



Semantic MyPage

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eGovernment

Semantic Days 2009 -- Stavanger, Norway, May 20

Semantic MyPage

- A concept developed in a Master Thesis at Section for eGovernment Studies, which is part of [The Norwegian Research Centre for Computers and Law \(NRCCL\)](#)
- By Kjetil Helberg and Steinar Skagemo
- Supervisor: Associate professor [Arild Jansen](#)
- The Thesis was submitted May 2 2007, and accepted for the degree Cand. Polit. in June 2007



WE HAVE A PROBLEM ...

Scenario

- “Marte Kirkerud and Peder Ås have **just become parents**.
- The hospital has informed the registry office about the new citizen and in a few weeks Marte will receive a letter from The Norwegian Labour and Welfare Administration (Nav) telling that a decision has been made to allocate **children’s benefit** amounting to 970 NOK per month.
- Because Marte has not been working at least six of the last ten months they **can not claim “parents allowance at birth”**. (80 % of salary for 52 weeks)
- But Marte and Peder has made an investigation on the NAV and municipality web sites and MyPage and found that they can get **a one-time allowance of approx. 34 000 NOK**.

Scenario (II)

- What they **do not know** is that they during a half year period **also** have the right to a **housing allowance of 2 057 NOK** per month as well as **no interest on the student loan**. All together this would have given them a **25% increase** of net income, **i.e. 24 324 NOK** the first half year after the birth.”

Two problems (at least ...)

- P1. How to know about the services a person might be entitled to given his or her situation?
 - Depending on her situation she might be entitled to services provided by different institutions
 - 3 services from 3 agencies involved in our scenario (but they don't interact)
- P2. How to understand the conditions that give the right to a service or allowance?
 - Often presented in legal jargon - complicated to understand for a lay-person
 - i.e. "income"

But is it really a problem?

- Maybe it's meant to be each person's individual responsibility to find his or her way?

No ...

- 1. The government's information and communication policy
 - The citizens shall get information about *their rights, duties and opportunities*
- 2. The Public Administration Act, § 11 -- about the public administration's duty to provide guidance
 - The administrative agencies have, within their sphere of competence, *a general duty to provide guidance(...)*



**WHAT HAS BEEN
DONE TO FIX THE
PROBLEM?**

MyPage

- A one stop shop for citizens oriented electronic services
- Types of services
 - Message box and Calendar
 - Links to other portals – with single sign on
 - Access to personal data in public registries
- Europe liked it ...

mypage



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Frontpage

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Welcome to MyPage

Temporary closure of online register services (6 May 2009)

Due to technical maintenance work, some of the MyPage services will be temporarily unavailable. We hope to have these services running again as soon as possible.

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16. May 2009 23:08

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2009						
May						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
18				<u>1</u>	2	3
19	4	5	6	7	<u>8</u>	9 10
20	<u>11</u>	12	13	14	<u>15</u>	<u>16</u> <u>17</u>
21	<u>18</u>	19	20	21	22	23 24
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+ [Pension](#)

Din pensjon (NAV) 

Min pensjon (KLP) 

+ [Recreation, culture and the environment](#)

+ [Taxes](#)



Din pensjon

Bruker: KJETIL HELBERG

Logg ut

Du er her: // NAV // Pensjon // Din pensjon

[? Bruk av Din pensjon](#)

Din pensjon

[Pensjonskalkulator](#)[Din pensjonsopptjening](#)[Dine utbetalinger](#)[Din innboks \(0 uleste\)](#)[Kontakt NAV om pensjon](#)[Forhåndsutfylte skjemaer](#)

▼ Din profil

[Adresser](#)[Familieforhold](#)[Inntekt og skatt](#)[Fullmakter](#)

Velkommen Kjetil Bertelsen Helberg

På disse sidene finner du informasjon om dine opptjente pensjonsrettigheter og eventuelle løpende pensjonsytelser fra folketrygden.

Du kan bruke pensjonskalkulatoren til å beregne hva du vil få i pensjon basert på informasjon NAV har om deg og informasjon du legger inn selv. Her kan du også simulere fremtidig pensjon ved å variere forutsetningene som kan påvirke din pensjon.

Du kan også sende inn elektroniske søknader og krav her, og du vil kunne motta og lese vedtak og andre dokumenter elektronisk.

Dine saker og søknader til behandling og skjema som du har startet å fylle ut. ?

Du har ingen saker og søknader til behandling eller startet å fylle ut noen skjema.

Dine lagrede beregninger fra pensjonskalkulatoren. ?

Du har ingen lagrede beregninger fra pensjonskalkulatoren

[// Start ny beregning i Pensjonskalkulatoren](#)

Utbetaling

Siste: Du har ingen løpende utbetalinger fra NAV pensjon.

Neste: Du har ingen løpende utbetalinger fra NAV pensjon.

Hva vil jeg få i pensjon?

Hva vil jeg få i pensjon fra folketrygden, hvis jeg jobber til jeg er 67 år med dagens lønn? ?

[// Beregn pensjon](#)

Søk om pensjon

- [Søknad om alderspensjon](#)
- [Søknad om forsørgingstillegg](#)

[// Flere skjema for pensjon](#)

Search bar: Type in your search [SEARCH]

Navigation links: Frontpage, Sitemap

Menu categories: Education, Employment, Forsvar, Health, Housing and property, My address, My properties, Report new address, Social security, Taxes, Travel and transport

Show details

You are here: [Frontpage](#) > [My address](#) > [Show details](#)

Information from the Central National Register

Date of birth	030775
National ID-number	28503
Name	STEINAR SKAGEMO
Address	0575 OSLO
Municipality	0301 OSLO
Dwelling no.	H0102
Marital status	UGIFT
Citizenship	NORSK

[Hide details](#) | [Print view](#)

HELP

Other services in Mypage

- Report new address

[Display relevant information outside of Mypage](#)

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STEINAR SKAGEMO
Last log in:
6. March 2007 19:37

My messages
[Message box \(1 unread\)](#)

2007						
March						
				2	3	4
10	5	6	7	8	9	10
11	12	13	14	15	16	17
12	19	20	21	22	23	24
13	26	27	28	29	30	31

My home municipality

[Oslo kommune](#)

Postal address: Oslo rådhus, 0037 Oslo
Visit address: Oslo rådhus, (Inngang sjøsiden)
E-mail: [Send e-mail](#)
Telephone: 02 180 23 46 16 00
Telefax:

View personal data
MyPage requests and receives data via WS



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Active schemas
Interesseregisteret

- Education
- Employment
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- Health
- Housing and property
 - My address
 - My properties
 - Report new address
- Social security
- Taxes
- Travel and transport
 - My vehicles

My vehicles

You are here: [Frontpage](#) > [My vehicles](#)

The service provider has no registered details about you in their system

Display relevant information outside of Mypage

LOG OFF

STEINAR SKAGEMO
Last log in:
6. March 2007 19:37

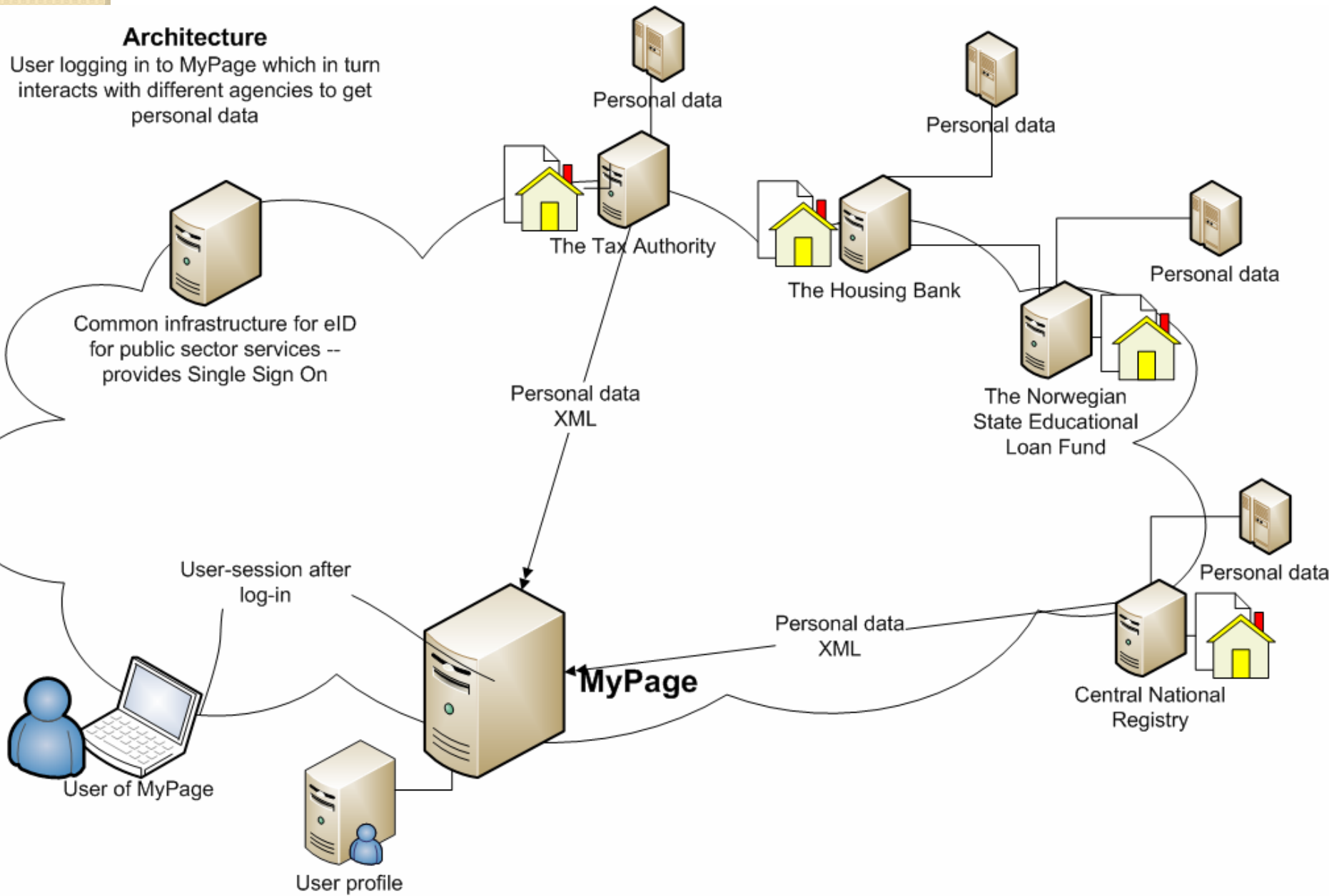
My messages
Message box (1 unread)

2007						
March						
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Architecture

User logging in to MyPage which in turn interacts with different agencies to get personal data



Winner of the European Championships 2007!


- The MyPage portal won the 2007 European eGovernment Awards --in the category Transparency and Participation



"**Grande Bretagne: nul points.** Fans of the Eurovision Song Contest would have felt at home last week watching Britain pick up no prizes [...]"

The project that **really knocks the UK in to the second division**, however, is from Norway -a self-service web portal called Mypage which not only allows citizens to carry out transactions across government, but also to inspect what data official bodies hold on them.

"Source: "[British e-government fails to achieve the X-Factor](#)", by Michael Cross, The Guardian September 27, 2007



Europe liked it, but Kjetil was a bit disappointed ...

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Forsiden

Melding:

Du har ikke noe medlemstid hos KLP, og vi har dessverre ikke noe å tilby deg i dagens løsning, men besøk oss gjerne igjen ved en senere anledning

Innlogget via 'Felles innlogging':



Logg ut

Shortcomings:

- Information is still presented “one agency at a time” (P1)
- If the person finds the information, there is no guarantee he or she will understand the conditions that give the right to a service or allowance (P2)



**SO, WHAT SHOULD
WE DO?**

The answer is in the big red book called "Norges lover" (Norwegian common law)

- and all the rules and regulations that spring out of it
 - Regulations, circulars etc
- making and maintaining a "user friendly front-end" to this enormous and ever-changing material is quite a lot of work ...

But how do the agencies deal with this?

- Through use of **computer systems for mass-processing** of applications
 - In 2007 nearly 60 % of all applications to Lånkassen was processed automatically.
- They **transform the rules** and regulations from texts **to computer code**
- Research shows that if the transformation-process is not done systematically and carefully, involving lawyers to help with the interpretation, the result can be computer code that
 - is in conflict with the rules
 - "create" rules, for instance making it stricter/narrower than intended -- when the text is not specific enough
- And: "It is often the case that something vague is precisely what we want to say" (Bench-Capon 1988:46)

”How to” transform law to computer code?

- As a remedy,
 - based on examples of bad practise from studying source code in the main mass-processing systems in Norway,
 - a general methodology for transforming legal texts to computer code has been proposed by professor Dag Wiese Schartum
- Example of steps
 - How to collect and organise all relevant sources
 - How to identify the different parties/roles that the rules regulates
 - How to divide the rules between rules that defines criterias that needs to be met vs rules that describes the outcome if those criterias are met



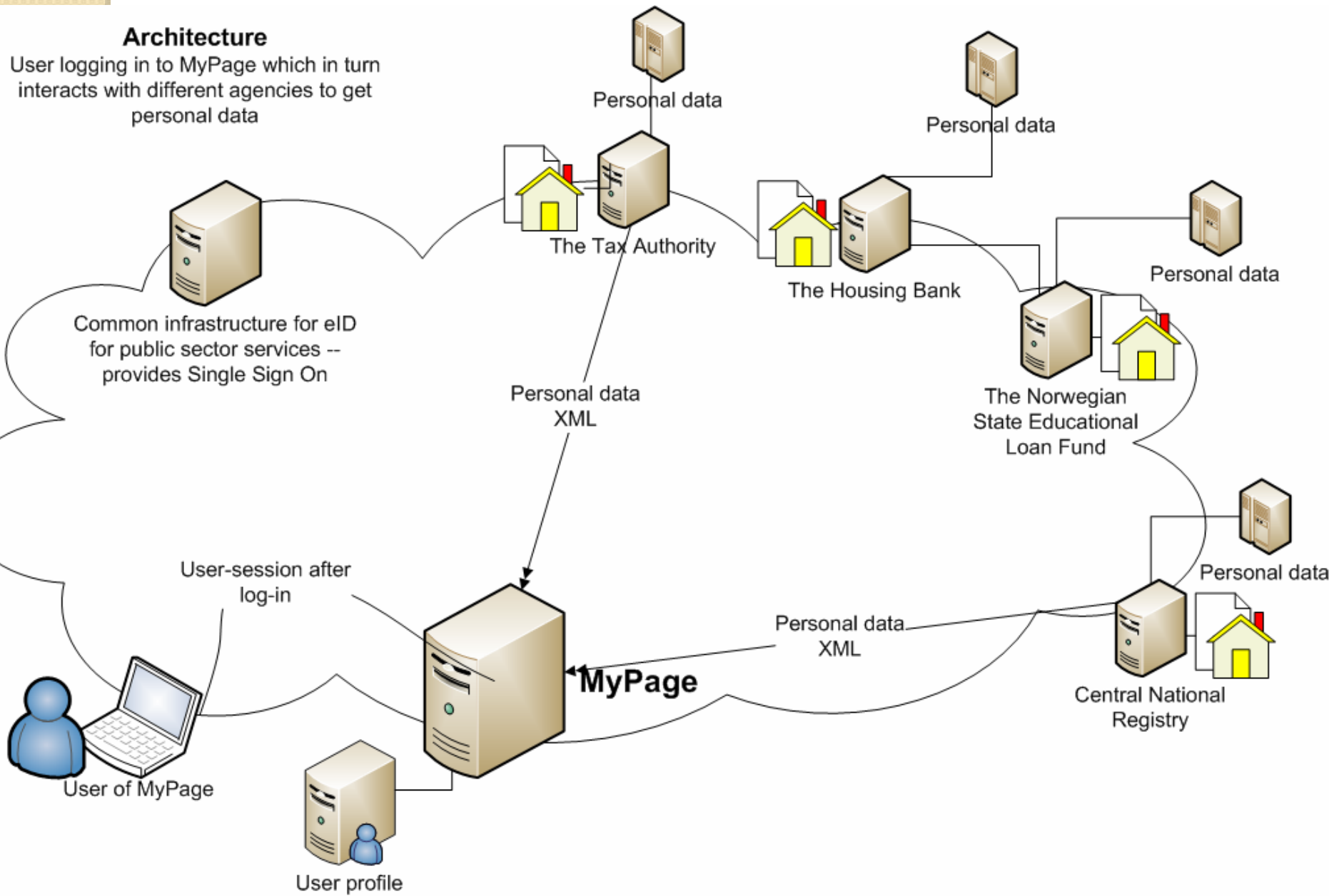
**SO, WHAT DID WE
DO?**

Semantic MyPage -- a combination of

- information about the user from the public registries, available through MyPage
 - "enhanced" - from ordinary XML today to RDF-data
- the rules and regulations already transformed to computer code -- in the computer systems used for mass-processing applications
 - The transformed rules are made available through a common rule language format (RIF), published on the agencies web-pages

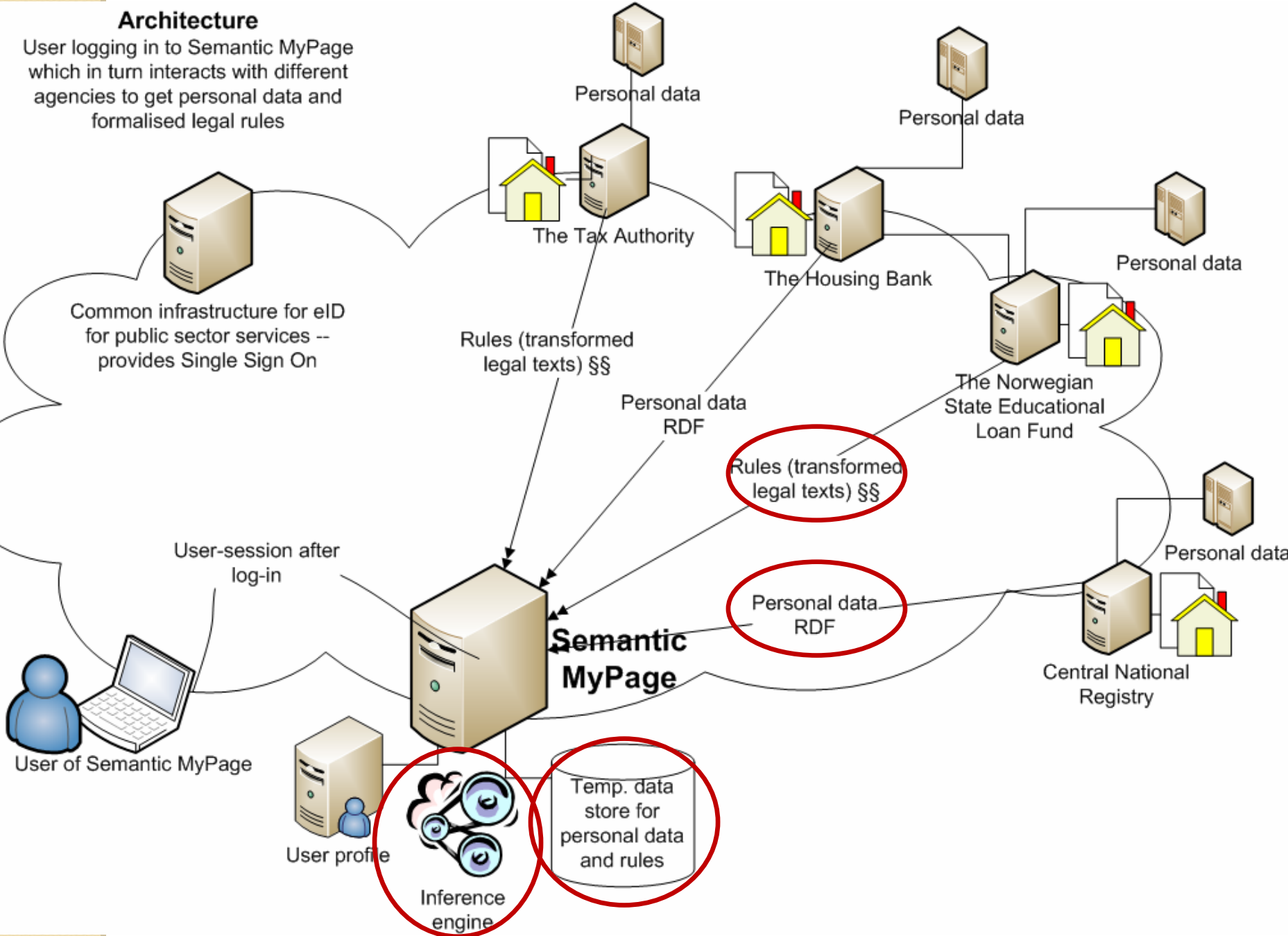
Architecture

User logging in to MyPage which in turn interacts with different agencies to get personal data



Architecture

User logging in to Semantic MyPage which in turn interacts with different agencies to get personal data and formalised legal rules



Semantic MyPage -- result

- Information in public registries are accessible for the citizens
- The use of the data is accessible for the citizen
- They get the *right information instead of all the information*
 - *public sector has more than 1000 web portals in Norway*
- Applications/forms can be pre-filled with information from different sources to help the citizen
- Information can be showed based on the data about the *individual citizen*
 - **Age/gender** - "hide" information about the military service for women over 80
 - **Situation** - e.g. "hide" information about kindergarden for people without children
 - and **use the data** to give **new information** based on information in different databases - e.g. if your income is A (tax database) and you have a child B (Register office) and you have a loan C in the bank of education then Y
- in a way that it enhances the citizens privacy -- the information is shared with the citizen only, not everybody else (e.g. other public offices)

Does it work?

- Implemented a prototype using Semantic Web technologies
 - Using CWM (by TimBL et al.) to test the SW
- Tested on excerpts on the relevant legislation
- Transformed the legislative texts to rules written in CWMs rule-language
- Made information about the user (Peder Ås) available as RDF-data
- GUI: Report to the user if one or more criteria(s) are met
 - could be used to highlight a service on a web-page

Peder logs in to S.M.S. which requests and receives information from different sources – in RDF

From register office

sms:peder

a skdf:Person;

skdf:fnr "03077512345";

skdf:navn "Peder Ås";

skdf:adresse "Konkretveien 12";

skdf:bostedskommune "Oslo";

skdf:barn [

a skdf:Person;

skdf:fnr "15010712345";

skdf:fdato "150107";

skdf:navn "Synnøve Kirkerud Ås";

skdf:adresse "Konkretveien 12";

skdf:bostedskommune "Oslo"] ;

skdf:samboer [

a skdf:Person;

skdf:fnr "08087512345";

skdf:navn "Marte Kirkerud";

skdf:adresse "Konkretveien 12";

skdf:bostedskommune "Oslo" .

From the tax office – income

sms:peder

a skdf:Person;

skdf:fnr "03077512345";

skds:personinntekt "130000";

skds:almInntekt "168000" .

From the bank of education

sms:peder

a skdf:Person;

skdf:fnr "03077512345";

lanekassen:kundenummer "13579";

lanekassen:totalGjeld "300000" .

... and legal rules on a common rule format

Step	Operations (pseudocode)	Transformed rule (CWM-format)
PK3: Fødsel		
M1: Låntaker som dokumenterer fødsel	Bruker (x) har kundenummer (y) i Lånekassen OG Bruker (x) har barn (z) → ja/nei Låntaker som dokumenterer fødsel og omsorg etter fødsel.	{ ?x lanekassen:kundenummer ?y . ? ?x skdf:barn ?z . } => { rentefritak:M1 sms:resultat "true" }
M2: Den av foreldrene som har omsorgen for barnet inntil tolv måneder fra fødselen → ja/nei	Bruker (x) har omsorgen for barnet (z) → ja/nei Den av foreldrene som har omsorgen for barnet inntil tolv måneder fra fødselen → ja/nei	{ ?x rentefritak:harOmsorgenForBarn ?y . } => { rentefritak:M2 sms:resultat "true" }
M3: Inntil 12 måneder etter fødselen	Barnets fødselsdato (dato) større enn [dagens dato minus ett år] → ja/nei Barnets fødselsdato (dato) større enn [dagens dato minus ett år] → ja/nei	{ ?x skdf:forelderTil ?z . ? ?z skdf:fdato ?dato. ?dato math:greaterThan [today - 365] . } => { rentefritak:M3 sms:resultat "true" }

Testing it with CWM

- Requests personal information (.data)
- Requests rules (.regel)
- "Think" (--think) and report (--filter)

```
C:\CWM\Hovedoppgaven>python %CWM%\cwm.py
Registeropplysninger-Peder-skdf.data Registeropplysninger-
Peder-skds.data Registeropplysninger-Peder-lanekassen.data
Registeropplysninger-Peder-egne.data Rentefritaksregel-
M1.regel Rentefritaksregel-M2.regel Rentefritaksregel-PK1-
FM1.regel --think --filter=Rapportregel-rentefritak.rapp
```

Testing it with CWM – the result:

rentefritak:M1	:resultat	"testet med positivt resultat" .
rentefritak:M2	:resultat	"testet med positivt resultat" .
rentefritak:PKI-FMI	:resultat	"testet med positivt resultat" .

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You meet three out of three criterias for interest relief in periods with low income from the Norwegian State Eductational Fund – you should consider applying

[Apply for interest relief](#)

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Make no mistake ...

- We have not solved the problem of transforming rules and regulations from legislative texts to computer code
- But being aware of the problem is an important step in order to solve it
- Solving it is not a one-time job, but a continuous process (that should be done using the methodology by Schartum mentioned earlier)
- Semantic MyPage does not solve the challenges related to the transformation, but can serve as a driver for a better and more open process;
 - the result of the process becomes visible (open for challenge), through the rule-language, published on the responsible agency's web-site)
 - The responsible agencies might be more aware of the problem, as they know there is an increasing chance someone will discover errors/misinterpretations
 - standardising the output of the process will probably help standardise the process itself -- making it "best practise"
 - and our goal wasn't to transform every rule, that's impossible, but try to enhance the information you get, and transform some of the rules that is easily transformable. A one step at the time approach is necessary
- "a little semantics goes a long way"

Questions?

- kjetil (a) helberg.no
- sskagemo (a) gmail.com
- The thesis is available at www.afin.uio.no

Future

- CAPS-application -- a research proposal which plans two working pilots, including one of Semantic MyPage

Methodology

- Inter-disciplinary -- combination of law and technology (and social science)
- Research design: "Science of the artificial"/"Design science"
 - The rationale for considering designing and testing something to see if it works as scientific work: Because it produces results
 - Would we have had air planes without design science?
- Different work-methodologies to analyse the problem (law), understand the technology (document studies, learning-by-doing)
- "Participatory observation" -- both became parents for the first time during the last few months before the master thesis was due ...