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ISACA

NOREA
DE BEROEPSORGANISATIE VAN IT-AUDITORS

Roundtable Access Governance

13-09-2023

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SonicBee

SonicBee in short

Our vision:
Bring together and automate the data-driven world

Our drive:
Help organisations to use data to be better equipped to take decisions, enhance the customer experience and lower costs in a secure an compliant way of working

30

IAM business experts & growing fast

Locations:

Amsterdam (NL)
Regensburg (DE)

International (EU) growth ambitions

Founded

2020

By Patrick, André & Anne

Unique business oriented IAM Advisory Services and portfolio

ISO 27001 Certified

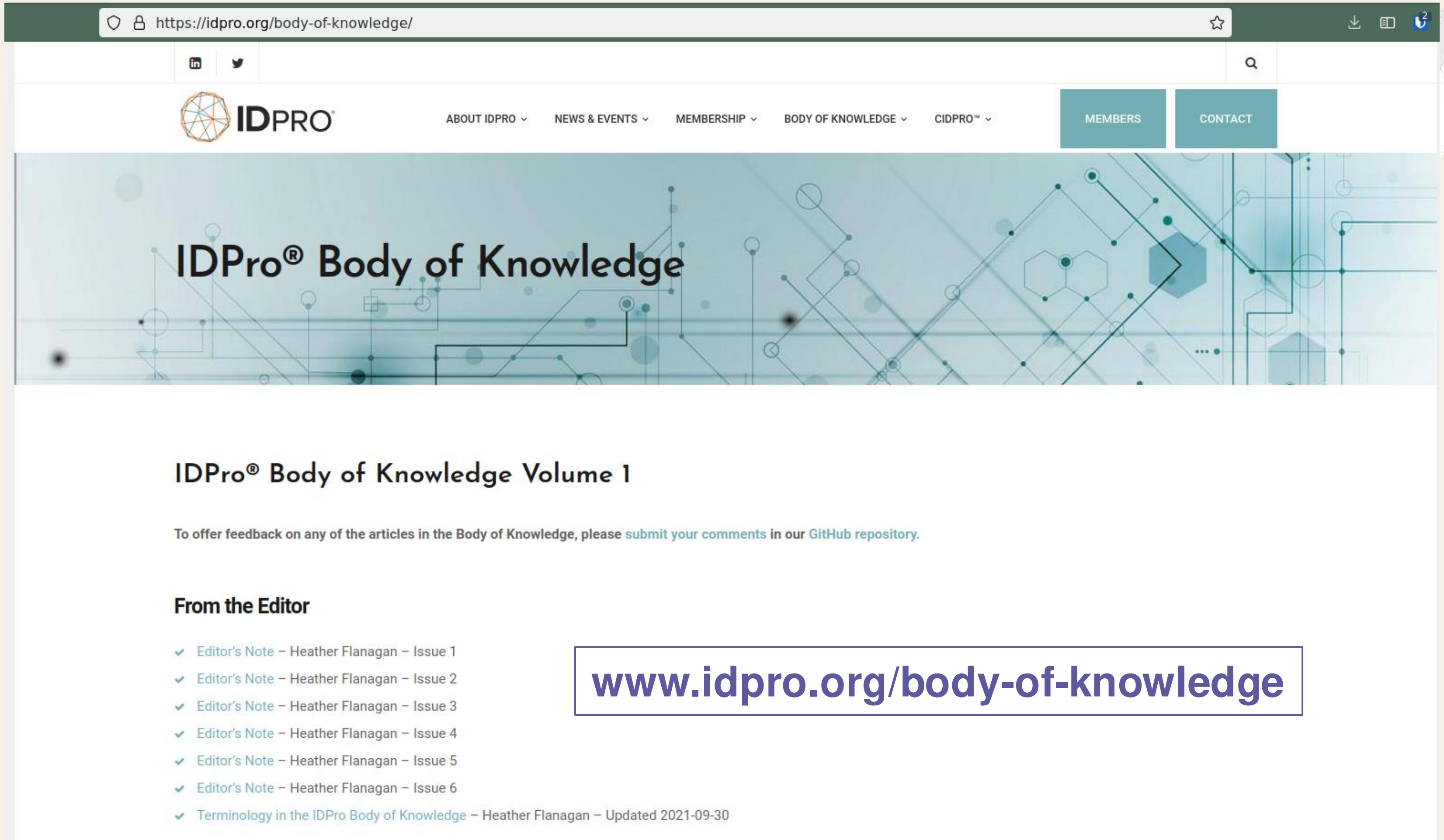
SaaS developments:

NEXIS PlatinumPartner

SynerBee

SonicBee

IDPro



IDPro® Body of Knowledge Volume 1

To offer feedback on any of the articles in the Body of Knowledge, please submit your comments in our GitHub repository.

From the Editor

- Editor's Note – Heather Flanagan – Issue 1
- Editor's Note – Heather Flanagan – Issue 2
- Editor's Note – Heather Flanagan – Issue 3
- Editor's Note – Heather Flanagan – Issue 4
- Editor's Note – Heather Flanagan – Issue 5
- Editor's Note – Heather Flanagan – Issue 6
- Terminology in the IDPro Body of Knowledge – Heather Flanagan – Updated 2021-09-30

www.idpro.org/body-of-knowledge

Typical audit findings in identity and access audits can include:

1. Inactive or Orphaned User Accounts:

   Finding user accounts that are no longer in use or associated with any active employees or contractors. These accounts should be disabled or removed to reduce security risks.

2. Excessive Permissions:

   Identifying users with unnecessary or overly permissive access rights to systems, data, or applications. This can pose a security risk, as it increases the potential for misuse or data breaches.

3. Inadequate Access Controls:

   Discovering instances where proper access controls and segregation of duties are not in place. This includes situations where individuals have access to both sensitive and conflicting roles or data.

4. Unauthorized Access:

   Uncovering instances of unauthorized access to systems or data, potentially indicating security breaches or insider threats.

5. Weak Password Policies:

   Identifying weak password policies, such as easily guessable passwords, lack of password complexity requirements, or insufficient password rotation rules.

6. Lack of Multi-Factor Authentication (MFA):

   Noting situations where MFA is not implemented for systems or applications that require an extra layer of security for user authentication.

7. Inadequate User Account Monitoring:

   Discovering deficiencies in monitoring and auditing user account activity and access logs, which can make it difficult to detect unauthorized or suspicious activities.

Typical audit findings in identity and access audits can include:

1. Unapproved Access Requests:
   Finding instances where access requests and approvals are not properly documented or authorized according to company policies and procedures.
2. Incomplete Documentation:
   Identifying gaps in documentation related to user access, roles, permissions, and changes, making it challenging to trace access and changes in the system.
3. Lack of Training and Awareness:
   Observing situations where employees or users are not adequately trained or informed about security best practices and policies, which can lead to security lapses.
4. Outdated Access Reviews:
   Finding that periodic reviews of user access privileges are not conducted or are not up-to-date, potentially leading to inappropriate access over time.
5. Missing Disaster Recovery and Business Continuity Plans:
   Noting that plans for managing identity and access during disasters or incidents are inadequate or missing, posing a risk to business operations.
6. Vendor and Third-Party Access:
   Discovering weak controls or unmonitored access granted to vendors, third-party contractors, or service providers, which can introduce security vulnerabilities.
7. Compliance Violations:
   Identifying instances where the organization fails to comply with regulatory requirements or internal security policies related to identity and access management.

The training program

- Scope of IAM
- IAM is IT...?
- Traditional IAM: JML, ACL, RBAC
- Future of IAM: PBAC and zero trust, impact on audit

IAM – What is that?

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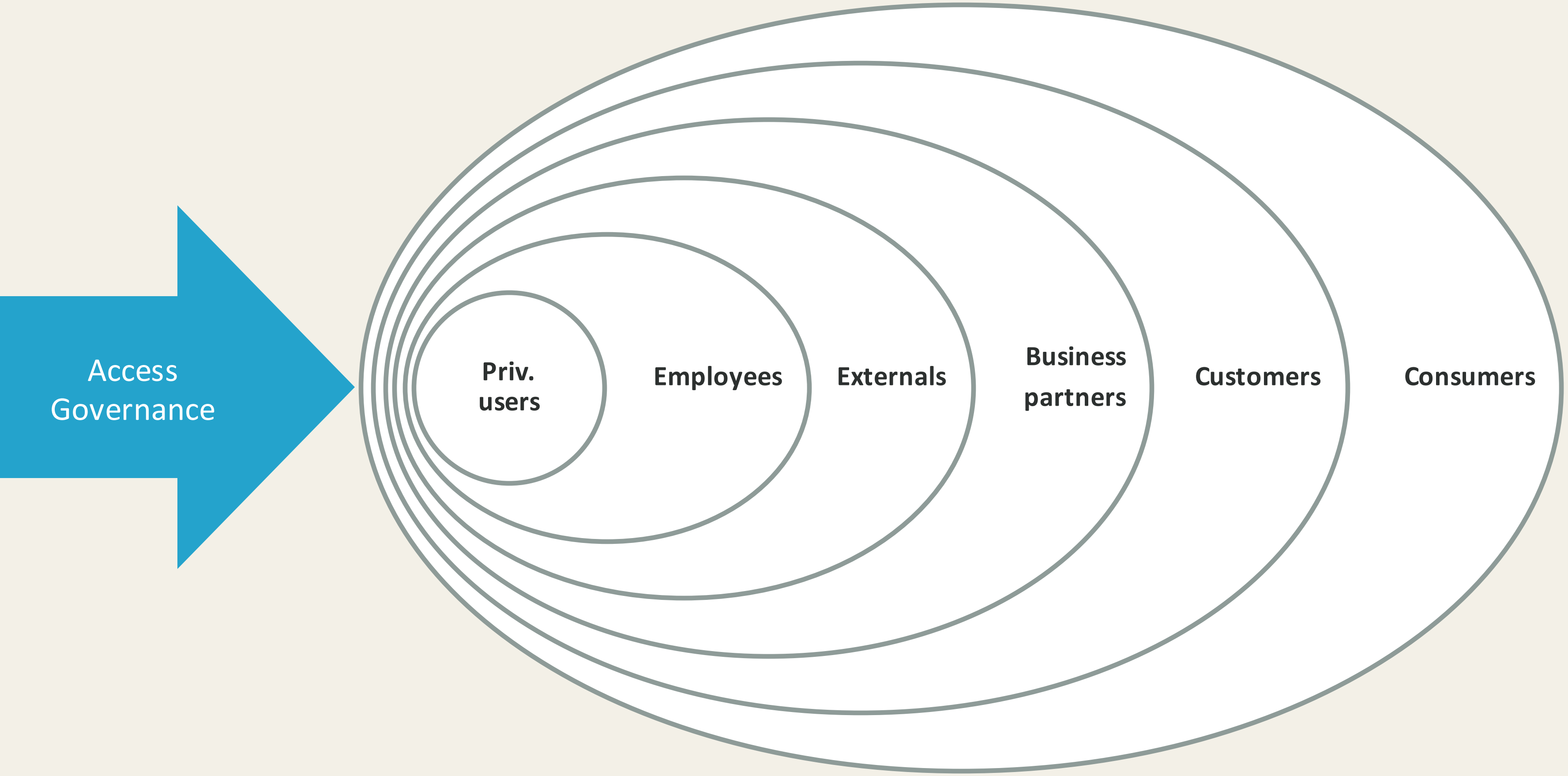
Identity management and access control



Industrial internet

Wearables

Connected homes

Transportation

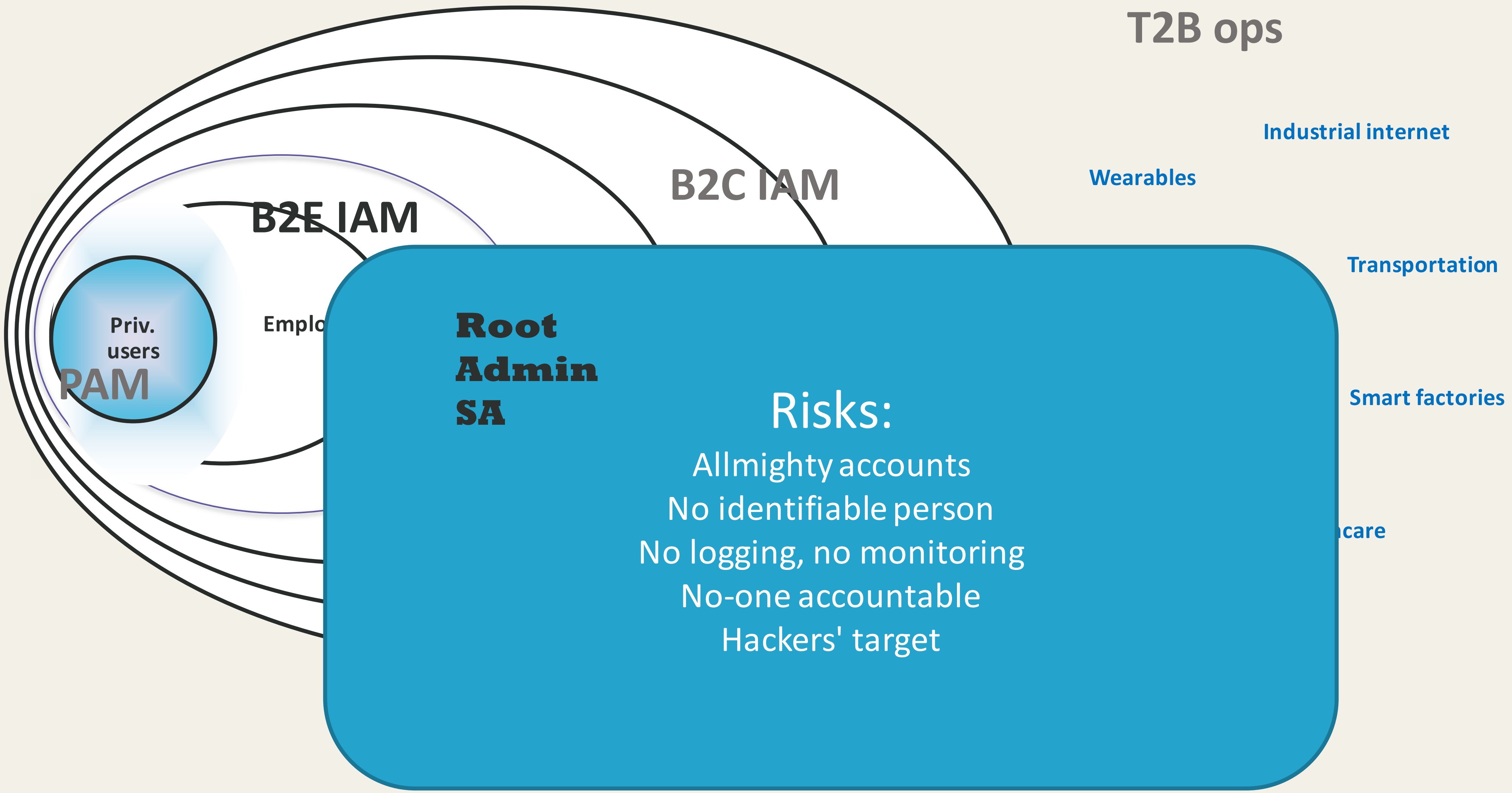
Connected cities

Smart factories

Connected cars

Healthcare

Scope of PAM

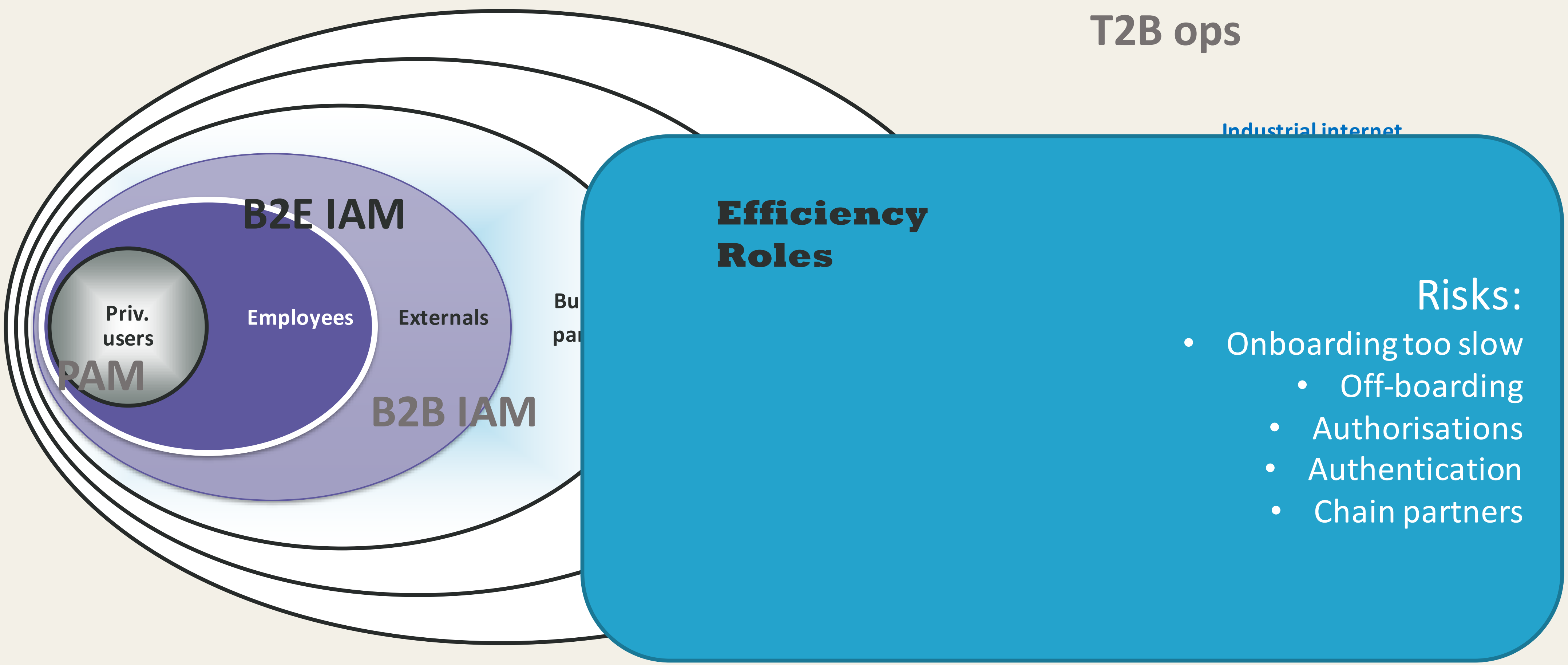


Root
Admin
SA

Risks:

Allmighty accounts
No identifiable person
No logging, no monitoring
No-one accountable
Hackers' target

Scope of Internal IAM



Efficiency
Roles

Risks:

- Onboarding too slow
- Off-boarding
- Authorisations
- Authentication
- Chain partners

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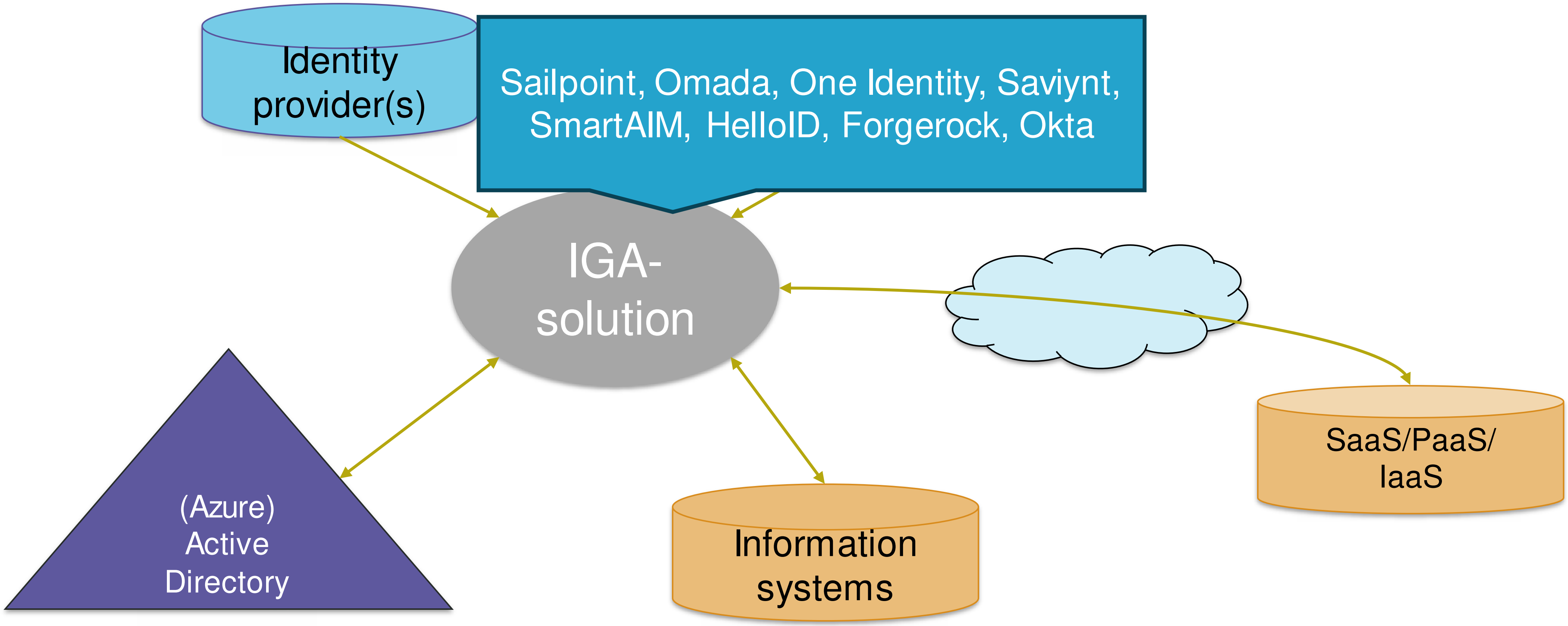
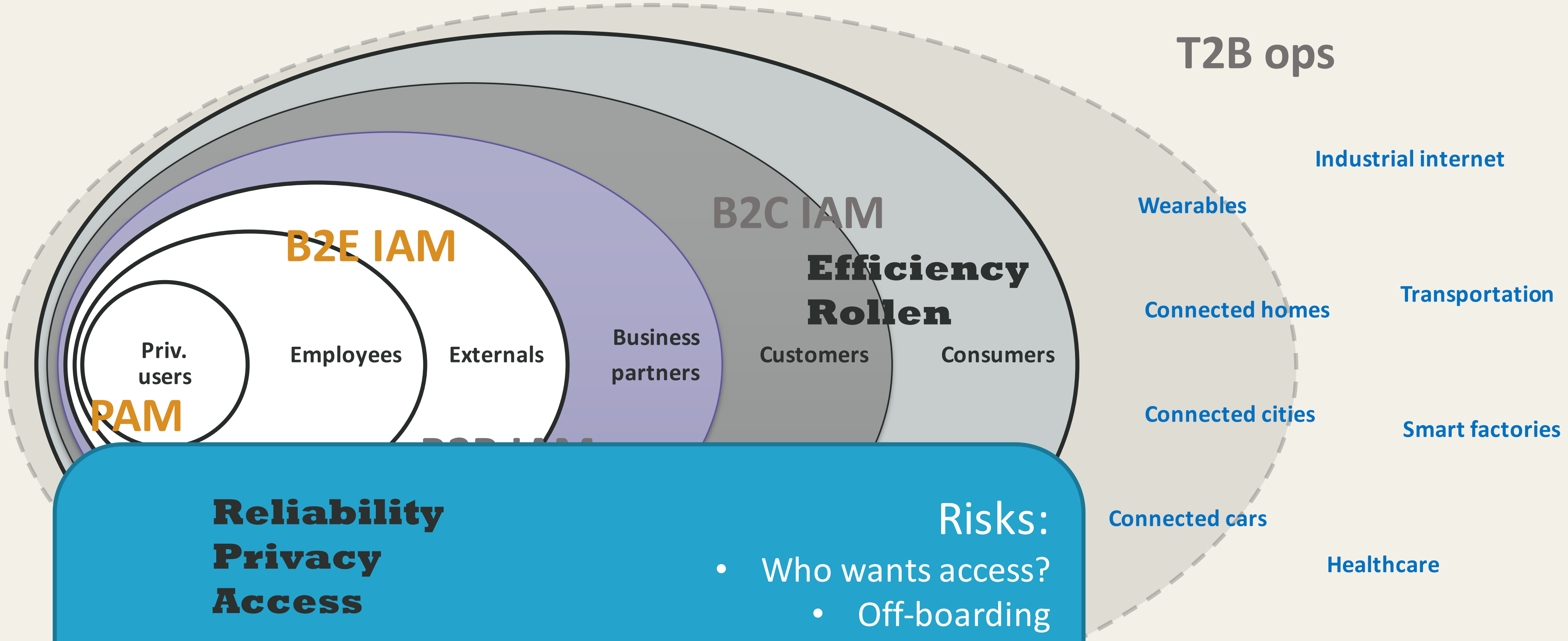
Workforce IAM Reference Architecture



Scope of External IAM



Reliability
Privacy
Access

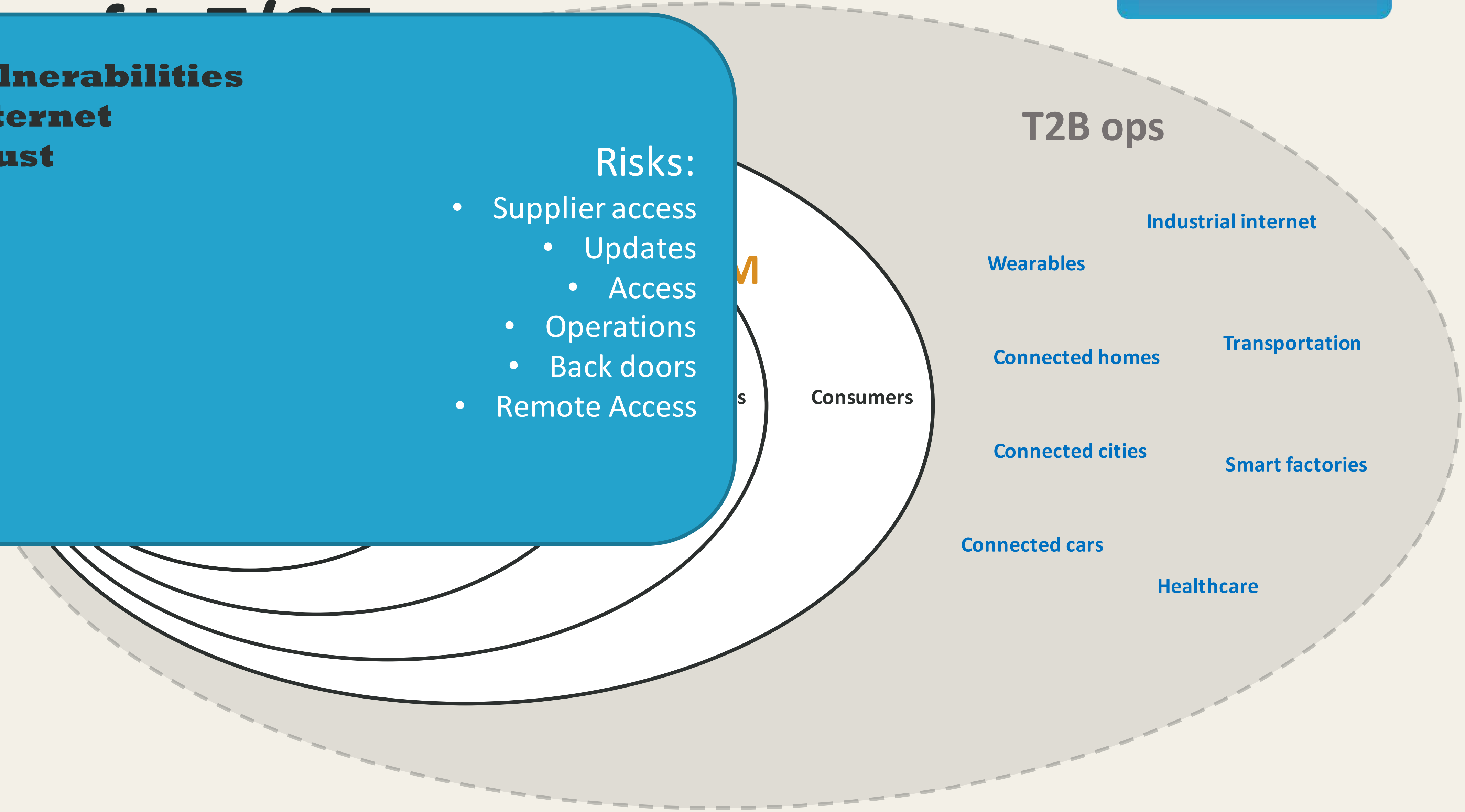
Risks:

- Who wants access?
  - Off-boarding
  - Authorisation
  - Authentication
- Vendors and suppliers
  - Remote Access

Vulnerabilities
Internet
Trust

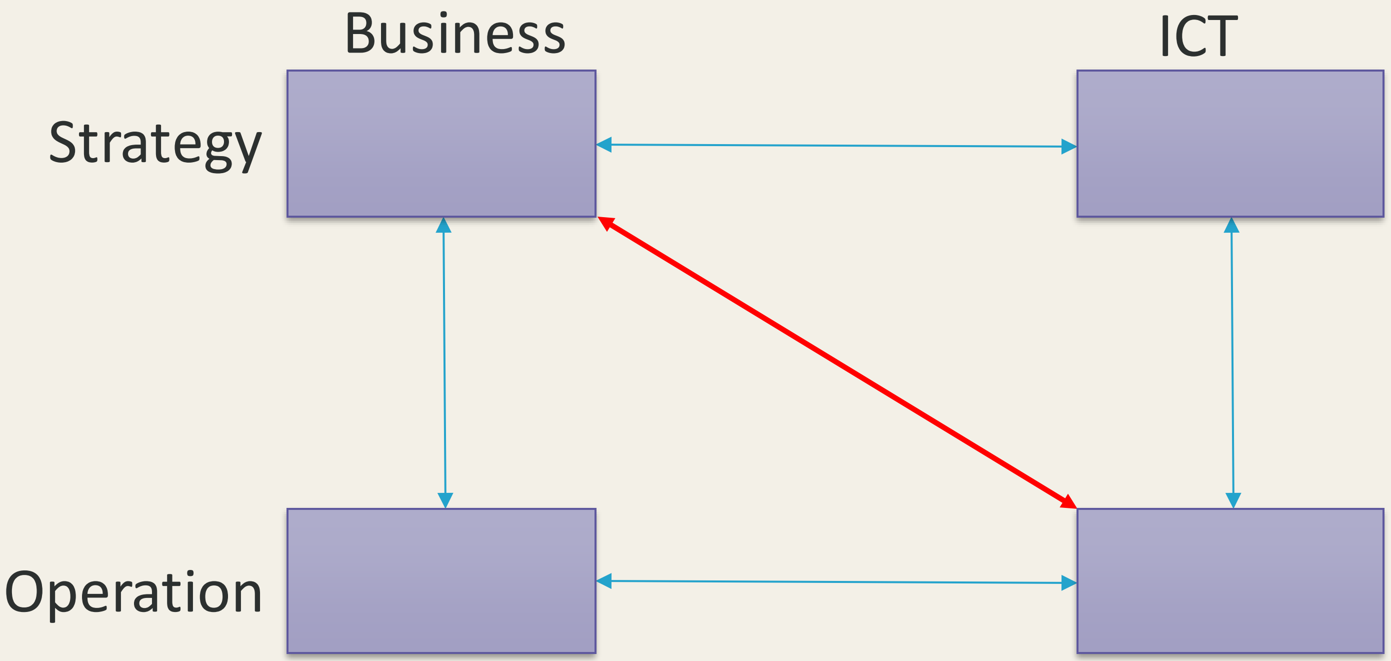
Risks:

- Supplier access
- Updates
- Access
- Operations
- Back doors
- Remote Access



Strategic alignment

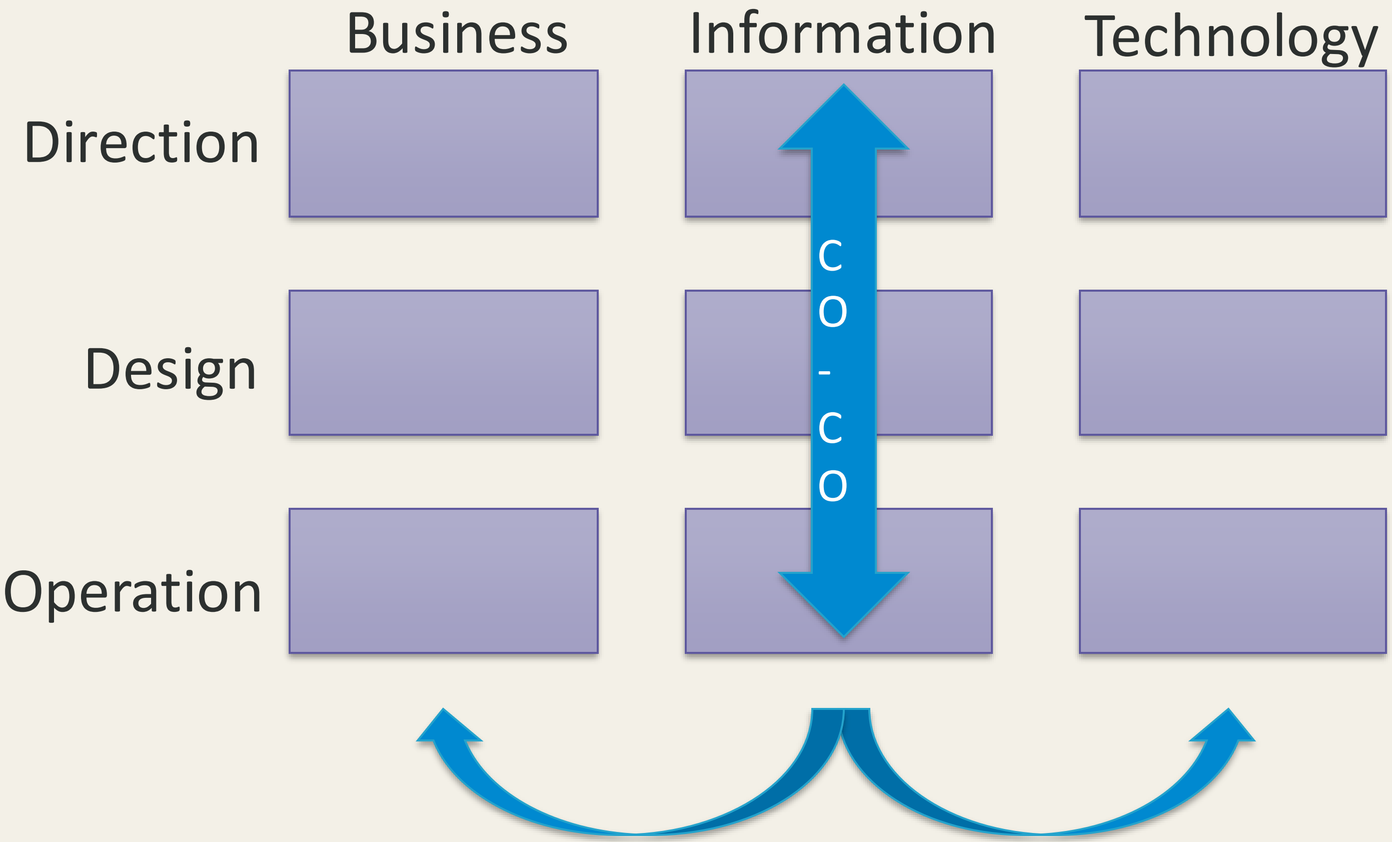
Henderson - Venkatraman



Amsterdam information model

	Business	Information	Technology
Direction			
Design			
Operation			

Amsterdam information model



Business

Information

Technology

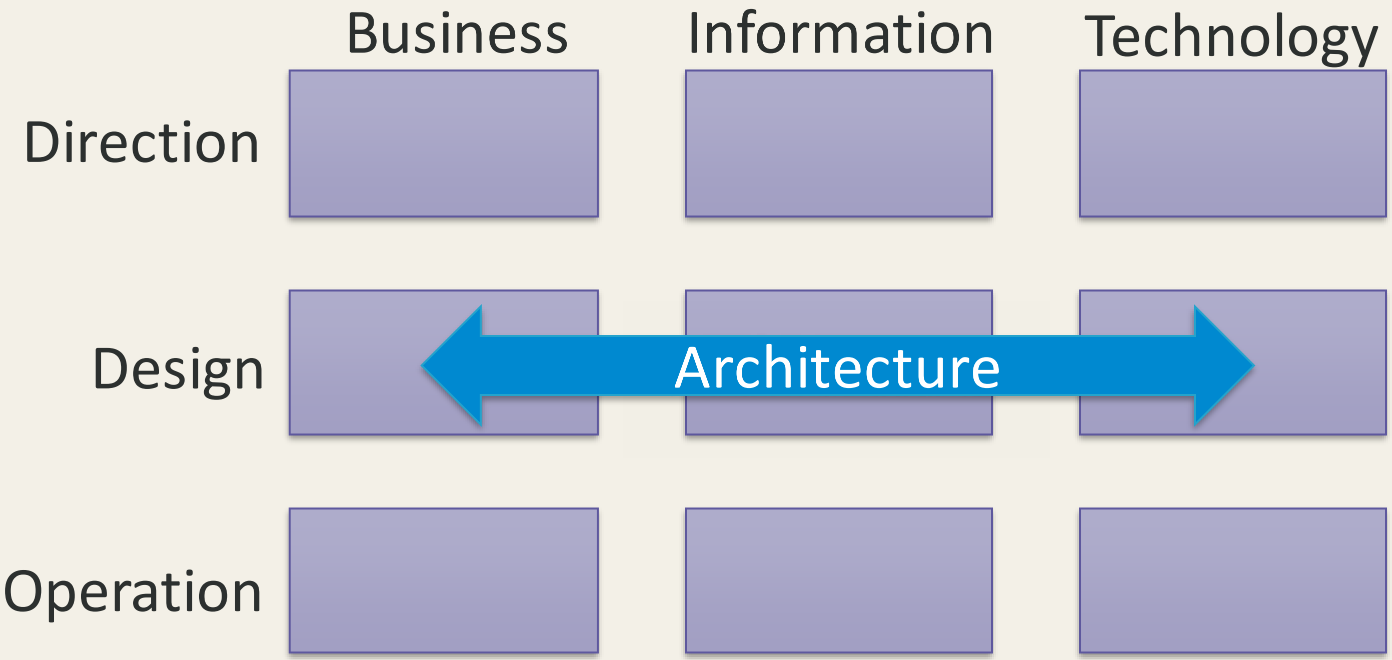
Direction

Design

Operation

CO-CO

Amsterdam information model



Business

Information

Technology

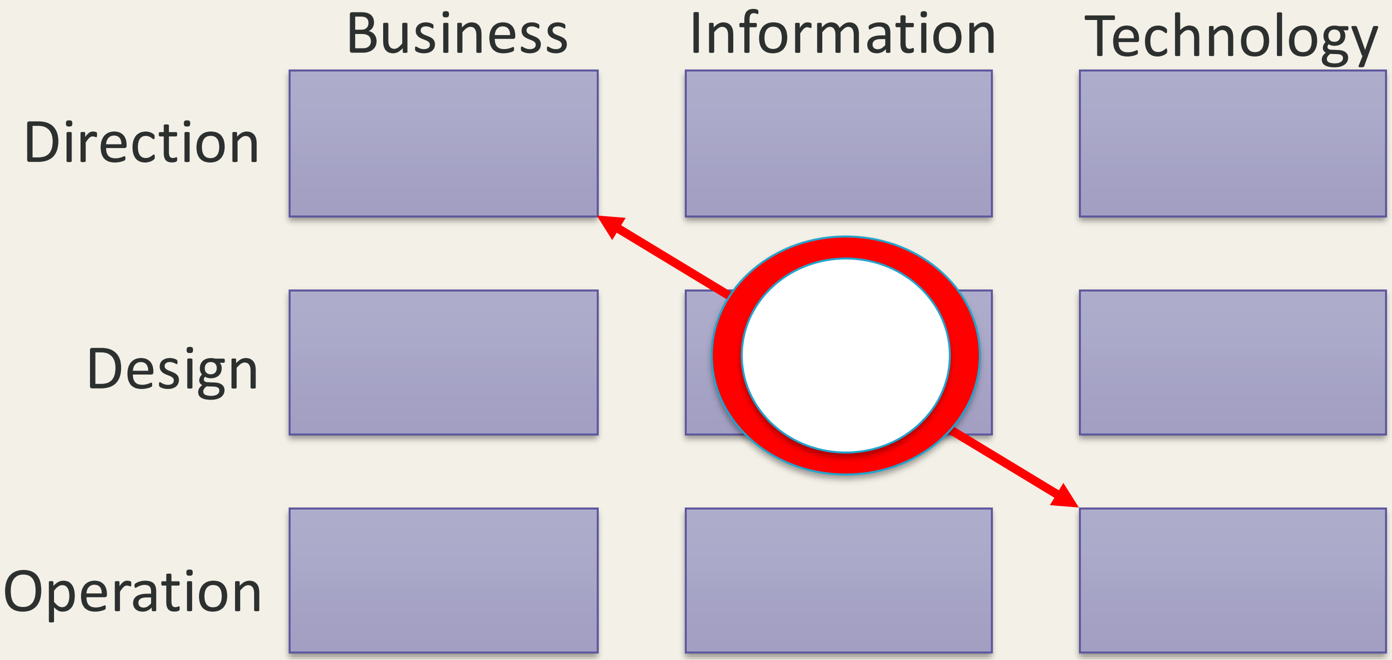
Direction

Design

Architecture

Operation

Amsterdam information model



Business

Information

Technology

Direction

Design

Operation

Infosec Pain

- Business versus IT
  - No assurance on “who can do what and why”
  - Is privacy protection at stake?
  - Business doesn't understand what's needed
  - Business doesn't support GRC, whereas they are the problem owner

Infosec Pain

- Auditability
  - (External) auditors need data
  - Too little transparancy with regards to access
  - No assurance about “who can do what, why”

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Identity management

Context

Social media - Account

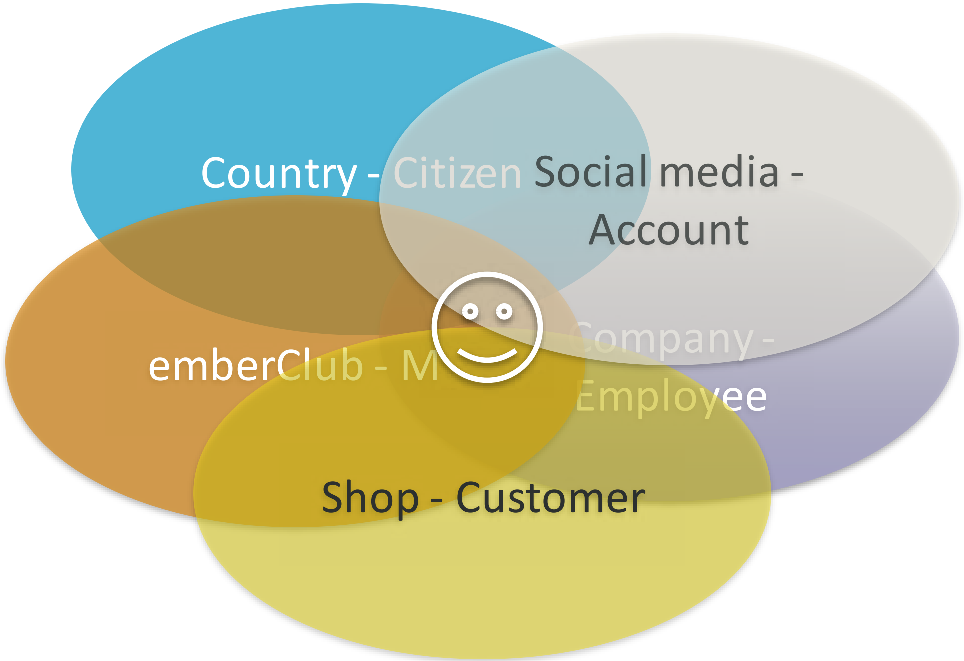
Club - Member

Country - citizen

Company - Employee

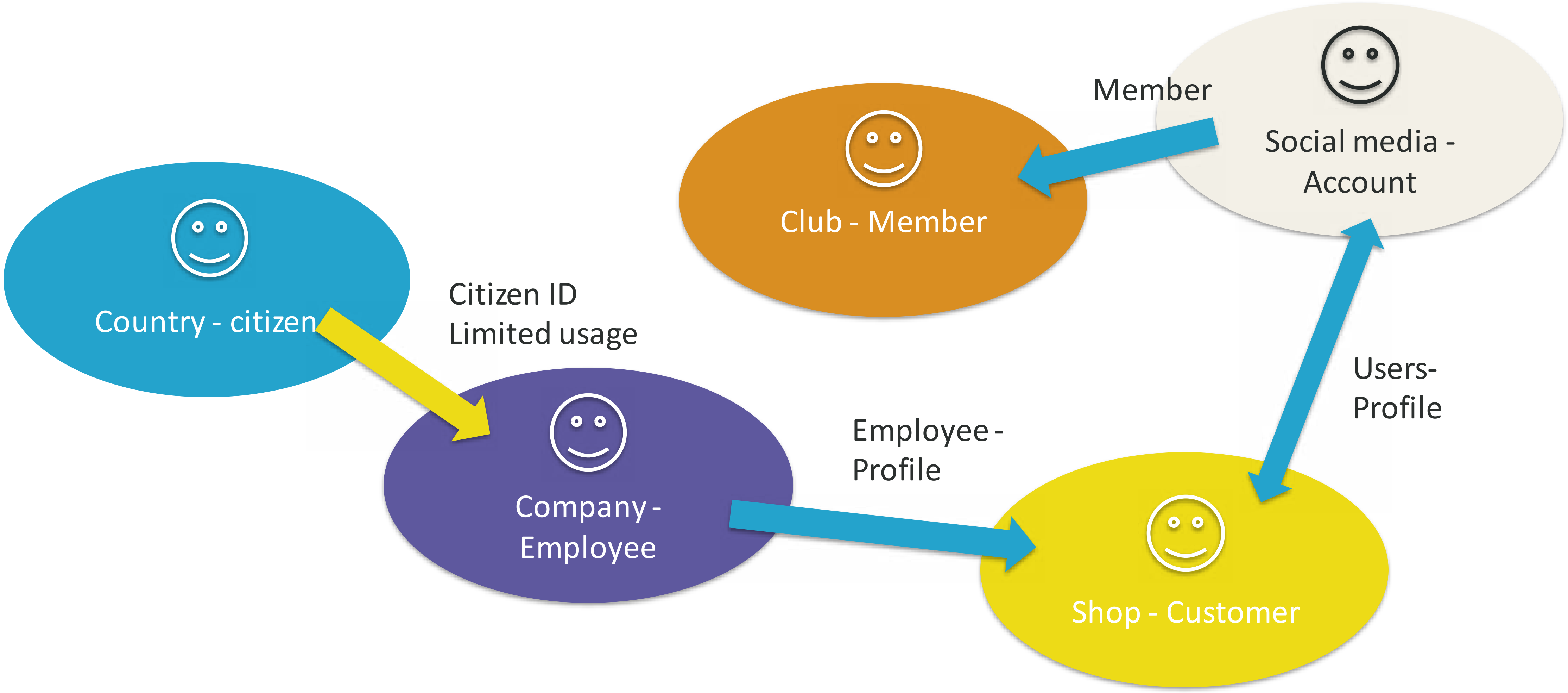
Shop - Customer

Context


Country - Citizen
Social media - Account
emberClub - M
Company - Employee
Shop - Customer

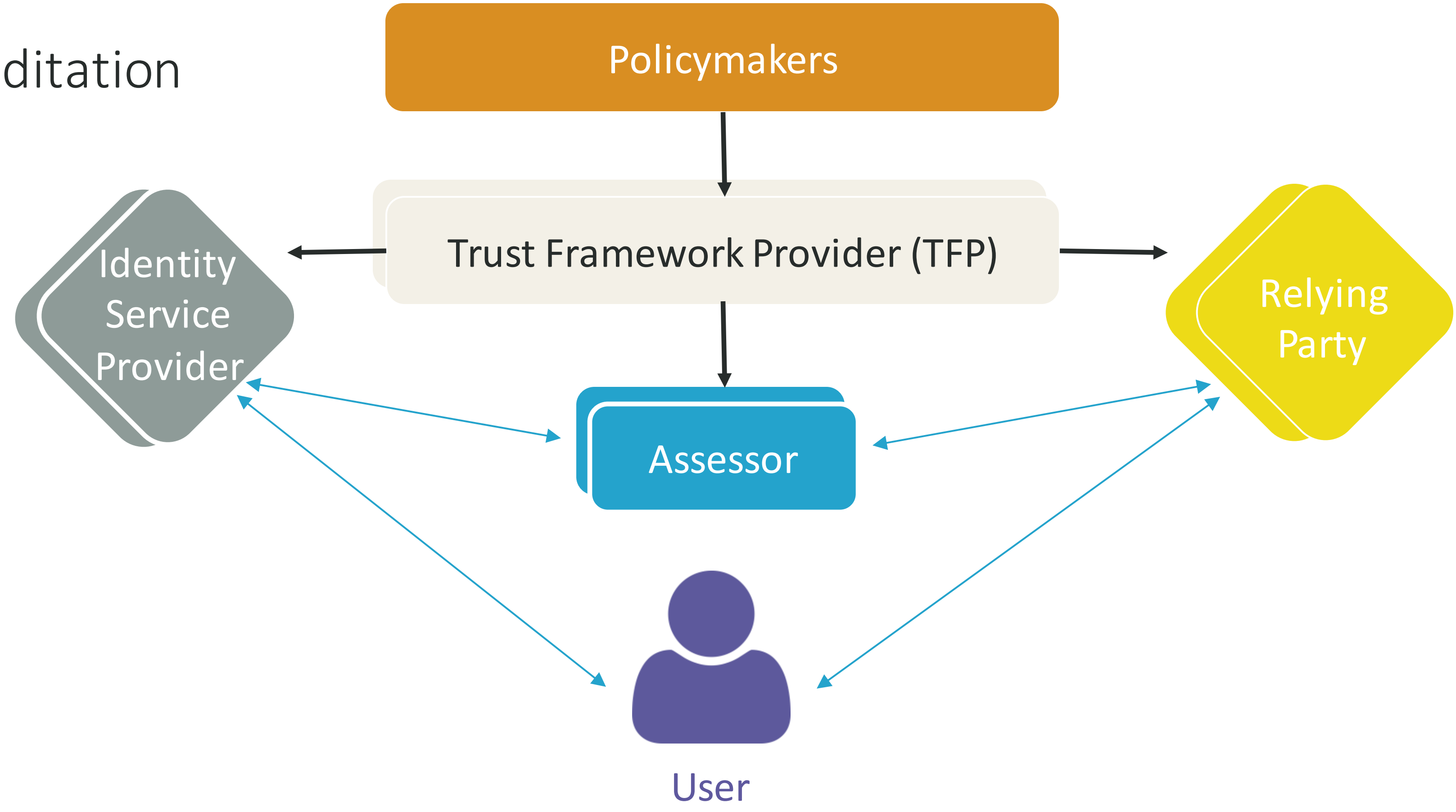
Federation - Trust

Context -> federation



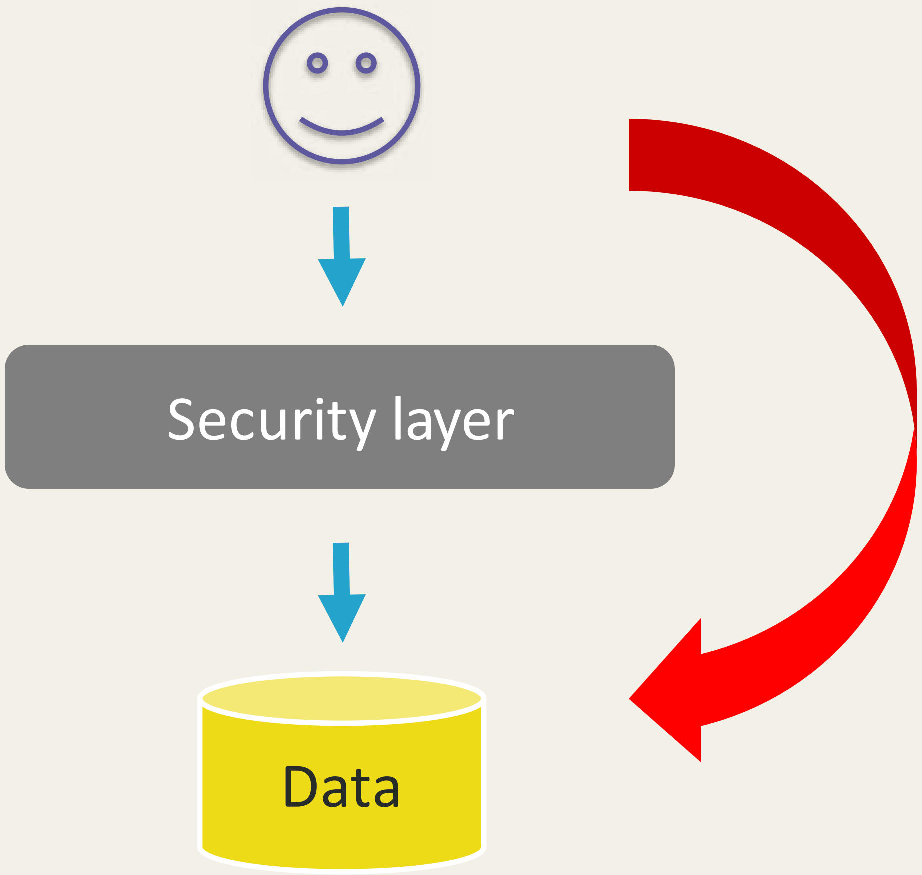
Assurance framework, trust framework

- Certification and accreditation



Access Control

Discretionary Access Control

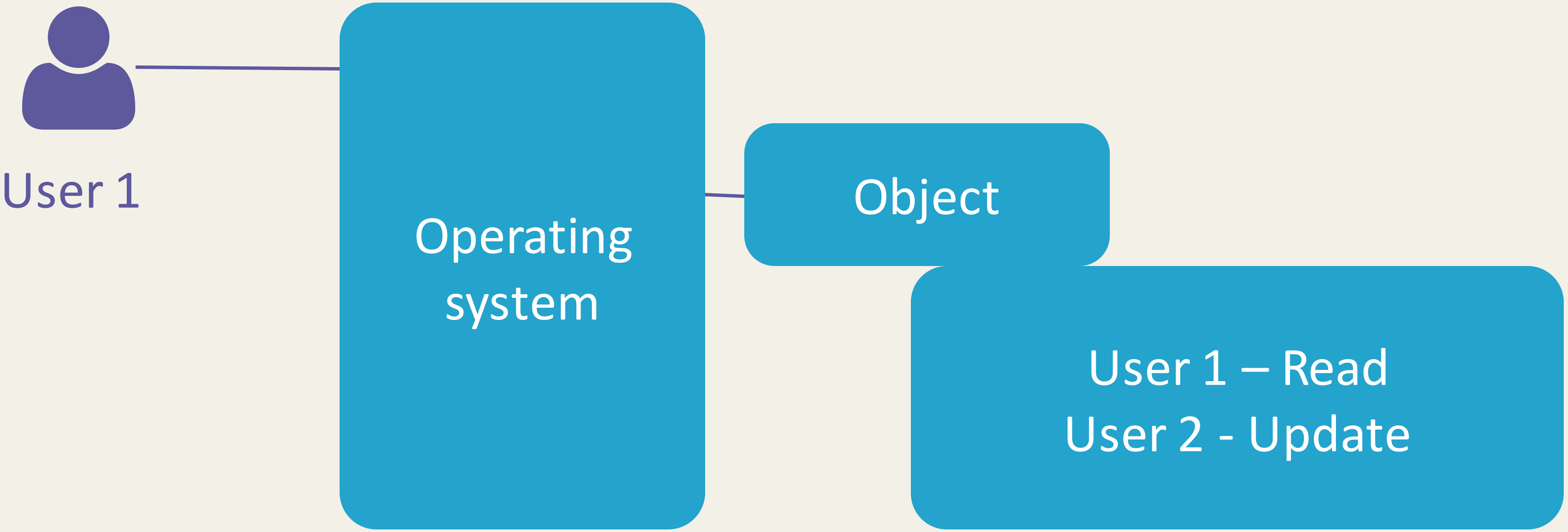


Access Control

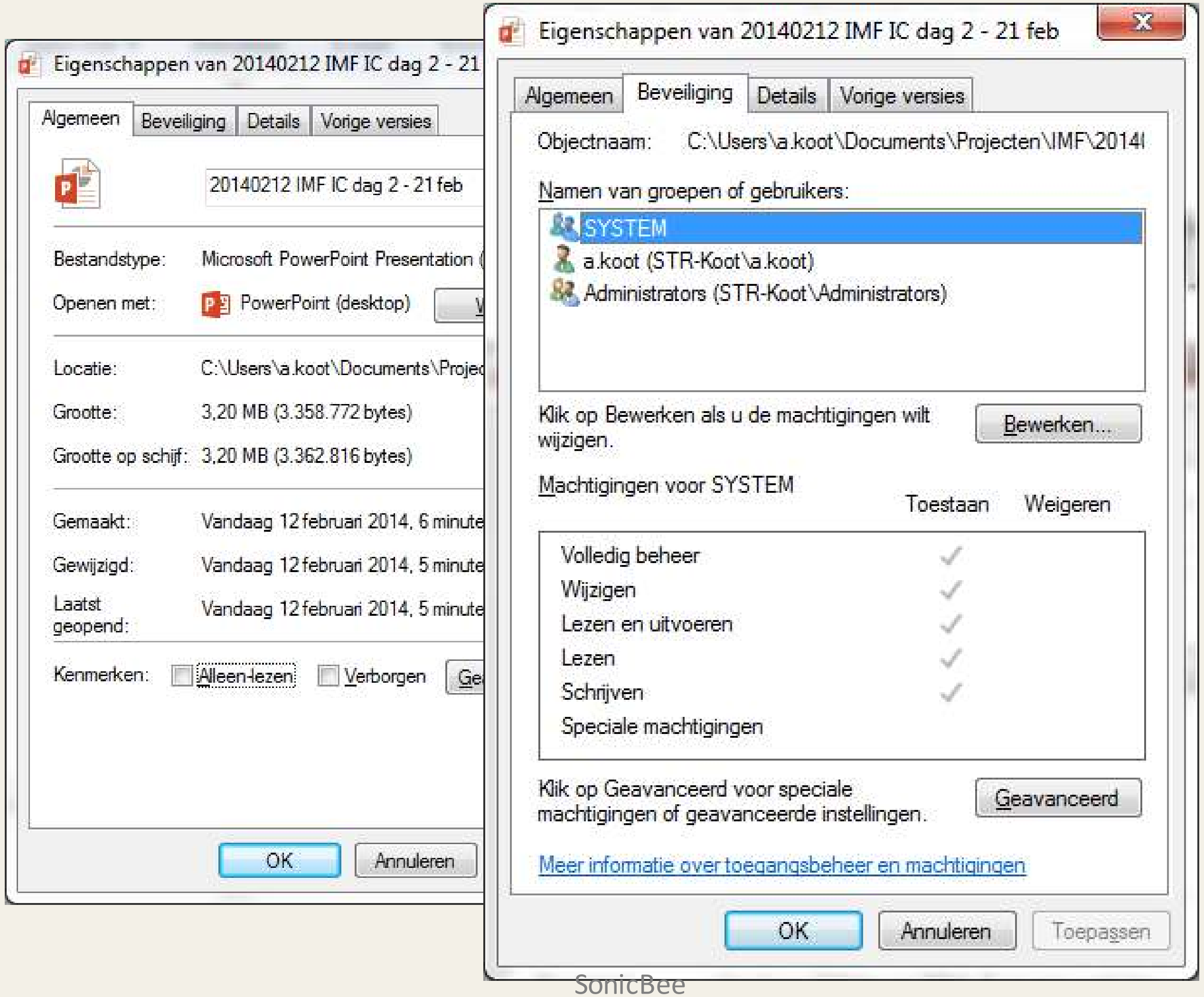
- Traditional: Access Control Lists (ACL)
- Mainstream: Role Based Access Control (RBAC)
- Future: Rule Based Access Control
  - Attribute Based Access Control (ABAC)
  - Or Context Based Access Control (CBAC)
  - Or Policy Based Access Control (PBAC)

Access Control models

- Access Control Lists



Access Control Lists



Eigenschappen van 20140212 IMF IC dag 2 - 21

20140212 IMF IC dag 2 - 21 feb

Bestandstype: Microsoft PowerPoint Presentation (

Openen met: PowerPoint (desktop)

Locatie: C:\Users\a.koot\Documents\Projec

Grootte: 3,20 MB (3.358.772 bytes)

Grootte op schijf: 3,20 MB (3.362.816 bytes)

Gemaakt: Vandaag 12 februari 2014, 6 minute

Gewijzigd: Vandaag 12 februari 2014, 5 minute

Laatst geopend: Vandaag 12 februari 2014, 5 minute

Kenmerken: □ Alleen-lezen □ Verborgen

Eigenschappen van 20140212 IMF IC dag 2 - 21 feb

Objectnaam: C:\Users\a.koot\Documents\Projecten\IMF\2014

Namen van groepen of gebruikers:

- SYSTEM
- a.koot (STR-Koot\a.koot)
- Administrators (STR-Koot\Administrators)

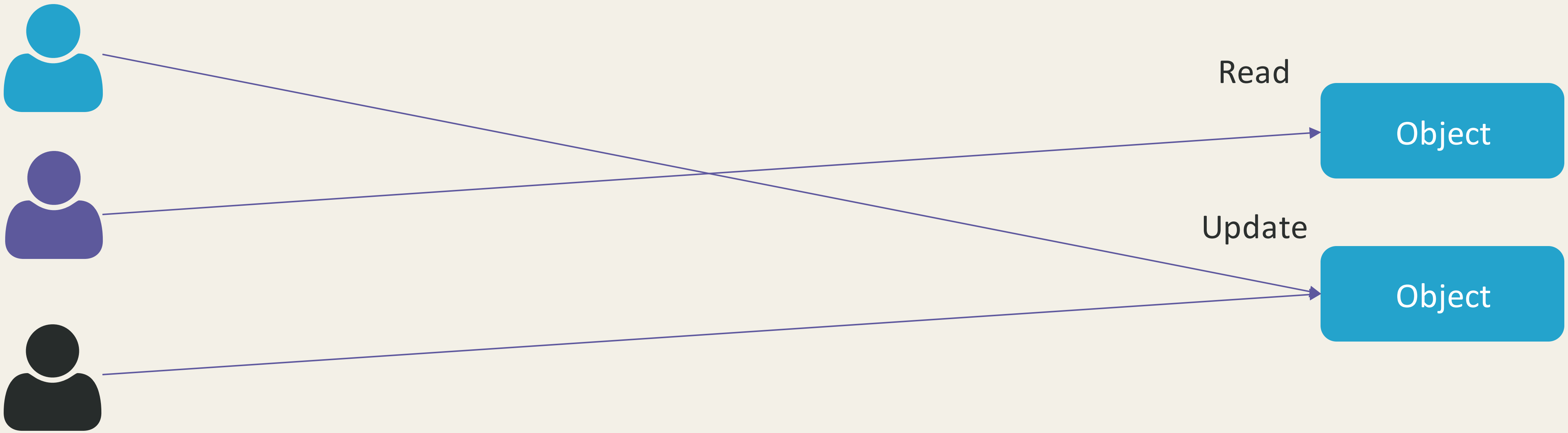
Klik op Bewerken als u de machtigingen wilt wijzigen.

Machtigingen voor SYSTEM	Toestaan	Weigeren
Volledig beheer	✓	
Wijzigen	✓	
Lezen en uitvoeren	✓	
Lezen	✓	
Schrijven	✓	
Speciale machtigingen		

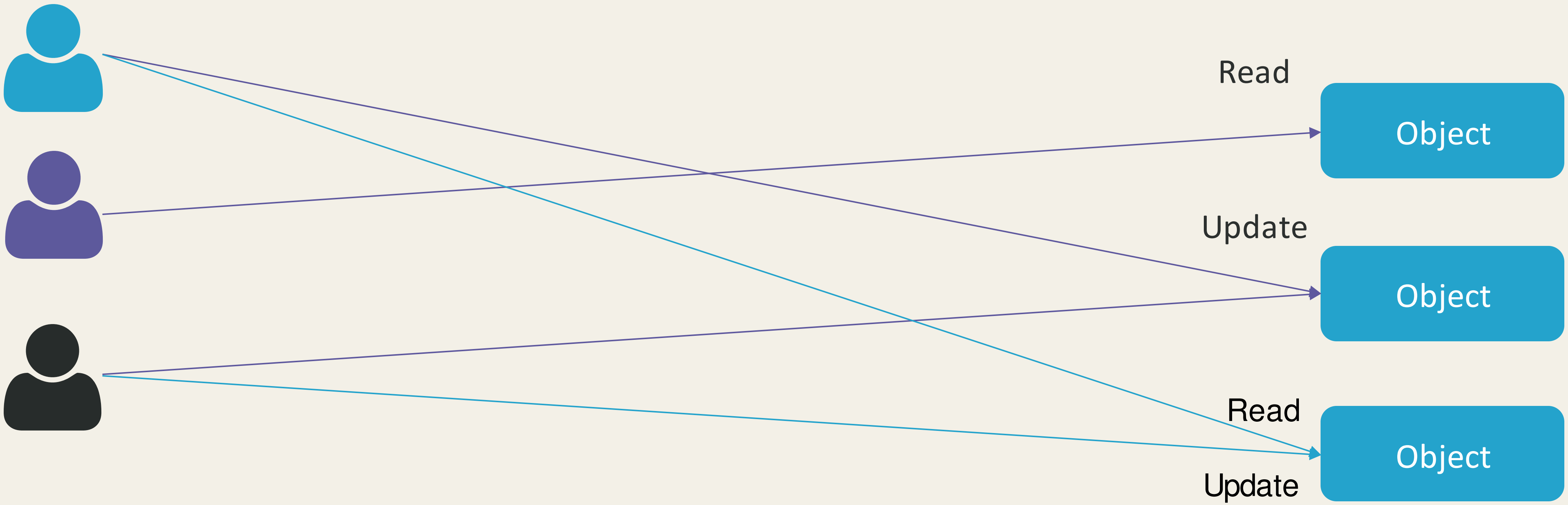
Klik op Geavanceerd voor speciale machtigingen of geavanceerde instellingen.

Meer informatie over toegangsbeheer en machtigingen

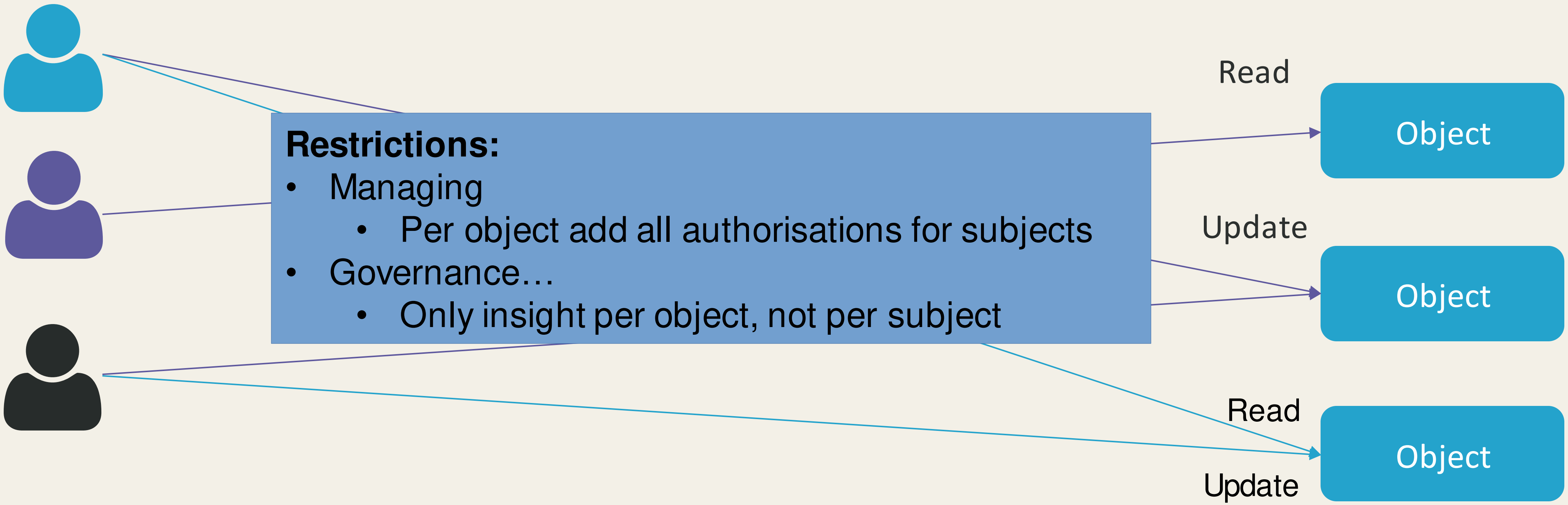
Access Control models



Access Control models



Access Control models



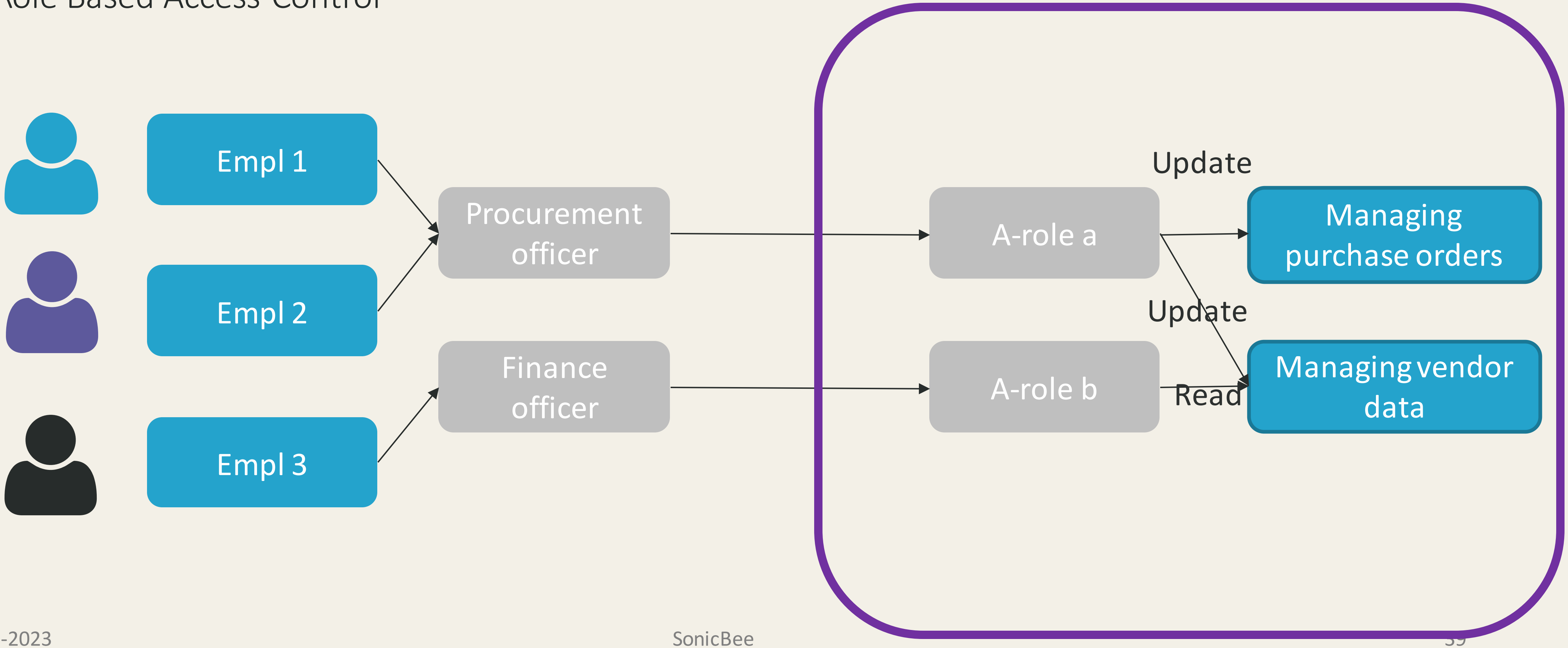
Restrictions:

- Managing
  - Per object add all authorisations for subjects
- Governance…
  - Only insight per object, not per subject

RBAC

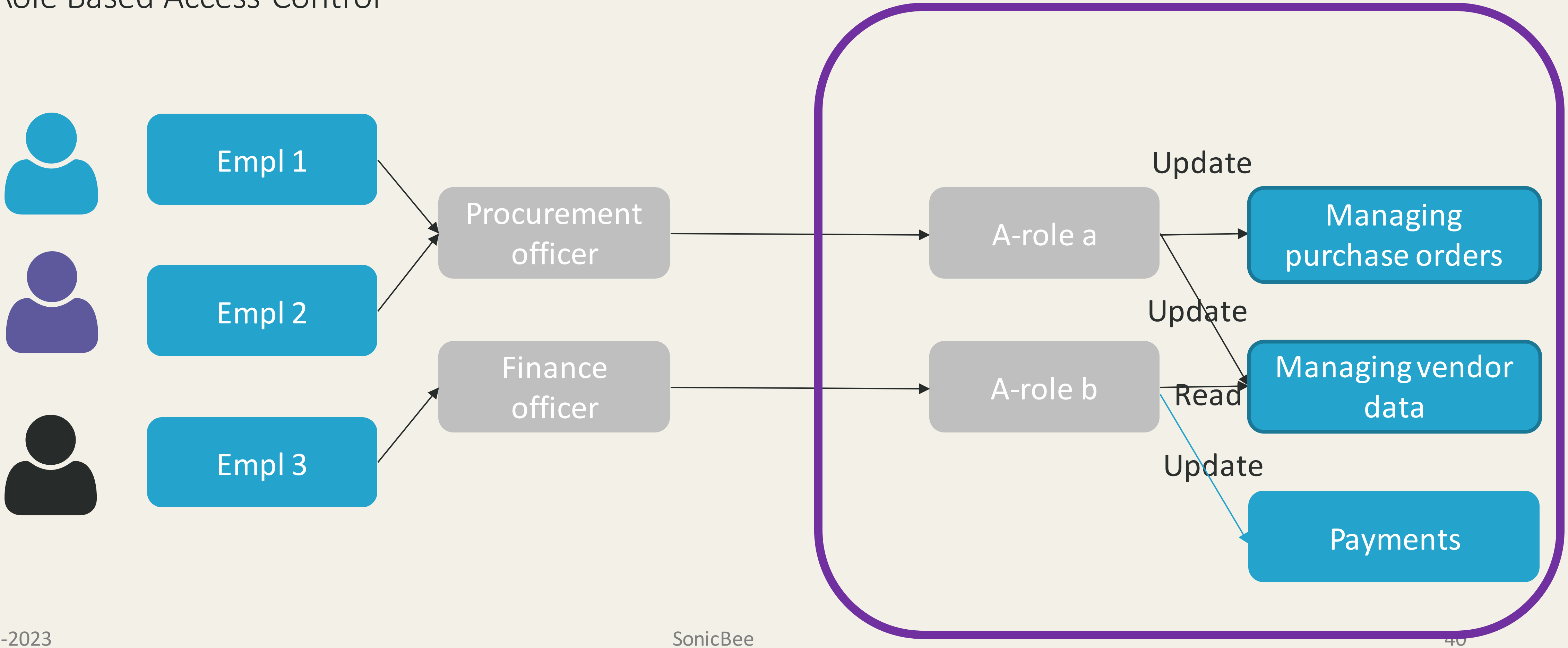
Access Control models

- Role Based Access Control



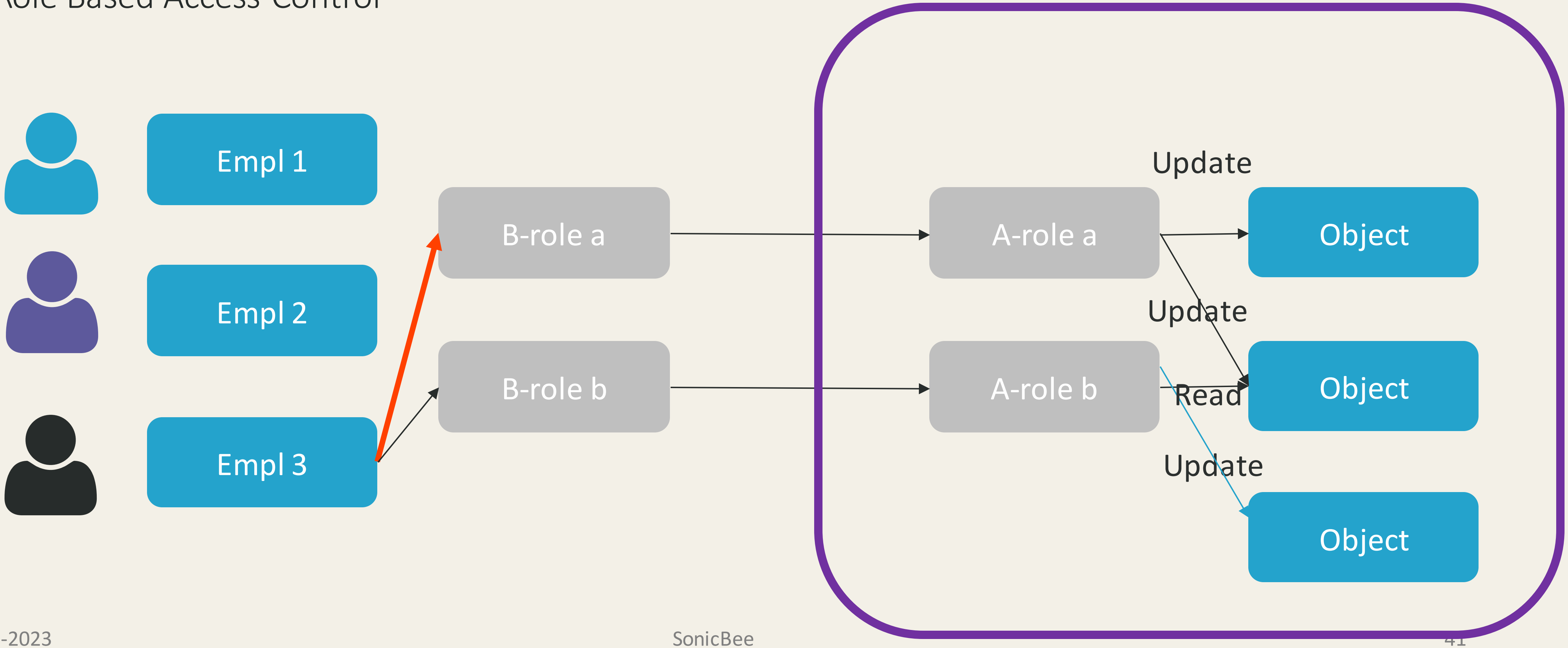
Access Control models

- Role Based Access Control

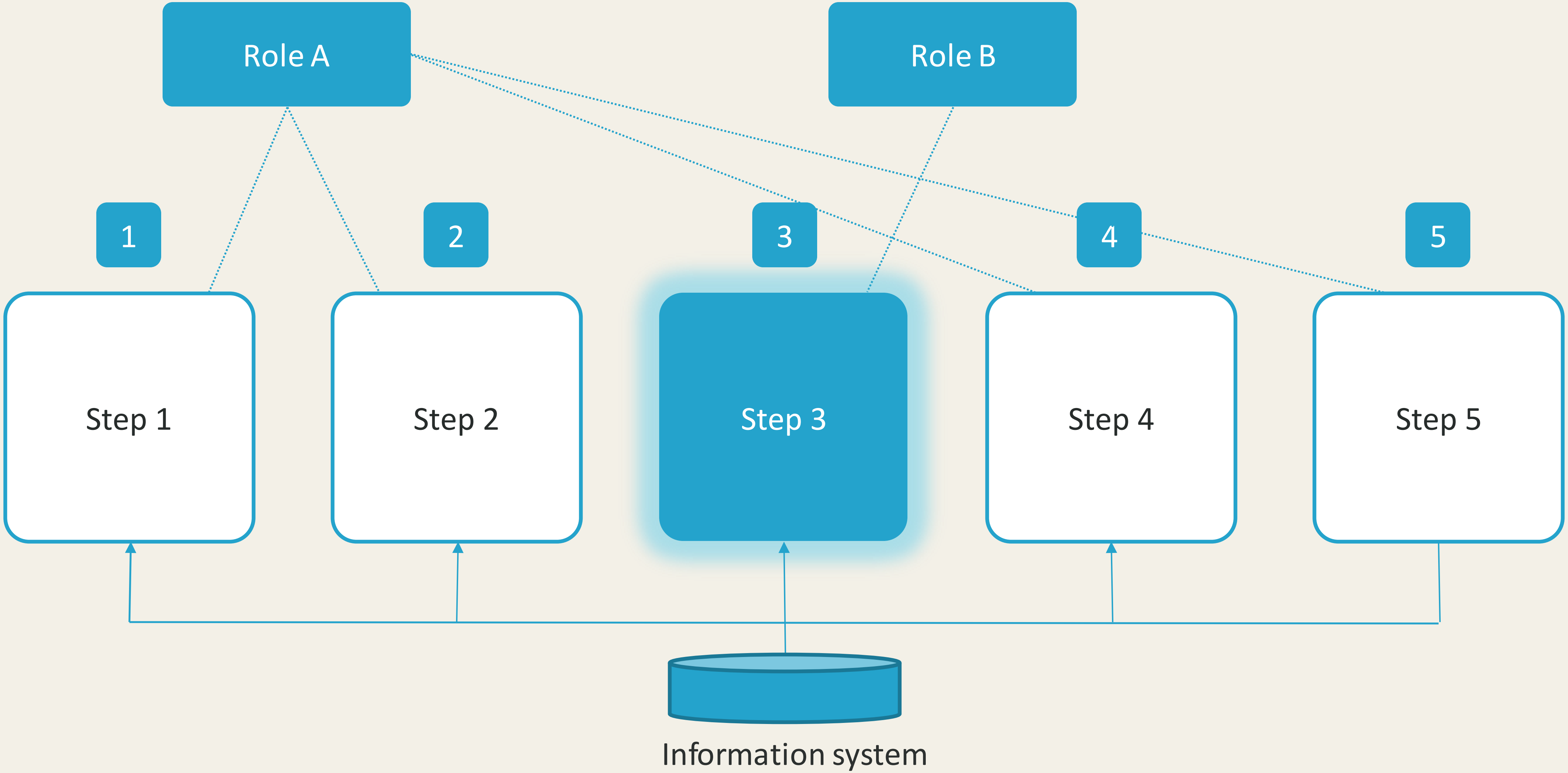


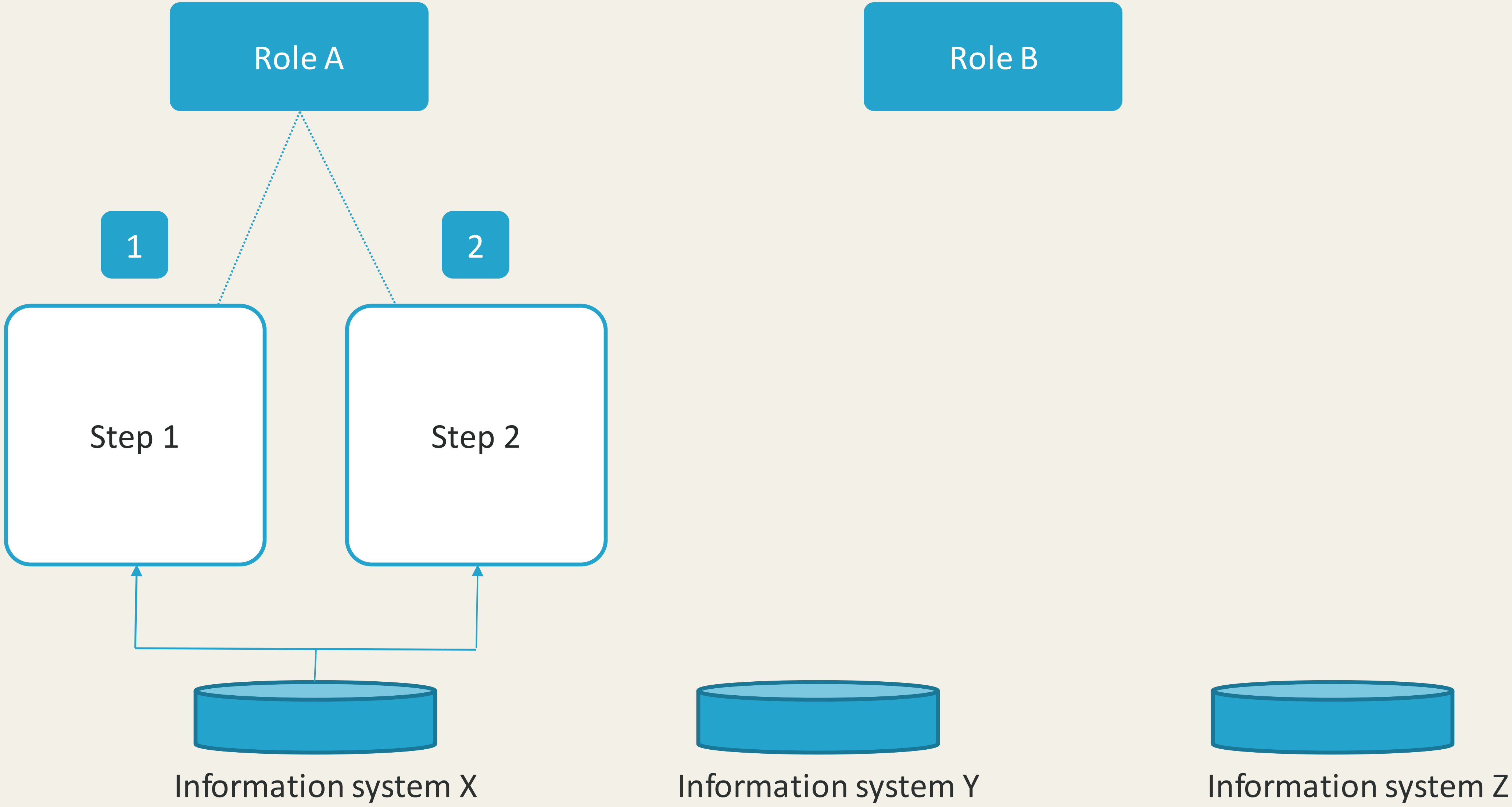
Access Control models

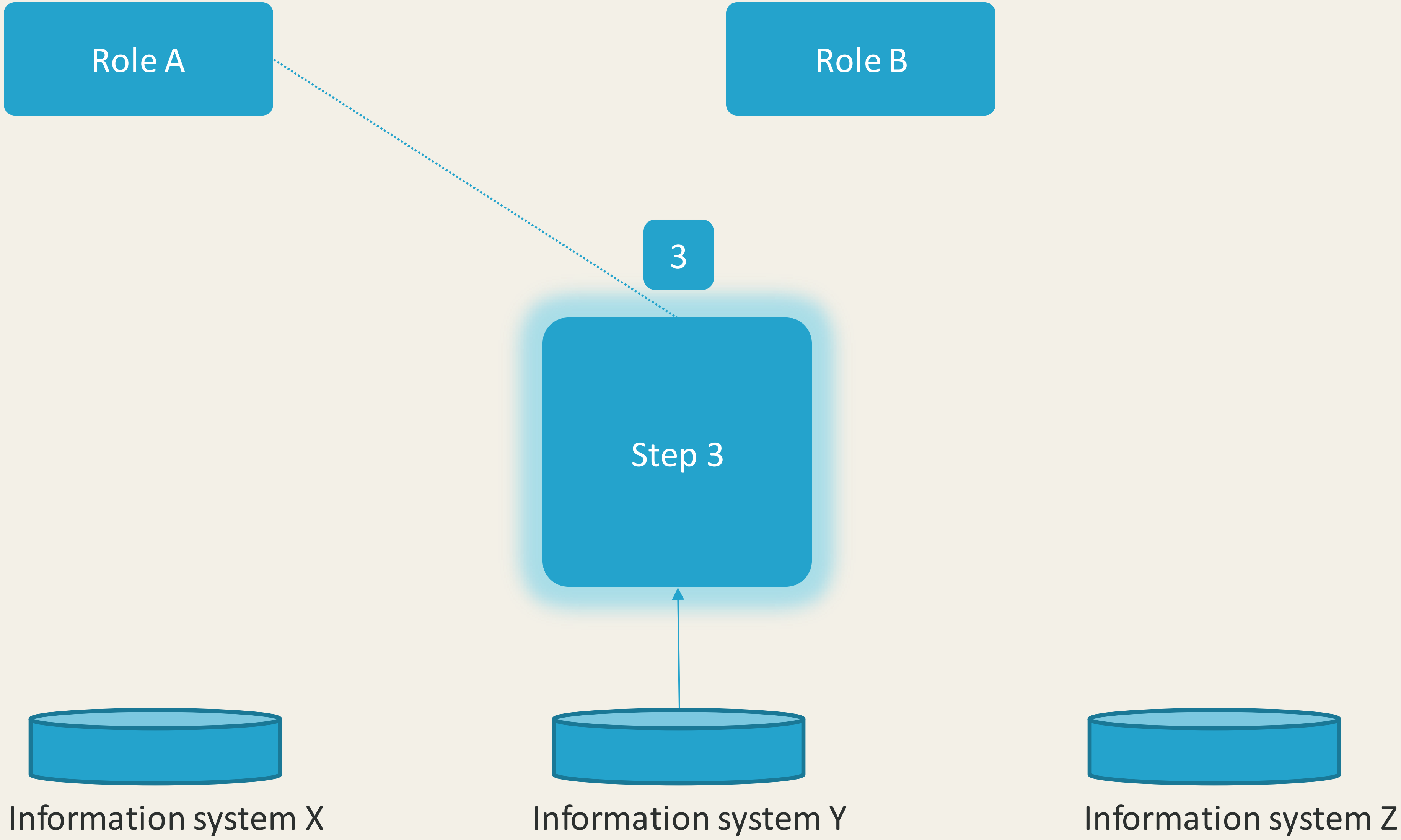
- Role Based Access Control

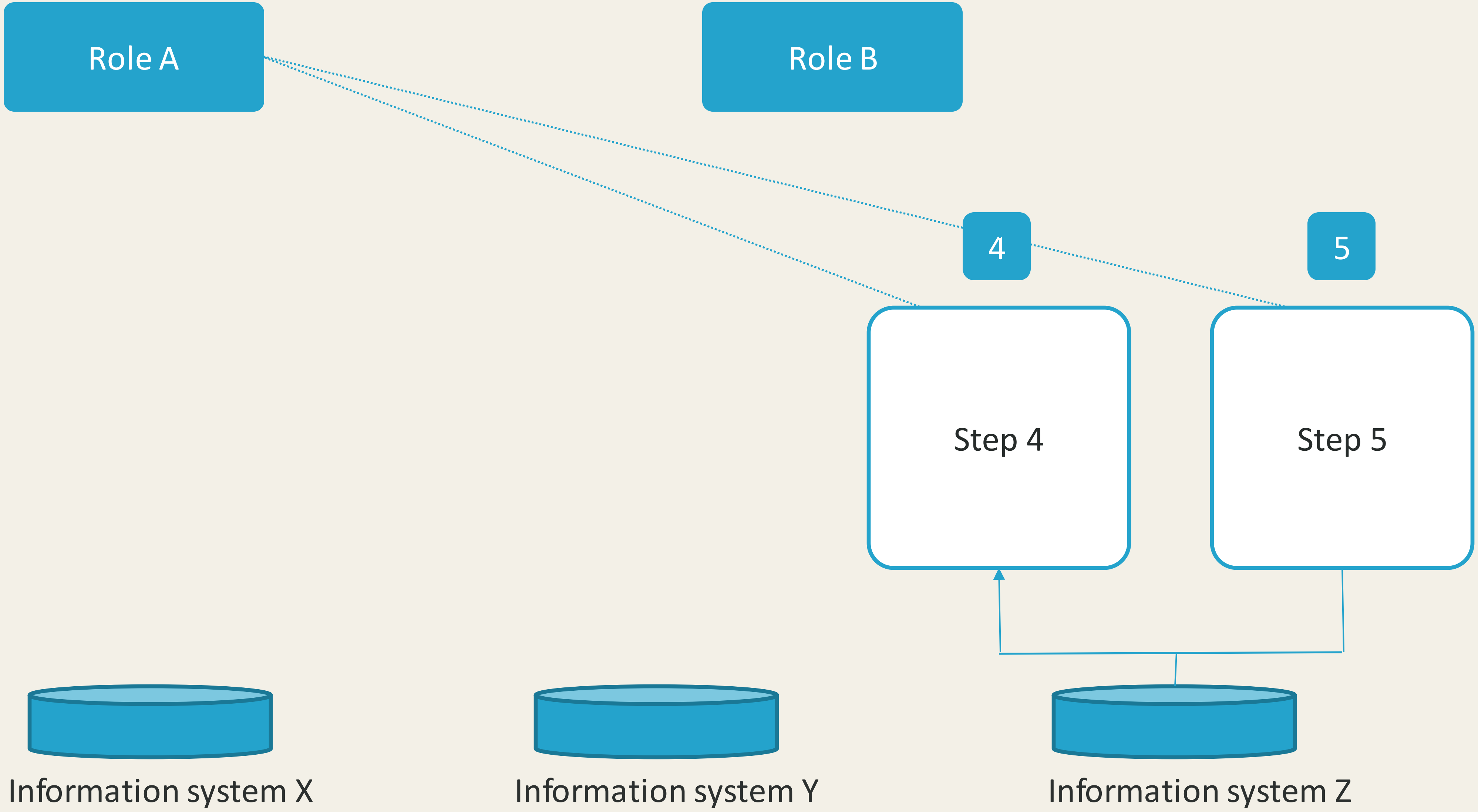


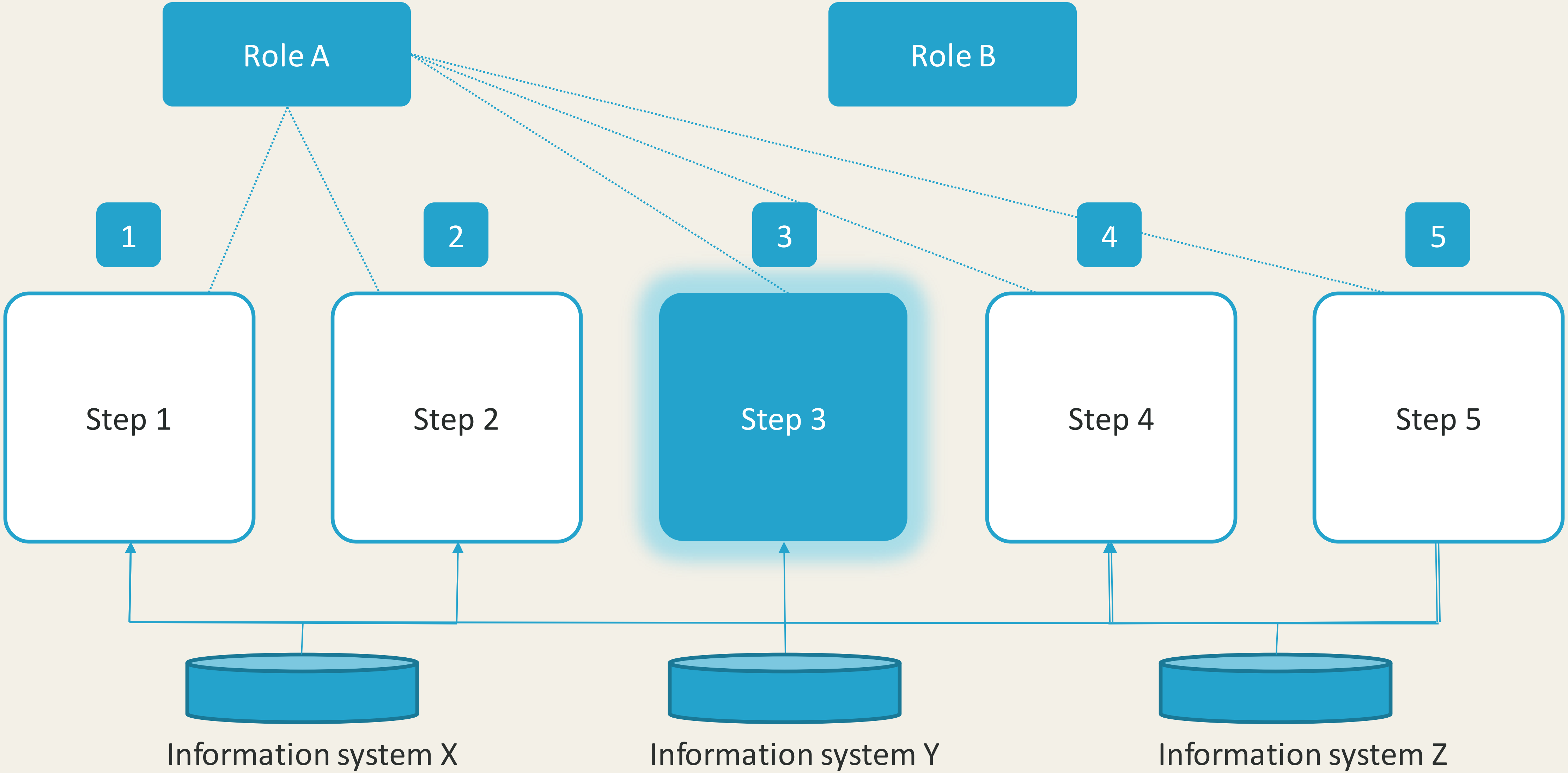
Access Governance


Role A
Role B
1
2
3
4
5
Step 1
Step 2
Step 3
Step 4
Step 5
Information system


Role A
Role B
1
2
Step 1
Step 2
Information system X
Information system Y
Information system Z


Role A
Role B
3
Step 3
Information system X
Information system Y
Information system Z


Role A
Role B
4
5
Step 4
Step 5
Information system X
Information system Y
Information system Z


Role A
Role B
1
2
3
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Step 1
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Step 5
Information system X
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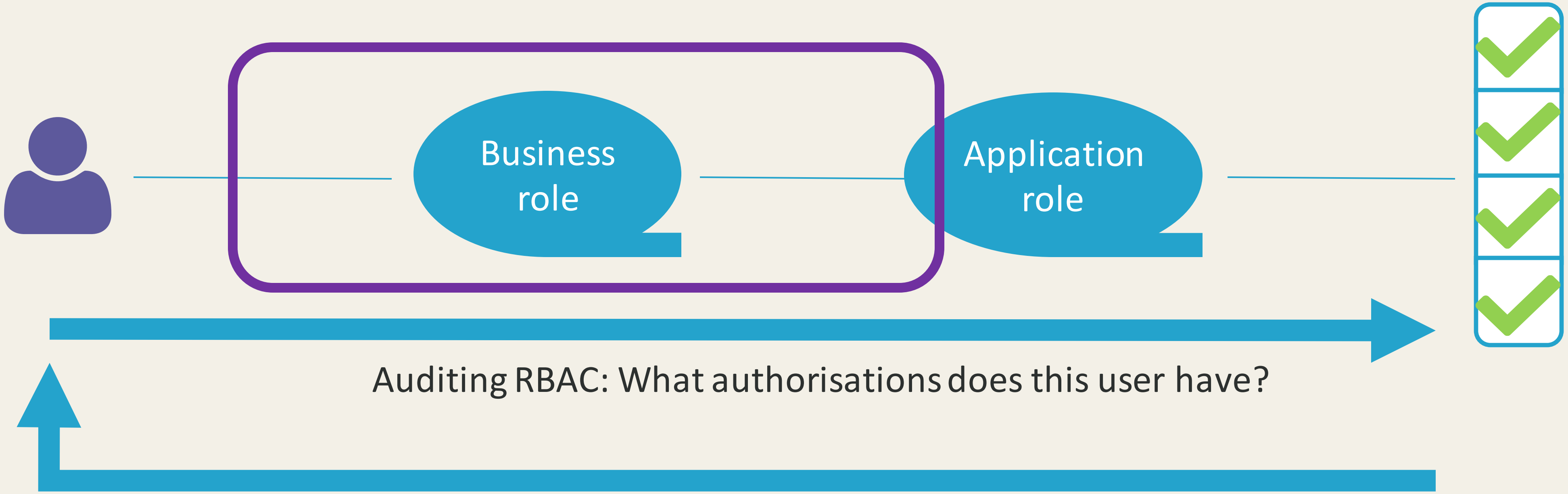
Information system Z

Traditional Access Governance RBAC

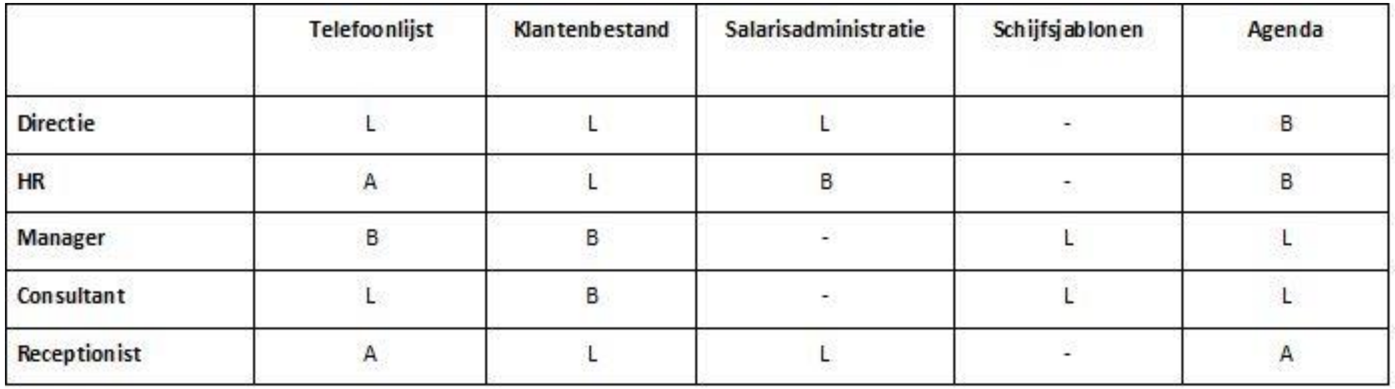


Auditing RBAC: What authorisations does this user have?

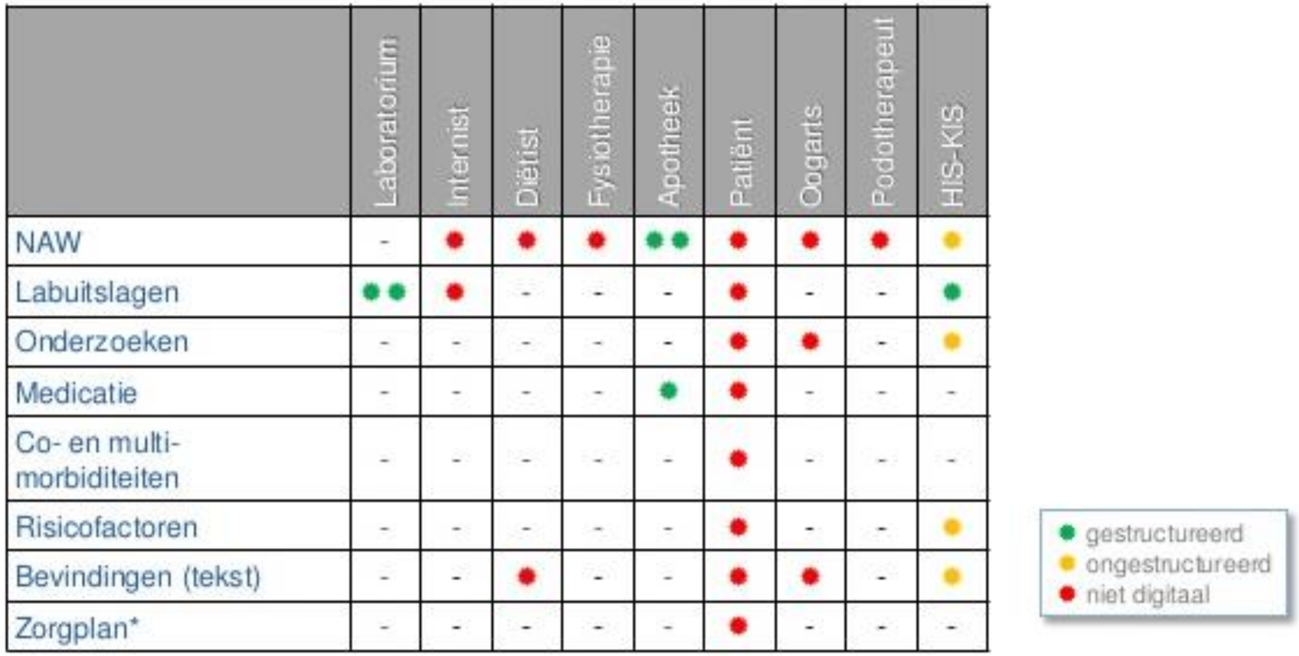
Auditing RBAC: What accounts have access to these authz??

Authorisation matrix

- What does it say?
- Soll-matrix
- Ist? Audit?
- Who is the owner?

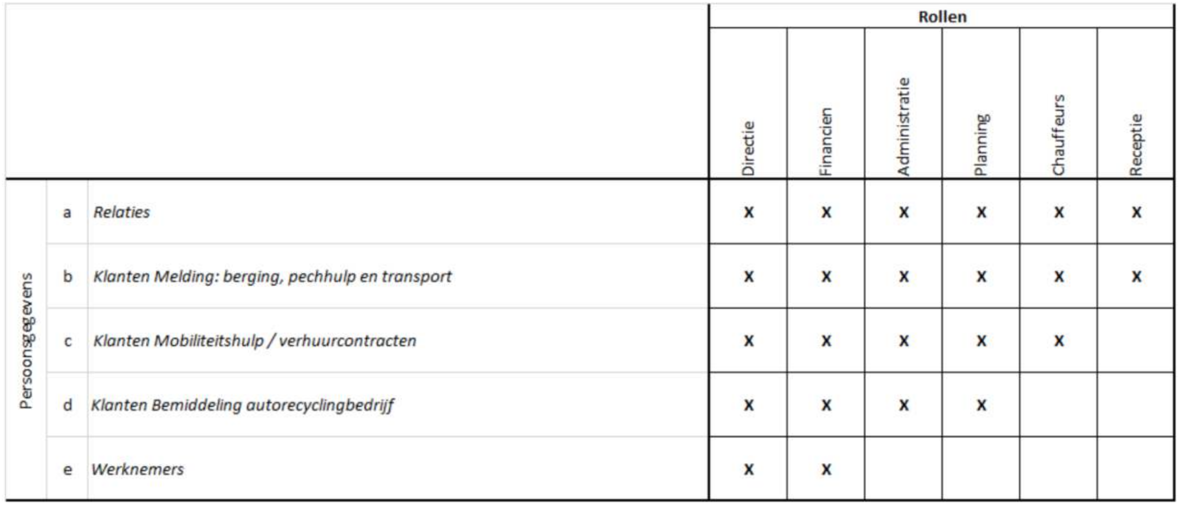


	Telefoonlijst	Klantenbestand	Salarisadministratie	Schijfsjablonen	Agenda
Directie	L	L	L	-	B
HR	A	L	B	-	B
Manager	B	B	-	L	L
Consultant	L	B	-	L	L
Receptionist	A	L	L	-	A



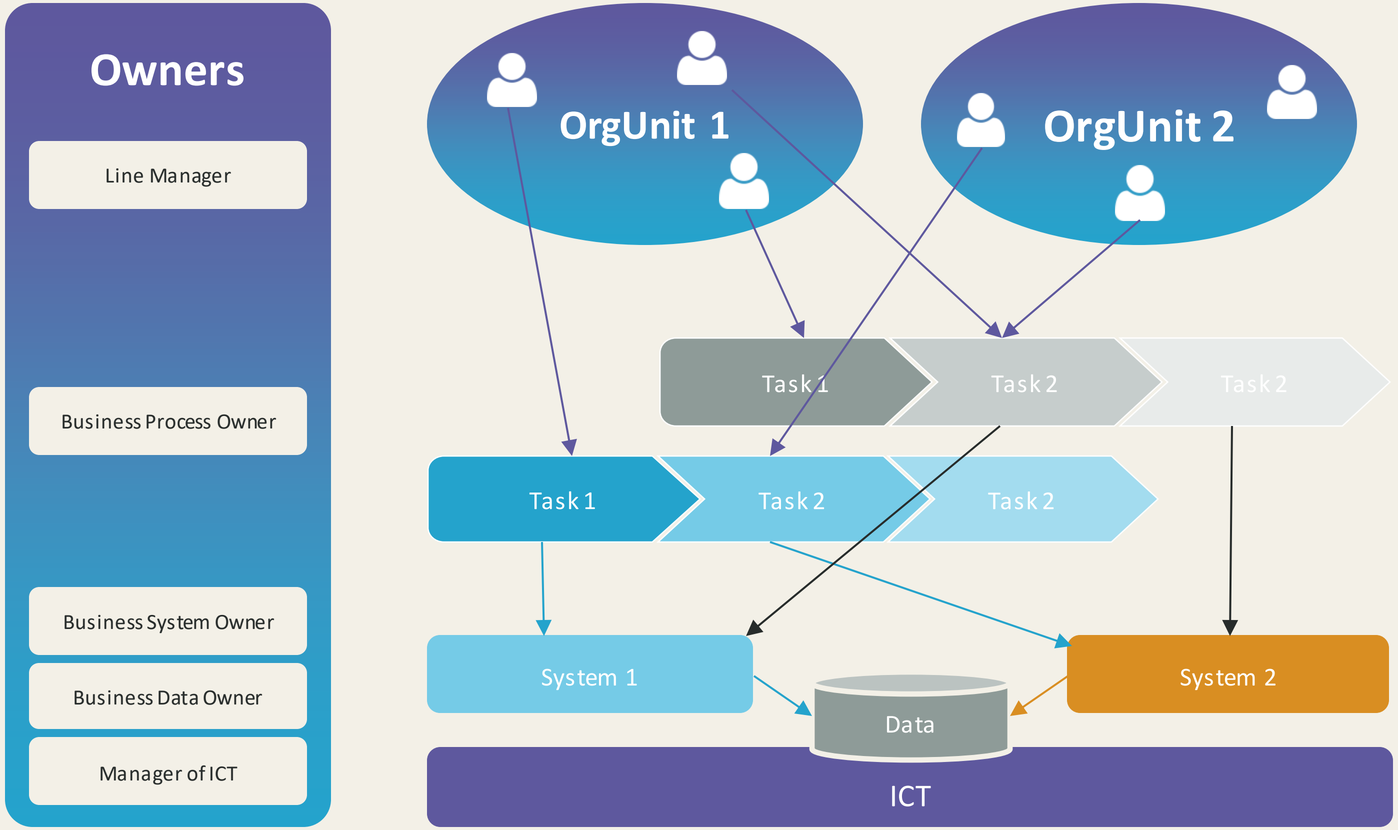
	Laboratorium	Internist	Diëtist	Fysiotherapie	Apotheek	Patiënt	Oogarts	Podotherapeut	HIS-KIS
NAW	-	🔴	🔴	🔴	🟢 🟢	🔴	🔴	🔴	🟡
Labuitslagen	🟢 🟢	🔴	-	-	-	🔴	-	-	🟢
Onderzoeken	-	-	-	-	-	🔴	🔴	-	🟡
Medicatie	-	-	-	-	🟢	🔴	-	-	-
Co- en multi-morbiditeiten	-	-	-	-	-	🔴	-	-	-
Risicofactoren	-	-	-	-	-	🔴	-	-	🟡
Bevindingen (tekst)	-	-	🔴	-	-	🔴	🔴	-	🟡
Zorgplan*	-	-	-	-	-	🔴	-	-	-

🟢 gestructureerd
🟡 ongestructureerd
🔴 niet digitaal



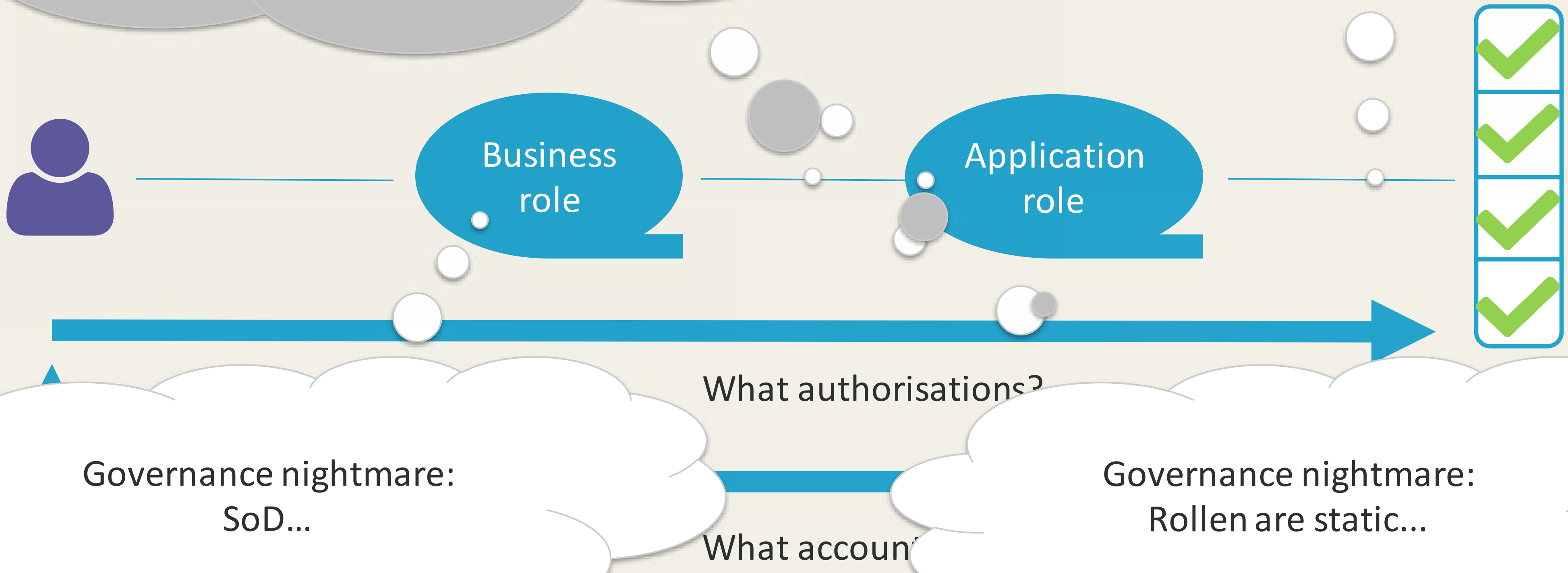
			Rollen					
			Directie	Financien	Administratie	Planning	Chauffeurs	Receptie
Persoonsgegevens	a	*Relaties*	x	x	x	x	x	x
	b	*Klanten Melding: berging, pechhulp en transport*	x	x	x	x	x	x
	c	*Klanten Mobiliteitshulp / verhuurcontracten*	x	x	x	x	x	
	d	*Klanten Bemiddeling autorecyclingbedrijf*	x	x	x	x		
	e	*Werknemers*	x	x				

Access Governance



Security nightmare: RBAC doesn't work across multiple 'domains'…: One needs to know both the Id and the Authz

Governance nightmare:
Context…

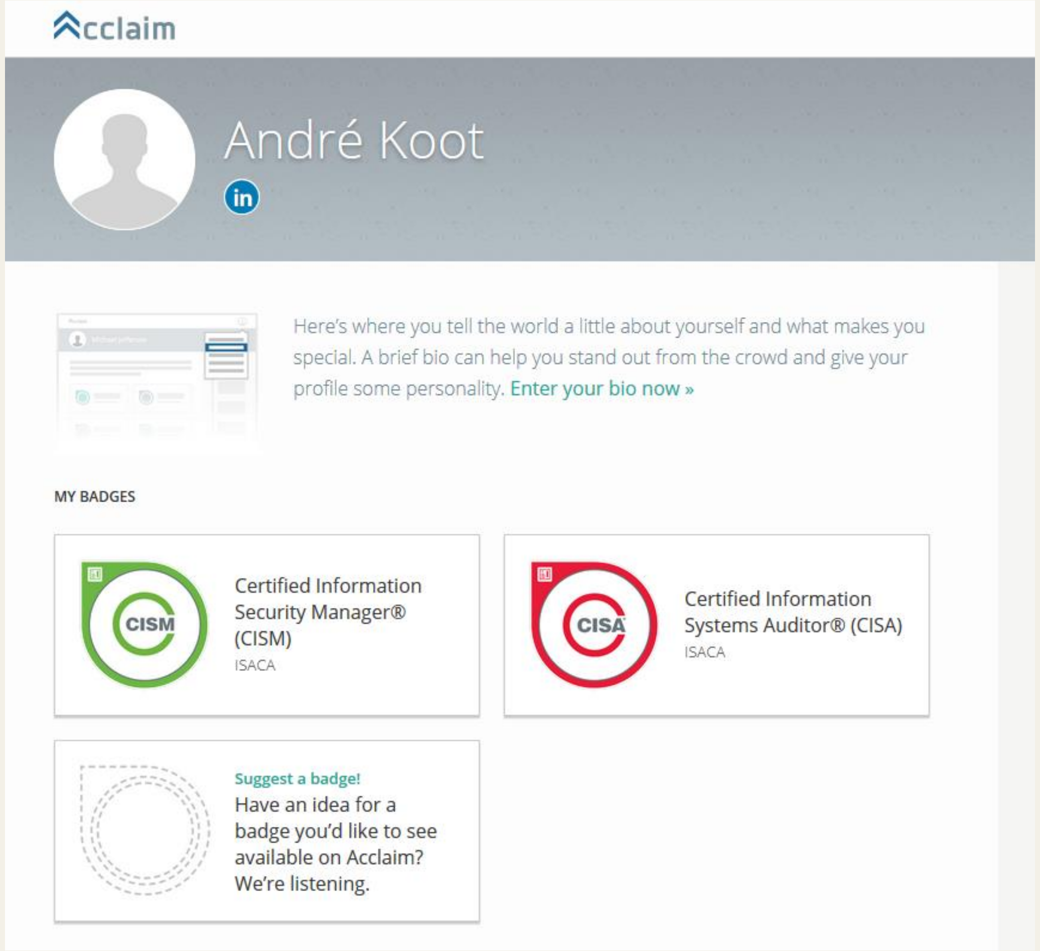


Governance nightmare:
SoD…

Governance nightmare:
Rollen are static...

Future

- Processes and process quality will be leading
  - SoD
    - Based on business rules
  - Quality criteria within a proces
    - Based on attributes



Acclaim

André Koot

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ISACA

Certified Information Systems Auditor® (CISA)
ISACA

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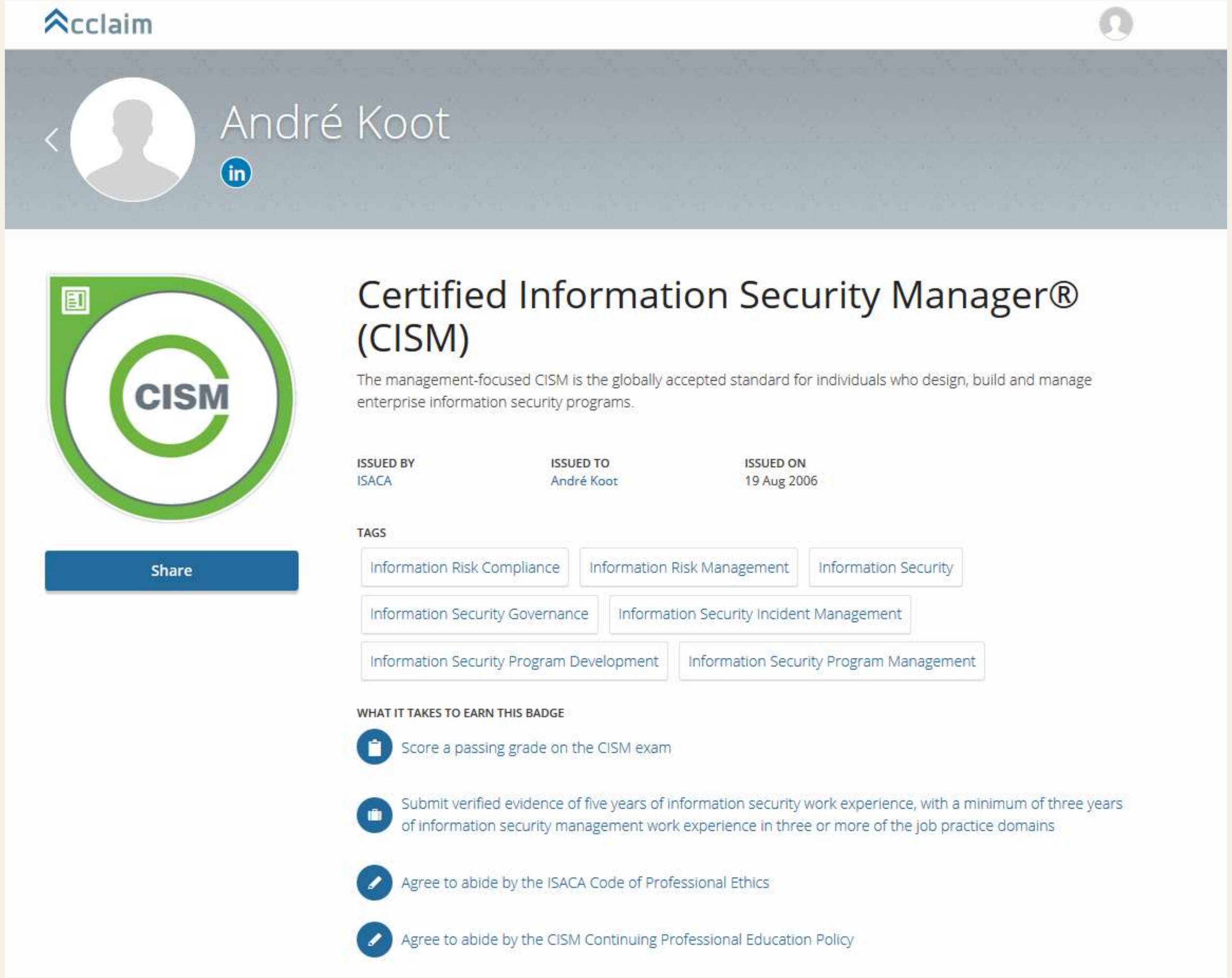
Have an idea for a badge you'd like to see available on Acclaim? We're listening.



André Koot

Certified Information Security Manager® (CISM)

The management-focused CISM is the globally accepted standard for individuals who design, build and manage enterprise information security programs.

ISSUED BY	ISSUED TO	ISSUED ON
ISACA	André Koot	19 Aug 2006

TAGS

Information Risk Compliance · Information Risk Management · Information Security · Information Security Governance · Information Security Incident Management · Information Security Program Development · Information Security Program Management

WHAT IT TAKES TO EARN THIS BADGE

- Score a passing grade on the CISM exam
- Submit verified evidence of five years of information security work experience, with a minimum of three years of information security management work experience in three or more of the job practice domains
- Agree to abide by the ISACA Code of Professional Ethics
- Agree to abide by the CISM Continuing Professional Education Policy

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Dynamic Access Control

'New': ABAC

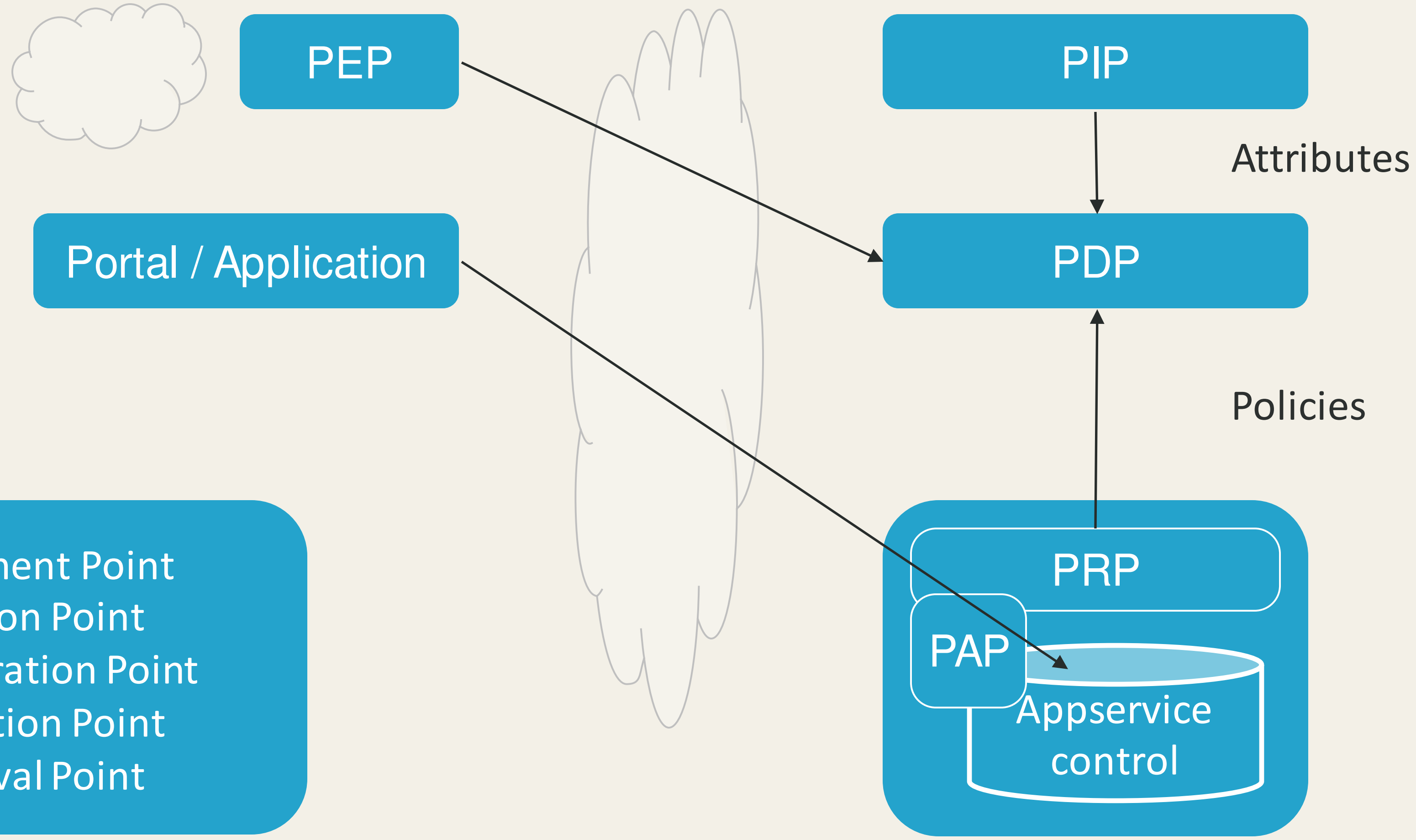
- Exit if:
  - Paid amount due
  - Recently…

Inrit 13-10-2012 11:38 Kaartnr. 957318
P-Klanderij (058-2128005)
Parkeergarages Leeuwarden is niet verantwoordelijk
voor schade en/of diefstal
DEZE ZIJDE BOVEN / THIS SIDE UP

- Only if…
  - brand is Kia

Access Control models

- XACML



PEP: Policy Enforcement Point
PDP : Policy Decision Point
PAP : Policy Administration Point
PIP : Policy Information Point
PRP : Policy Retrieval Point

From dynamic access control to Zero trust

'New': ABAC

- Exit if:
  - Paid amount due
  - Recently...
- Only if:
  - Brand is Kia

- We don't care:
  - Who is the actor...

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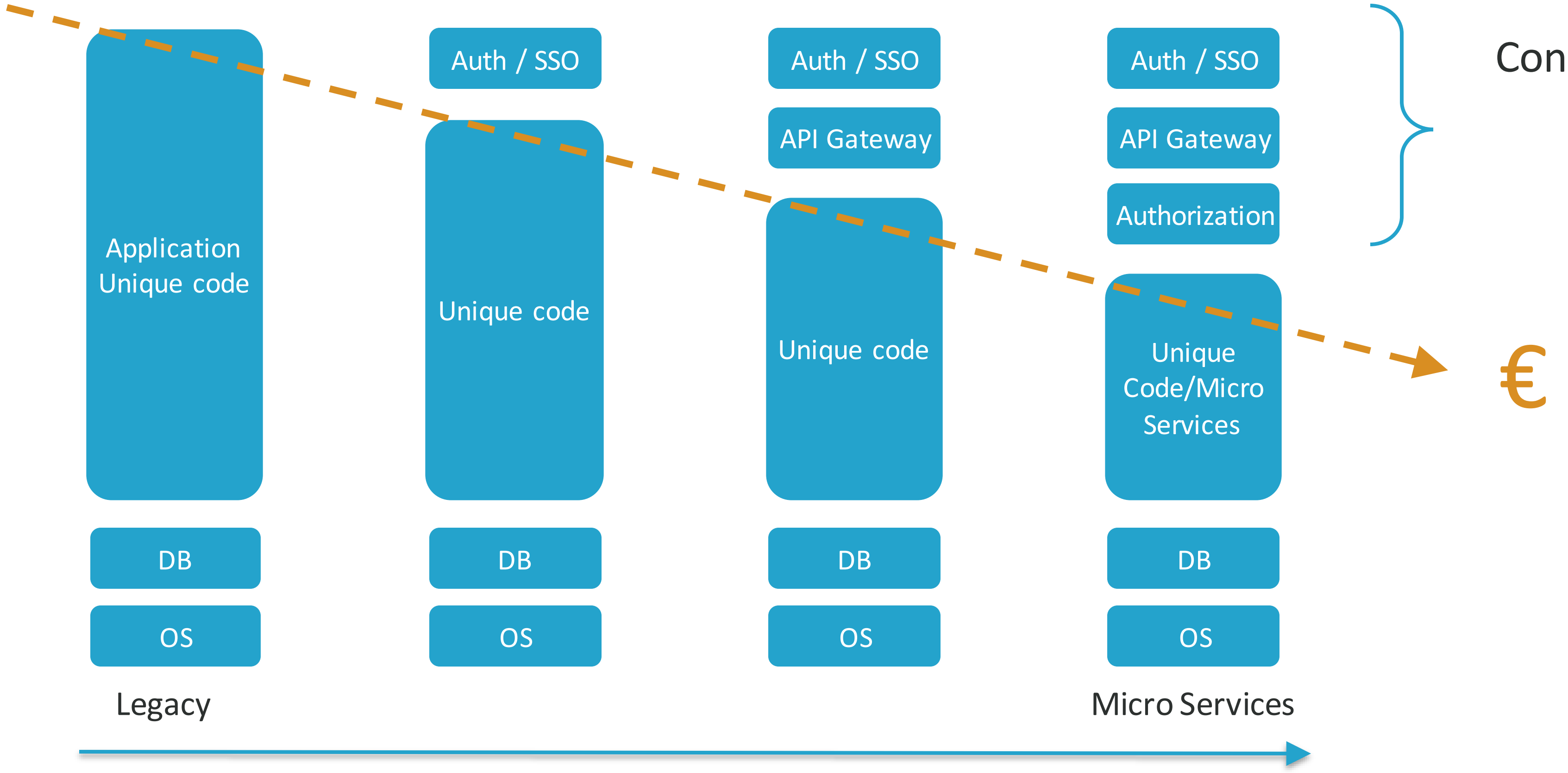
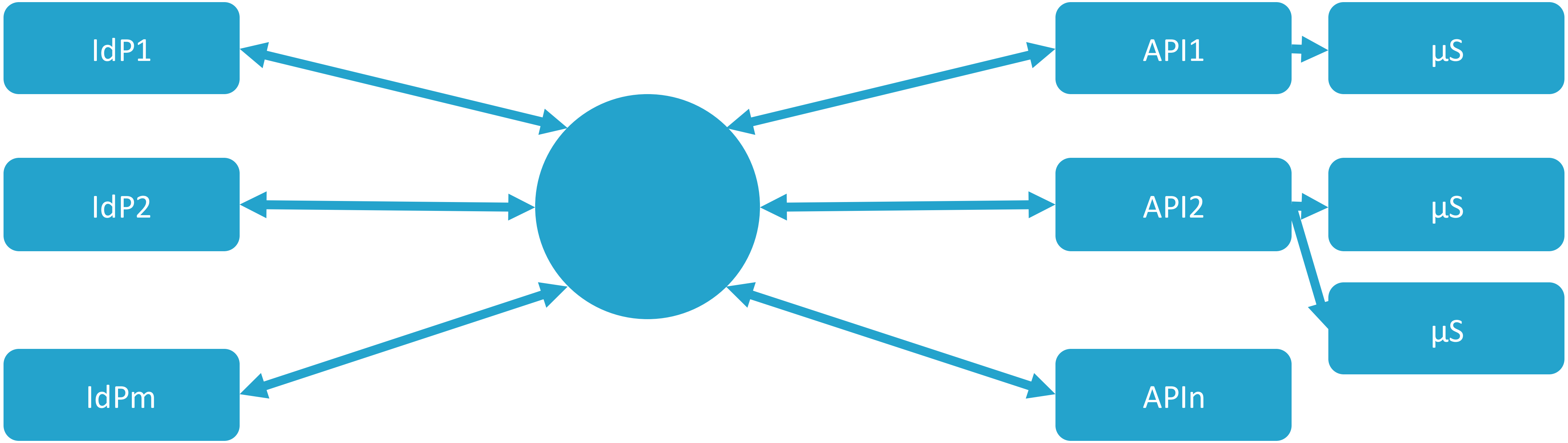
DevOps transition

Externalised Services for Application Development

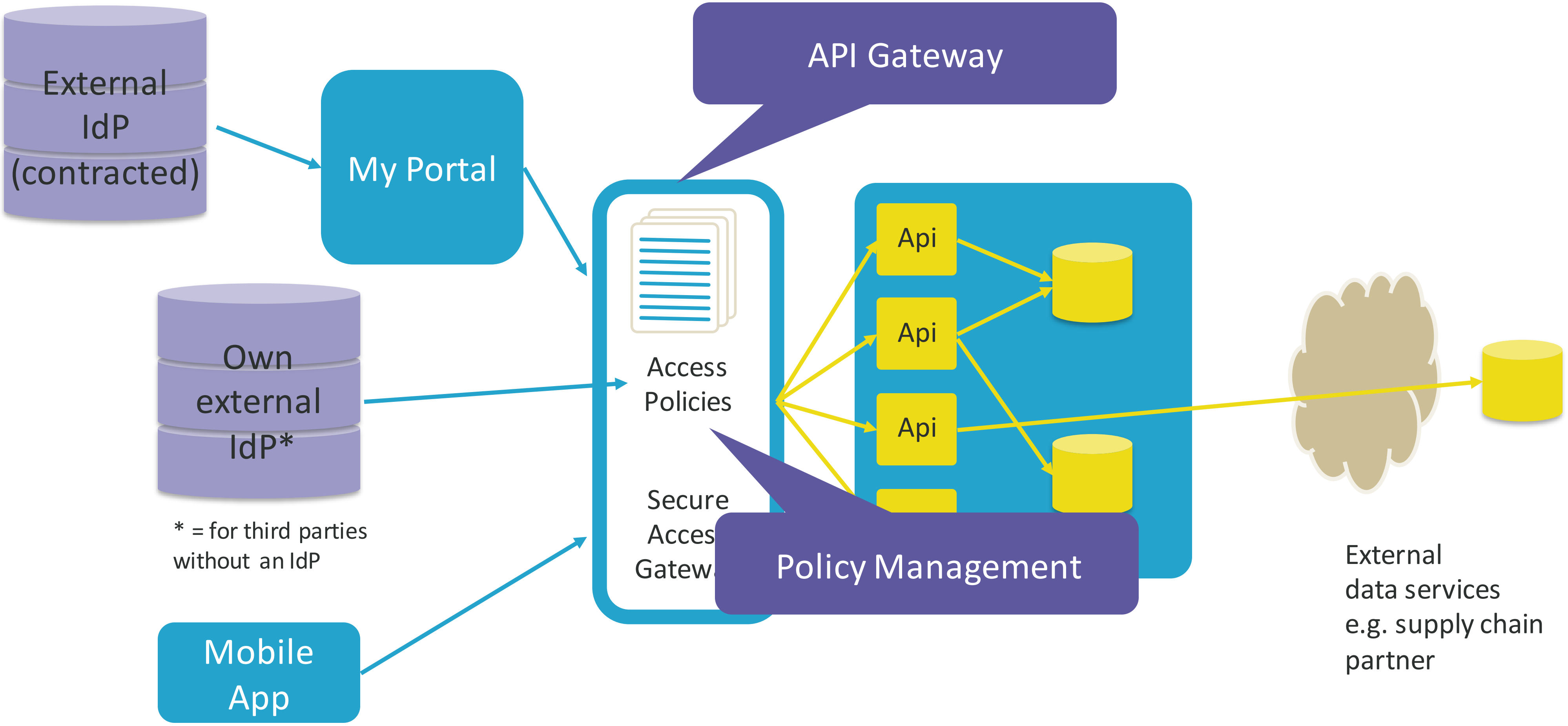


Continuously reusing capabilities developed

Access Broker

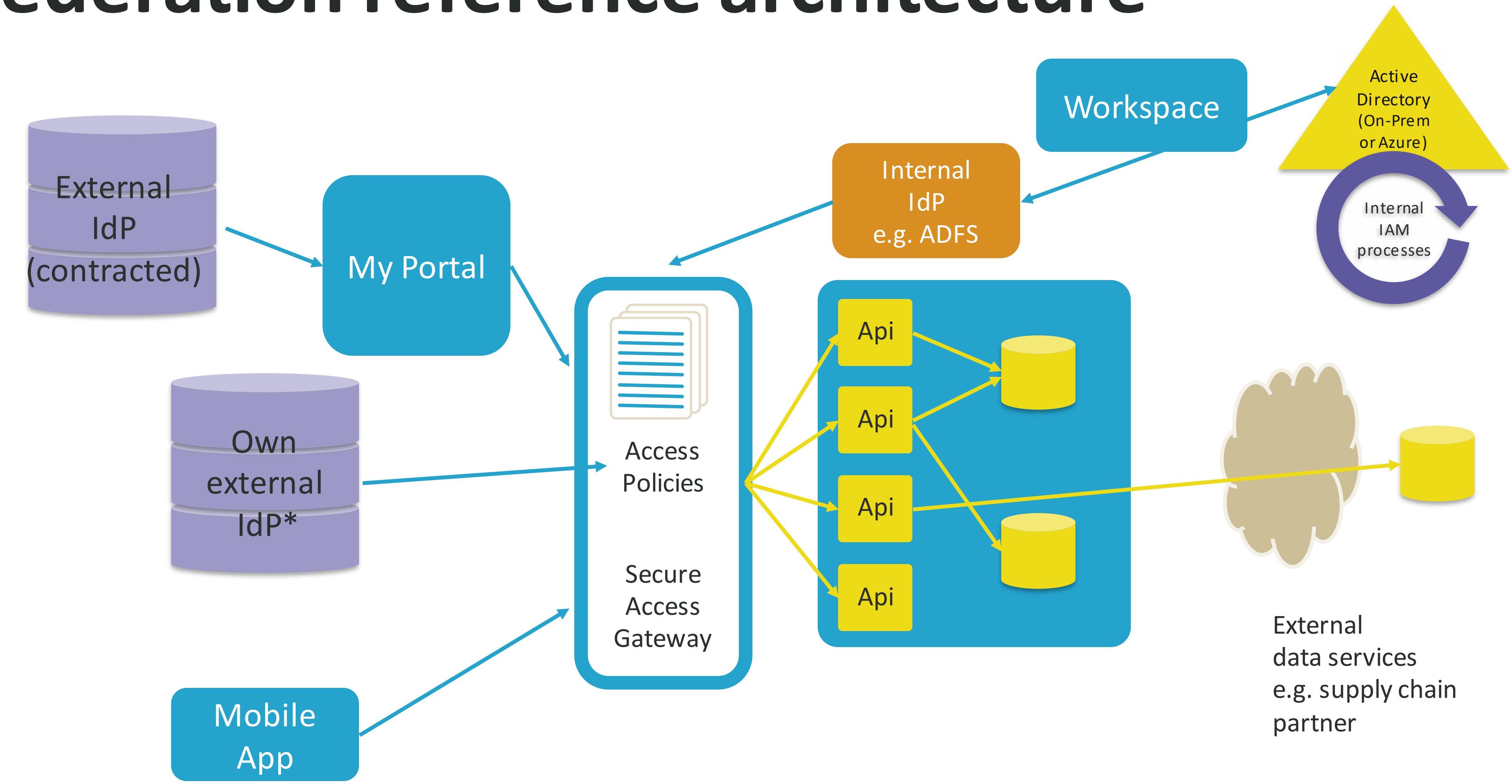


Federation reference architecture



* = for third parties without an IdP

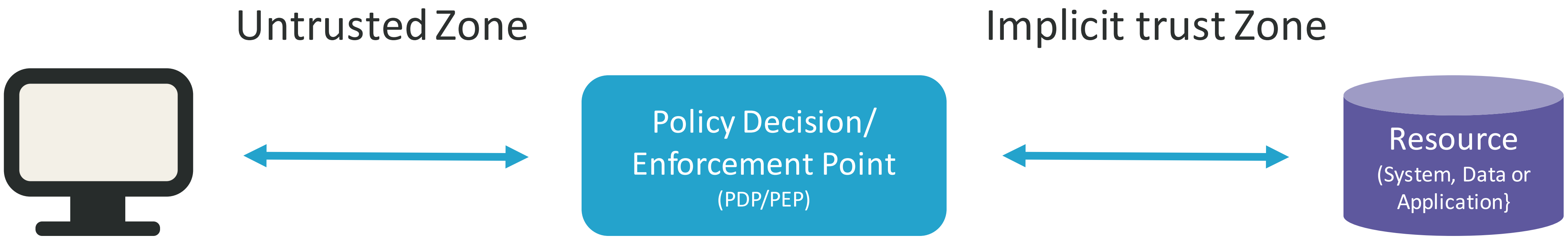
Federation reference architecture



SonicBee

Zero Trust reference architecture

NIST SP 800-207



Zero Trust Access

SonicBee

Access Governance

Owners

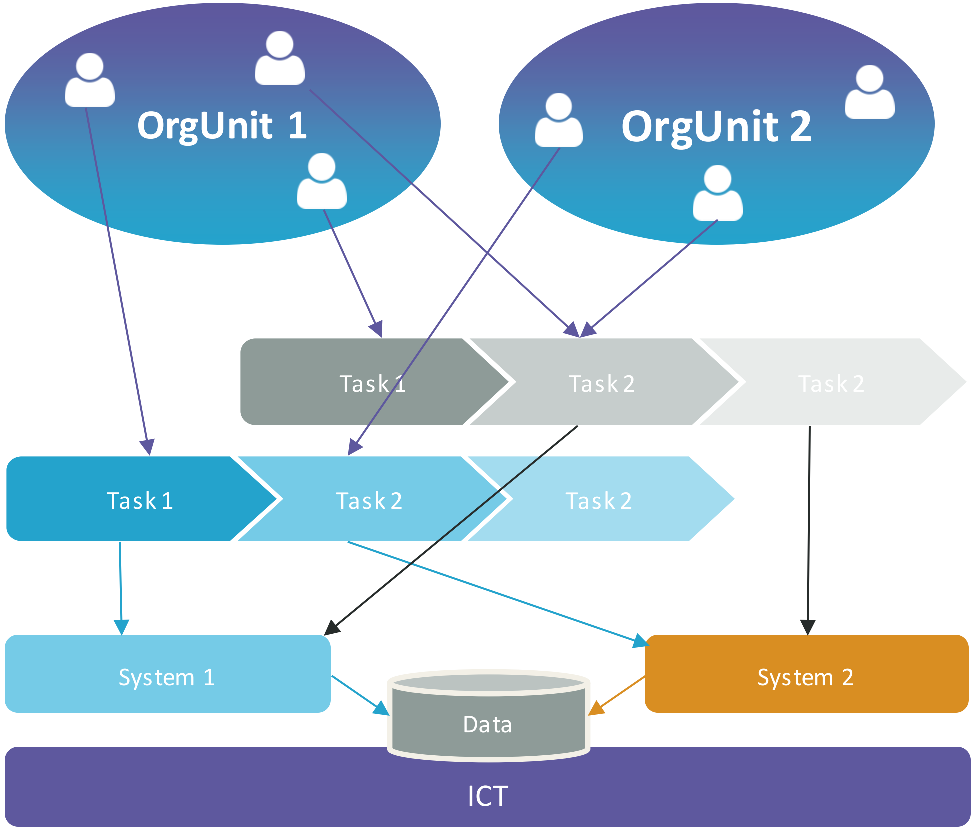
Line Manager

Business Process Owner

Business System Owner

Business Data Owner

Manager of ICT



Policy Management where in the organisation:

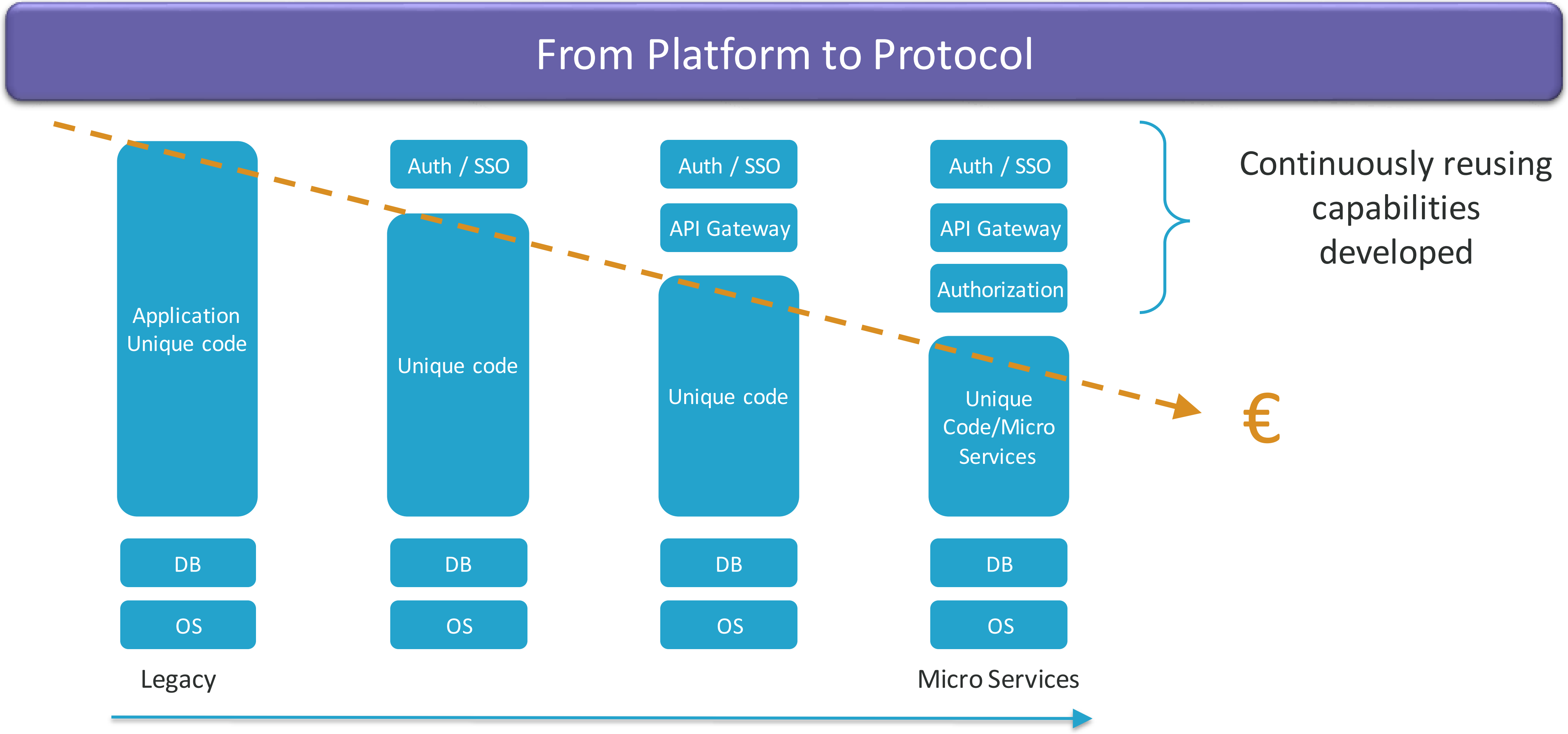
HR reqs / attribs

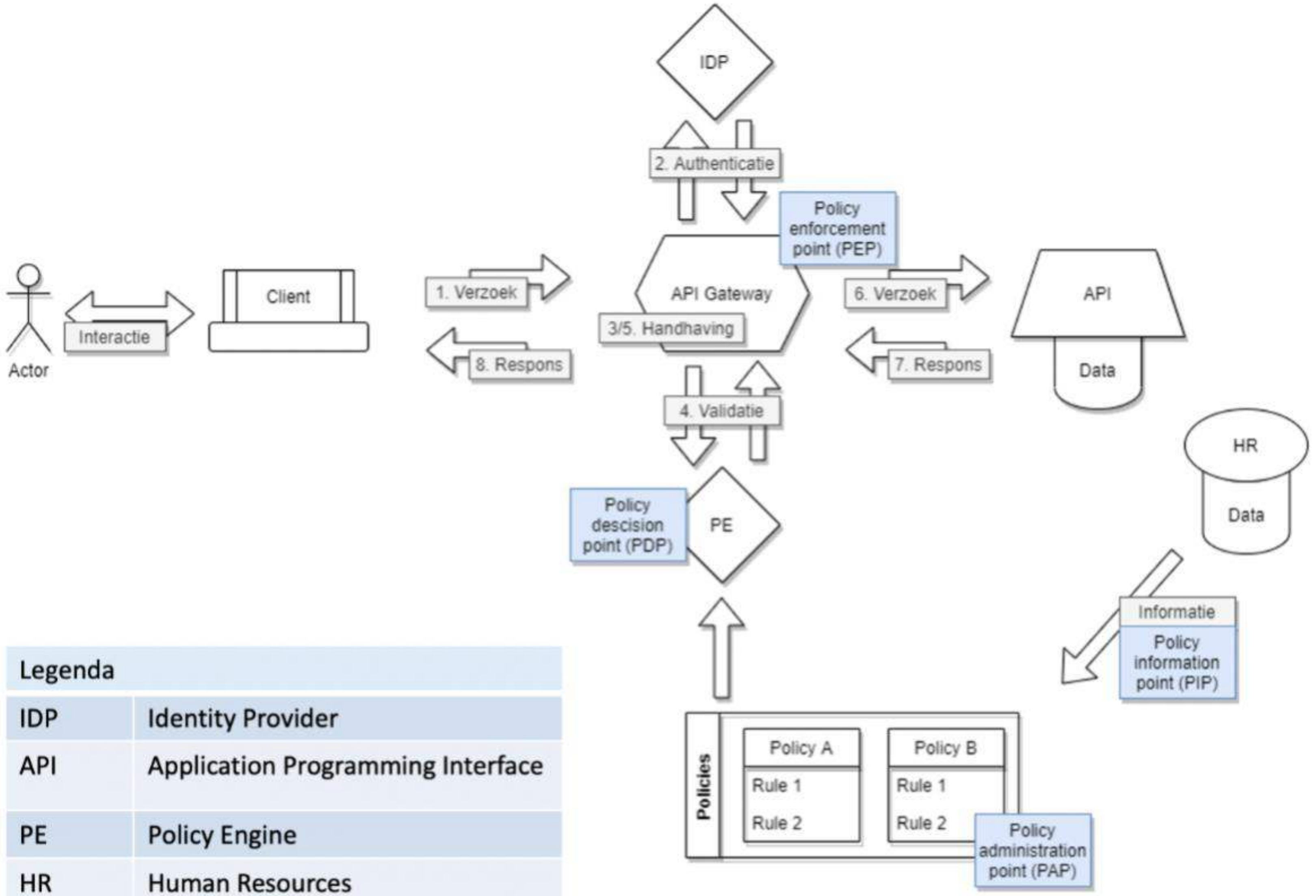
Actor reqs, SoD
Quality reqs

Authz model, licensing

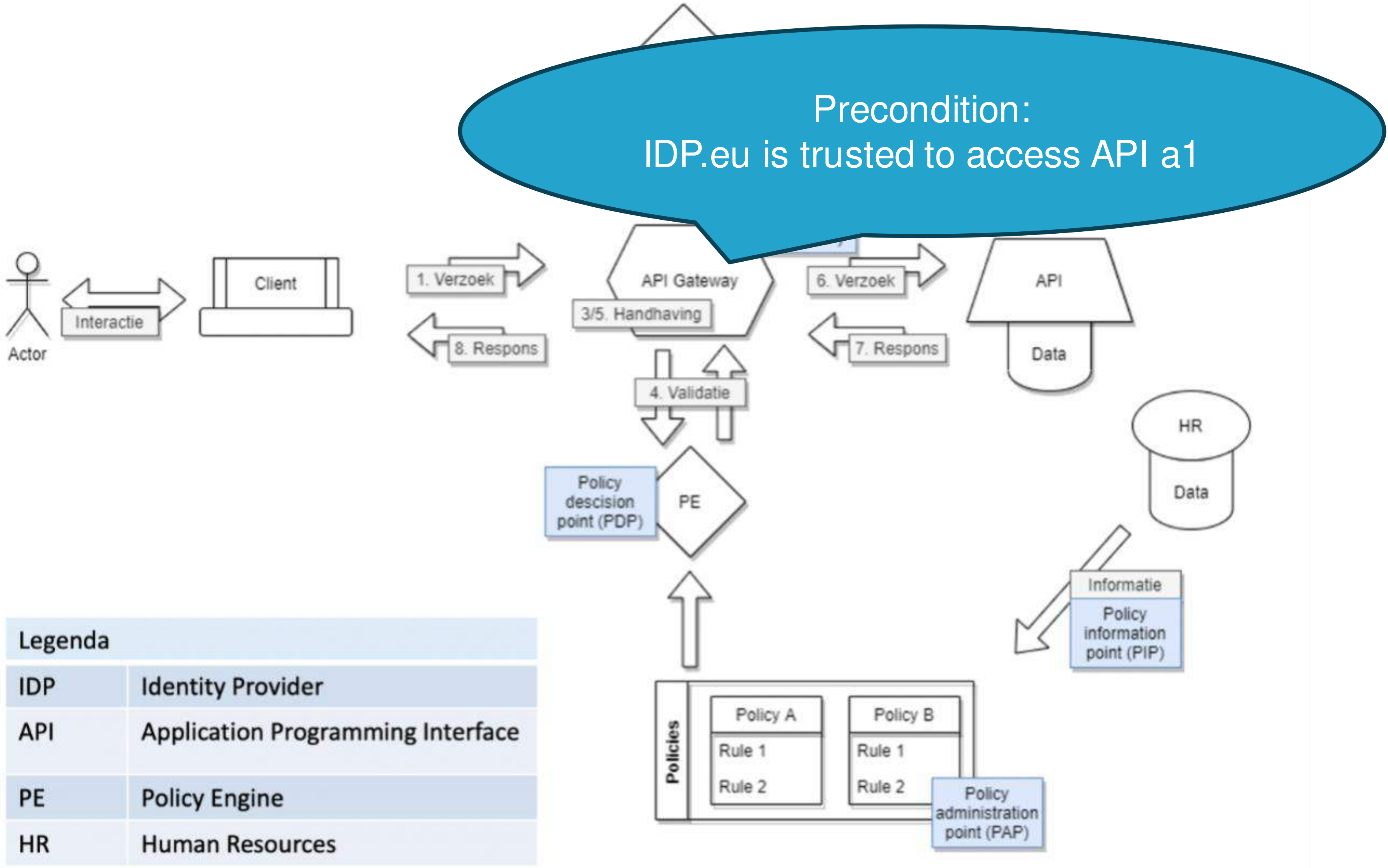
Compliancy Access Rules (privacy etc.)
Physical Access rules

IT architecture transition



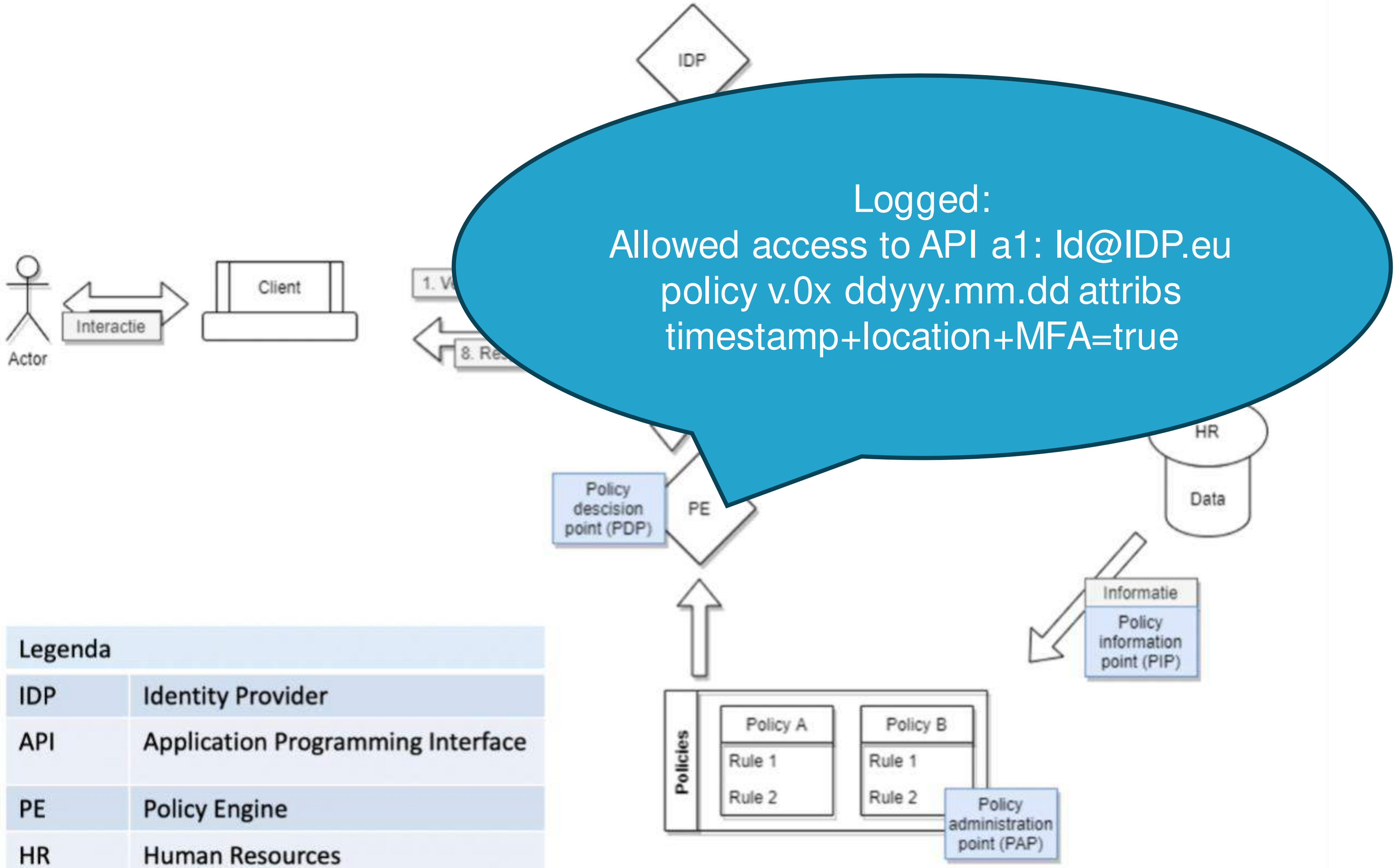


Legenda	
IDP	Identity Provider
API	Application Programming Interface
PE	Policy Engine
HR	Human Resources



Precondition:
IDP.eu is trusted to access API a1

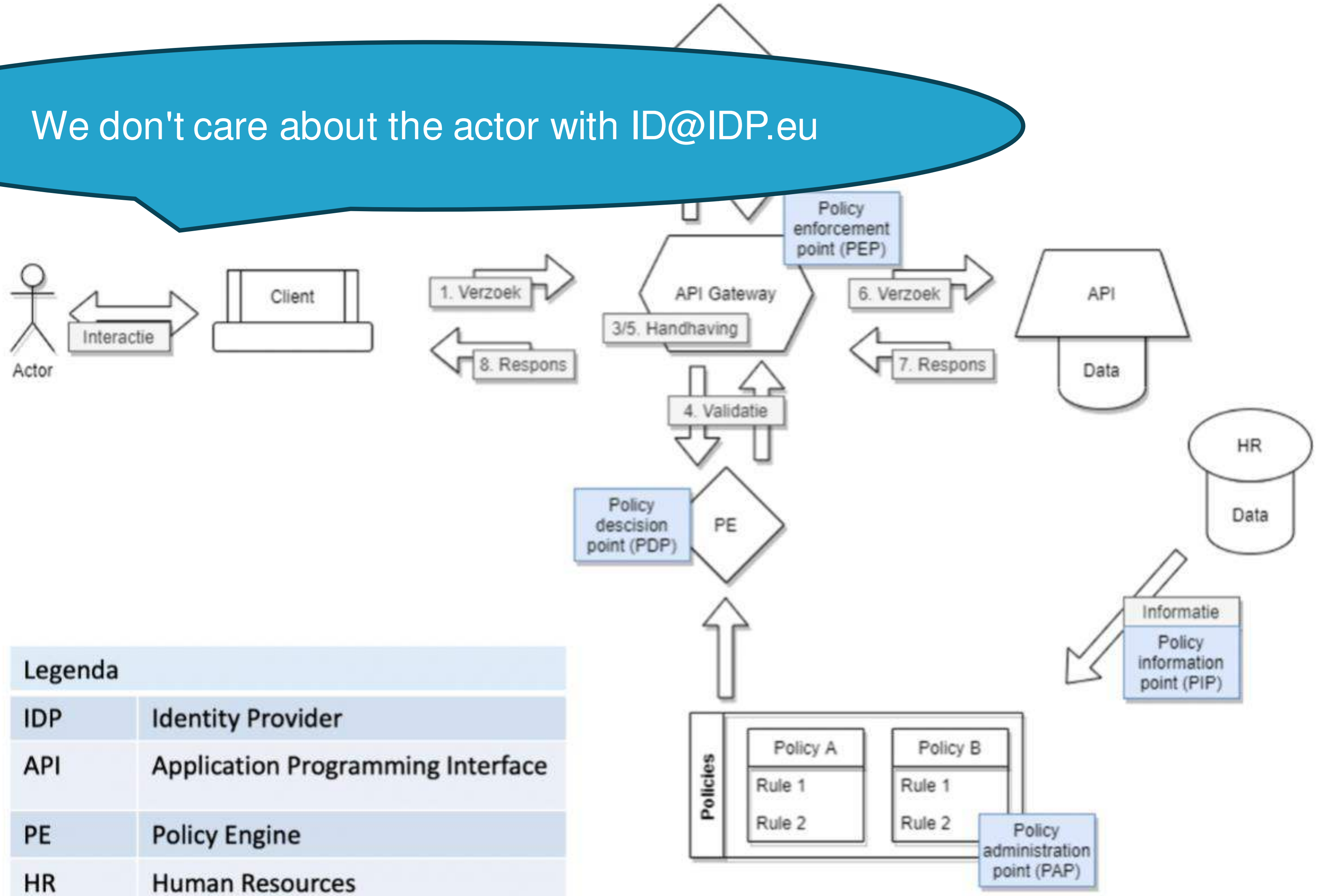
Legenda	
IDP	Identity Provider
API	Application Programming Interface
PE	Policy Engine
HR	Human Resources



Logged:
Allowed access to API a1: Id@IDP.eu
policy v.0x ddyyy.mm.dd attribs
timestamp+location+MFA=true

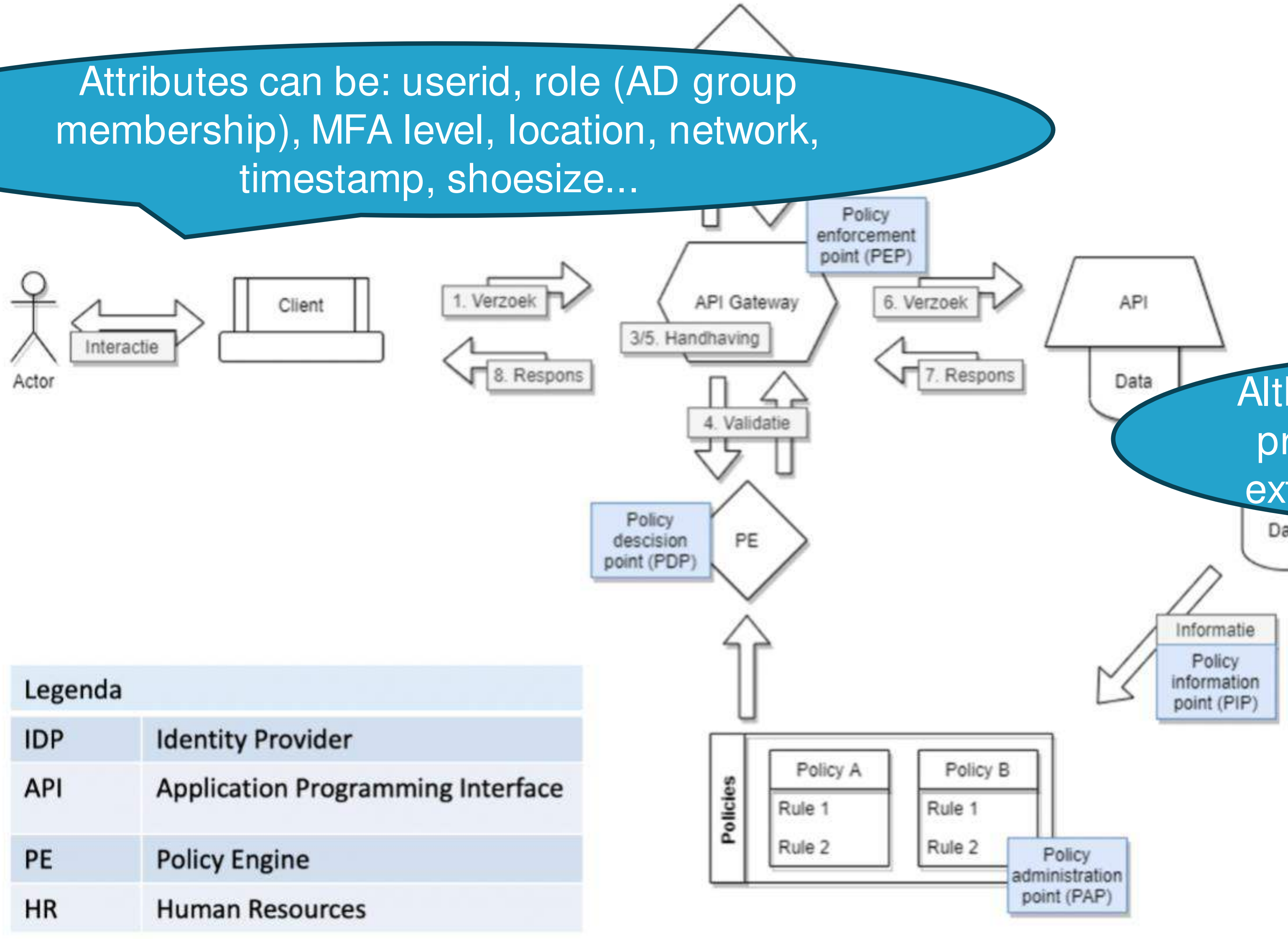
Legenda	
IDP	Identity Provider
API	Application Programming Interface
PE	Policy Engine
HR	Human Resources

We don't care about the actor with ID@IDP.eu



Legenda	
IDP	Identity Provider
API	Application Programming Interface
PE	Policy Engine
HR	Human Resources

Attributes can be: userid, role (AD group membership), MFA level, location, network, timestamp, shoesize...

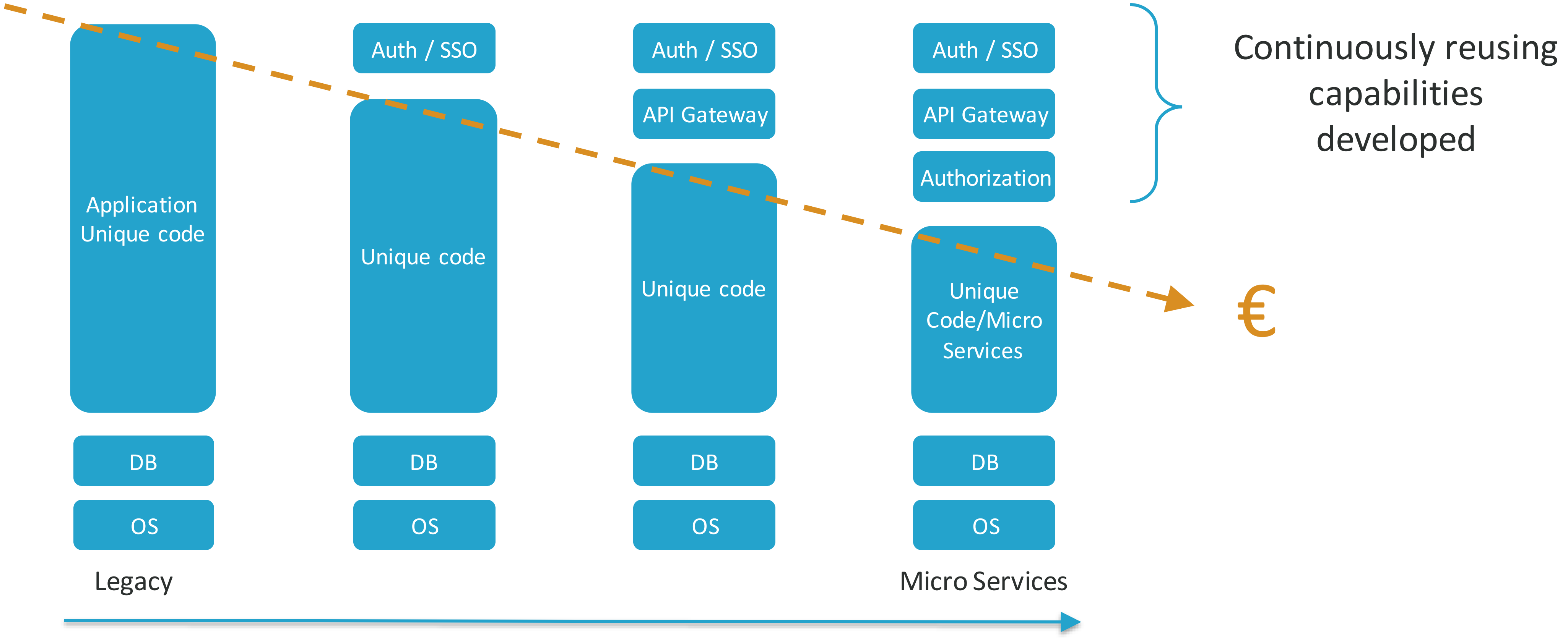


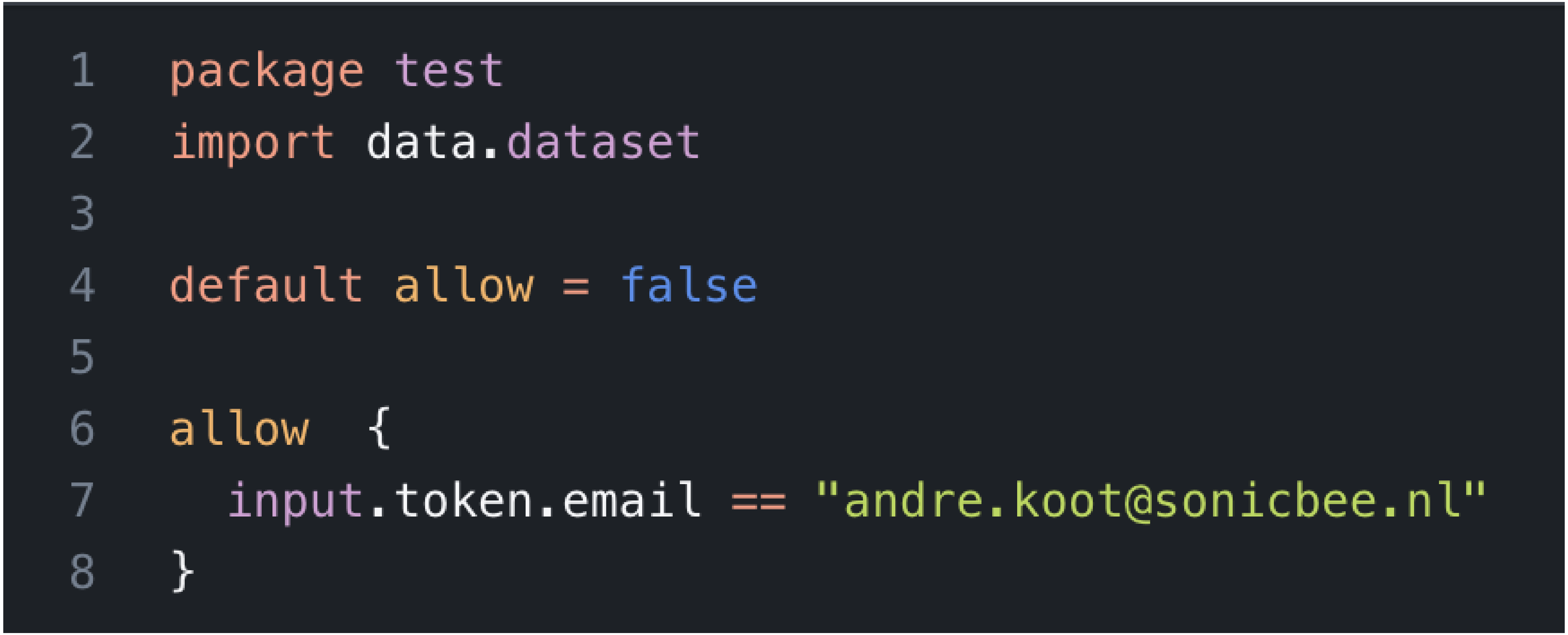
Legenda	
IDP	Identity Provider
API	Application Programming Interface
PE	Policy Engine
HR	Human Resources

Although attrib shoesize is probably provided by an external attribute provider

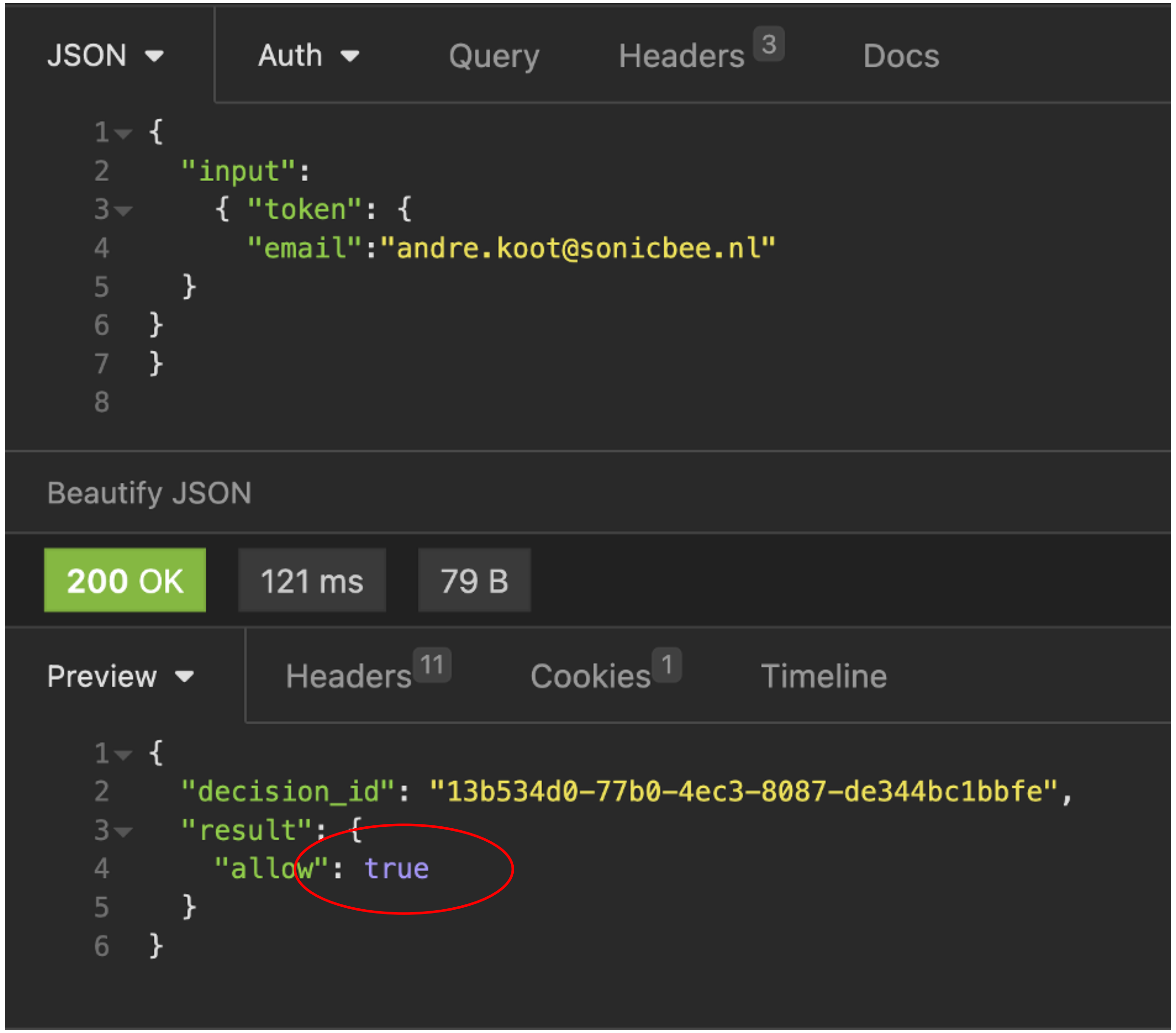
Auditing transition

From data and roles to Policy validation



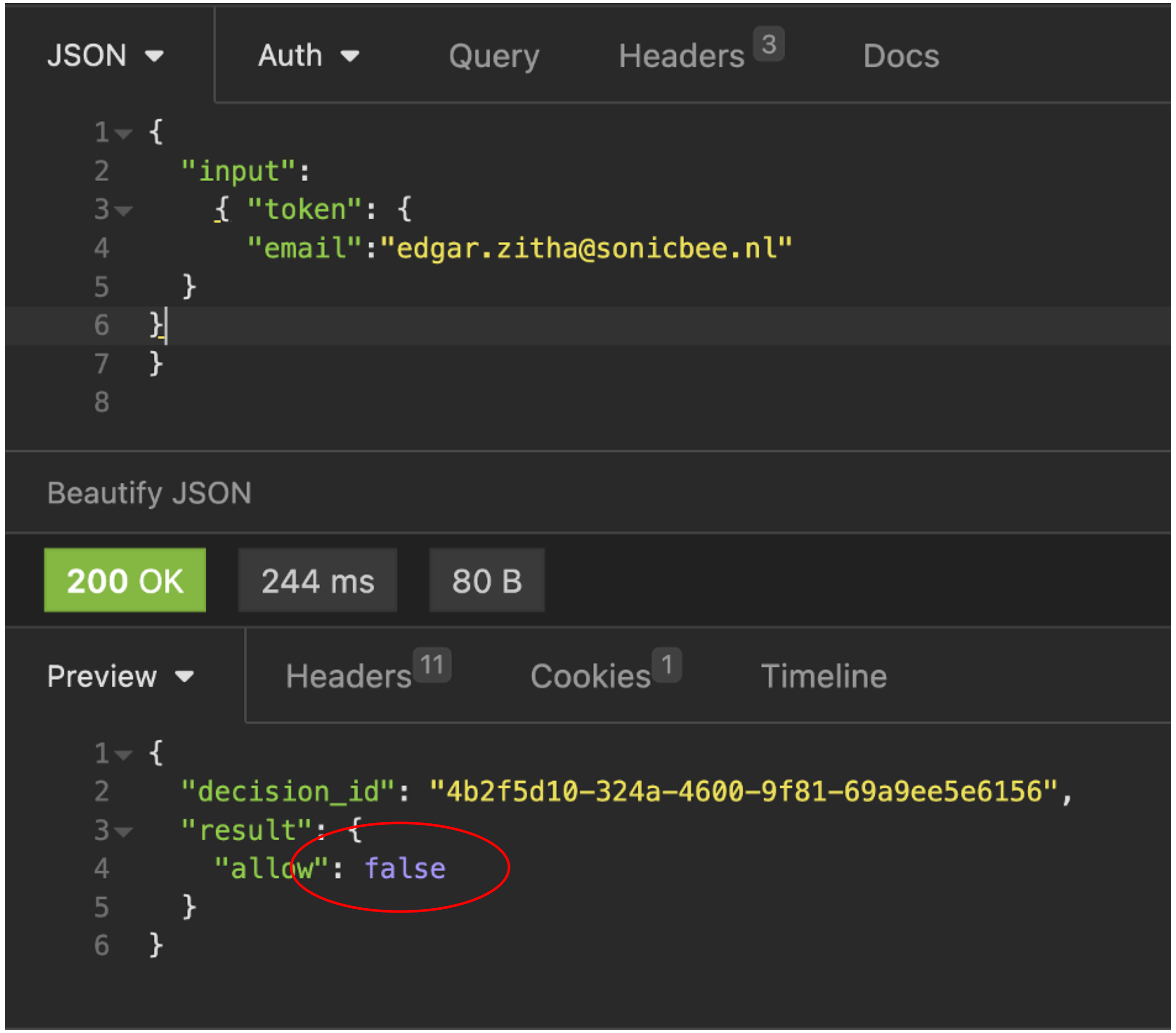


```
package test
import data.dataset

default allow = false

allow  {
  input.token.email == "andre.koot@sonicbee.nl"
}
```



```
{
 "input":
  { "token": {
   "email":"andre.koot@sonicbee.nl"
 }
}
}

```

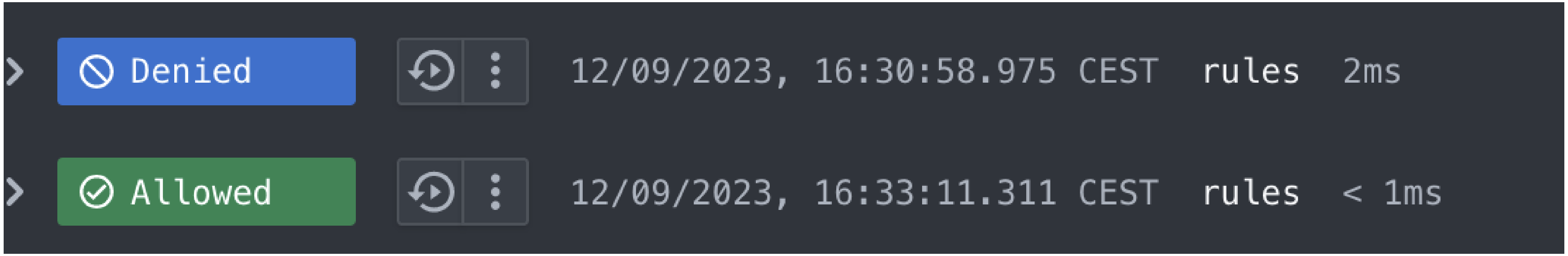
```
{
 "decision_id": "13b534d0-77b0-4ec3-8087-de344bc1bbfe",
 "result": {
  "allow": true
 }
}
```



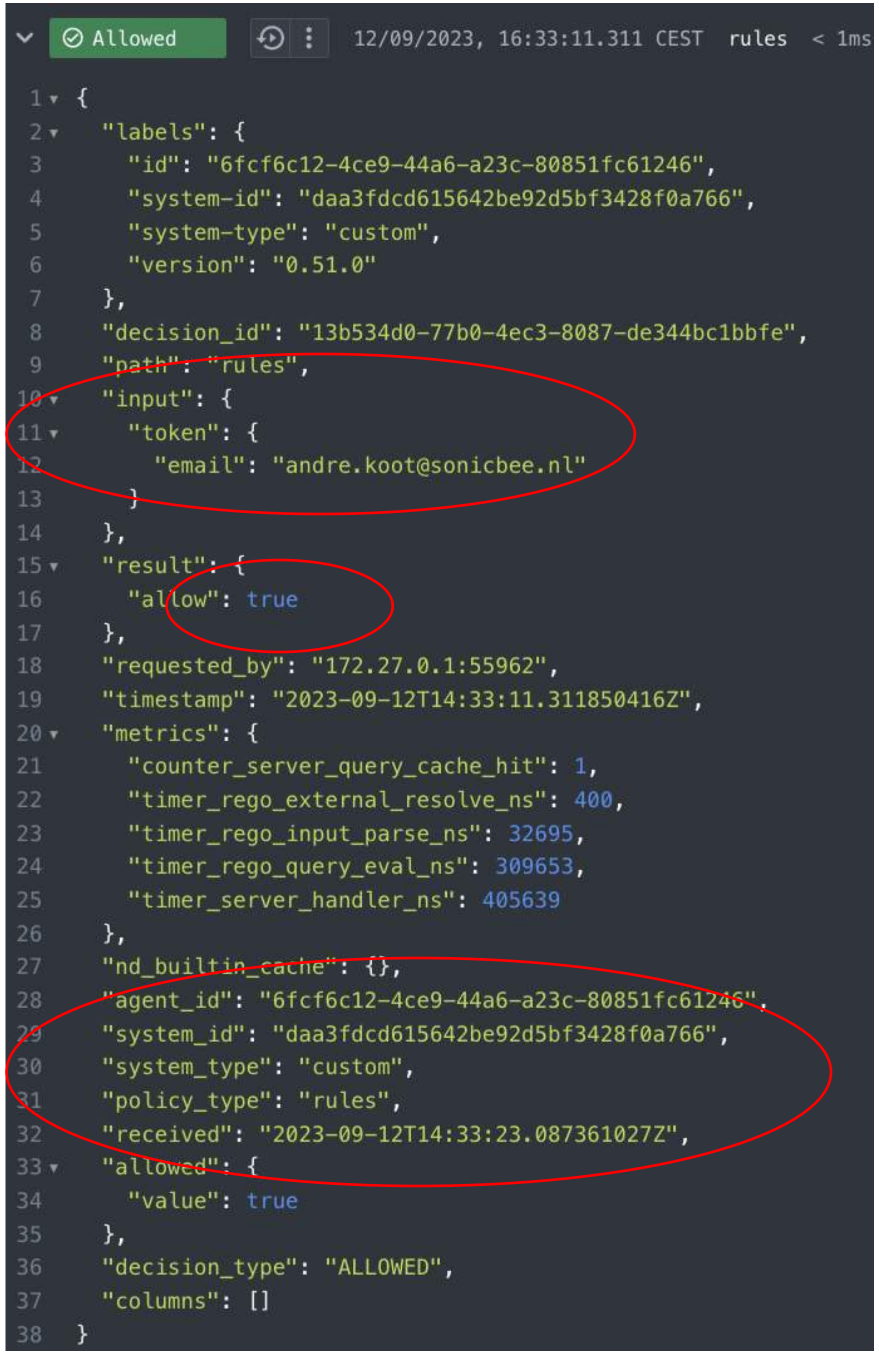
```
{
 "input":
  { "token": {
   "email":"edgar.zitha@sonicbee.nl"
 }
}
}

```

```
{
 "decision_id": "4b2f5d10-324a-4600-9f81-69a9ee5e6156",
 "result": {
  "allow": false
 }
}
```

Styra Decision logs

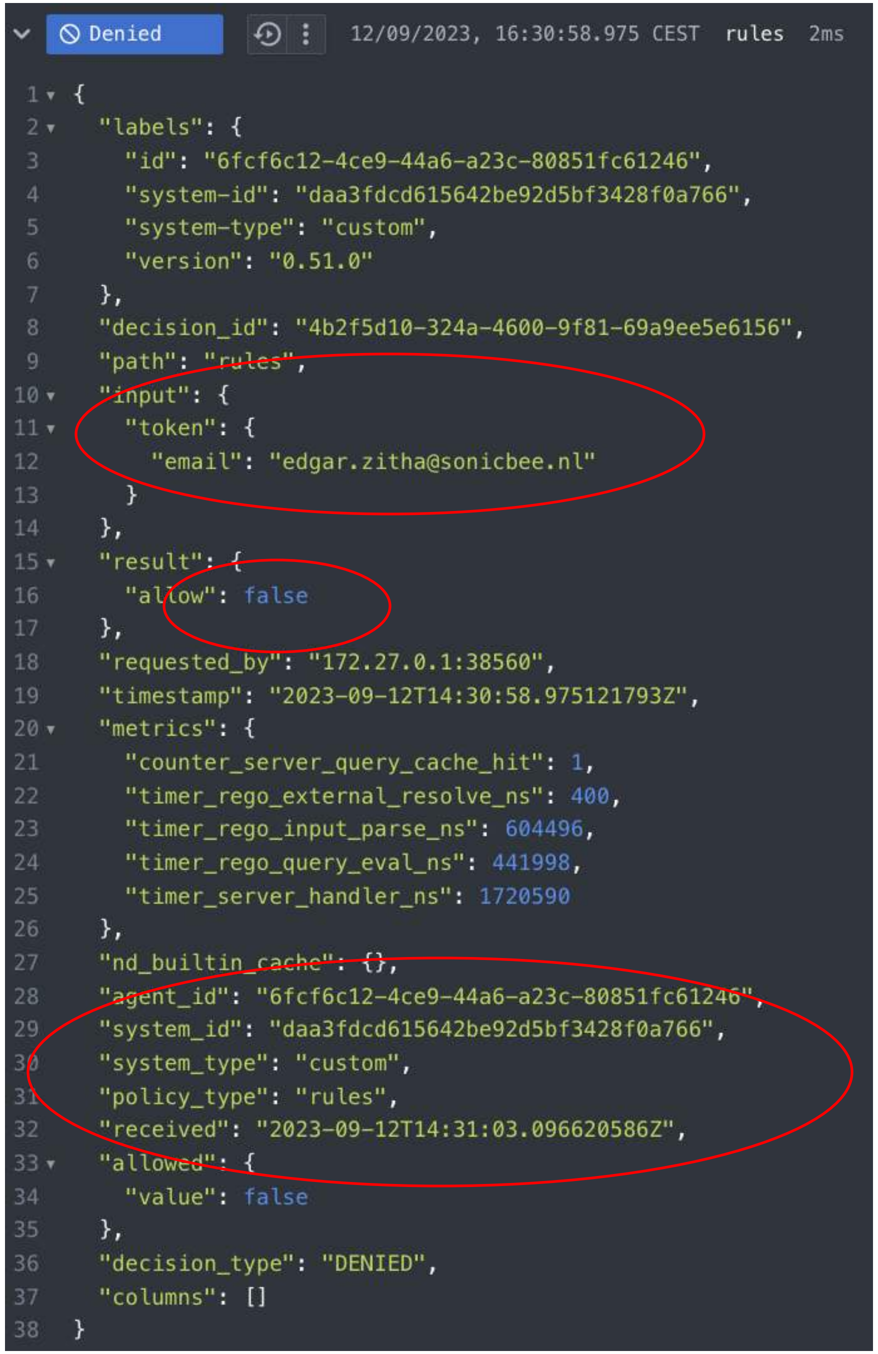


```
Denied   12/09/2023, 16:30:58.975 CEST  rules  2ms
Allowed  12/09/2023, 16:33:11.311 CEST  rules  < 1ms
```



12/09/2023, 16:33:11.311 CEST rules < 1ms

```
{
  "labels": {
    "id": "6fcf6c12-4ce9-44a6-a23c-80851fc61246",
    "system-id": "daa3fdcd615642be92d5bf3428f0a766",
    "system-type": "custom",
    "version": "0.51.0"
  },
  "decision_id": "13b534d0-77b0-4ec3-8087-de344bc1bbfe",
  "path": "rules",
  "input": {
    "token": {
      "email": "andre.koot@sonicbee.nl"
    }
  },
  "result": {
    "allow": true
  },
  "requested_by": "172.27.0.1:55962",
  "timestamp": "2023-09-12T14:33:11.311850416Z",
  "metrics": {
    "counter_server_query_cache_hit": 1,
    "timer_rego_external_resolve_ns": 400,
    "timer_rego_input_parse_ns": 32695,
    "timer_rego_query_eval_ns": 309653,
    "timer_server_handler_ns": 405639
  },
  "nd_builtin_cache": {},
  "agent_id": "6fcf6c12-4ce9-44a6-a23c-80851fc61246",
  "system_id": "daa3fdcd615642be92d5bf3428f0a766",
  "system_type": "custom",
  "policy_type": "rules",
  "received": "2023-09-12T14:33:23.087361027Z",
  "allowed": {
    "value": true
  },
  "decision_type": "ALLOWED",
  "columns": []
}
```



12/09/2023, 16:30:58.975 CEST rules 2ms

```
{
  "labels": {
    "id": "6fcf6c12-4ce9-44a6-a23c-80851fc61246",
    "system-id": "daa3fdcd615642be92d5bf3428f0a766",
    "system-type": "custom",
    "version": "0.51.0"
  },
  "decision_id": "4b2f5d10-324a-4600-9f81-69a9ee5e6156",
  "path": "rules",
  "input": {
    "token": {
      "email": "edgar.zitha@sonicbee.nl"
    }
  },
  "result": {
    "allow": false
  },
  "requested_by": "172.27.0.1:38560",
  "timestamp": "2023-09-12T14:30:58.975121793Z",
  "metrics": {
    "counter_server_query_cache_hit": 1,
    "timer_rego_external_resolve_ns": 400,
    "timer_rego_input_parse_ns": 604496,
    "timer_rego_query_eval_ns": 441998,
    "timer_server_handler_ns": 1720590
  },
  "nd_builtin_cache": {},
  "agent_id": "6fcf6c12-4ce9-44a6-a23c-80851fc61246",
  "system_id": "daa3fdcd615642be92d5bf3428f0a766",
  "system_type": "custom",
  "policy_type": "rules",
  "received": "2023-09-12T14:31:03.096620586Z",
  "allowed": {
    "value": false
  },
  "decision_type": "DENIED",
  "columns": []
}
```

Typical audit findings in identity and access audits could include:

1. Are the relevant business stakeholders in Access Governance defined:
   Access control is a business responsibility, with different stakeholders.
2. Are the relations between identity providers and relying parties formalised:
   Services and API's should only be consumed by trusted internal and external parties. If there is no trusted external party, is a trusted IdP available?
3. Are relevant attributes clearly defined in the access policy:
   Attributes, claims and verifiable credentials contain information that can be used to validate access requests. Identities and accounts are not relevant anymore (although a role can be treated as an attribute if the back-end system is still an RBAC-application
4. Have reliable attribute sources been defined:
   Attributes can be gathere from multiple sources. Define the one source that is primarily accountable for the attribute operations store.
5. Do access logs contain the relevant data:
   We need at least these attributes: id@idp and timestamp.
6. Is version control of policies in place:
   An access policy should be treated as a configuration item, it cannot easlity change, the po9licy definied the access control behavior, it's a critical component. With multiple stakeholders relying on the integrity of the dataset.
7. Make sure there is no bypasses accessible:
   is zero trust in place, is PKI embedded.

Time for you all…!

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