

PAN-EUROPEAN STRUGGLE FOR INTEROPERABILITY
IN E-GOVERNMENT ENVIRONMENTS

*ANALYSIS OF INTEROPERABILITY APPROACHES OF EU MEMBERS,
SWITZERLAND AND RUSSIA*

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AGENDA

Research question

Theoretical background

Methodology

Results of analysis

Discussion of results

RESEARCH QUESTION

Question

Theory

Method

Results

Discussion

- Analysis of
 - e-Government Interoperability Frameworks (e-GIFs)
 - 6 EU member states + EU + Switzerland & Russian Federation
 - UK, Germany, France, Estonia, Belgium, Denmark
- Research Questions
 - How different / equal are the approaches?
 - How could a framework look that is suitable for all?

Interoperability - Overview



(<http://techreviews.in/>)



INTEROPERABILITY - INTRODUCTION

Question

Theory

Method

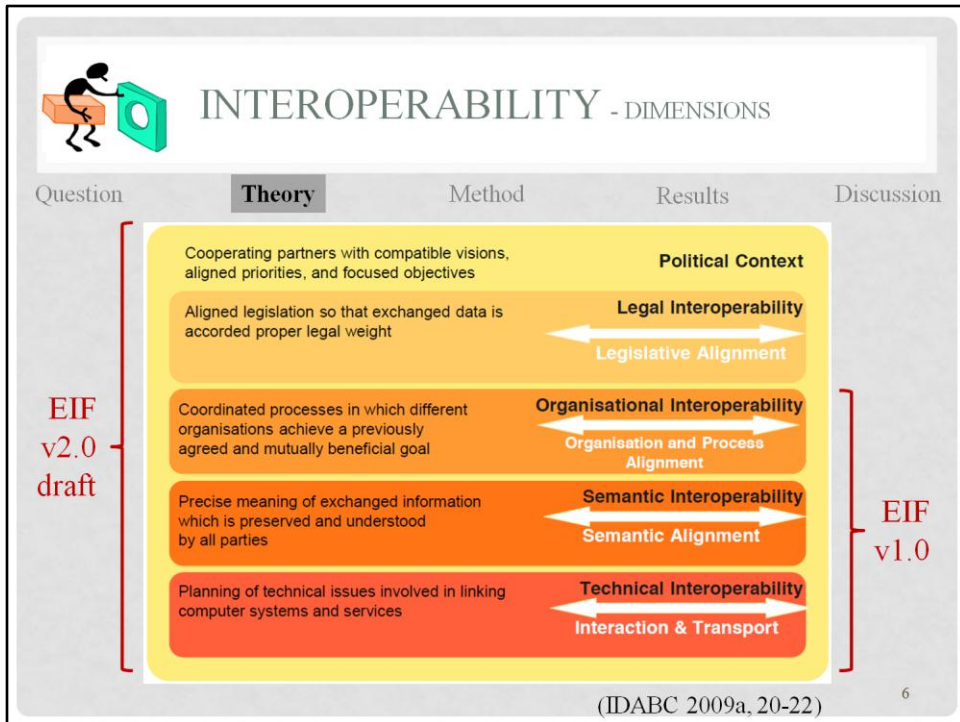
Results

Discussion

- *“defining interoperability means to define how technical systems, people and organisations work together”*
- Collaboration of systems, services and people
 - IT systems support processes
 - Integration of technical systems = Compatibility
 - Ensuring precise meaning of exchanged information = Interoperability
- E-Government Interoperability Framework
 - Cover the tools enabling and promoting interoperability
 - e.g. Standards Profiles, Repositories, Enterprise Architecture etc.
- Different dimensions of the interoperability problem

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- The term “services” in this definition refers to a business service = a process with underlying IT, and certain input and outcome



- EIF = European Interoperability Framework (pan-European e-government Interoperability Framework)
 - Includes reference and guidance, but no standards
 - First version from 2004, comprehensive update underway

E-GOVERNMENT - INTRODUCTION

Question

Theory

Method

Results

Discussion

- *“the use of modern ICTs in public administrations”*
- *“involves customers of administrations in government activities”*
- Policy & Managerial concept = Strategy & Implementation
- Expected advantages
 - Improved service delivery towards citizens, businesses, and administrations
 - Efficiency gains and government modernisation
 - Democratic participation (vs. e-Democracy)
 - Increased access, transparency and accountability of public sector

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- No general definition
- ICT = Information and Communication Technologies
- For some democratic participation is referred not by e-government, but by e-Democracy
 - Many definitions include political participation but still few related actions

E-GOVERNMENT – RELATIONS

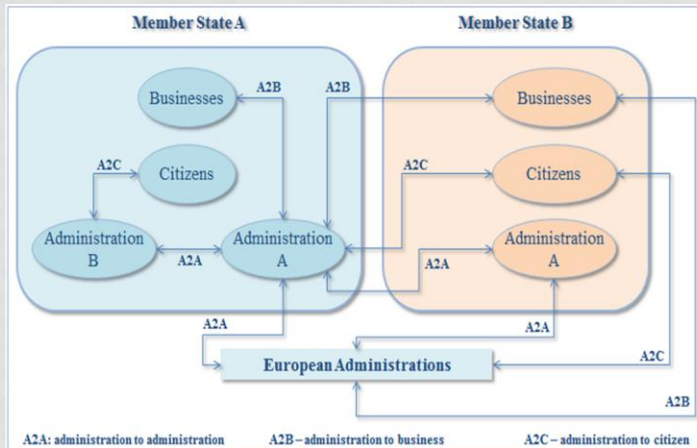
Question

Theory

Method

Results

Discussion



(IDABC 2004, 13)

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- Main stakeholders:
 - Citizens
 - Businesses
 - Other administrations
- Further stakeholders:
 - Non-profit / Non-government organisations
 - Governmental employees
- Relations are also called:
 - Government-2-Citizens (G2C)
 - Government-2-Business (G2B)
 - Government-2-Government (G2G)
 - (Government-2-Non-profit/Non-government organisation [G2N])
- Specific relations have specific needs
- The term “Administration X” in the figure refers to a random governmental department/agency (within any ministry)

E-GOVERNMENT – LAYERS OF INTERACTION

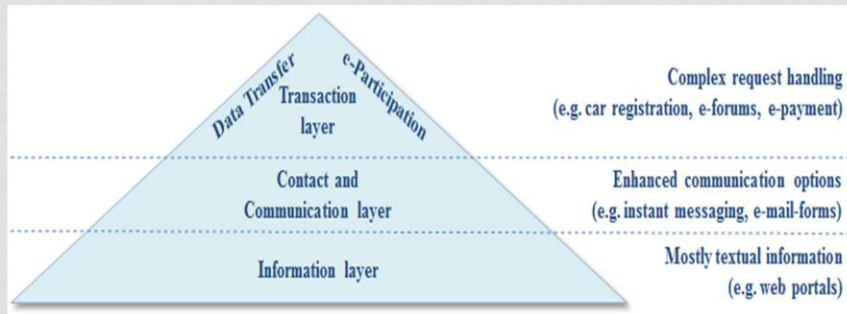
Question

Theory

Method

Results

Discussion



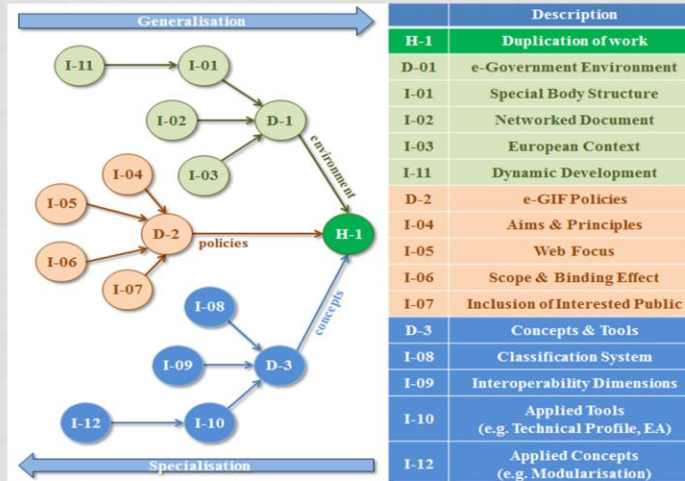
(Bekkers/Homburg 2007, 375)

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- Maturity process: First information, then Communication options, then complex Transactions

RESEARCH HYPOTHESIS

Question Theory **Method** Results Discussion



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- Analysis of the 9 selected countries → Comparative study as far as possible
 - Focus of study: e-Government Interoperability Frameworks (e-GIFs)
- Central thesis: There should be not much difference between the countries' approaches since in literature the necessary steps are widely discussed
 - But: The practical implementation may be complex and tricky, anyway!
- A framework of indicators is to provide an informational base
 - Three areas: Environmental, policy, and applied concepts
 - Indicators used to structure the gathered information

QUESTIONNAIRE

Question Theory **Method** Results Discussion

- Gaining practical insight by asking practitioners
- Two expert communities
 - SEMIC.eu = Semantic Interoperability Centre Europe
 - Gosbuk.ru = Russian Competence Network on Public Administration
- 15 questions

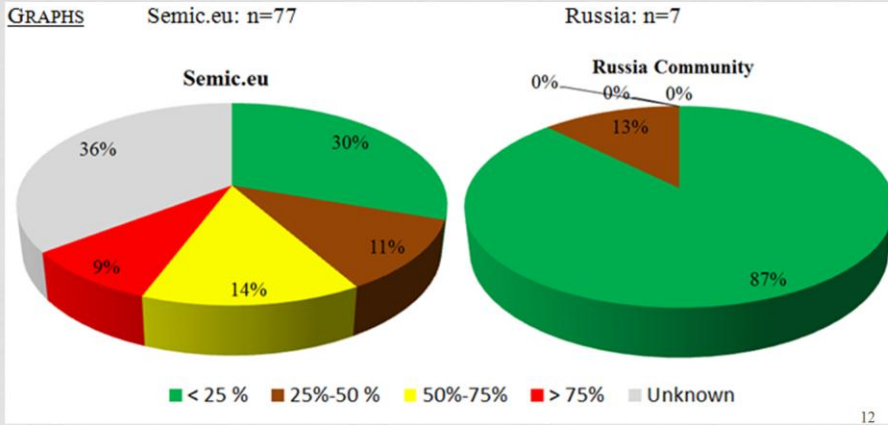
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- To provide practical inside a expert survey was performed
- The number (e.g. “n=70”) over the graphs are to show the number of respondents for the respective graph

FINDINGS – QUESTIONNAIRE (Q1)

Question Theory Method **Results** Discussion

- How many of the new projects apply the regulations?



- The most important finding was that in Russia there is no commonly agreed framework
- All other surveyed countries had national approaches
- It can be expected that most experts in SEMIC.eu come from countries with related approaches in work
- Since Russia has no common framework its projects cannot apply to common rules
- But: also for the SEMIC.eu group only a small group reached already more than 50 % compliance
- When the rules are not applied, no benefit can occur
 - E-GIFs govern national procurement

FINDINGS – QUESTIONNAIRE (Q2)

Question

Theory

Method

Results

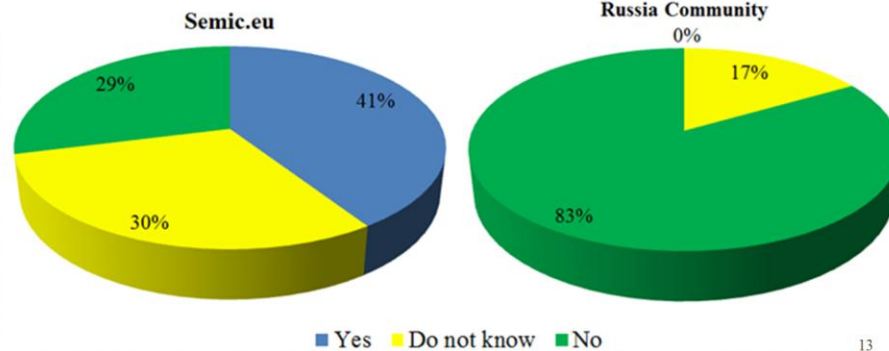
Discussion

- Does your approach reflect all relevant topics?

GRAPHS

Semic.eu: n=76

Russia: n=7



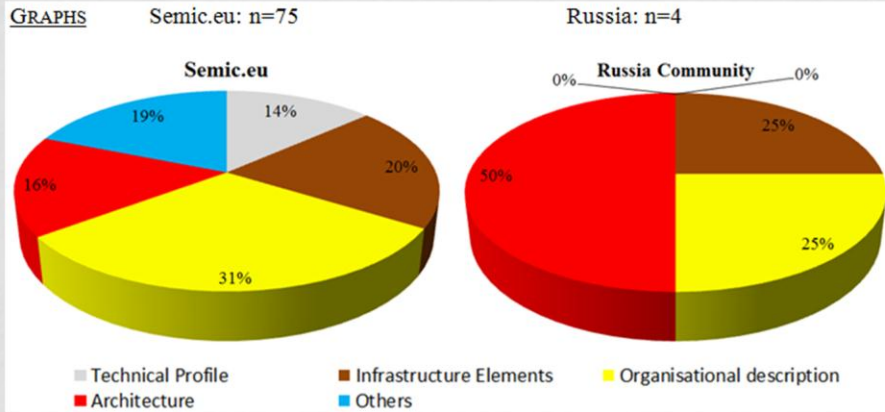
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- There was no definition given for “relevant topics”
- The respondents were to decide themselves whether their approaches are on a good way or need further adjustments
- Since Russia does not have a common framework it cannot comprise all relevant topics
- Also in the SEMIC.eu community many who marked “Yes” anyway stated that further work is ongoing
 - Thus, the development/standardisation process will hardly come to an end

FINDINGS – QUESTIONNAIRE (Q3)

Question Theory Method **Results** Discussion

- What is the most important element of an e-GIF?



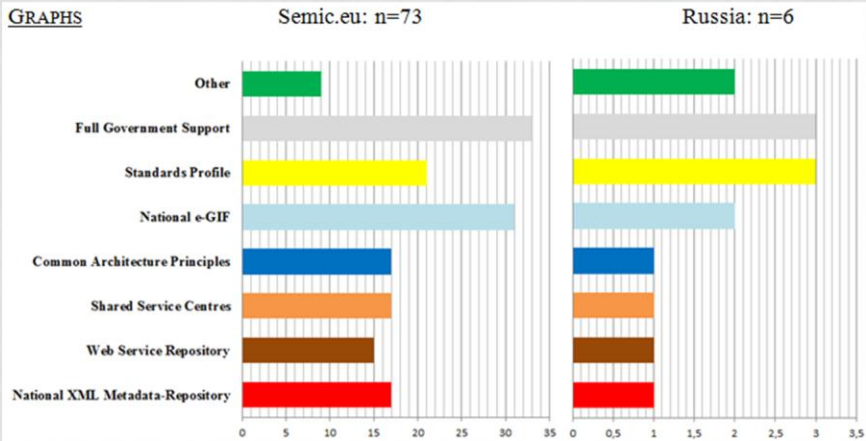
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- Without organisational description there is no enforcement to make projects comply with standards
 - Hence the investments are worthless
- Thesis: One can guess that many of the frameworks promoted already work on architectures
 - Since Russia lags behind there is first a need to promote architecture first, then taking care of the rest

FINDINGS – QUESTIONNAIRE (Q4)

Question Theory Method **Results** Discussion

- What milestones help developing e-government? [multiple choice]

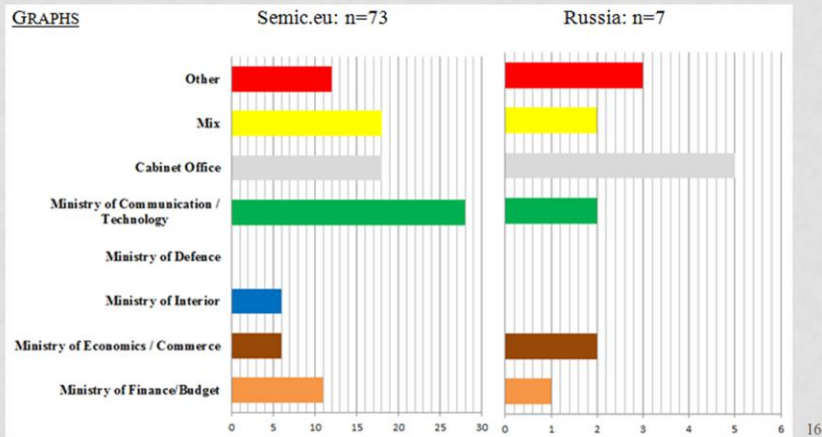


- Basically all the mentioned are useful to promote e-government development

FINDINGS – QUESTIONNAIRE (Q5)

Question Theory Method **Results** Discussion

- Which department should have the lead in e-GIF development?

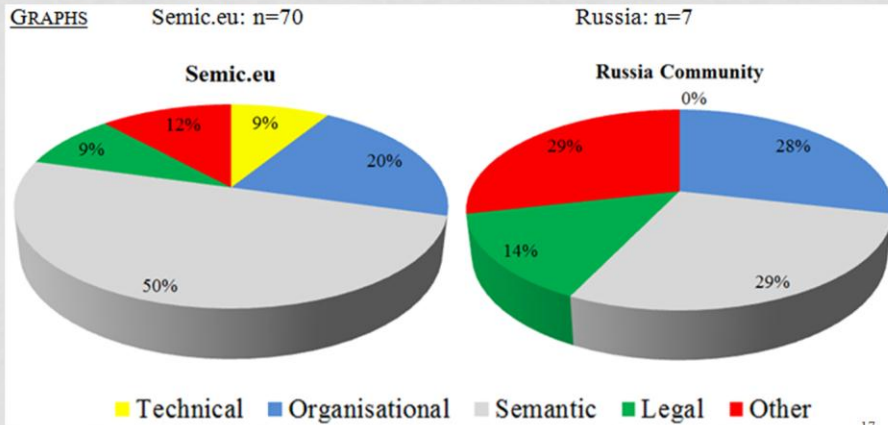


- It turned out that in Russia there are problems with law enforcement and responsibilities
 - Respondents asked for a strong enforcement by the government / presidents office

FINDINGS – QUESTIONNAIRE (Q6)

Question Theory Method **Results** Discussion

- Which part should be stressed more in the framework document?

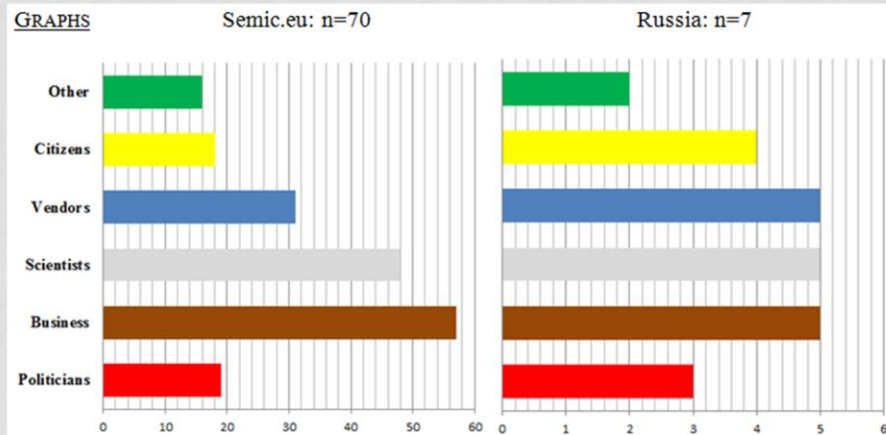


- SEMIC.eu community deals with semantic interoperability assets (namely: XML schemas for data models, ontologies)
 - But still: Other dimensions are recognised to be important

FINDINGS – QUESTIONNAIRE (Q7)

Question Theory Method **Results** Discussion

- Who should participate in a standardization committee?

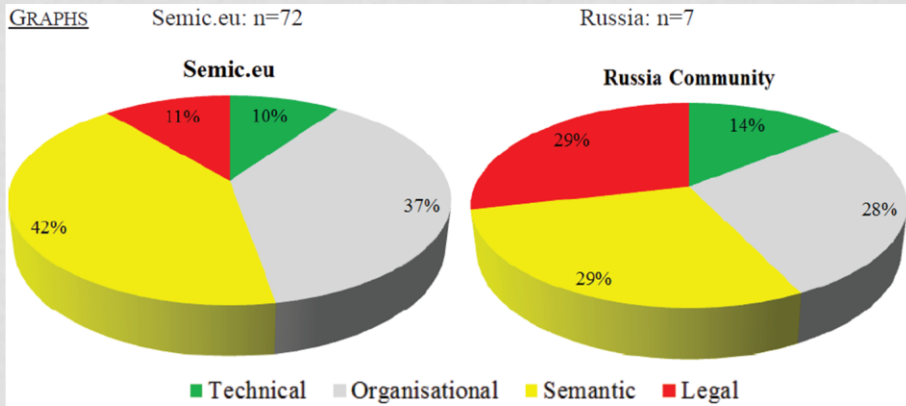


- Who should sit together on a table when it comes to standardisation / the setting of standards?
 - Mostly business and scientists as the respective experts
 - Also vendors as the suppliers of the technology

FINDINGS – QUESTIONNAIRE (Q8)

Question Theory Method **Results** Discussion

- Which dimension causes most interoperability problems?



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- Organisational level and semantic level are referred to by both communities
- Generally the technical issues are recognised as the ones that can be handled most easily
- For Russia still the legal environment is an important issue

SELECTED COUNTRIES – EIU RANKING

Country	EIU 2002 ⁴⁸	EIU 2004 ⁴⁹	EIU 2006 ⁵⁰	EIU 2008 ⁵¹	EIU 2010 ⁵²
Belgium	41	42	44	48	45
Denmark	7	1	1	5	2
Estonia	/ ⁵³	26	27	28	25
France	17	18	19	22	20
Germany	8	13	12	14	18
Russian Fed.	45	55	52	59	59
Switzerland	4	10	3	9	19
United Kingdom	3	2	5	8	14

• EIU = “The Economist” Intelligence Unit: e-readiness rankings

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- Remark: Number of investigated countries increased from 60 to 70 countries between 2002 and 2010
- Category Weight for e-Readiness ranking
 - Connectivity and technology infrastructure 20%
 - Business environment 15%
 - Social and cultural environment 15%
 - Legal environment 10%
 - Government policy and vision 15%
 - Consumer and business adoption 25%
 - Source: Economist Intelligence Unit, 2009
- http://www.eiu.com/site_info.asp?info_name=digitaleconomy_2010

SELECTED COUNTRIES – UN RANKING

Question Theory Method **Results** Discussion

Country	UN 2003 ⁵⁴	UN 2004 ⁵⁵	UN 2005 ⁵⁶	UN 2008 ⁵⁷	UN 2010 ⁵⁸
Belgium	23	16	18	24	16
Denmark	4	2	2	2	7
Estonia	16	20	19	13	20
France	19	24	23	9	10
Germany	9	12	11	22	15
Russian Fed.	58	52	50	60	59
Switzerland	8	15	17	12	18
United Kingdom	5	3	4	10	4

• UN = United Nations e-Government Survey

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- Worldwide review performed by the UN
- http://www.unpan.org/egovkb/global_reports/08report.htm
- The two reviews show that Russia is not performing very well in terms of ICT implementation and e-government

FINDINGS – DYNAMICS OF FRAMEWORKS

Question	Theory	Method	Results	Discussion
Country	Name		Current	First
European Union	EIF = European Interoperability Framework		v1.0 (2004)	/
United Kingdom	e-GIF = e-Government Interoperability Framework		v6.1 (2005)	2001
Germany	SAGA = Standards and Arch. for e-Gov. Applications		v4.0 (2008)	2002
France	RGI = Référentiel Général d'Interopérabilité		v1.0 (2009)	2002 (CCI v1)
Denmark	OIO Catalogue of Technical Standards		/	2008
Belgium	BELGIF = BELgian Gov. Interoperability Framework		/	2005
Estonia	Estonian IT Interoperability Framework		v2.0 (2006)	2004
Switzerland	SAGA.ch = SAGA Switzerland		v5.0 (2010)	2004
Russia	"E-Russia" projects for interoperability and architecture		/	/

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- Current = Version information for current information
- First = Year of first publication
- EIF = work on version 2.0 in progress;
- British e-GIF = Comprehensive update underway;
- SAGA = Update to version 5.0 underway;
- RGI = Formerly: Cadre Commun d'Interopérabilité (CCI);
- Danish OIO Catalogue = Standards are accessible online on Digitaliser.dk, no version information
- BELGIF = Using Wiki technology; dynamic development; no versions
- For Russia there is no common framework, but project reports from the "E-Russia" programme
 - Information of some projects could be used to create a framework
 - Up to now no intention to create a framework

FINDINGS – SPECIAL BODY STRUCTURE

Question Theory Method **Results** Discussion

Country	Political Responsibility	Technical coordination
European Union	European Commission	Directorate-General for Informatics (DIGIT)
United Kingdom	Cabinet Office	CTO Council (division of the CIO Council)
Germany	Ministry of Interior	CIO Bund
France	M. o. Budget, Public Accounts & State Reform	Directorate-General for State Modernisation
Denmark	Ministry of Finance / Digital Task Force	National IT & Telecom Agency
Belgium	Minister for Entrepreneurship and Simplification	Federal Department for ICT
Estonia	M. o. Economic Affairs and Communications	Department of State Information Systems
Switzerland	Steering Committee / Federal IT Council	Federal Strategy Unit for IT

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- To keep pace with the fast changing environment a sustained support is necessary
- The best performer in the group (Denmark) has the its responsibilities in force for the longest period
- Switzerland: Steering Committee (all levels) / Federal IT Council (federal level)
- Russia: Ministry of Communications and Mass Media, Ministry of Economic Development of Russia, Ministry of Finance, Council in the Government

FINDINGS – CLASSIFIERS FOR STANDARDS

Country	Binding	Recommended	Observed	Proposed	Dated	Rejected
Germany	X	X	X	X	X	X
UK	X	X	X	X		
France	X	X	X			
Denmark	X	X	X	X	X	X
Belgium	X	X		X		
Switzerland	X	X	X			X

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- The classifiers are used to evaluate standards
 - Standards, e.g. PDF for fixed documents, ODF [Open Document Format] for work in progress, XML for data models etc.)
 - The standards need to be in line with the stated aims, such as interoperability, openness, and reusability
- The classifiers of the different countries have different names, but the concepts are comparable
- Since many frameworks are not mandatory (,yet), the classifier “binding” is often referred to as e.g. “strongly recommended”

FINDINGS – OBJECTIVES

Question

Theory

Method

Results

Discussion

- The commonly stated goals are:
 - Government modernisation, effective and efficient public administration
 - Building skills and infrastructure
 - Improved services delivery and free access to information
 - Promote inclusion, reduce digital divide, and personal development
 - Improved transparency, accessibility, and accountability
 - Enabling and promoting democratic participation
 - Sustainability of investments; Flexibility of the public sector
 - Unique collection of data

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- These objectives are stated by basically all frameworks and related policy papers
 - But: They do not always result in related actions!
- In an early development stage the infrastructure and inclusion of citizens is more important
- Later service delivery, transparency and accessibility become important
- Internal effectiveness (“doing the right things”) and efficiency (“doing things right”) are important drivers in all maturity levels
- Political participation is often mentioned, but seldom enabled

FINDINGS – FURTHER RESULTS

Question

Theory

Method

Results

Discussion

- EIF interoperability dimensions recognised by all
- Reference to European context in all EU frameworks
- Most frameworks apply the following tools
 - Organisational descriptions (Organisational, Legal)
 - Standard profiles (Technical)
 - Common XML schemas (Semantic)
 - Service infrastructure (Technical, Semantic, Organisational)

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- EIF = European Interoperability Framework
- Behind the tools in brackets the interoperability levels that are affected

DISCUSSION (1/3)

Question

Theory

Method

Results

Discussion

- Main difference: In Russia no official standardised framework
 - Only project reports from “Electronic Russia” (2002 – 2010)
 - Government architecture investigated – but no regulation
 - Do not reflect key issues of interoperability
- A lack of systematic work to establish a framework in Russia
- Problems of institutional design in Russia
 - The respondent wish a body in the government
 - Enabling sufficient law enforcement and coordination
- Information Society programme 2011 – 2020 (88 млрд. Рублей)

DISCUSSION (2/3)

Question

Theory

Method

Results

Discussion

- SEMIC.eu:
 - Emphasis of technical issues (i.e. standards) and security (i.e. infrastructure)
 - Focus on development of solutions of semantic interoperability
 - Number of respondents and interdisciplinary nature of work suggest objectivity
 - Emphasis on infrastructure elements, such as *Repository*
- Interoperability Frameworks, Repository etc.
 - Enable public discussions
 - Enable knowledge exchange between experts, politics, scientists etc.
 - Promote a central reference of standards & best practices
 - Promote coordination of work and reduce island solutions

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- Already the existence of an central discussion platform for coordination of respective work efforts

DISCUSSION (3/3)

Question

Theory

Method

Results

Discussion

- Big Bang solutions often fail!
- Approach needs to balance different aspects:
 - Set up organisational structure with clear responsibilities
 - Communicate organisational structures and responsibilities
 - Setting legal environment and promote law enforcement
 - Promote standardisation → Need for knowledge exchange!
- Only then there is a reason to step further:
 - Promote common data models and a common public repository
 - Promote common architecture

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- Changes in the organizational structure need the most time: Processes, People and their habits need to change
 - Responsibility have to be defined and communicated to all stakeholders
- Unless the legal and organizational environment is not in place only few benefits can be expected from further actions, such as architectures and standards

Thanks for attention! Any questions?

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For further material please feel free to mail me!

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- If interested in the Thesis paper or an final report of the questionnaire with comments of the respondents attached please write me an e-mail!

Appendix - Questionnaire

- Links

- Questionnaire:

- <http://dynacont.net/sys/modules/questionnaire/questionnaire-rpc.php?&if=EGov20110207&cmd=Login&SLANG=En>

- Call for participation on SEMIC.eu

- <http://www.semic.eu/semic/view/snnav/currentInformation/News.xhtml?newsId=eee65a43-9c12-45ab-be32-e4d183741036&tmpl=News>

- SEMIC.eu

- <http://www.semic.eu>

- Gosbuk

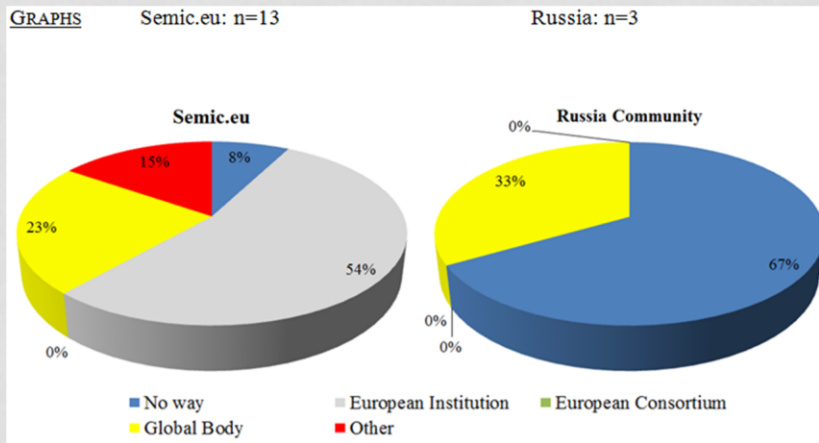
- <http://www.gosbook.ru/>

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- Attached there are the questions from the second part of the questionnaire
- Most respondents refused to fill also the second page – But: Many made interesting comments, more than expected!

FINDINGS – QUESTIONNAIRE (Q9)

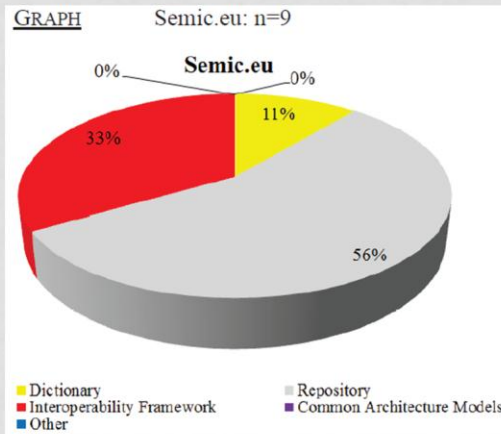
- Who can lead a supranational framework?



- Is it possible to integrate the work even on a multi-lateral level?
 - For SEMIC.eu community the European Institutions may be a central coordinator

FINDINGS – QUESTIONNAIRE (Q10)

- Which element can solve interoperability problems quickly?

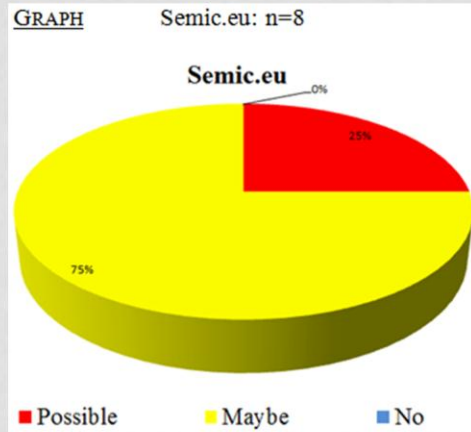


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- Dictionary = Controlled vocabulary, a reference for concepts that may have different names in different domains, countries, etc.
- Repository = Central knowledge exchange platform; central reference for assets, such XML schemas, WSDL service descriptions, guidance material etc.

FINDINGS – QUESTIONNAIRE (Q11)

- Is it possible to use corporate sector's experience?

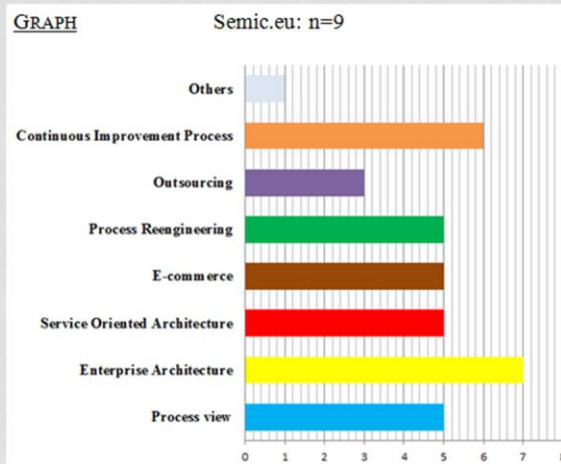


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- Corporate Sector = many global companies face comparing issues such as governments
 - Multiple languages
 - Multiple law systems
 - Need to reduce cost
 - Need to secure investments
 - Different groups of stakeholders
 - ...
- Anyway: Different objectives
 - Businesses = Selling products
 - Governments = Improving living conditions
- Further: Different principles, visions, etc.

FINDINGS – QUESTIONNAIRE (Q12)

- Where to use corporate sector experience? [Multiple choice]

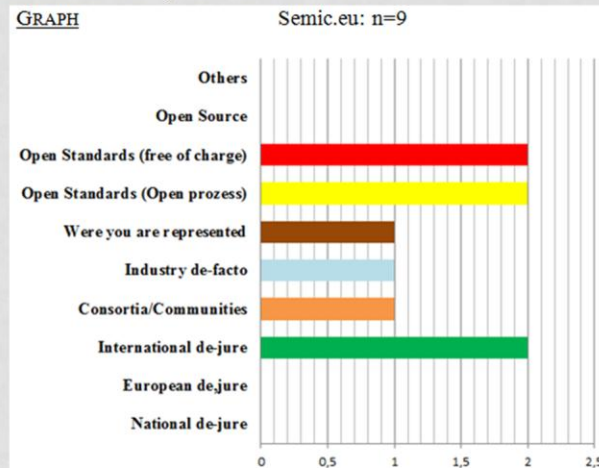


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- Process View = horizontal integration of government agencies
- E-Commerce = e-Procurement platforms for public tenders
- Process Reengineering = Redesigning processes rather than just putting the old processes online
- SOA = Promoting reuse of services, reducing cost for development
- Outsourcing = External service providers (some legal issues may apply for certain tasks)
- Process Improvement = driving the quality and promoting efficiency

FINDINGS – QUESTIONNAIRE (Q13)

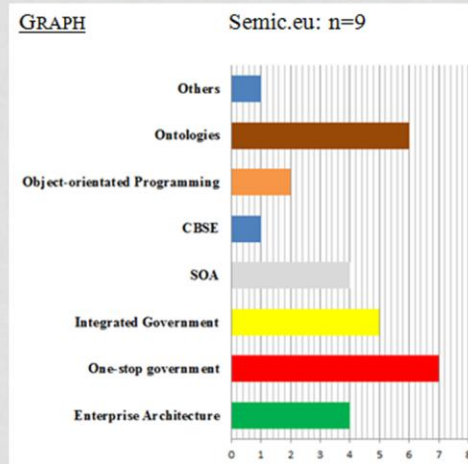
- Which standards do you trust more?



- Who can set up standards?
- Consider: A standards body needs to be recognised to set up standards!
 - If a body is not recognised it provides no standards, but specifications
 - A specification becomes a standard by
 - being agreed in a consensus-based process
 - being set up by a recognised standards body
 - by being applied in practice
- De-jure = e.g. ISO standards (see definition above)
- De-facto = a specification that rules the market, like PDF for documents
 - Since the market supports the specification it becomes a de-facto standard
 - PDF even became an de-jure standard published by ISO afterwards (Adobe set it Open Source)
- Open Standards = ongoing discussions, how to define; generally the definition mentioned above + useable free of charge (as far as possible)

FINDINGS – QUESTIONNAIRE (Q14)

- Are you still committed to the following things? [Multiple choice]

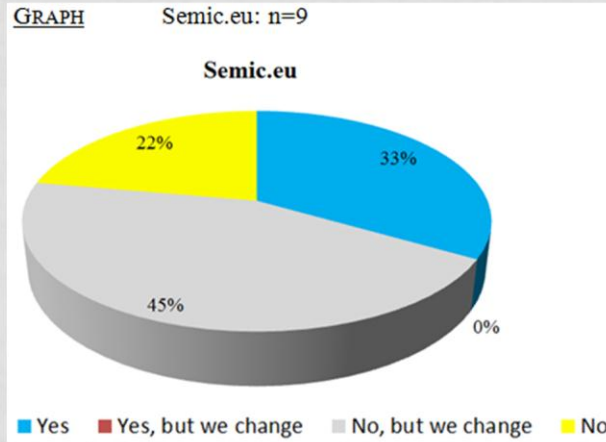


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- One Stop Government: Central focal point (i.e. portal website) for e-government services
- Integrated Government = Process orientation, horizontal integration of government agencies
- CBSE = Component Based Software Engineering, approach for modular development of application components
 - Provided the basis for the development of services, which are essentially programmatically accessible components, which are distributed over a network
- Enterprise Architecture = a structured description of an enterprise according to certain views
- SOA = Service Oriented Architecture, promotes the reuse of once released services
- Ontologies promote data integration and discovery in distributed databases
- OO-Programming = Separation of concerns, modelling data and related actions together in objects

FINDINGS – QUESTIONNAIRE (Q15)

- Is your framework / are your regulations mandatory?



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- Most Frameworks are going to set the framework mandatory or are already