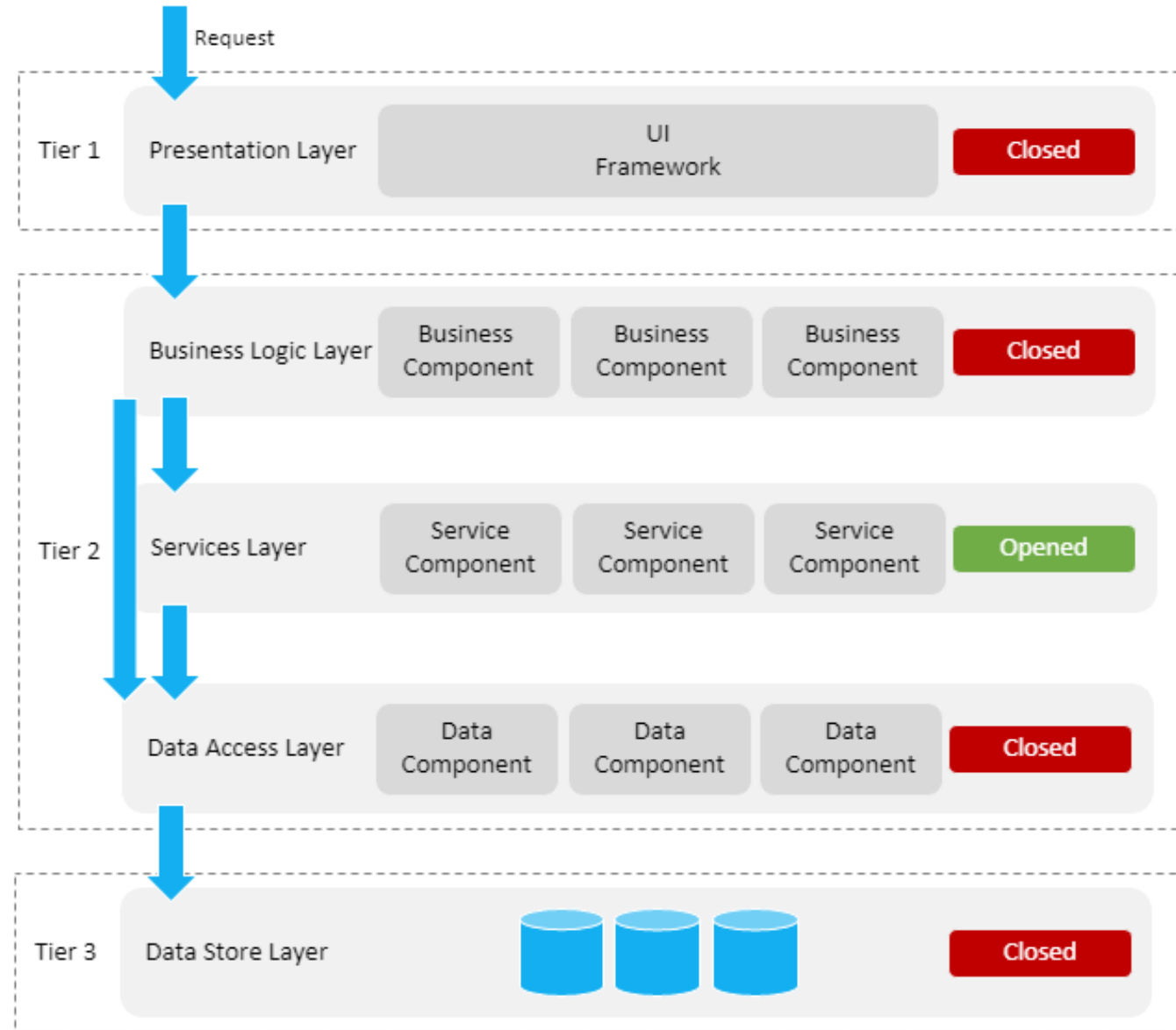
- what ?

“Service Oriented Architecture (SOA) is a paradigm for organizing and utilizing **distributed** capabilities that may be **under the control of different ownership domains**. It provides a uniform means to offer, discover, interact with and use capabilities to produce desired effects consistent with measurable preconditions and expectations. This style of architecture **promotes reuse** at the macro (service) level rather than micro levels (eg. objects). It also **makes interconnection** of existing ICT assets **trivial**” (OASIS Reference Group)
- characteristics
  - service-oriented
  - modular
  - interoperable (based on open standards or open specifications)
  - extensible
  - layered
  - based on reuse of components and data



# Layered, service oriented architecture

- presentation layer, e.g.
  - web applications
  - mobile applications
- business logic layer, e.g.
  - workflow
- services layer, e.g.
  - user & access management service
  - communication service
  - blockchain
- data store layer, e.g.
  - authentic sources
  - personal vaults
  - local storage on mobile device



# Across layers

- interoperability standards
  - technical: oa APIs (Application Programming Interface)
  - semantic
- security, eg
  - access authorisation
  - logging
  - business continuity
- configuration, eg
  - capacity management
  - load balancing

# Advantages of layered, service oriented architecture

- multifunctional reuse possibility
  - lower cost
  - higher quality
  - quicker time to market
  - better user experience
- reduced dependency of components
  - easier and less costly maintenance
- easier unit testing because each component can be tested individually
  - but need for sound integration and performance testing

# Several EC digital programs

- Electronic Identification and Trust Services (eIDAS)
- European Blockchain Services Infrastructure (EBSI)
  - Conformant Wallets
  - Verifiable Credentials Framework
- Single Digital Gateway (OOTs)
- Electronic Exchange of Social Security Information (EESSI)
- European Social Security Pass (ESSPass)
- EU Digital COVID Certificate (EU DCC)
- European Health Data Space (EHDS)
- European Health Data Evidence Network (EHDEN)
- ...

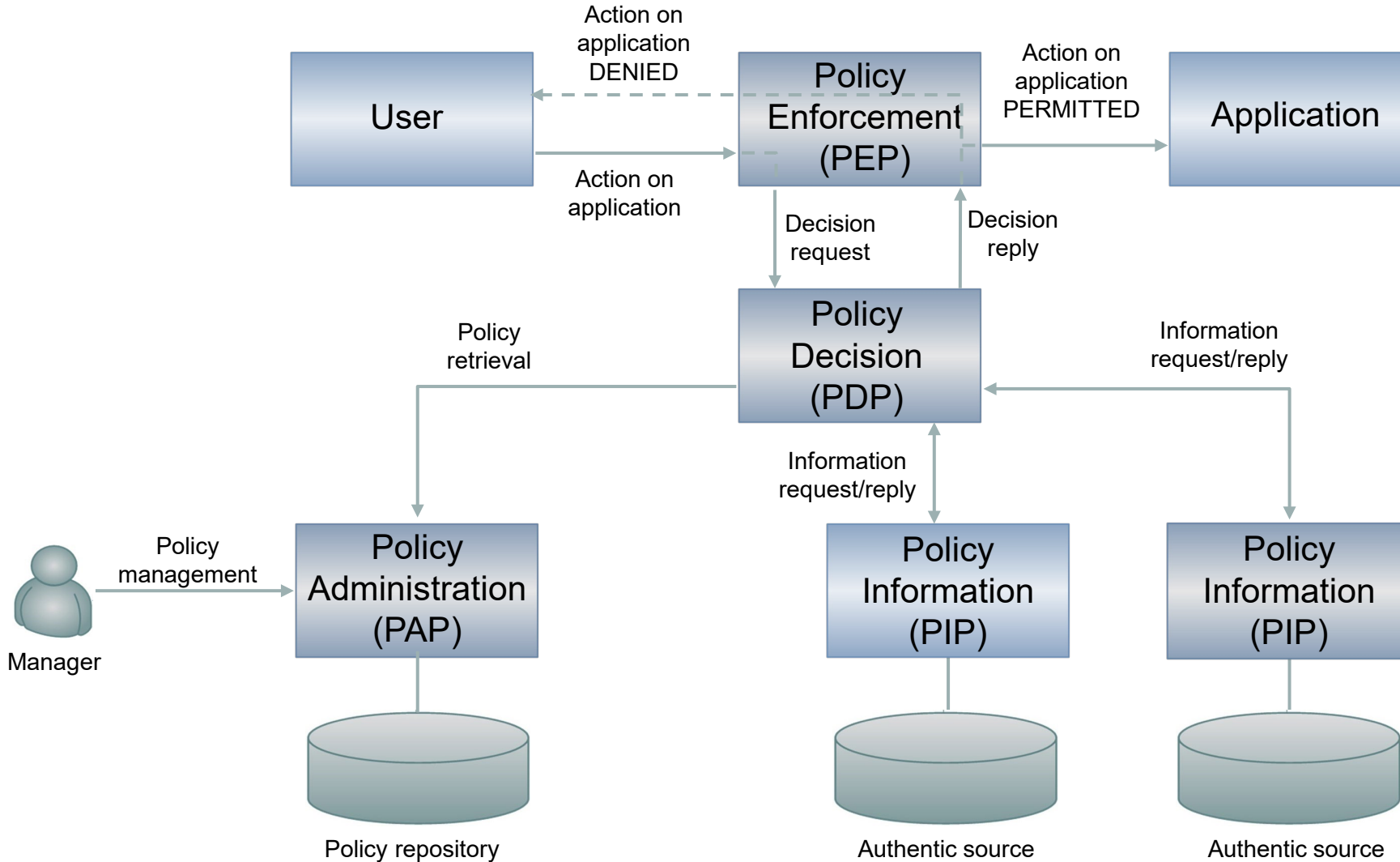
# Need for a global, integrated architecture

- need for
  - global, integrated architecture across DGs of the European Commission
  - based on a common conceptual framework
- need for modular, generic, domain agnostic, interoperable and reusable components/services: develop once, use many
- no technology driven choice of components and services used, but use of ICT components and services as enabler and means for meeting business requirements
- need for the organisation of a set of integrated services on a paneuropean level

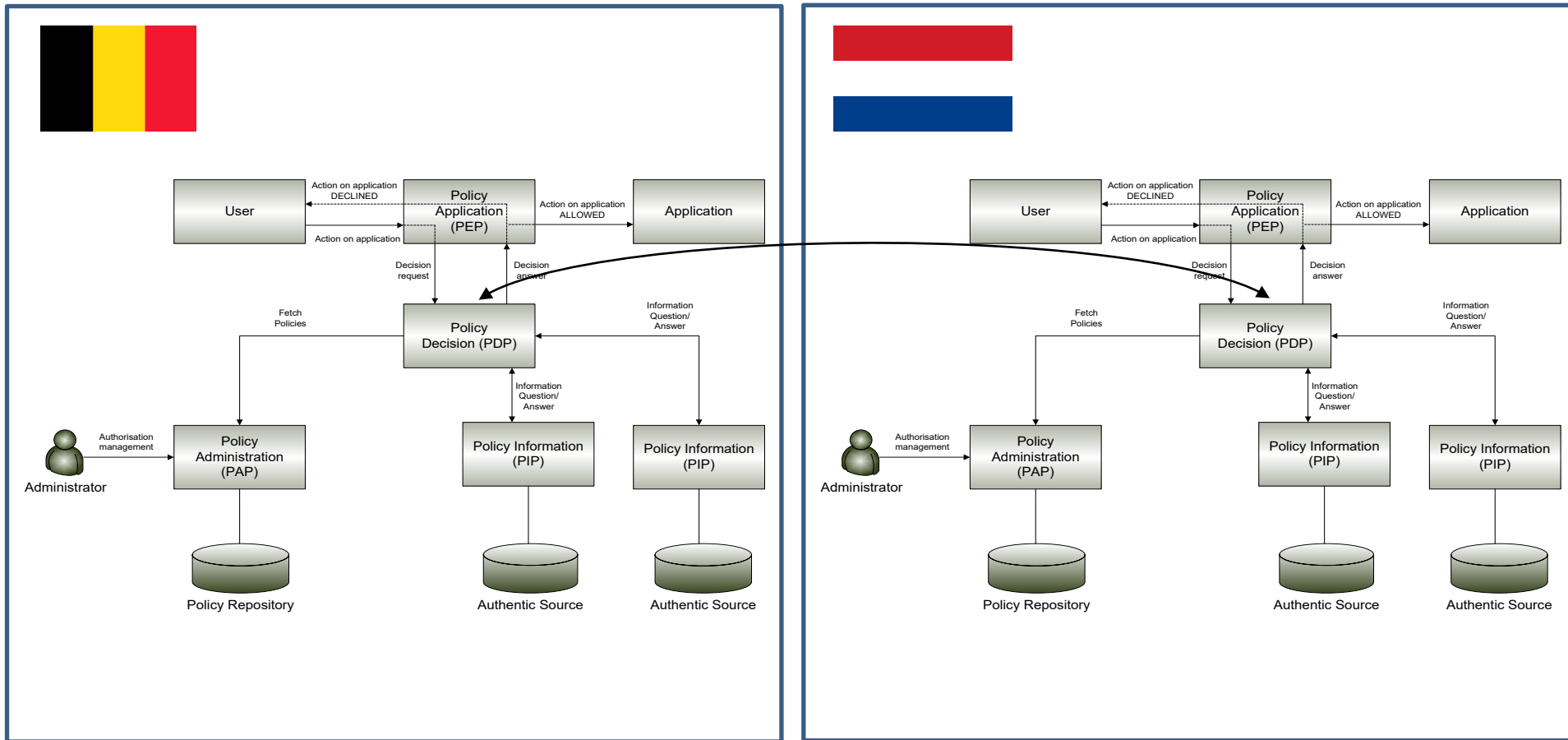
# Example: identity, user & access management (IUAM)

- objectives to be reached: to be able to (digitally)
  - **identify** all relevant entities (physical persons, companies, applications, machines, ...)
  - **authenticate the identity** of all entities
  - know the **relevant characteristics** of the entities
  - know the **relevant relationships** between entities
  - know that an entity has been **mandated** by another entity to perform a legal action
  - know the **authorizations** of the entities
- in a sufficiently certain and secure way
- in as much relations as possible (C2C, C2B, C2G, B2B, B2G, ...)
- multichannel (web application, mobile application, ...)
- using open interoperability standards

# Policy Enforcement Model (XACML)



# User and access management







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