

Role Management in a Privacy-Enhanced Collaborative Environment

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Agenda



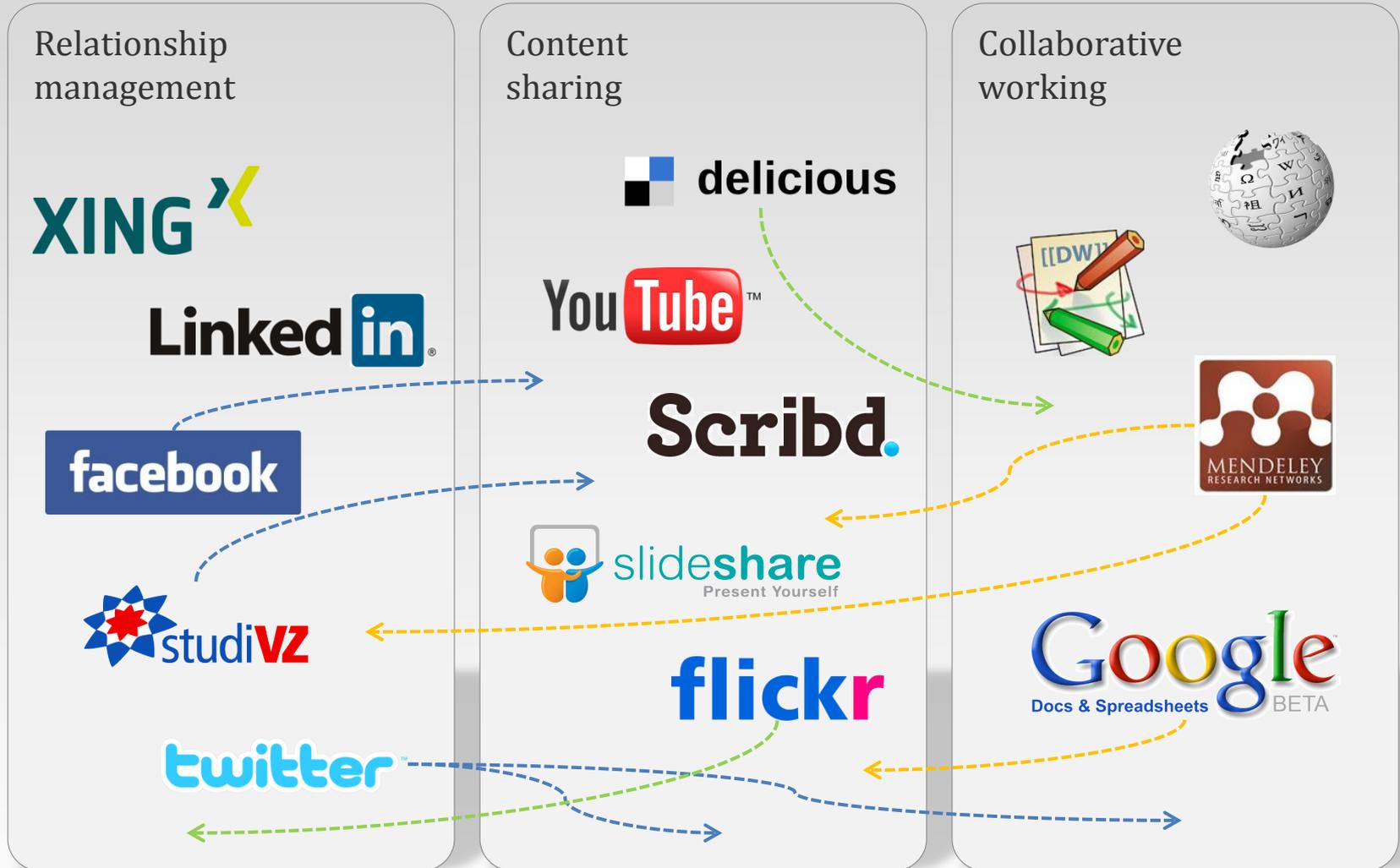
Role Management

in a

Privacy-Enhanced

Collaborative Environment

Collaborative environments



Motivation for privacy-enhancement

Many spreaded personal data on web profiles for different reasons...



Web profiles of Katrin

- for research
- for professional networking
- for private networking



Web profiles of Anja

- for research
- for professional networking ([@anjalorenz](#))
- for private networking

The collage displays several web profiles for Anja Lorenz:

- University Profile:** Technische Universität Chemnitz, Fakultät für Wirtschaftswissenschaften. Anja Lorenz, Dipl.-Medieninf. Mitarbeiterin. Address: Thangauer Weg 7, Raum 211, Chemnitz, 09111. Contact: 03731 631-2967, Fax 03731 631-2629, Email anja.lorenz@tu-chemnitz.de, Internet anja.lorenz.
- MENDELEY:** Signed in as anja.lorenz@wirtschaft.tu-chemnitz.de. Dashboard, Library, Research papers, My Profile, People, Statistics, Support.
- XING:** Anja Lorenz, Dipl.-Medieninf. Doktorand / Wissenschaftlicher Mitarbeiter. Anja Lorenz kontaktieren! Melden Sie sich kostenlos und unverbindlich beim Business-Netzwerk XING an.
- Twitter:** @anjalorenz. Name: Anja Lorenz, Ort: Chemnitz, Web: http://www.tu-chemnitz.de. 97 Following, 35 Followers, 8 Tweets.
- StudiVZ:** Anja Lorenz' Seite (TU Chemnitz). Account info: Name: Anja Lorenz, Verzeichnis: StudiVZ, Mitglied seit: 06.11.2006, Letztes Update: 29.10.2009, Hochschule: TU Chemnitz.

Motivation for privacy-enhancement

Things that may happen...

Motivation for privacy-enhancement



Via <http://thenextweb.com/2009/08/09/note-friend-boss-fb-bitch-job/>

Motivation for privacy-enhancement



 **PLEASE ROB ME** 

Listing all those empty homes out there 

Check out the same results on [Twitter search](#).

Next step

 We at Forthehack have been thinking about how we want to continue pleaserobme.com. It has received a lot of attention and it's time for a next step. We want to offer this website to a professional foundation, agency or company that focuses on raising awareness, helping people understand and provide answers to online privacy related issues.

If you're such a foundation, agency or company, contact us.

More Info

Home
Why
About

Made Possible By

Forthehack
Foursquare
Twitter
@m0nk
@forthehack

Ads by Google

Executive Career Service
Senior Jobs From 100 000 € Access over 6 000 Headhunters
www.Experteer.com

Dating Chinese Women
7000+ Beautiful
Classy Chinese Women Seek Love & Marriage Join Free!
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Pro Web 2.0 Platform
Download XCAP today. A jvabased platform with more than 20 modules
www.magp.se

Chatten, Flirten und mehr
Online Dating ganz einfach. 42 Mio Profile stehen zur Auswahl!
www.Neu.de

Hi there, all we can say is wow. The amount of attention we're getting is amazing. It's great to see that the website has been picked up by so many awesome blogs, news providers and people out there, who got our point perfectly.

- Mashable
- The Next Web
- cnet
- 1938media
- Forbes blog
- More

Hi there, all we can say is wow. The amount of attention we're getting is amazing. It's great to see that the website has been picked up by so many awesome blogs, news providers and people out there, who got our point perfectly.

Share 

Recent Empty Homes

5 new opportunities

 **@VickiLaszlo** left home and checked in less than a minute ago: I'm at Starbucks (5140 Yonge St, at Park Home Ave, Toronto). <http://4sq.com/S1UnwW>

 **@McWriters** left home and checked in less than a minute ago: I'm at Calypso Coffee w/ @jamieebirch @srobinson. <http://4sq.com/beOJce>

 **@JonathanDroz83** left home and checked in less than a minute ago: I'm at Zentralplatz Bushaltestelle (Zentralstrasse 49, Bienne). <http://4sq.com/8SdtZ>

<http://pleaserobme.com/>

Motivation for privacy-enhancement

Be careful with spreading personal data in the web!

Privacy-Enhancement

Protection in collaborative environments

The surrounding of each person is
uniformly untrusted!

(Chaum 1995)

State-of-the-art

Technical approaches for privacy-enhancement

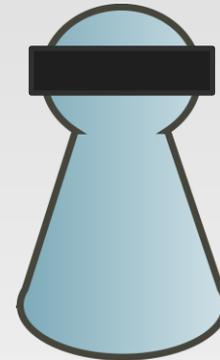
Encryption



Pseudonymisation



Anonymisation



Well-proved for sender-recipient relationships (e-Shops etc.)

➔ **But** do not support requirements for privacy respecting collaborative working

Collaborative environments

Conditions for privacy protection

- No predefined protocols
- Ad-hoc decisions
- Spontaneous activities
- **And** interaction is a strongly wanted feature

Our approach:
Privacy enhanced identity
management

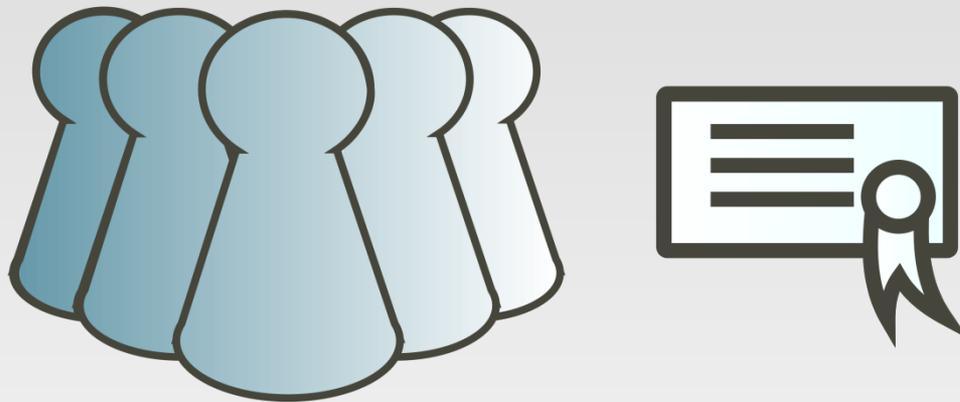


Focus:

User Control

Privacy enhanced ID-management

Main concept: Partial identities



Not: showing whole profiles of one person

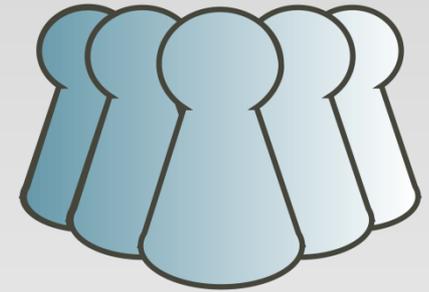
But: disclosing selected attributes of one person
→ partial identity

Privacy enhanced ID-management

Main concept: Partial identities

A **partial identity (pID)**

... „represents the person in a specific context or role.“



- a subset of attributes
- union of all pIDs = complete identity
- credentials for proof-demanding attributes

(Pfitzmann & Hansen 2008, Chaum 1985)



The User

decides which personal data is disclosed
and to whom in what context!

Research Background

BluES, PRIME, BluES'n, Prime Life



<https://www.prime-project.eu>

<http://www.primelife.eu/>

Research Background

BluES'n



A **privacy-enhanced** collaborative environment for learning

Identity management

→ partial identities for user representation in certain contexts

Authentication & authorisation

→ based on anonymous credentials and policies
(cf. David Chaum 1985)

Research Background

BluES'n



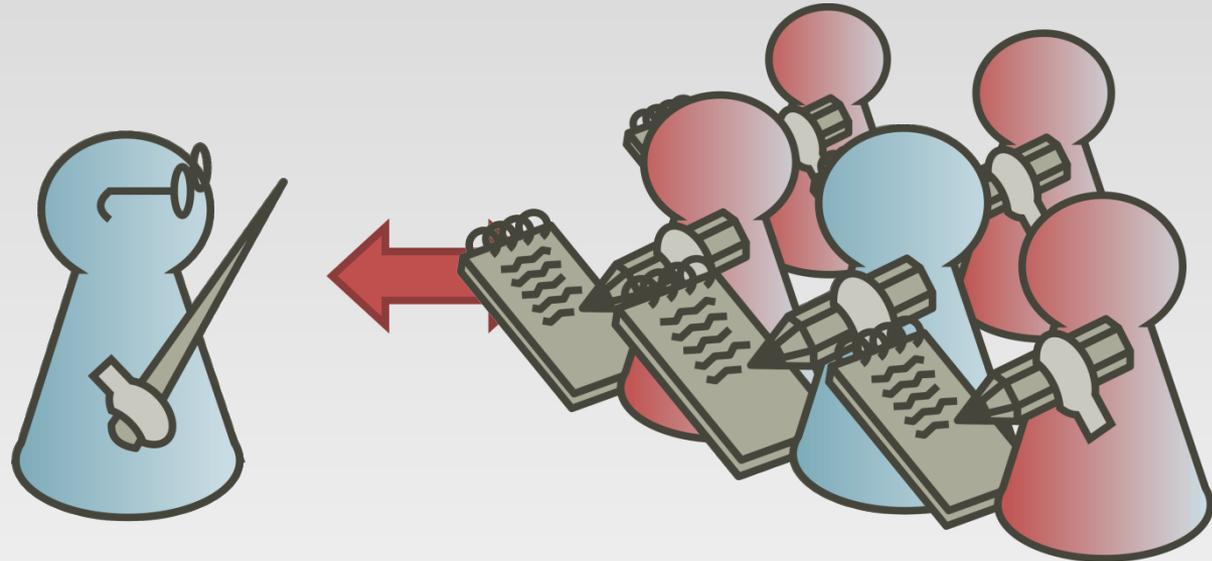
A **privacy-enhanced** collaborative environment for learning

Social interaction vs. privacy requirements

- Intra-application partitioning (Borcea et al. 2005)
- Awareness information (cf. e.g. Franz et al. 2006)
- Reputation (Steinbrecher 2006)
- **Roles**

Understanding of Roles

Different interpretations



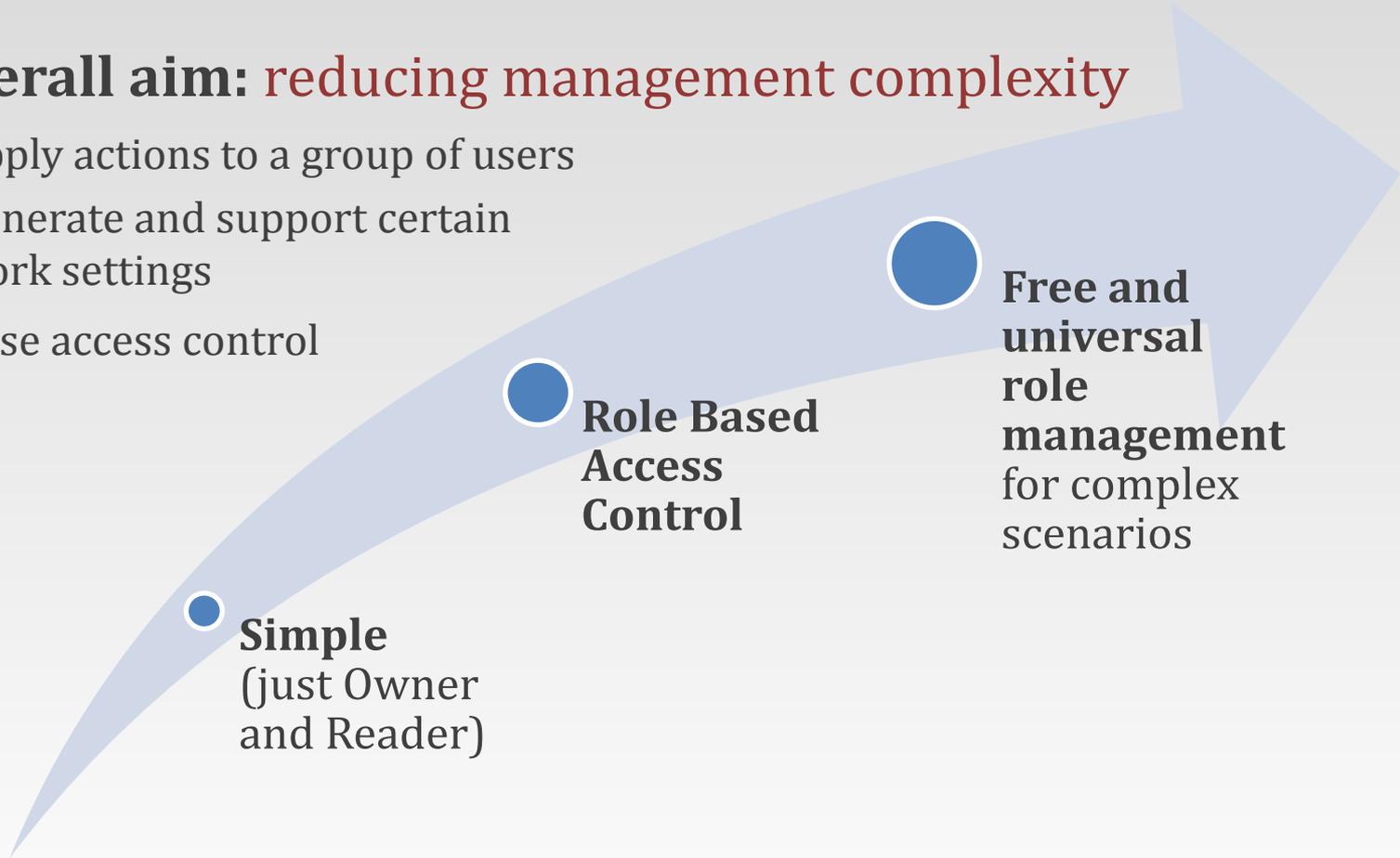
- **Position** (Linton 1936, Luhmann 1984)
- **Behaviour** (Gerhardt 1971)
- **Relations** (Mead 1967, Goffman 1974, Carell+ 2002)
- **Groups** (Znaniecki 1965)

Understanding of Roles

Different usage

Overall aim: reducing management complexity

- Apply actions to a group of users
- Generate and support certain work settings
- Ease access control



Simple
(just Owner
and Reader)

**Role Based
Access
Control**

**Free and
universal
role
management
for complex
scenarios**

Role Concept for BluES'n



Our interpretation

Roles = stereotypes of users

- Equal rights and duties
- Expectations of behavior
- Help interaction partners to range in a user's position within a group

(Lorenz 2009, Borcea-Pfitzmann 2008)

Role Concept for BluES'n

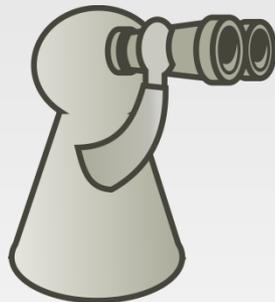


Our usage: 3 role dimensions

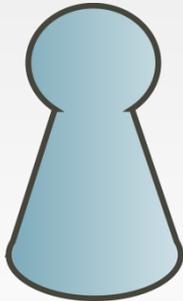
1. Administrative Roles



Owner



Guest



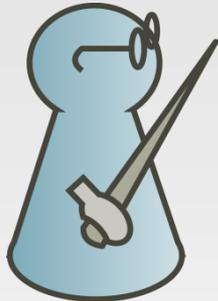
Participant



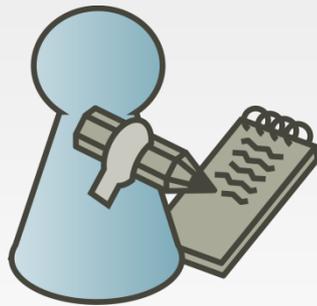
Role Concept for BluES'n

Our usage: 3 role dimensions

1. Administrative Roles
2. Functional Roles



Teacher



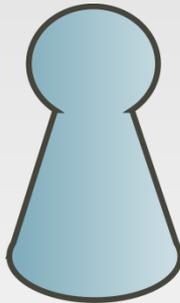
Learner



Role Concept for BluES'n

Our usage: 3 role dimensions

1. Administrative Roles
2. Functional Roles
3. Group dynamic Roles



Problem Solver



Creative

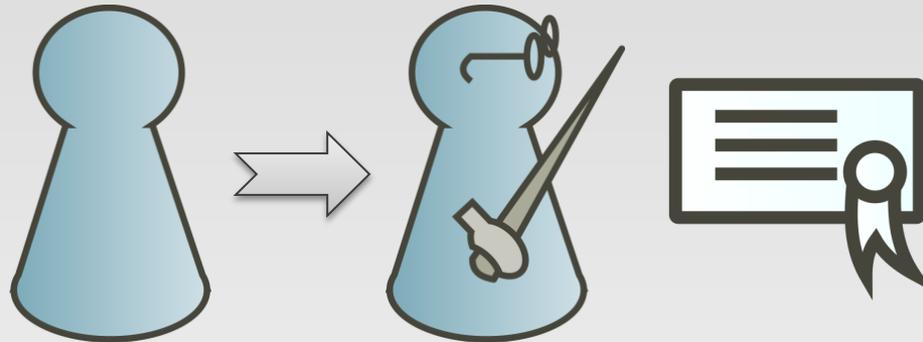


Motivator



Role Management for PECEs

Benefits regarding privacy issues

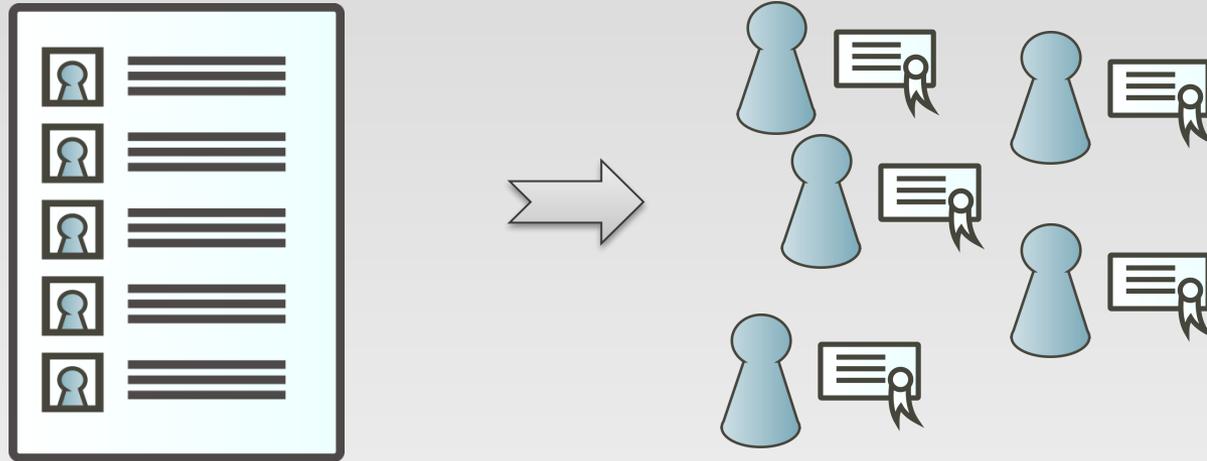


Not: disclose attributes of the pID

But: disclose attributes of the role

Role Management for PECEs

Benefits regarding privacy issues

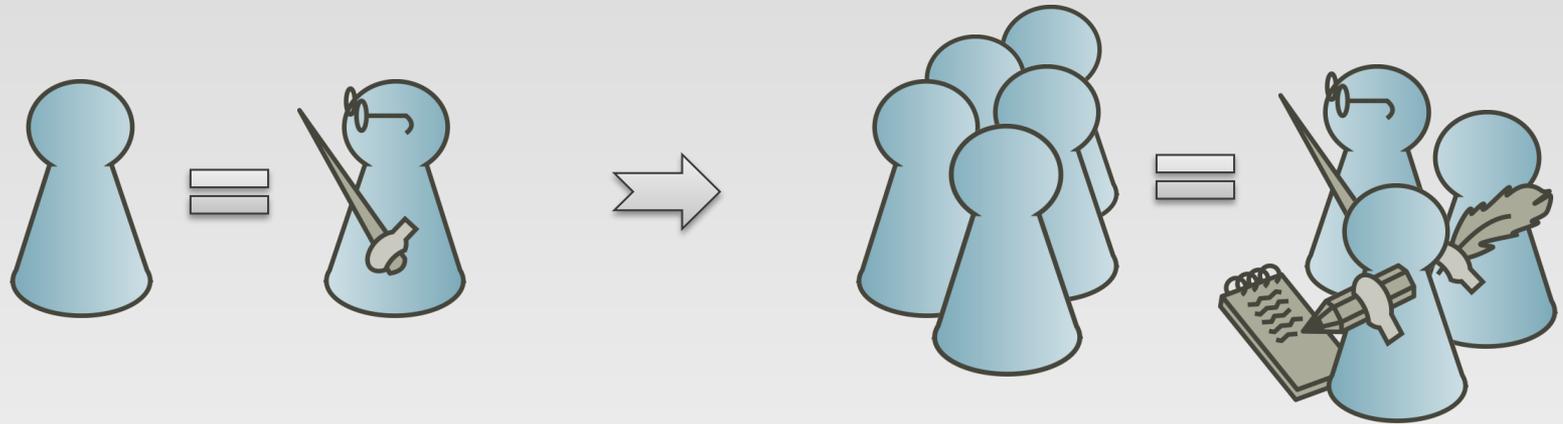


Not: centrally managed list of role holders

But: decentralisation by anonymous credentials for roles

Role Management for PECEs

Benefits regarding privacy issues



Not: one role for each pID

But: n:m relationship of roles and pIDs

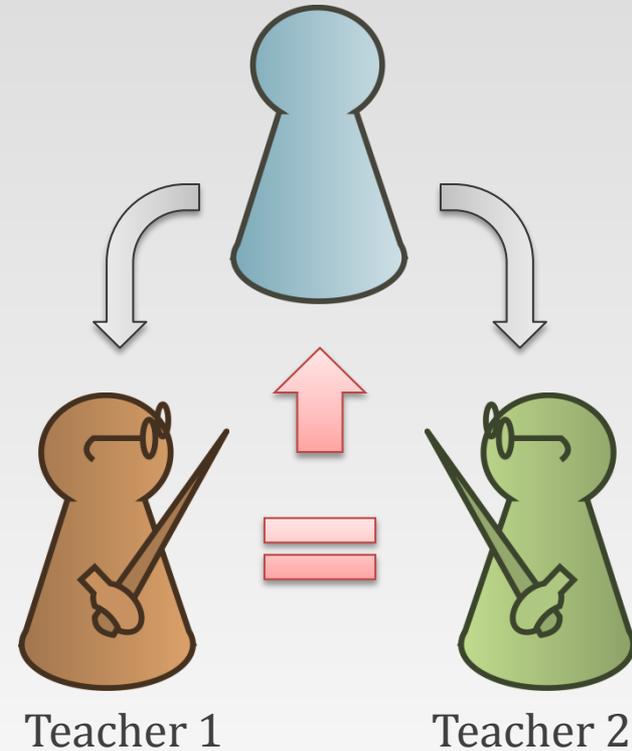
Role Management for PECEs

Remaining core problem

- Roles are **information** about users

Scenario: Only few users can hold teacher role

Question: What is the right context to switch to another pID?



Role Management for PECEs

Approaches for automatic choice of pID

In BluES: **Decision suggestion module** (DSM)

- helps to select the appropriate pID according to preferences for the corresponding context

Question: What are relevant contexts for switching pIDs?

- Transactions?
- Roles?
- Interaction Partners?



No default way

→ Only advices by user's preferences

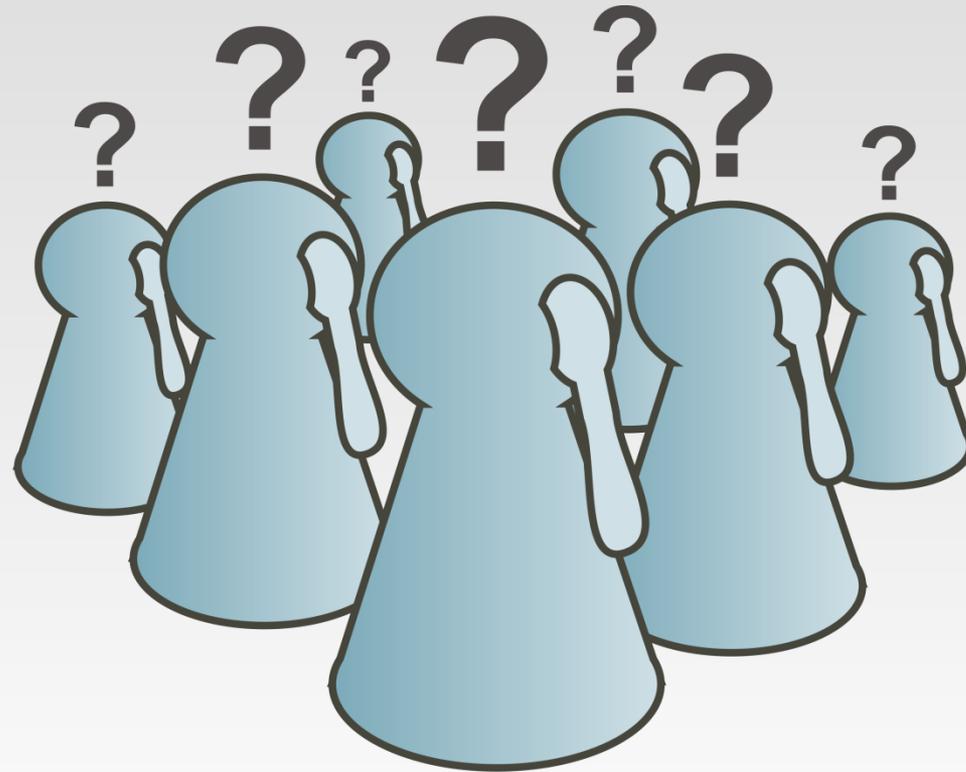
Role Management for PECEs

Conclusions

- PECEs provide means to protect users' privacy, e.g. by partial identity management
 - Mission: keep pIDs unlinkable
- Flexible, decoupled role management allows to distribute roles onto several pIDs
 - Risk of linkability can be reduced but not removed

Thank you!

Questions?



References

1 | 2

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Images

Joystick: <http://www.flickr.com/photos/beggs/103038447/>

Dishes: <http://www.flickr.com/photos/starwarsblog/514453347/>

Classroom: <http://www.flickr.com/photos/wolfra/2873071778>