



# Decentralised Approach to Provision of Home Services

THE 16TH CONFERENCE OF THE OPEN INNOVATIONS ASSOCIATION FRUCT  
SMART SPACES AND INTERNET OF THINGS II SESSION

VADYM KRAMAR

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## Smart Living

### DOMAIN: Real Estate & Living Environment

- Smart City
- Smart House
- Smart Infrastructure
- Smart Data Management
- Smart Energy Management
- Smart Maintenance
- Smart Transportation
- Smart Utilities
- ...

### DOMAIN: Health & Welfare

- Smart Health Care
- Smart Home Care
- Smart Occupational Care
- Smart Hospital
- Smart Home Services
- Smart Social Services
- Smart Unemployment Services
- ...

### DOMAIN: Research & Education

- Smart Day Care
- Smart School
- Smart Vocational School
- Smart University
- Smart Research Aid
- ...

### DOMAIN: Industry

- Smart Factory
- Smart Supply Chain
- Smart Energy
- Smart Resources
- ...

### DOMAIN: Food & Consumer Goods

- Smart Shopping
- Smart Restaurant
- Smart Cafe
- Smart Store
- ...

### DOMAIN: Business & Financing

- Smart Enterprise
- Smart Banking
- Smart Insurance
- ...

### DOMAIN: Public Authorities

- Smart Government
- Smart City Council
- Smart City Hall
- ...

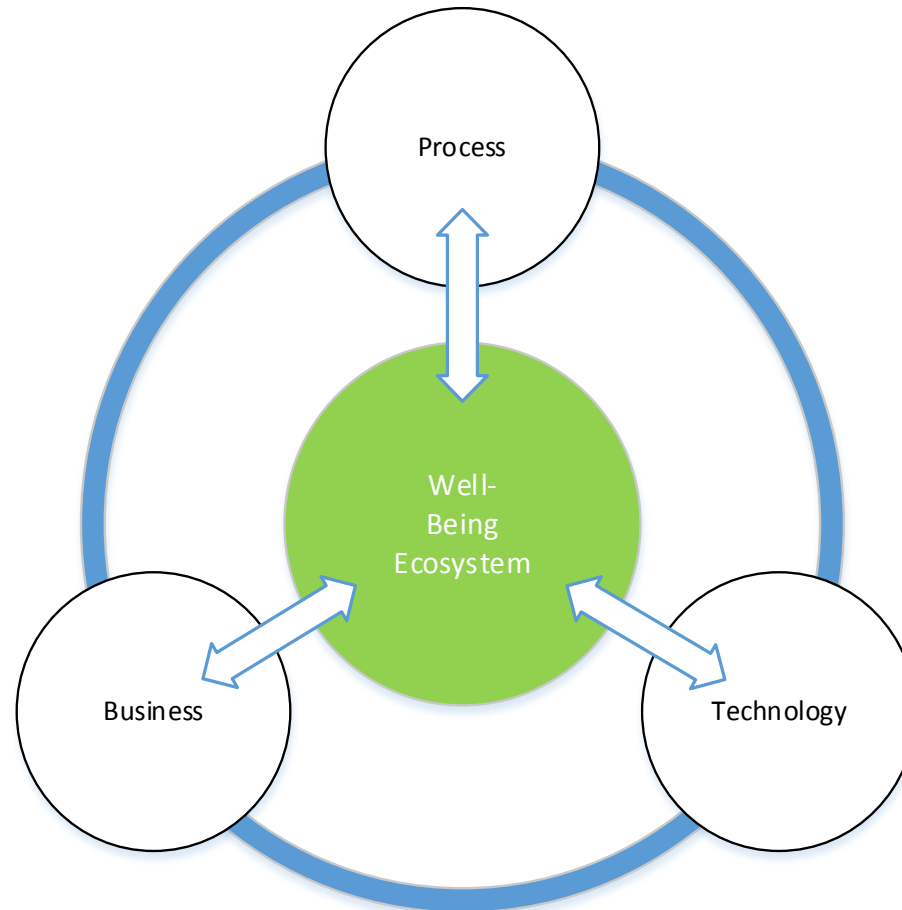
### DOMAIN: Communication & Security

- Smart Communication
- Smart Security
- Smart Data Protection
- ...

### DOMAIN: Culture and Leisure

- Smart Library
- Smart Theater
- Smart Community
- ...

# Well-Being Ecosystem



Source: J.Selkälä, M.Latvastenmäki, S.Niemelä, S.Kurttila, V.Kramar, Business Models for User Oriented Services in Well-Being Ecosystem, in proceedings of Sustainable Procurement in Urban Regeneration and Renovation, Oulu, 2013

# Well-Being Ecosystem

= Services that help people to be well and healthy as much as it is possible

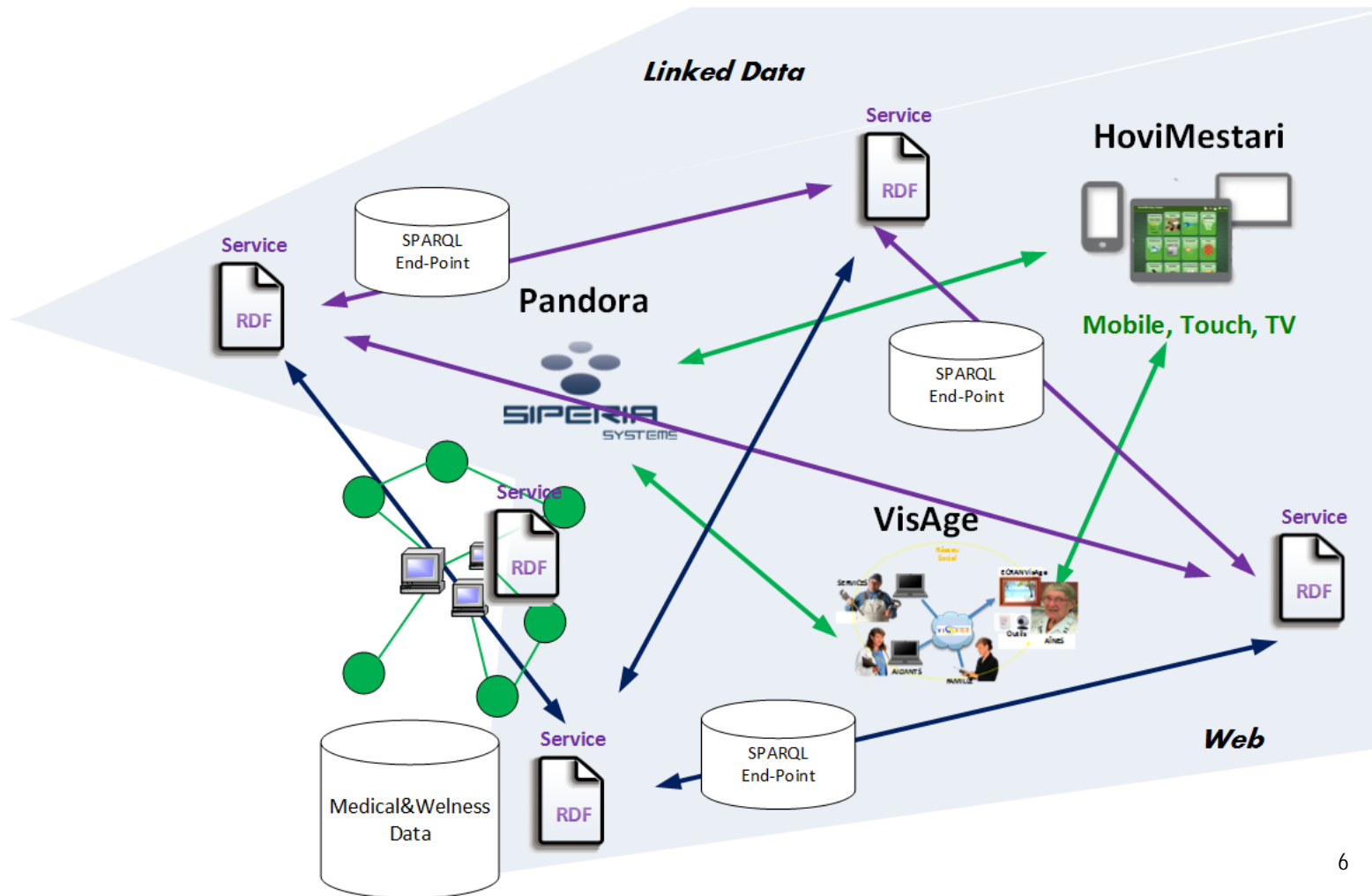
- Promoting
- Social Inclusion
- Disease prevention
- Maintaining
- Health-care
- Medical support
- Rehabilitation
- Care
- ...

Internet of Services?

# Technology Challenges

- Generation of data and information
- Infrastructure
- Information Management
- End-user terminals and interfaces
- Best Practices and Adoption

# Decentralised Approach to Provision of Home Services



# Widely-adopted Standards

- Resource Description Framework (RDF)
- RDF Schema (RDFS)
- Web Ontology Language (OWL)
- Friend of a Friend (FOAF)
- Microformats: hCard, vCard, hCalendar, hProduct

The GoodRelations Web Vocabulary for E-Commerce was selected to be the basis data model for home service provisioning. The GoodRelations model ontology is available under the Creative Commons Attribution 3.0 license and utilises the following models, vocabularies and namespaces: RDFS, OWL, PURL, Schema.org, vCard, FOAF, DBpedia, Dublin Core, eClassOWL, CEO, Geo, and Yahoo.

```

<xml> <?xml version="1.0" encoding="UTF-8"?>
<rdf:RDF xmlns:gr="http://purl.org/goodrelations/v1#"
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
xmlns:services="http://serviceprovidername.com/services.html#"
xmlns:eco="http://www.serviceprovidername.com/ontologies/eclass/1.0.0/#"
xmlns:base="http://www.serviceprovidername.com/#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
  <gr:BusinessEntity rdf:about="http://www.serviceprovidername.com/#BusinessEntity">
    <gr:offers>
      <gr:Offering rdf:about="http://serviceprovidername.com/services.html#Offering_N">
        <gr:acceptedPaymentMethods rdf:resource="http://purl.org/goodrelations/v1#Cash"/>
        <gr:acceptedPaymentMethods rdf:resource="http://purl.org/goodrelations/v1#MasterCard"/>
        <gr:acceptedPaymentMethods rdf:resource="http://purl.org/goodrelations/v1#VISA"/>
        <gr:availableAtOrFrom rdf:resource="http://www.serviceprovidername.com/#LOSOSPN_N"/>
        <gr:eligibleCustomerTypes rdf:resource="http://purl.org/goodrelations/v1#Enduser"/>
        <gr:eligibleRegions rdf:datatype="http://www.w3.org/2001/XMLSchema#string">FI</gr:eligibleRegions>
        <gr:hasBusinessFunction rdf:resource="http://purl.org/goodrelations/v1#ProvideService"/>
        <gr:includes>
          <gr:ProductOrServicesSomeInstancesPlaceholder rdf:about="http://serviceprovidername.com/services.html#Service_N">
            <rdf:type rdf:resource="http://www.serviceprovidername.com/ontologies/eclass/1.0.0/#taxcode"/>
            <rdfs:label xml:lang="en">Visit of Santa Claus - 85 EUR/visit</rdfs:label>
            <rdfs:comment xml:lang="en">Visit of Santa Claus: includes delivery of gifts of your gift(s) and artistic activities - 85 EUR/visit,
excluding travel expenses, any region in Finland</rdfs:comment>
            <foaf:page rdf:resource="http://www.serviceprovidername.com/services.html"/>
          </gr:ProductOrServicesSomeInstancesPlaceholder>
        </gr:includes>
        <gr:hasPriceSpecification>
          <gr:UnitPriceSpecification rdf:about="http://serviceprovidername.com/services.html#PriceSpec_N">
            <gr:hasCurrency rdf:datatype="http://www.w3.org/2001/XMLSchema#string">EUR</gr:hasCurrency>
            <gr:hasCurrencyValue rdf:datatype="http://www.w3.org/2001/XMLSchema#float">85</gr:hasCurrencyValue>
            <gr:hasUnitOfMeasurement rdf:datatype="http://www.w3.org/2001/XMLSchema#string">C62</gr:hasUnitOfMeasurement>
          </gr:UnitPriceSpecification>
        </gr:hasPriceSpecification>
        <gr:validFrom rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2014-12-14T00:00:00-08:00</gr:validFrom>
        <gr:validThrough rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2014-12-31T23:59:00-08:00</gr:validThrough>
        <rdfs:label xml:lang="en"> Visit of Santa Claus - 85 EUR/visit</rdfs:label>
        <rdfs:comment xml:lang="en"> Visit of Santa Claus: includes delivery of gifts of your gift(s) and artistic activities - 85 EUR/visit,
excluding travel expenses, any region in Finland</rdfs:comment>
        <rdfs:isDefinedBy rdf:resource="http://www.serviceprovidername.com/services.html"/>
        <foaf:page rdf:resource="http://www.serviceprovidername.com/services.html"/>
      </gr:Offering>
    </gr:offers>
  </gr:BusinessEntity>

```



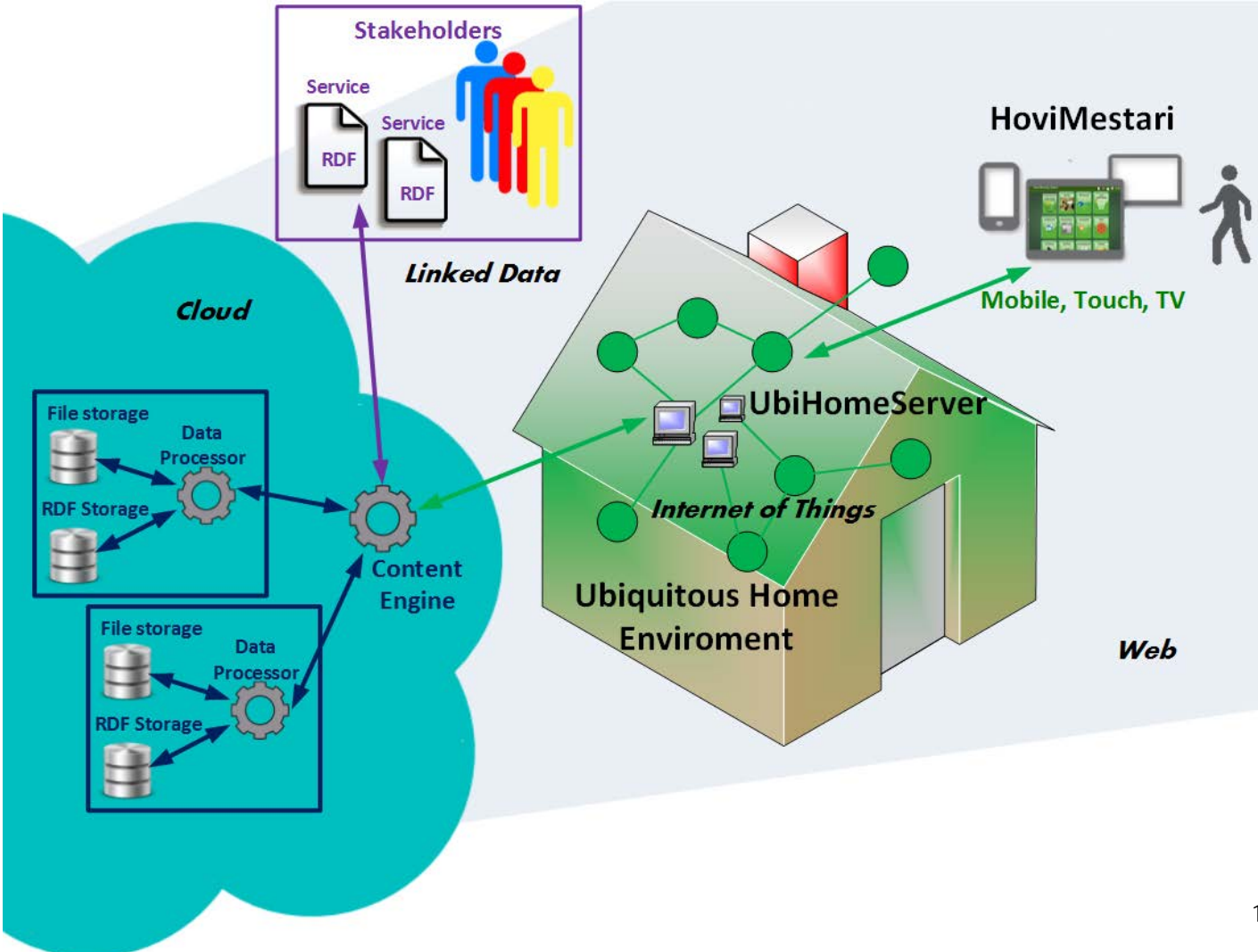
# SPARQL Query Example

```
SELECT ?offer ?uri ?price ?currency WHERE
{
  ?offer a gr:Offering .
  ?offer gr:hasBusinessFunction gr:ProvideService .
  {
    {
      ?offer gr:includes ?service.}
    UNION
    {
      ?offer gr:includesObject ?o .
      ?o gr:typeOfGood ?service .
    }
  }
  OPTIONAL {?service rdfs:label ?label}
  OPTIONAL {?service rdfs:description ?description}
  OPTIONAL {?service foaf:page ?uri}

  ?offer gr:hasPriceSpecification ?p .
  ?p a gr:UnitPriceSpecification .
  ?p gr:hasCurrency ?currency .
  ?p gr:hasCurrencyValue ?price .

  FILTER (regex(?label, "Santa Claus", "i") || regex(?description, "Santa Claus", "i"))
}
```

# HoviMestari



# Integration Levels

	Integration Levels:		
Properties:	0	1	2
System is aware who is a user	No	Yes	Yes
User profile is used	No/ Dumb	Yes	Yes
Personalisation	No	Yes	Yes
Customisation	Possible	Possible	Possible
Type of services	Informative	Interactive	Ultimate
Examples of services	Weather forecast RSS feeds info-pages persistent content	Shopping appointments communications	Home automation safety navigation transportation
Development effort	Relatively low	Average	High
Extra requirements	No	Interoperability with information systems of involved stakeholders	Domestic installation and maintenance

# Service Templates for Similar Services

- Appointments
- Purchases
- Info-services (RSS)
- Player
- Coaching (some cases)
- Serious gaming (some cases)

# Thank you for your attention!

Q&A

Vadym Kramar  
Oulu University of Applied Sciences, Finland  
[vadym.kramar@oamk.fi](mailto:vadym.kramar@oamk.fi)  
+358 44 325 0770  
+358 50 317 4651