Shared SOA services and specifications for health and social care in Finland

SOA in Healthcare Sydney

14 January 2011

Juha Mykkänen

University of Eastern Finland, Kuopio

School of Computing, HIS R&D Unit

juha.mykkanen@uef.fi

SOSIAALIALAN TIETOTEKNOLOGIAHANKE

UNIVERSITY OF EASTERN FINLAND

Presentation background

- R&D projects developing and applying architecture and interoperability approaches in healthcare:

National project for social services IT - Tikesos 2006-2011
SOLEA: Agile Enterprise Architecture using SOA and BPM 2008-2011
SerAPI: SOA and integration of healthcare applications 2004-2007
OmaHyvinvointi (MyWellbeing): personal wellness management 2008-2010
PlugIT: healthcare application integration 2001-2004
eKat / guidelines for national eBooking of health services 2008

TJSERT / Certification requirements of national health IT services, 2008
Healthcare services specification project (HSSP) / HL7 and OMG, 2005-
Integrating the Healthcare Enterprise - IHE.fi 2008-
China/Finland eHealth partnership + other projects in Shanghai 2004-2008
Various HL7 Finland and web services standards implementation guides, 2004-2009

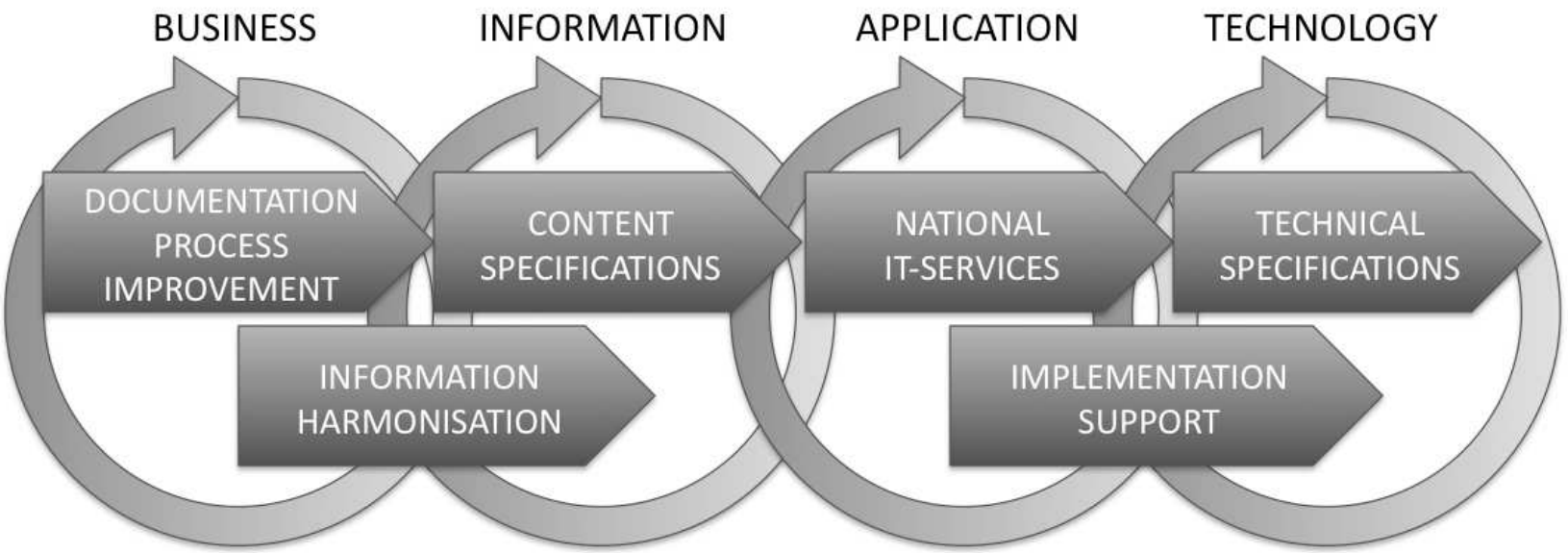
- Dr. Juha Mykkänen
- University of Eastern Finland, Kuopio
  - research director, School of Computing, Health Information Systems R&D Unit
  - research line director, Kuopio Welfare Research Center KWRC
- chair in HL7 Finland (co-chair common services & IHE SIG), vice chair in Finnish Social and Health Informatics Association, HL7 SOA Ambassador 2006-2008, Finnish representative in International Medical Informatics Association (IMIA) WG HIS

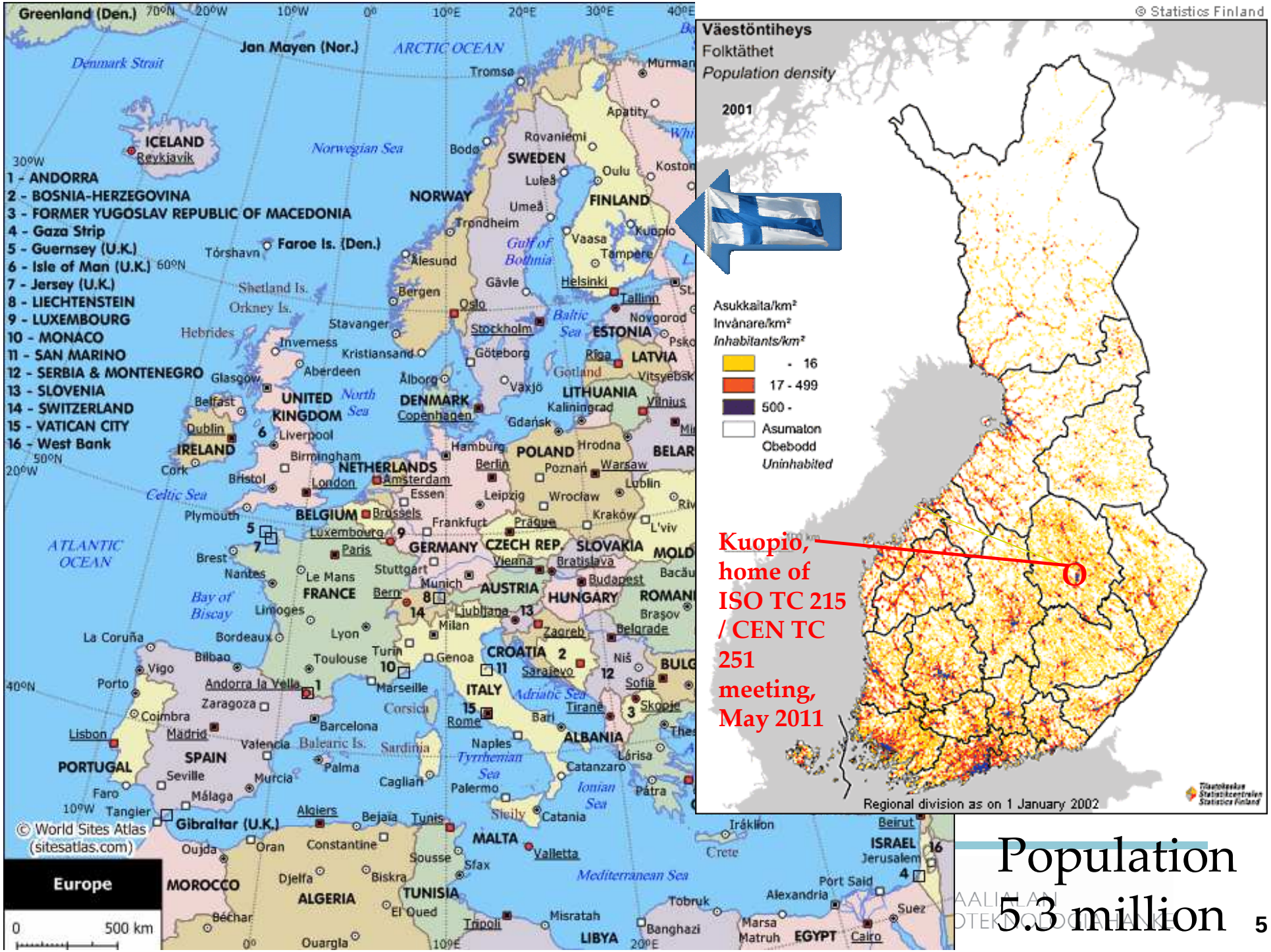
Outline

- Context
  - Finland, health and social care, health and social care IT in Finland
- Interoperability approach in the national project for social services IT
- Services: functionalities, deployment considerations and reuse across sectors
- Lessons and conclusions

Context

- Standards, architectures and specifications to support the national IT infrastructure for social services (Tikesos - Sosiaalialan tietoteknologiahanke)
- Focus on the information systems architecture, services and shared specifications between health and social services sector





Population 5.3 million

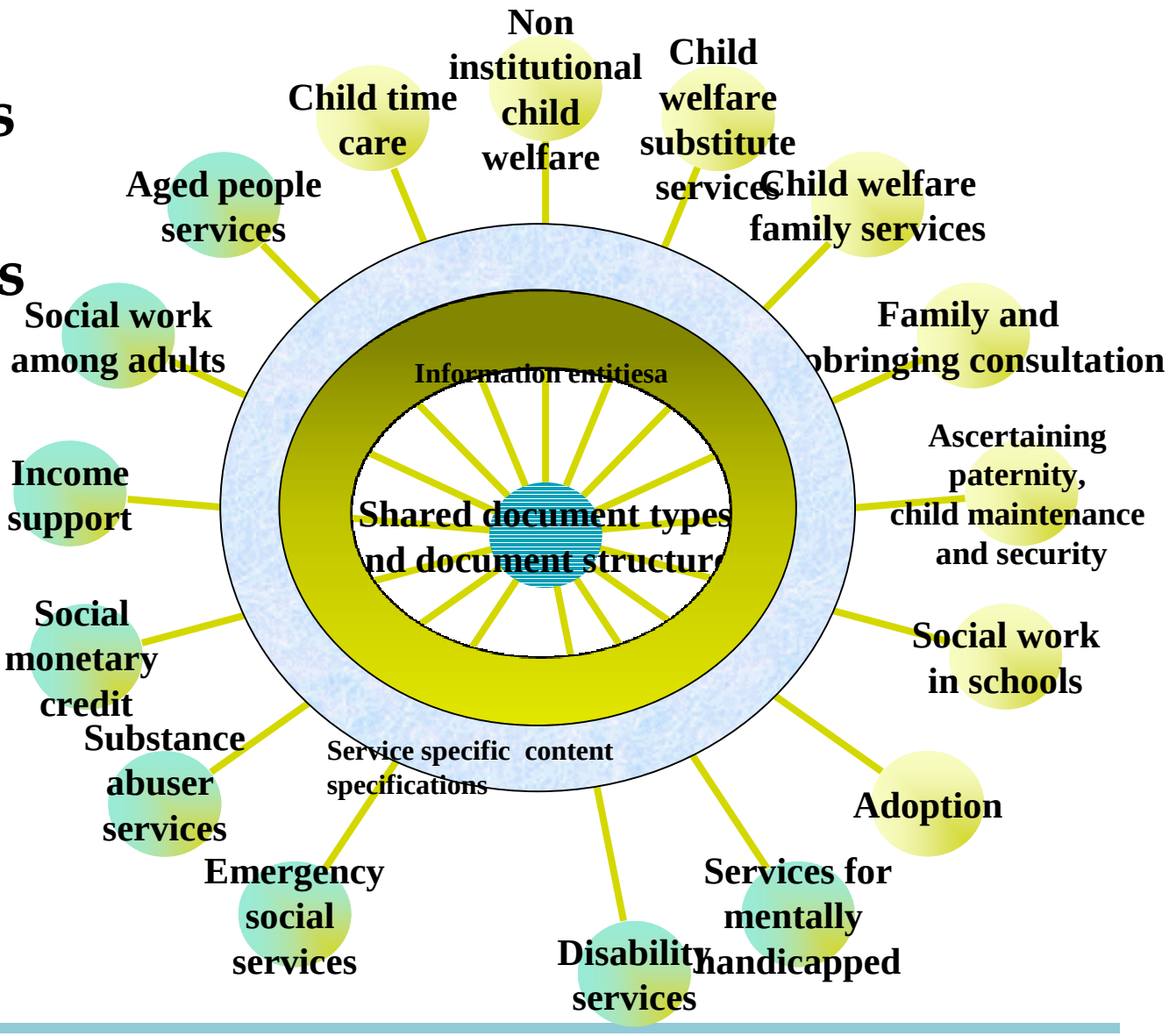
Social services and ICT applications

- The public authorities are to guarantee adequate social services for everyone living in Finland. (The Constitution of Finland)
- In Finland social services are
  - organised by local authorities (the municipalities) and
  - produced by both public and private service providers.

- Social services are mainly funded through taxes
- Municipal and other social services employ about 165 000 people
  - about 8 % of the employed working force
- ICT applications for client documentation are widely used in social and health care production in Finland.
  - but little exchange of information between the applications especially in social services

IT costs for social and health sector in municipalities: 400 M eur annually

Selection of social services provided by municipalities



Development Programme for eSocial Care in Finland (the Tikesos project)

- The Ministry for Social Affairs and Health started a national development programme to improve the utilisation of IT in social services in 2005
- Towards the production of the social services electronic
- The main goals are
  - to harmonise the client information systems (CISs) in social services
  - to develop electronic documentation and
  - to produce specifications for nationally organised electronic preservation and sharing of documents (archive)
- project specification deliverables will be finished in 2011
- healthcare national project costs 208 M€ (2006-2014), plans are to shift focus towards social services in 2014-2015

Health and social care - similarities and differences

Health services

- continuous and accumulative information
- patient-centric information
- summary-oriented information
- importance of screening information during care processes

Social services

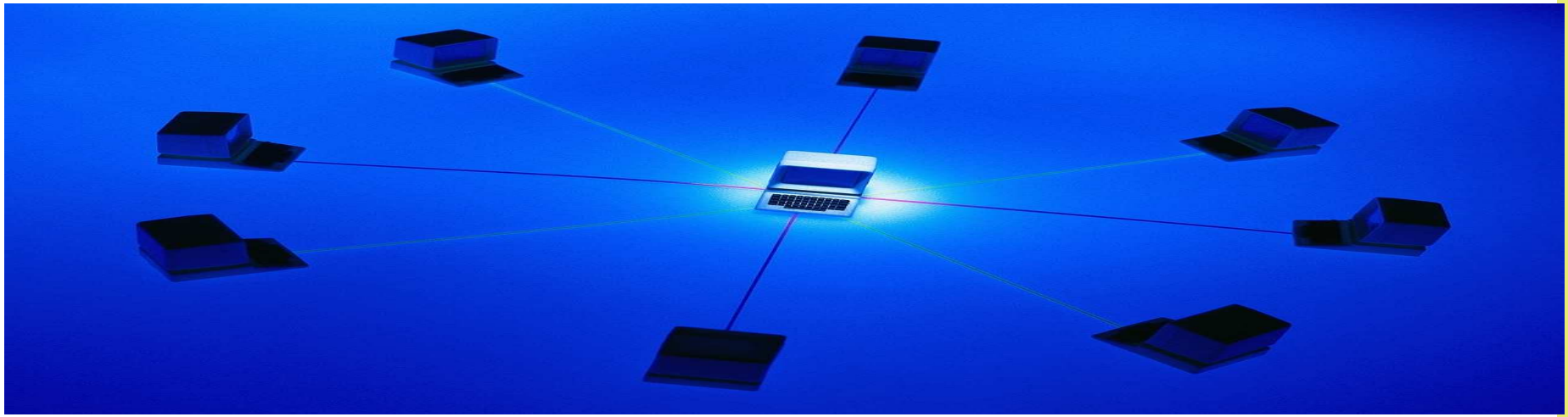
- client or client group specific information
- function specific information (child protection, day care, elderly care…)
- accumulative informatio only during the service
- little summary-oriented information
- importance of screening information according to information groups / document types
- preservation and archiving according to decision making level

Social and health services

- municipal responsibility of services
- some joint services (e.g. home care)
- responsibility of archiving documents
- availability and preservation requirements
- to most extent shared legislation and national development governance
- service provision models are being integrated to some extent
- **many shared development needs and information system requirements**

[partially from Sirpa Kuusisto-Niemi]

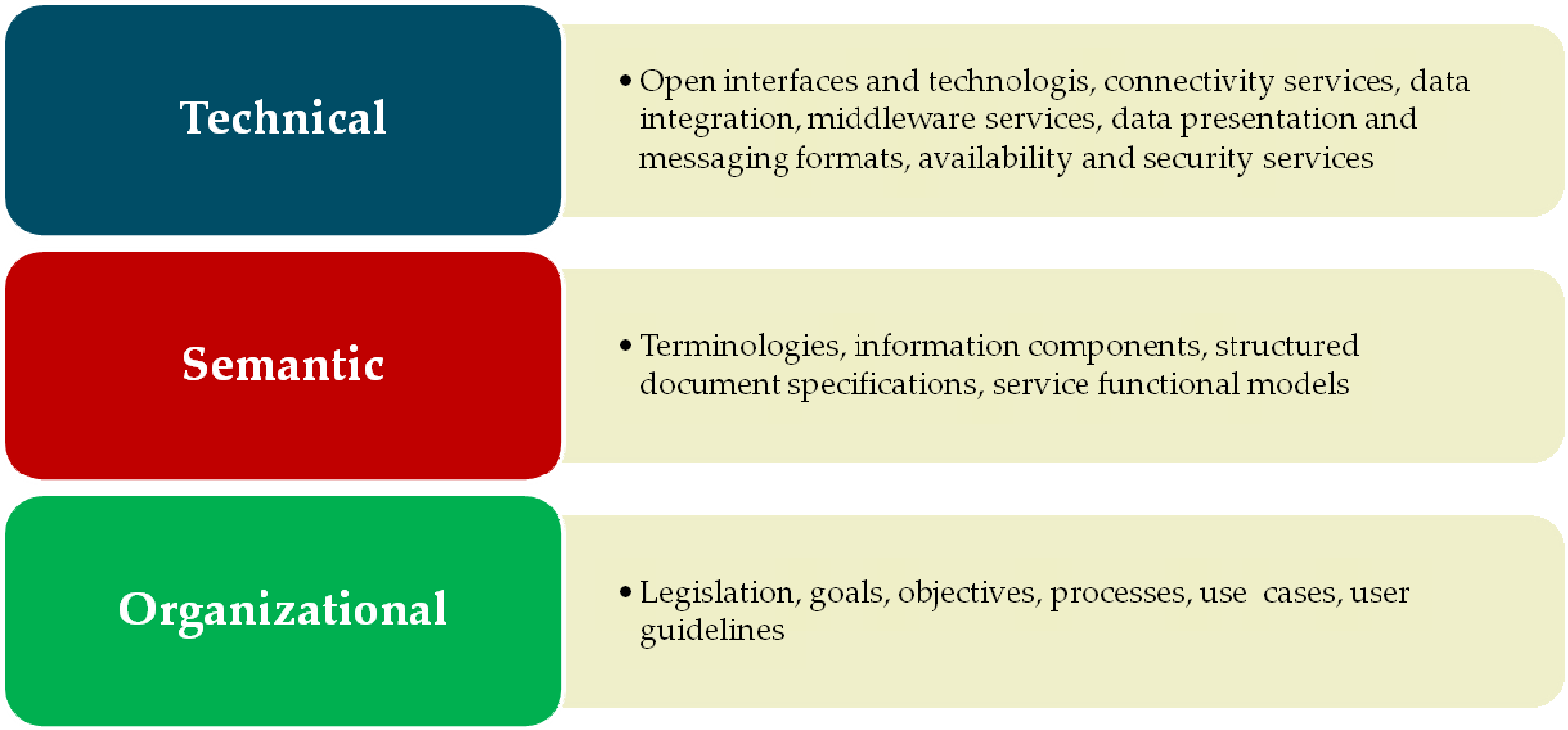
Interoperability approach in the Finnish national project for social services IT



UNIVERSITY OF EASTERN FINLAND

Support for interoperability levels in Tikesos

(using European Interoperability Framework)



- generic and domain-independent standards support all levels, but semantic and organizational levels are based on domain-specific

Strategic choices and starting points for national development in social services information management

- Primary goal to serve the needs of social services work and information management
  - better applications, improvements in availability and consistency
- Utilization of solutions already specified and implemented in healthcare
  - …where applicable…
  - the national eHealth infrastructure provides many building blocks
- Nationally centralized storage of documents (KanSa eArchive), following the healthcare strategy
- Document orientation, both structured and unstructured documents
- Feasibility and needs assessment → specifications → implementation and deployment
- Enterprise architecture viewpoints in project management and results dissemination

Example: reusability of healthcare models the national eArchive for social services

- Direct correspondence
  - document preservation requirements
  - functional model of information sharing and preservation services (document submission, queries)
  - application architecture responsibilities
  - log services
  - messaging standards
  - digital signature technologies
  - archive management needs and solutions
  - document replacement, deletion, metadata management
  - eView – client view to documents
  - non-structured pdf documents

- Basis for reuse, needs for adaptation
  - social services specific metadata
  - details of access management
  - consent management model and details
  - details of customer relationship management
  - technical details of metadata

- Needs for new solutions not yet specified in social or healthcare national services
  - Cross-sectoral information sharing
  - Research and health or social service statistics
  - further consumer eServices in addition to eView

User needs related to information sharing 1

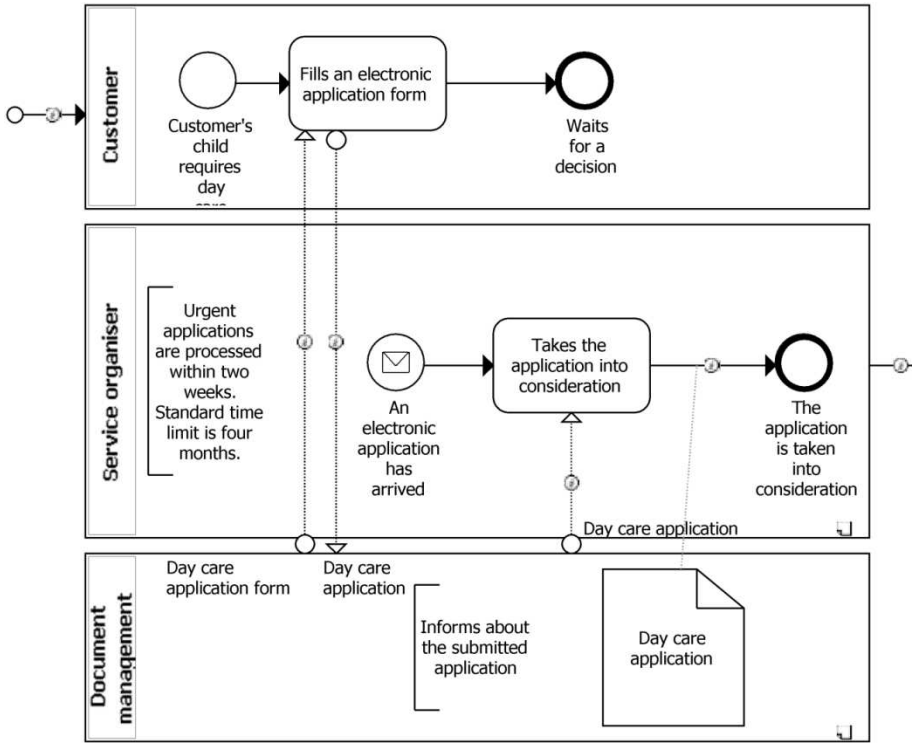
- Most important expected benefits (in order)
  - improved and faster availability of needed information
  - process improvements and efficiency improvements with both internal and external stakeholders
  - improved integrity, persistence and data protection
- Most important generic requirements for shared information (in order)
  - client services and decision documents
  - client service plans
  - status information of client service processes
  - not as much: daily entries from service provision

User needs related to information sharing 2

- Most important information sharing needs **between** organizations (in order)
  - information from related services of different producer organizations
  - information of previous services
  - information of service provider (person) of the same service
  - external stakeholder needs (police, national statistics, population register center, local register offices, national insurance institute, etc.)
  - information sharing between service organizers and service producers
- Process analysis and use case documentation performed for several social service processes

Process analysis examples

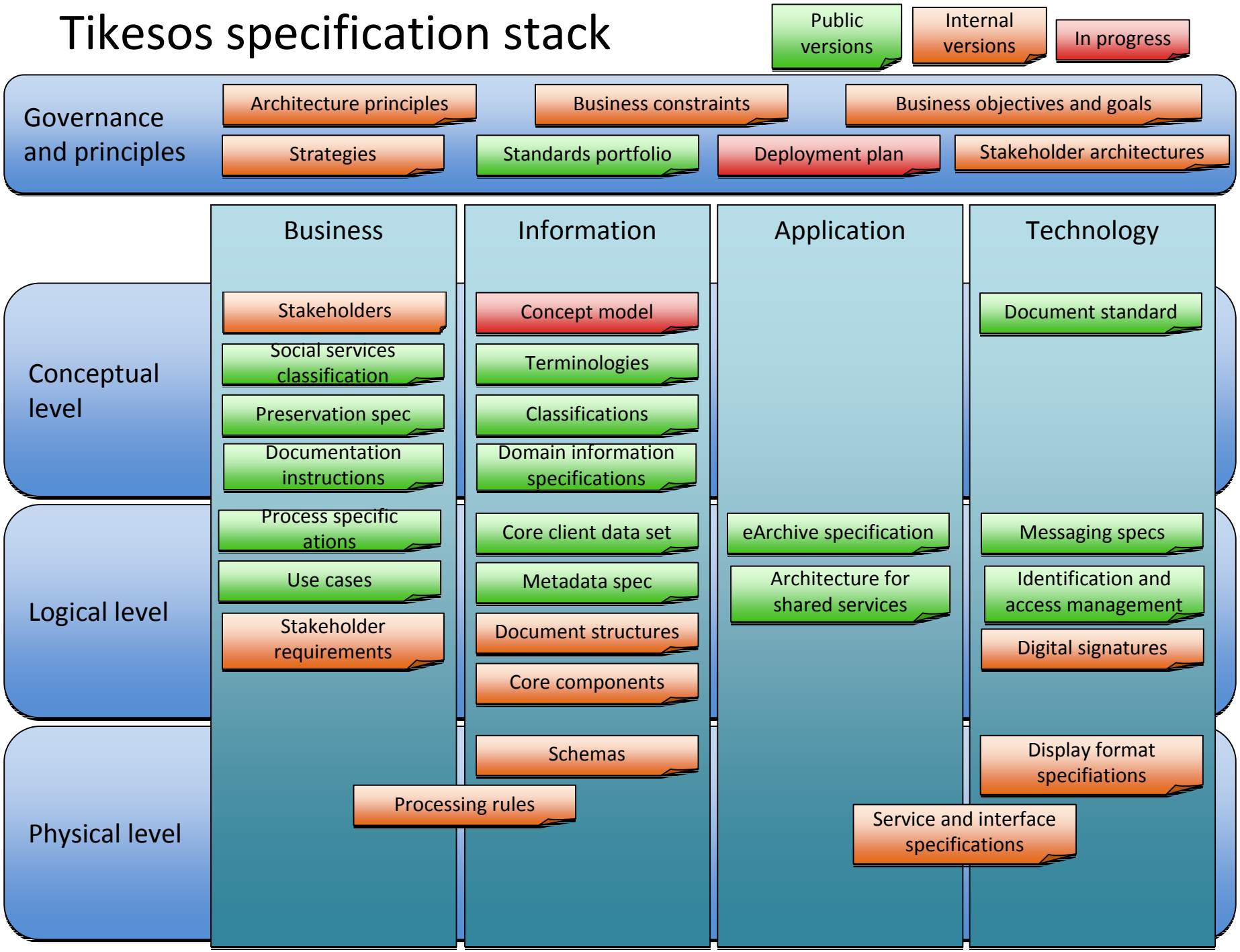
DAY CARE APPLICATION	DAY CARE ORGANISATION	DAY CARE PRODUCTION
Day care application initiation	Day care needs consideration	Individual day care planning
Day care application review	Day care resource allocation	Day care services implementation
Day care application resolution	Day care agreement	Day care services evaluation
		Day care services conclusion



Architectural and development decisions

- Document orientation
  - natural for social services administration, follows national eHealth strategy
- Nationally centralized archive, separated
  - based on analysis of 8 different architectural options
  - utilizing healthcare eArchive solutions and specifications, but separated
- Connectivity to nationally shared services from local systems
  - additional shared services can be deployed locally or regionally
- Main responsibility of security, access control and consent management on local/regional level
  - according to nationally agreed specifications
  - national log services and consent repository

Tikesos specification stack

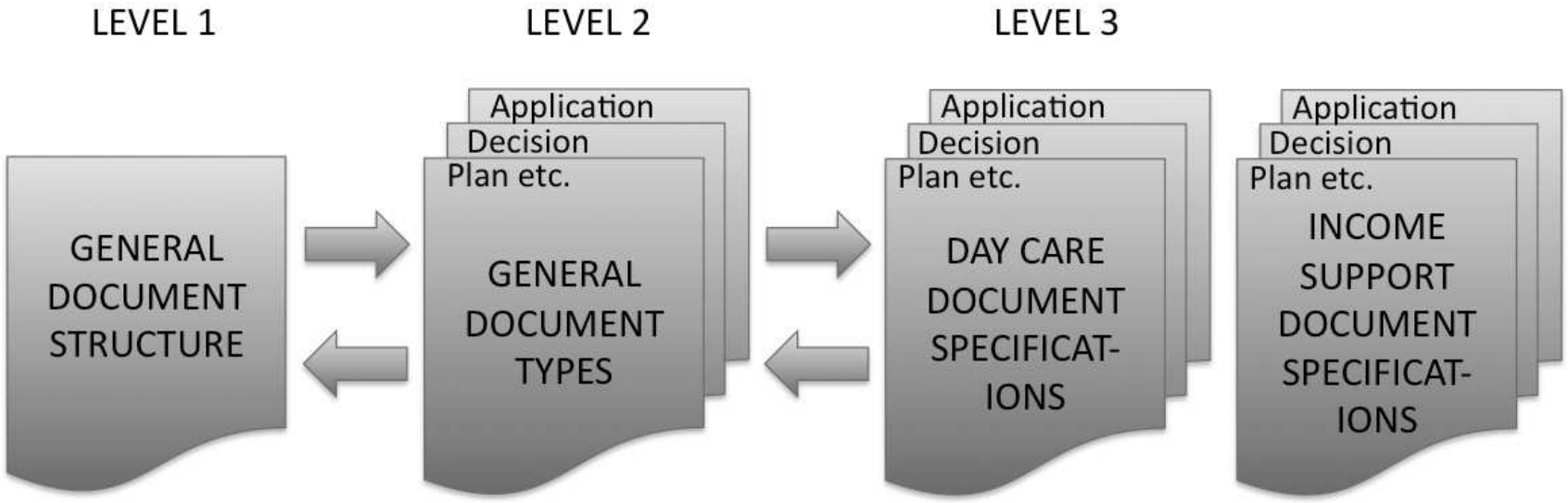


Expert groups for social care domain information specification

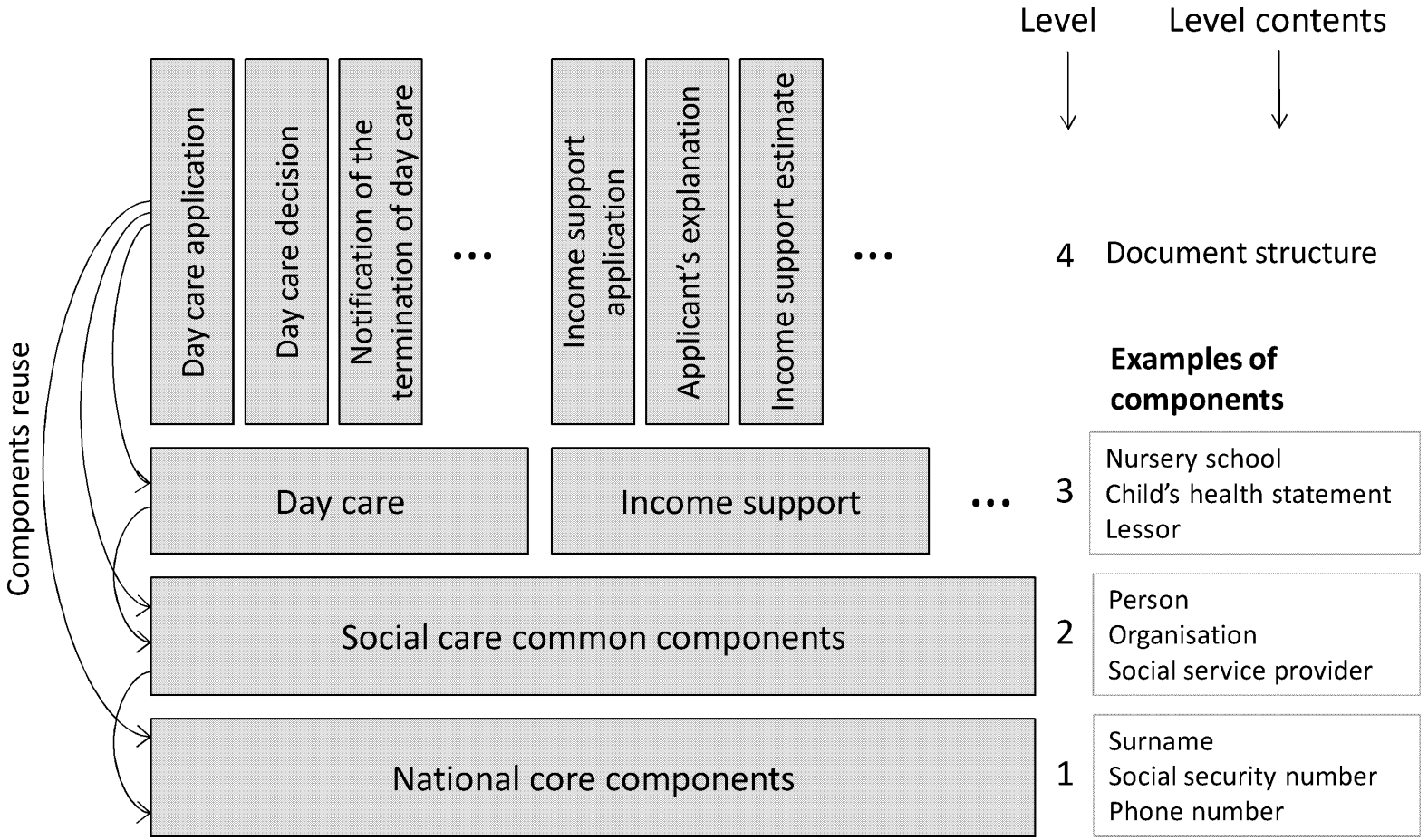
Child welfare	Family conciliation matters	Child day care	Disability services
Adoption counselling	Ascertaining paternity, child maintenance and security	Income support	Social work among adults
The treatment of substance abusers	Aged people services	Social work in schools	Etc.

Documentation structure

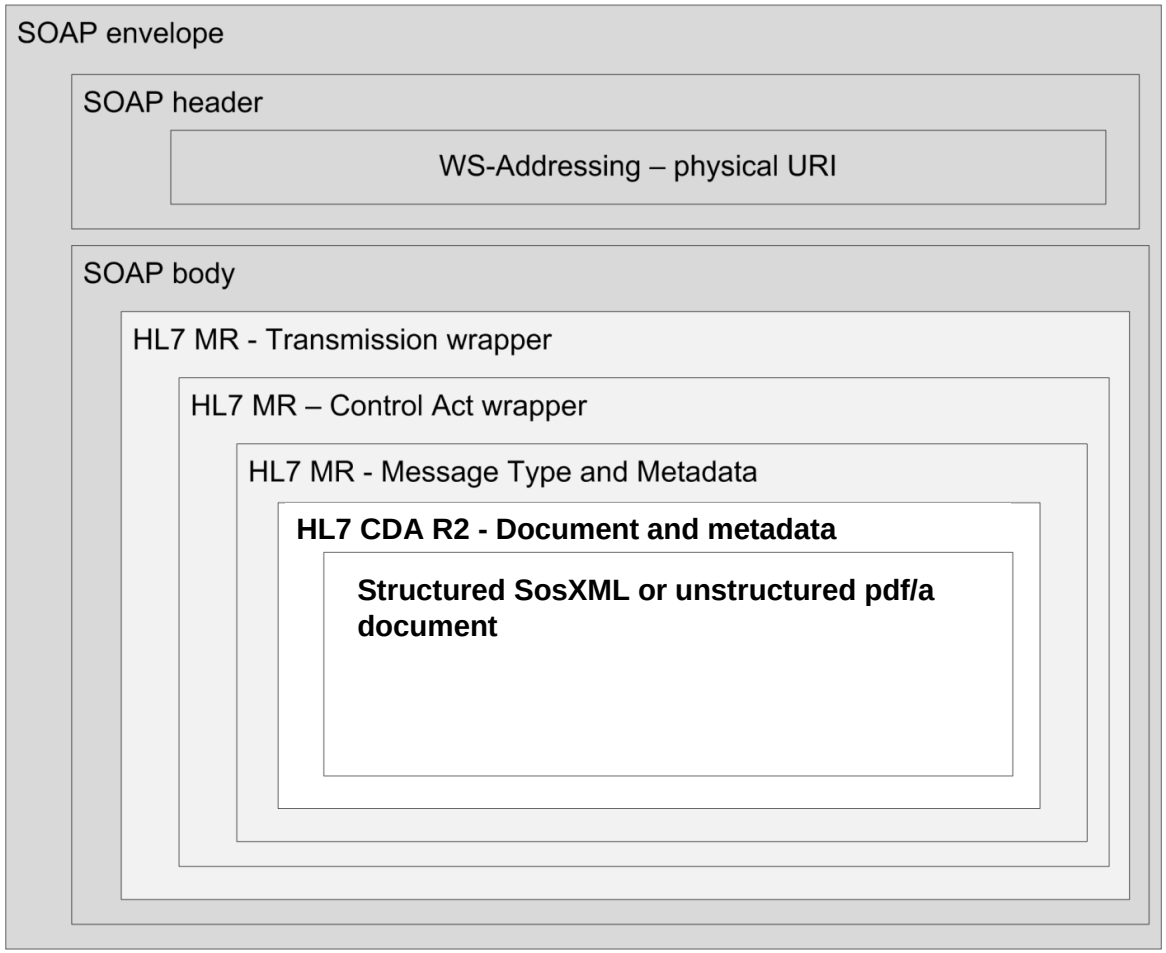
- Structured document specifications based on the work of expert groups
- Decision in 2008: a dedicated XML format for structured social document content
  - HL7 CDA R2 was evaluated, will be used for metadata (header, increased compatibility with health sector)
  - unstructured documents use pdf/a
- CCTS-based approach and national eGovernment recommended (JHS) element naming conventions



Use of information components in documents

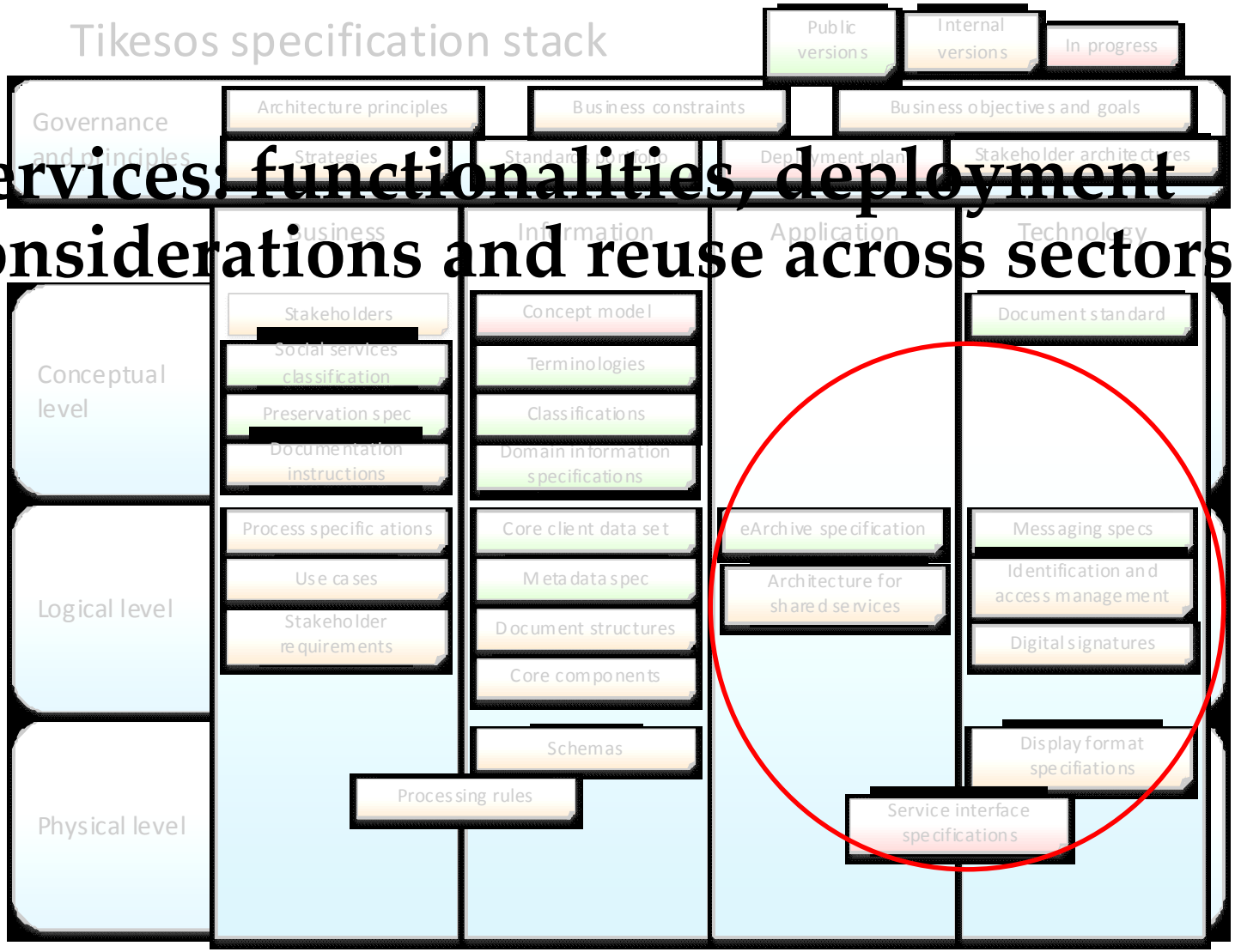


eArchive messaging layers and standards – messaging technology viewpoint



reusing national healthcare eArchive messaging specifications

Services: functionalities, deployment considerations and reuse across sectors



SOA and reuse approach in Tikesos

- Selected EA architectural principles include (in order)
  - 1. Client first
  - 2. Support for social services work
  - 4. Reuse before invent
  - 5. Compatibility between health care and social services
  - 6. Compatibility between social services and related sectors
  - 14. Use SOA principles
- SOA approach
  - solutions for entire sector, many organizations, many legacy systems
  - architecture specification through functional capabilities
  - mapping of requirements to services
  - service specification using HSSP/SSF type process and templates (for new services)
  - various service implementation and deployment options

Options of national social services information sharing and preservation / 2008

1. The adaptation of KANTA healthcare e-Archive
2. The utilization of KANTA services, models and specifications where possible, but separate national archiving service for social services
3. New cross-sectoral shared national archiving service for all municipalities
4. A new centralized national archiving service dedicated to social services
5. A central registry with document repositories on regional or local level
6. The development of norms and requirements to advance document archival based on current systems on local level
7. A new nationally developed information system for social services

Results of the evaluation

Alternative	Functional require-ments	Infor-mation mgmt attributes	Quality attributes	Archi-tecture	Cost Efficiency	Risk manage-ment	**Total**
Weight	2	1	1	1	1,2	1,2	
Maximum points	20	7	7	6	12	7,2	**59,2**
1	12,0	4,0	5,0	**5,5**	**8,4**	**6,6**	**41,5**
2	15,0	**4,5**	**5,5**	**5,5**	7,2	4,8	**42,5**
3	10,0	4,0	3,5	5,0	**10,2**	4,2	**36,9**
4	**18,0**	3,0	4,5	3,5	4,8	1,2	**35,0**
5	13,0	2,5	4,0	3,0	**2,4**	1,2	**26,1**
6	**7,0**	**2,5**	**2,0**	**0,5**	6,0	2,4	**20,4**
7	19,0	3,0	5,5	4,0	6,6	**0,6**	**38,7**

- extension and utilization of Healthcare KANTA eArchive specifications (options 1 and 2) was decided

Shared services

- roadmap for 28 SOA services / service domains to suppport information sharing and management on national level
  - service specifications for some of these already available, some produced by the end of project
  - service implementations in national projects, regional projects or local product development
  - varying degrees of service granularity
  - integration with health care and eGovernment roadmaps
- deployment options and sector considerations as part of the roadmap
  - **local**: organizational (organizer / producer) or application-specific
  - **regional**: covers several service organizers and producers, shared use
  - **national:** nationally centralised deployment, one service for all users

Information sharing and preservation (eArchive) services

N-national, R-regional, L-local

S-social services specific, H-health and social shared, C-across sectors

Service	Depl	Sect	Phase
KanSa eArchive for social services	N	S based on h	1
National code service (operational)	N/r	H	1
Document validation service	L/R/n	S	1
Display format generation service	N/r/l	S	1
UI services for municipal archive management	N	H/s	1
UI services for lightweight EA access	N	S	2/3

Infrastructure and security services

N-national, R-regional, L-local

S-social services specific, H-health and social shared, C-across sectors

Service	Depl	Sect	Phase
Message delivery service	N/R/l	H/c/s	1
Document signature services	L/R/n	s/H/c	1
Consent management service	L/R/N	H/s	1
Timing services	R/N	C	2
Role management service	N/R/L	S/C/h	2
Professional eIdentification service	L/R/n	S/c/h	1
Certificate services	N/r	h/c	1
Access management services	R/L	S/h/c	1
Log services	N/r/l	H/s/c	1

Resource and service management services

N-national, R-regional, L-local

S-social services specific, H-health and social shared, C-across sectors

Service	Depl	Sect	Phase
Wellbeing services directory	N/r	H/s	2
Case management services	l/R	s/c	2
Eligibility services	R/l	s/h	3
Scheduling services	R/l/n	S/H/c	3
Statistics services	N	H/s	2
Services for scientific research	N	H/s	3
Stakeholder eView portal	N	S/h	3

Consumer eServices

N-national, R-regional, L-local

S-social services specific, H-health and social shared, C-across sectors

Service	Depl	Sect	Phase
eView to KanSa (view personal documents)	N	s/h	2
Consumer eIdentification and eSignature services	N	C	2
Service portals	R/l/n	c/s/h	2
Personal service account	N	C	2
Contact information services	N	C	3
Delegation services	N	C/s	3
Scheduling services	see prev.	see prev.	see prev.

Observations from the standards field: two directions towards social services standards and large-scale IT deployments?

- Health care → Social care
  - France: principle on following the use of HL7/CDA standards from health care
  - England / NHS: Logical Record Architecture for Health and Social care (LRA): unified information modeling method and standards
  - Sweden / national standards: one electronic health record standard for health and social care, CEN/ISO 13606
  - requirements from social care in Patient Administration Committee in HL7
- eGovernment → Social services
  - e-GIF (e-Government interoperability framework):in England NHS study to be required for cross-sectoral information sharing
  - Healthnet / Norway: goal to use ebXML Messaging (OASIS) standards for social services information sharing
  - Germany: OSCI and Xmeld specifications for registries, buildings and social services
  - USA: HHS recommendations on NIEM for health/justice interface

Summary and lessons learned

- many pitfalls have been avoided by not rethinking what can be reused
  - promoted by SOA, separation of content semantics from functionality
- tendency in national programmes to overestimate national IT services and underestimate support for local change management?
- cost estimates of architectural choices and central services should have been made early in the process
  - including cumulative cost of ”doing nothing”
- inclusion of social service aspects and requirements in healthcare specifications where mutual functionality and content
- gray areas between health and social services: e.g. home services, child welfare
- requirements for convergence and reuse ACROSS sectors - are we ready?
  - move towards individual-centred care and self-help
  - increasing need for holistic service management for people
  - move towards unified government interoperability frameworks and standards portfolios

Kiitos

"We must learn to live together as brothers or perish together as fools."

-Martin Luther King Jr.
(1929 - 1968)

juha.mykkanen@uef.fi

SOSIAALIALAN TIETOTEKNOLOGIAHANKE

UNIVERSITY OF EASTERN FINLAND

More info: Chapter - National interoperability approach for social services information management in Finland, in Charalabidis Y, ed. *Interoperability in Digital Public Services and Administration: Bridging E-Government and E-Business*, p. 254-278. IGI Global, 2010.