

# A service-oriented approach using geo-information for integration in Agri-Food Supply Chain Networks

CAPIGI, 8 April 2008, Dublin

Dr.Ir. Sjaak Wolfert – WUR\LEI, The Netherlands



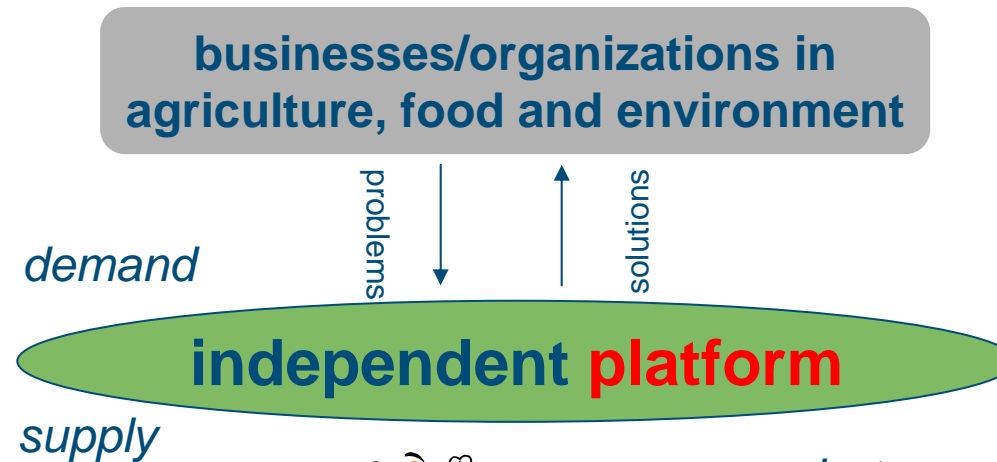


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# EFITA: European Federation for Information Technology in Agriculture, Food and the Environment

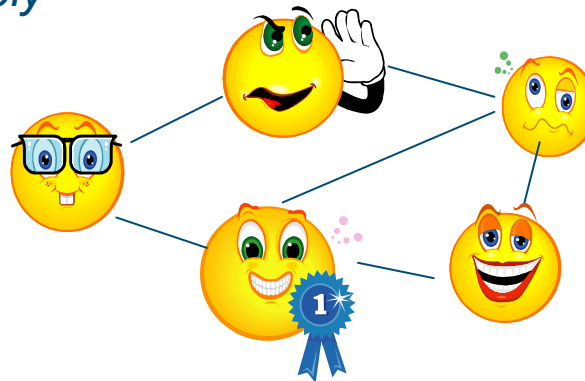
Dr. Sjaak Wolfert  
*President*

# Position of EFITA



## what we are:

- **network** of agri-ICT-professionals
  - science-based
  - practice-oriented
  - interdisciplinary
- NMO's in 14 EU countries



## what we can (help to) provide:

- state-of-the art RTD
- workshops, seminars
- living labs
- contact persons
- (EU)-funding
- dissemination of knowledge/information
- ...

# Management & ICT in Agri-Food Supply Chain Networks

Research Group





# Research Group – Management & ICT in AFSCN

- Dr. Sjaak Wolfert
- Prof. Adrie Beulens
- Dr. Wil Hennen
- Drs. Cor Verdouw
- Dr. Marco Verloop
- Ing. Henri Prins
- Drs. Tim Verwaart
- Ir. Ruud van Uffelen



# Key note

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**Business (process) is leading!**

# Presentation outline

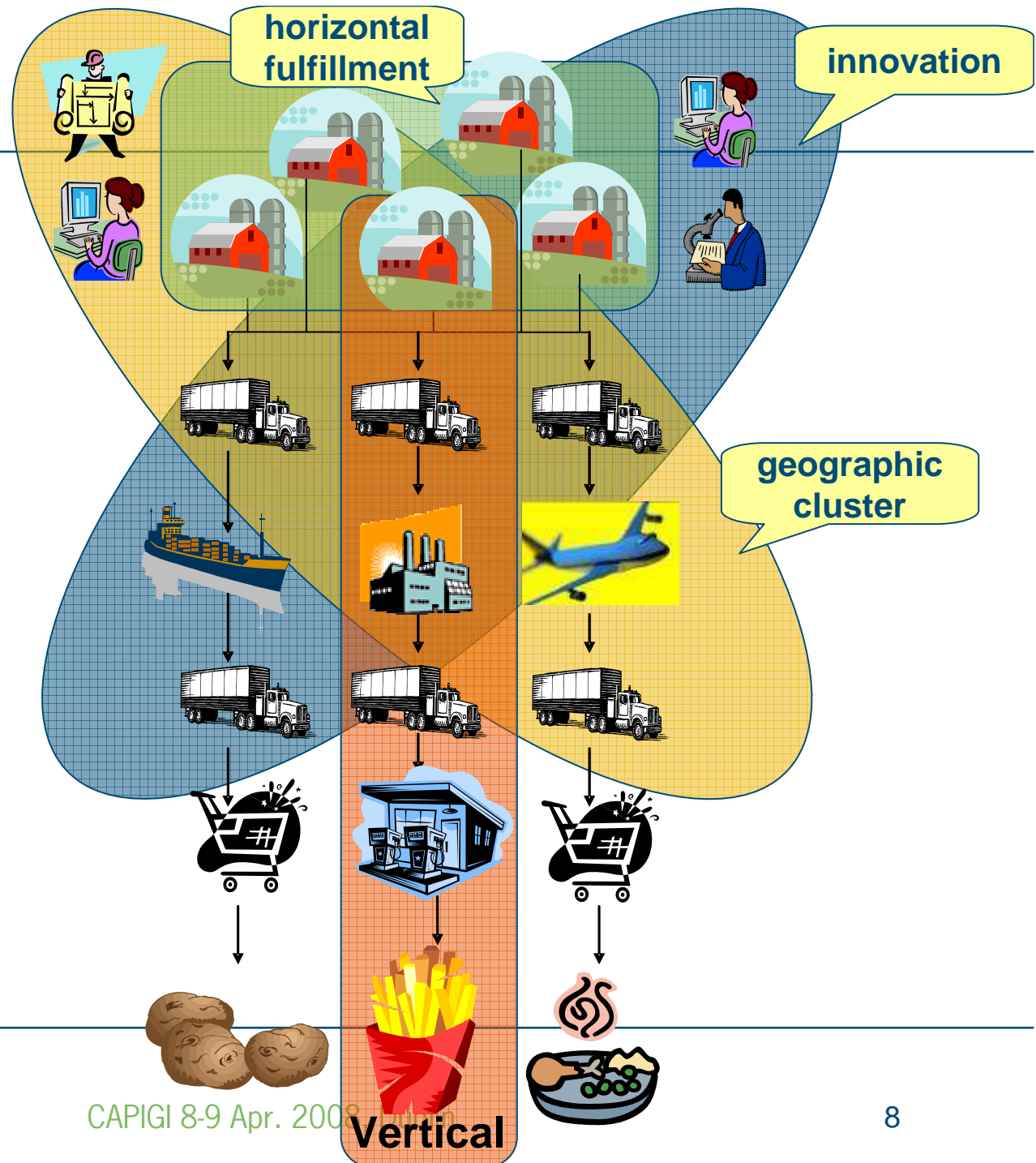
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## SOA-approach for geo-information integration in AFSCN

- Context and problem description
- Conceptual framework
- Some results from on-going research
- Vision for the future
- Some experiences from the Dutch 'KodA' project
- Main challenges
- On-going developments: agriXchange, EFITA2009

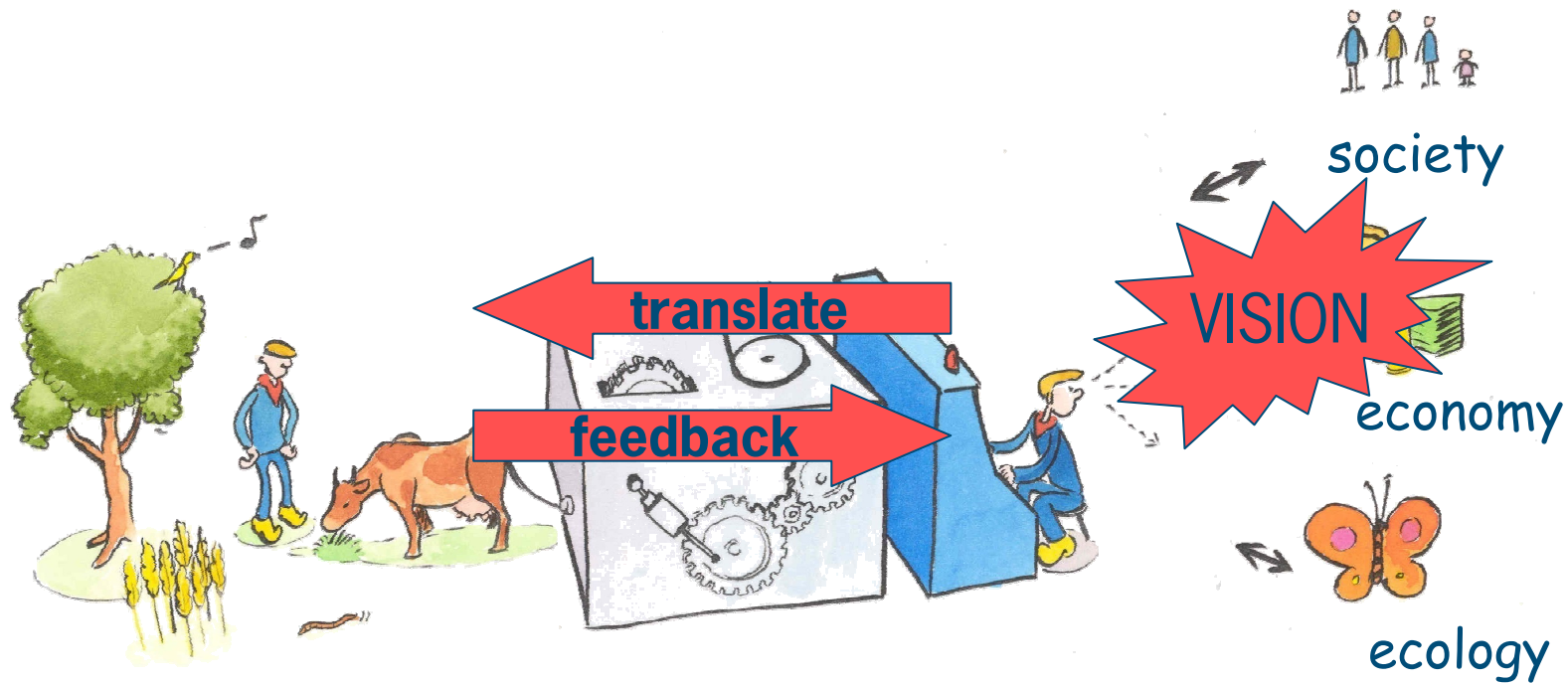
# multi-dimensional Agri-Food Supply Chain Networks (AFSCN)

- information for communication and control
- ICT plays a crucial role



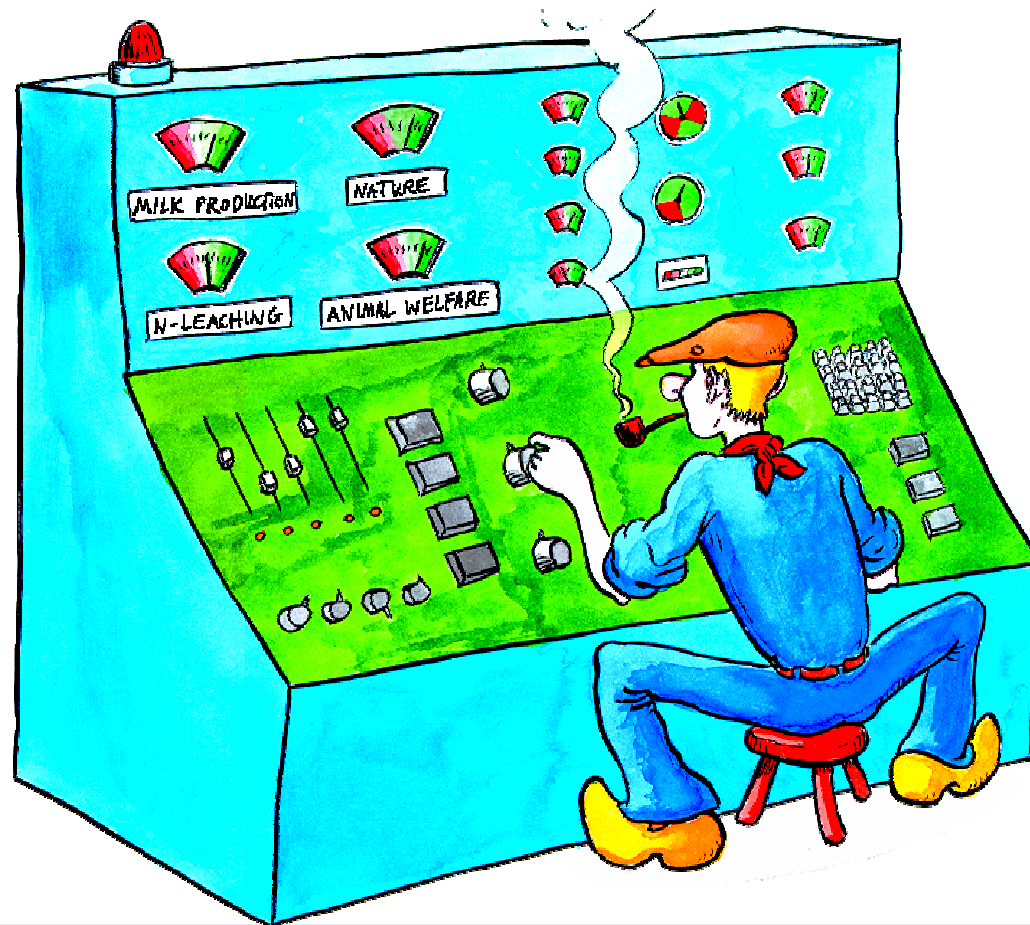


# Sustainable Agriculture: how to make it work?

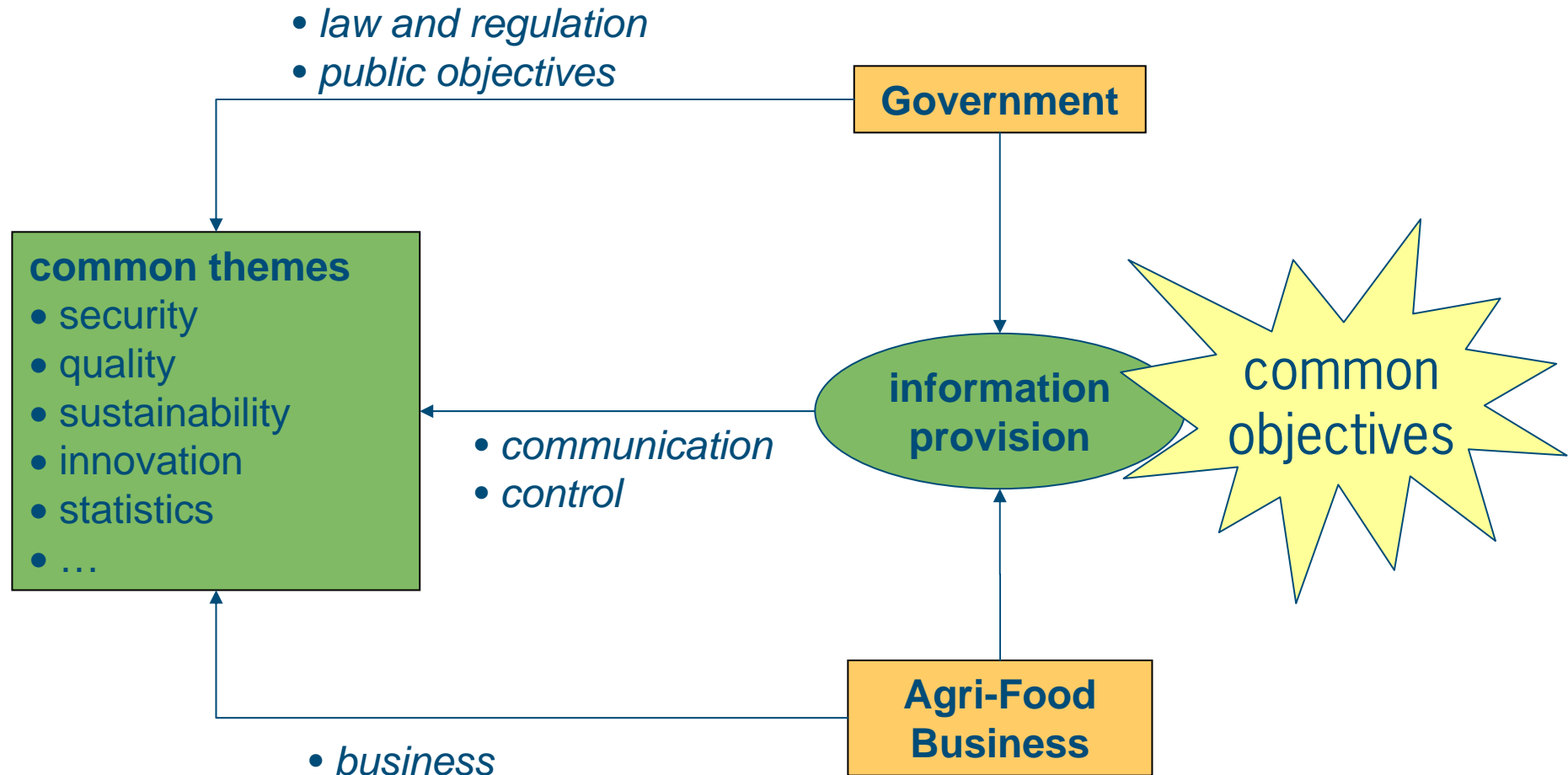


# Monitoring and control

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# Relationship Agri-Food Business and Government



# Problem definition by example for pesticide application

## government/society

- environmental impact

- *reduce environmental impact*

## food processor → consumer

- residues

- *reduce residues* [product]
- [d]

pesticide  
information

## farm

- pe

- *reduce pests*
- *reduce costs*
- *apply site-specific*

- [costs/ha]

- [app/10m<sup>2</sup>]

***business processes  
are driving!***

# Presentation outline

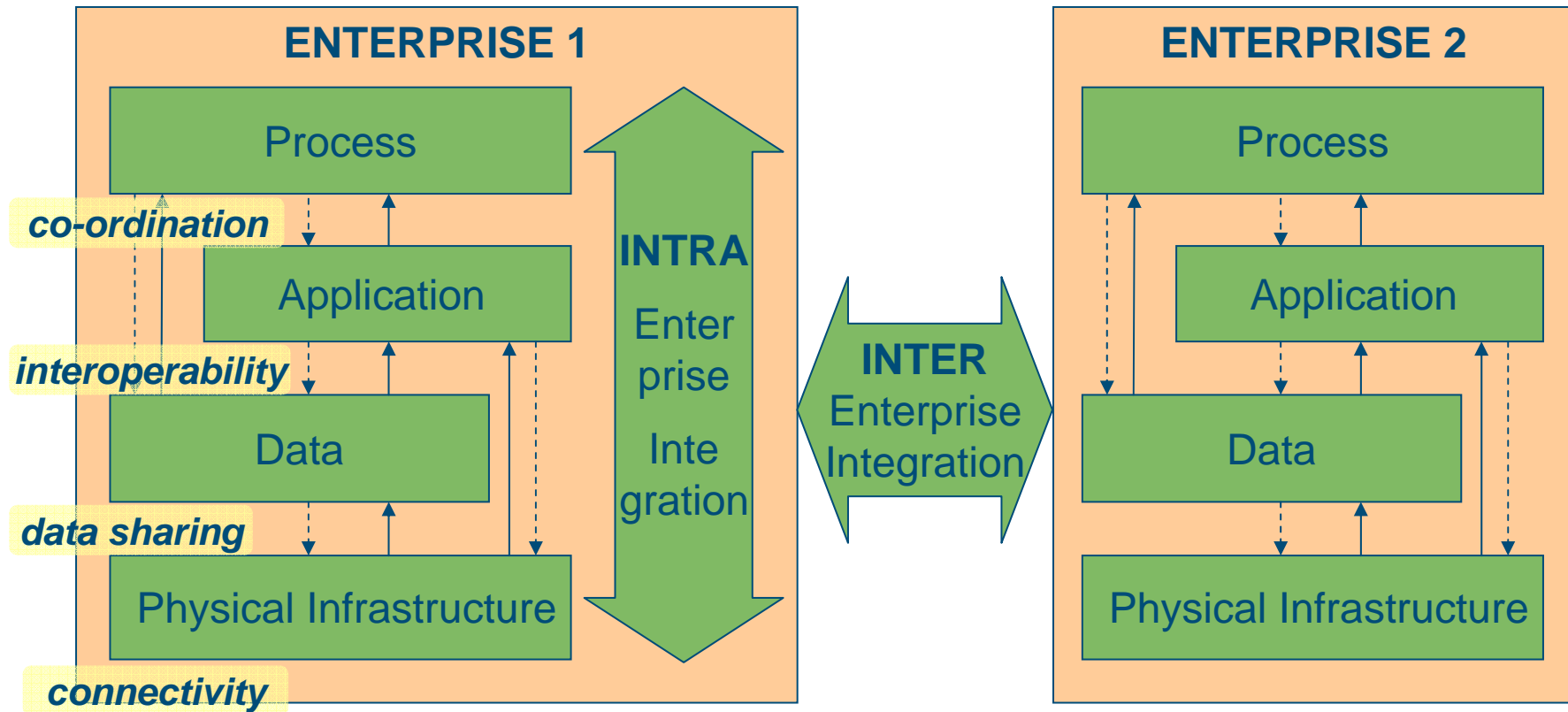
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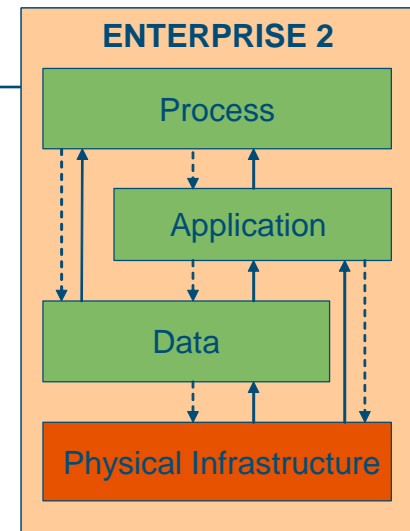
# Information Integration Framework



*Adapted from Giachetti 2004*

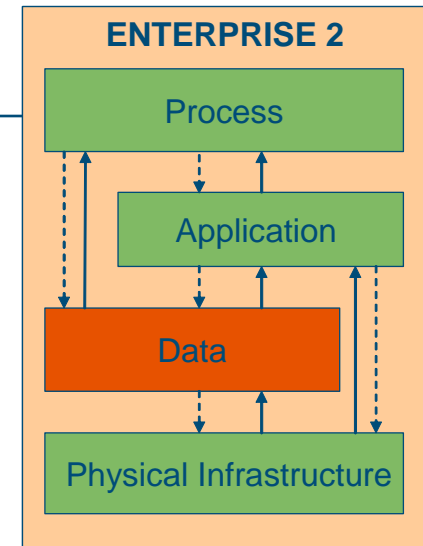
# Physical integration standardization

- connection between devices:
  - computers, machines, products, ...
- standards:
  - 1. interface: PLC, RFID
  - 2. communication:
    - network protocols: TCP/IP & PPP
    - transport protocols: HTTP, FTP, SMTP



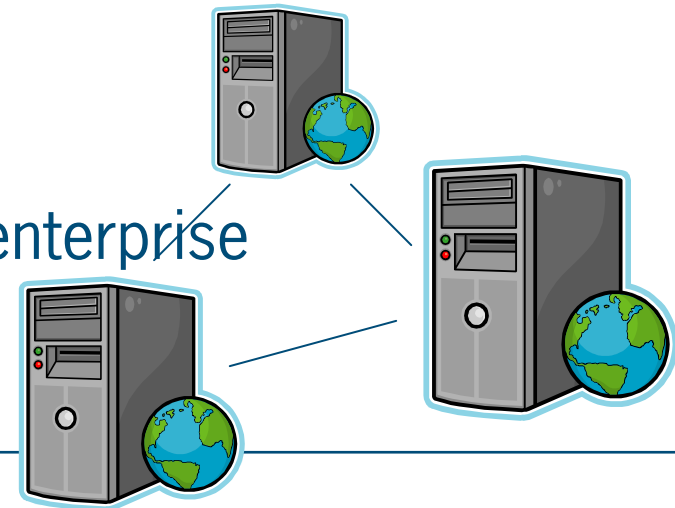
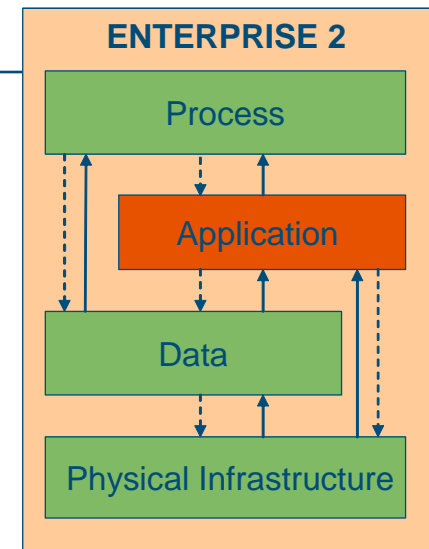
# Data integration standardization

- message format and data definitions
- XML has replaced EDI
- intra-enterprise: article coding (EAN), STEP
- inter-enterprise: eCommerce
  - former: EDIFACT, ANSI X12
  - now/future: ebXML = set of standardized XML messages for transactions, business relations, etc.



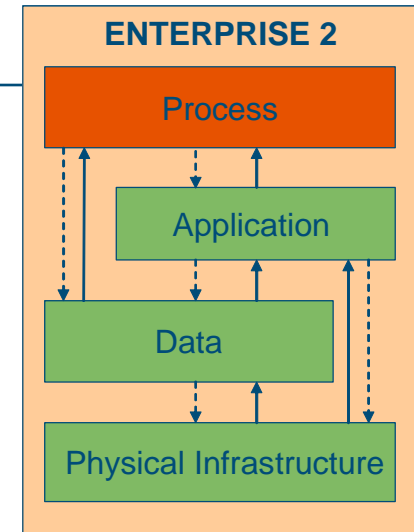
# Application integration standardization

- between applications: one app calls another and receives on-line response
- several applications are considered as components of one aligned system
- intra-enterprise:
  - former/now: ERP
  - now/future: web services → inter-enterprise



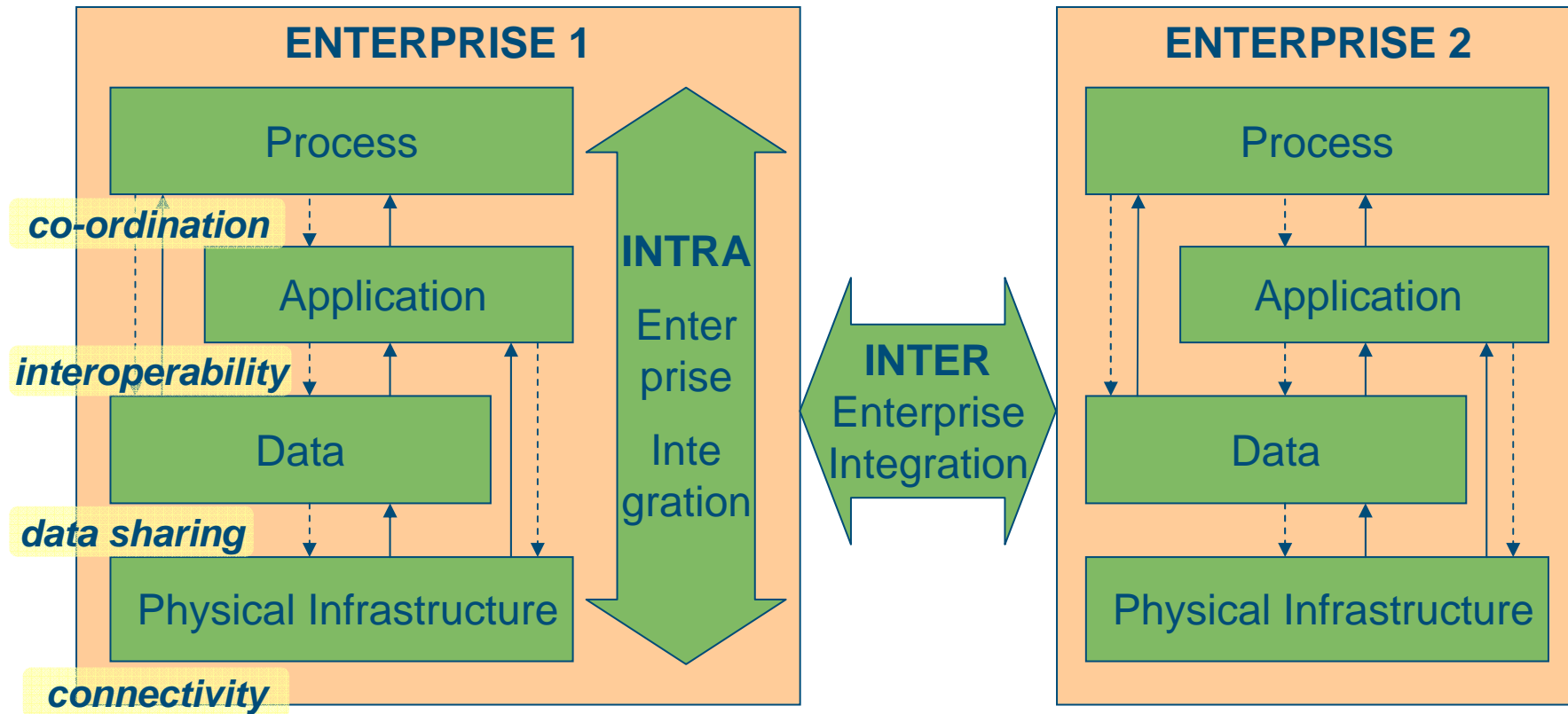
# Process integration standardization

- reference process and data models
- intra-enterprise: CIMOSA, ERP-ref. models (SAP, Infor), ISA-95
- inter-enterprise: VERA, SCOR, CPFR





# Interdependency between various levels



*Adapted from Giachetti 2004*

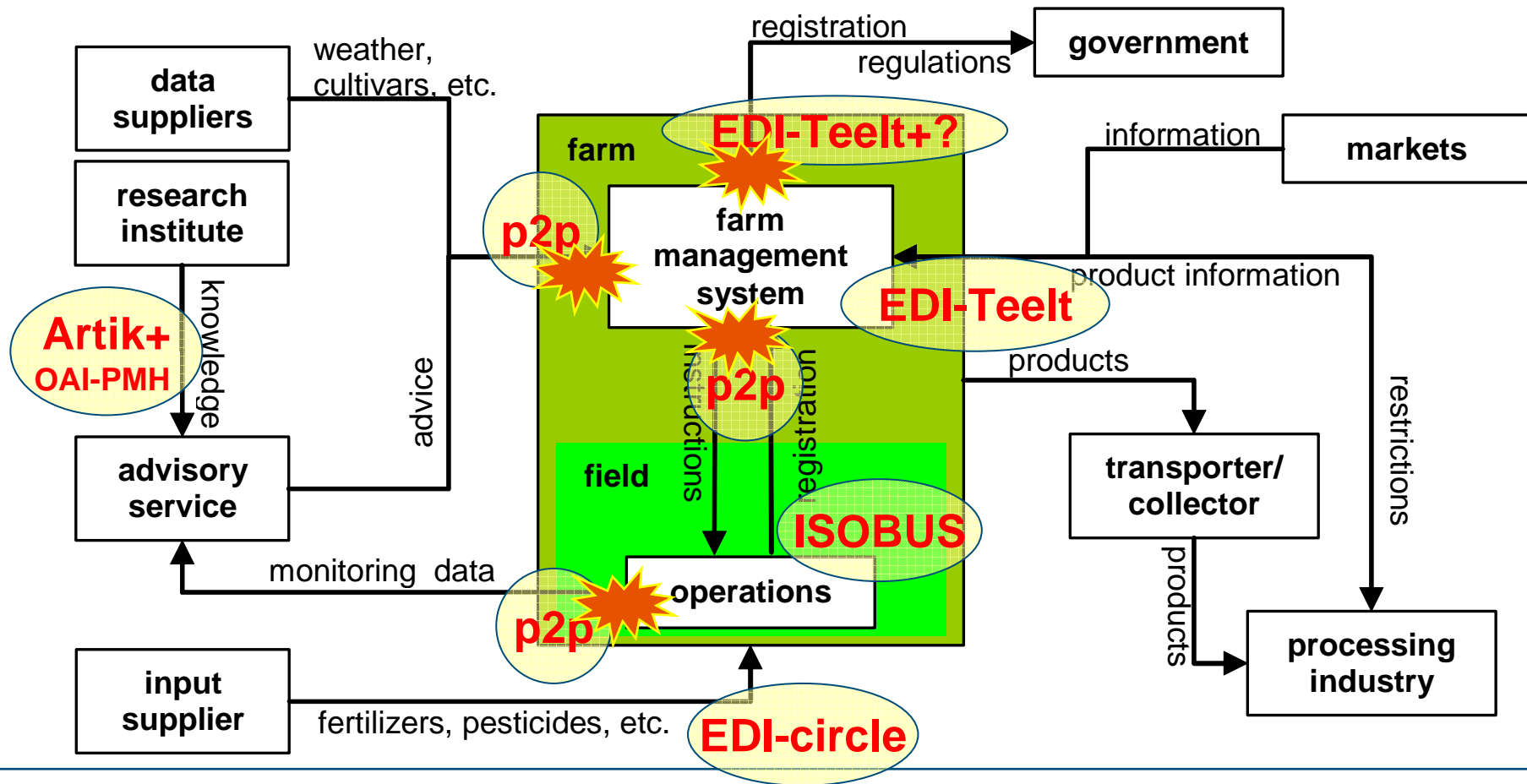
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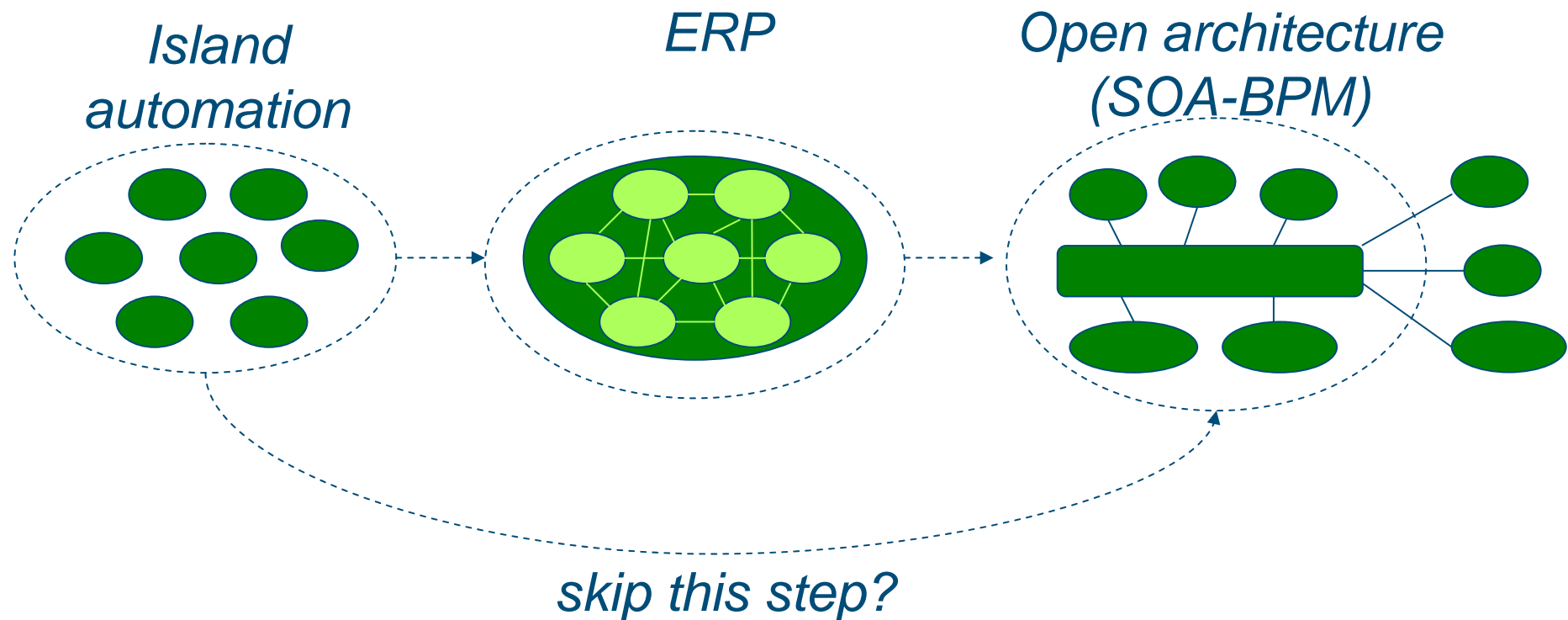
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# Current situation arable NL: many point-to-points



# ICT developments in general business

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# Vision for the future – design spec's

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- **Business processes** must be leading
  - Rapid re-configuration approach using dynamic modelling and component repositories
  - Based on Business Process Management (BPM) and Service Oriented Architecture (SOA)
  - Alignment of and interdependency between all integration types and levels
- **Business** in the lead and responsible!
  - Human and organizational change
  - Commitment and vision at both 'CEO-level' and 'workers level'
  - Co-operation and co-ordination in all dimensions of AFSCNs (as much as possible)
- Sector-specific, **open models and standards**
  - Based on cross-industry models/standards (e.g. OpenGIS, ebXML, XBRL)
  - Standards organizations

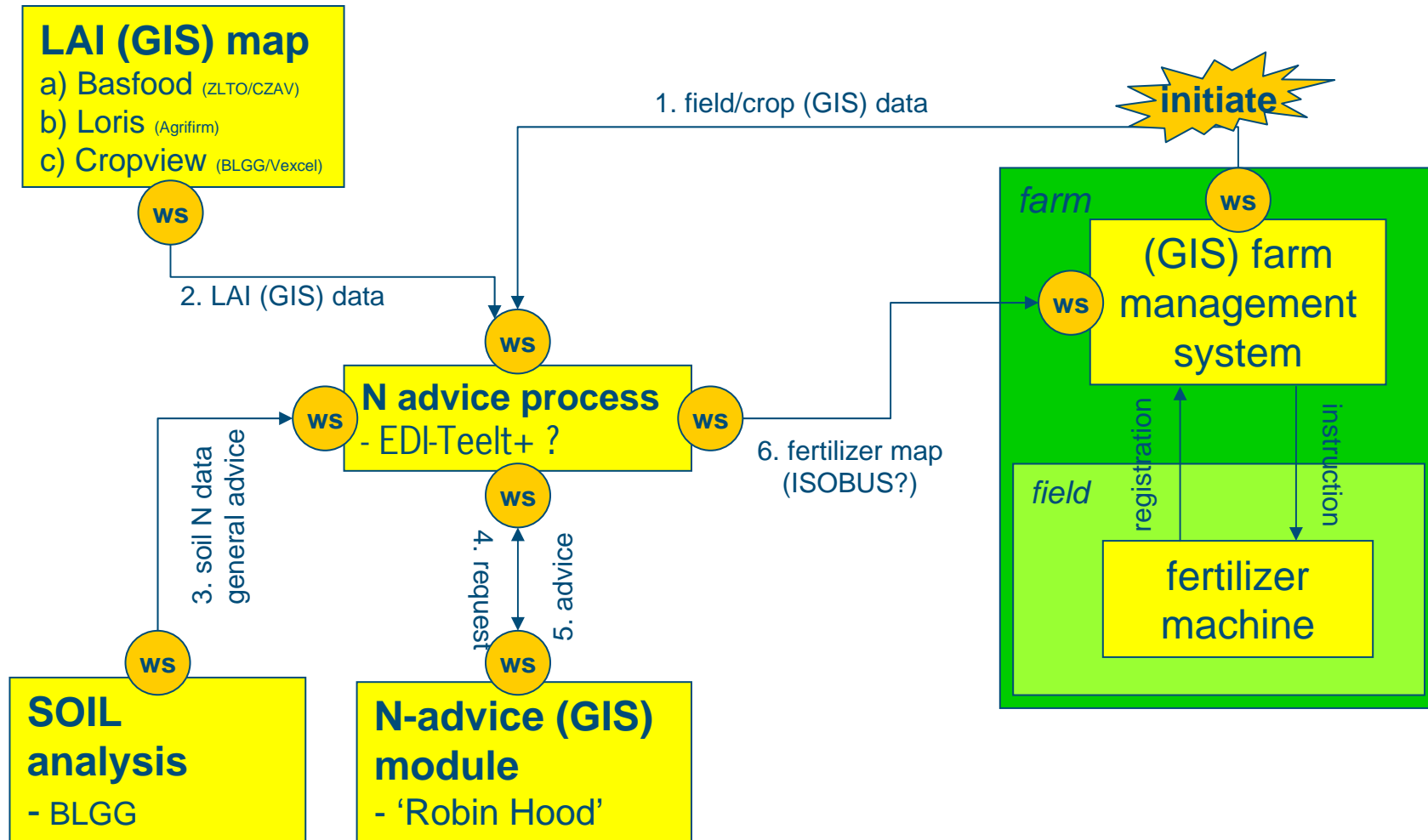
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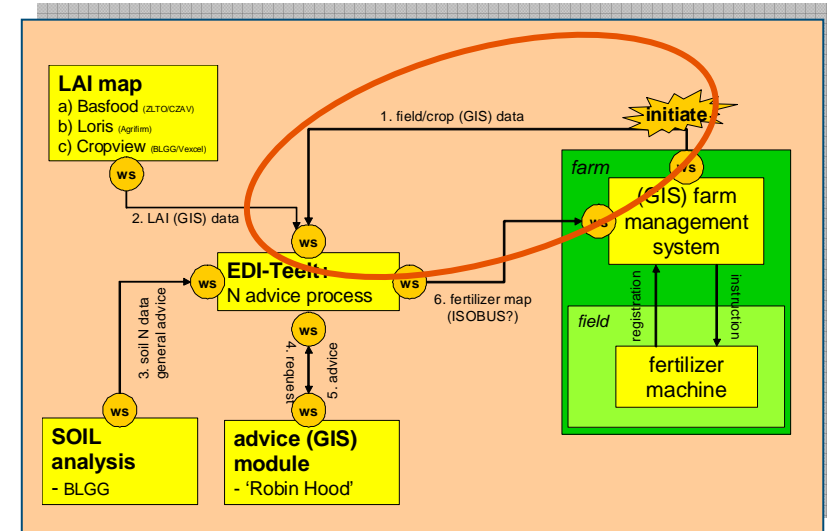
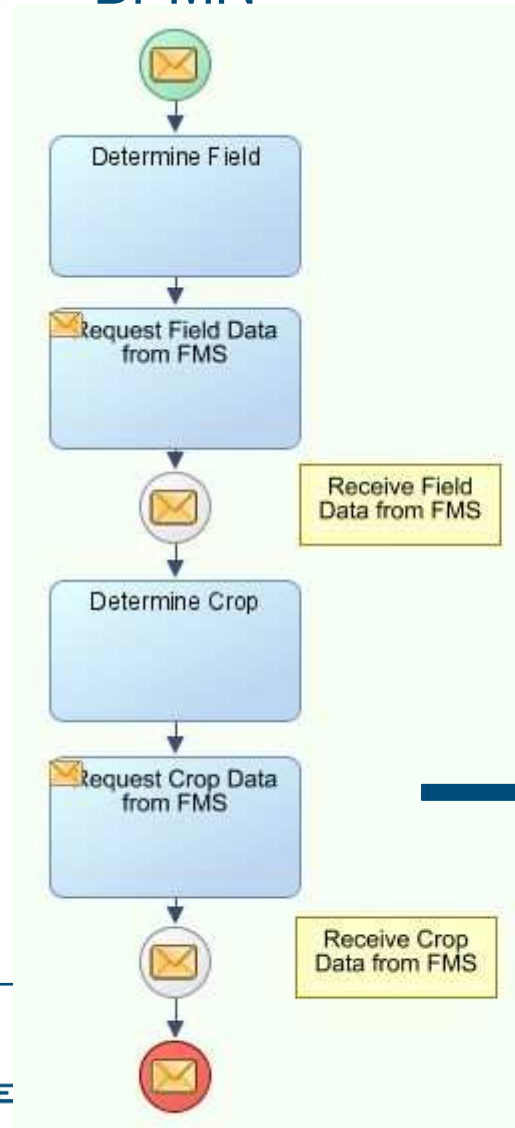
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# KodA I&S: geo-fertilizer advice



# Obtain field and crop data: BPMN to webservice

## BPMN



➡ BPEL code ➡ web service

# Keys for development

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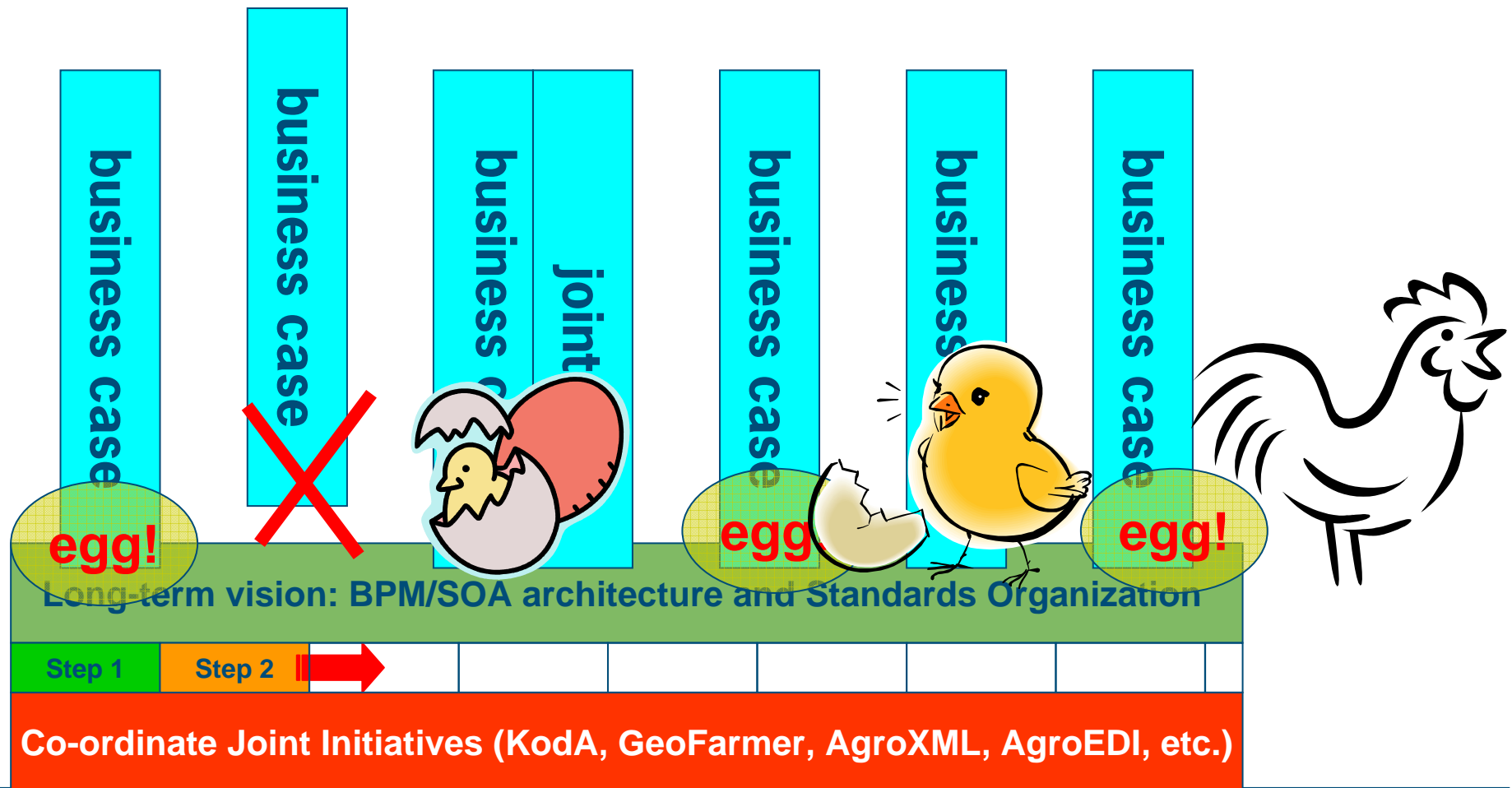
keys:

- business processes are leading
- involves several actors → platform independent approach
- many processes/webservices
  - need for architecture
  - need for central co-ordination on:
    - standards
    - ownership
    - quality, availability, etc.
- GIS software as a service???

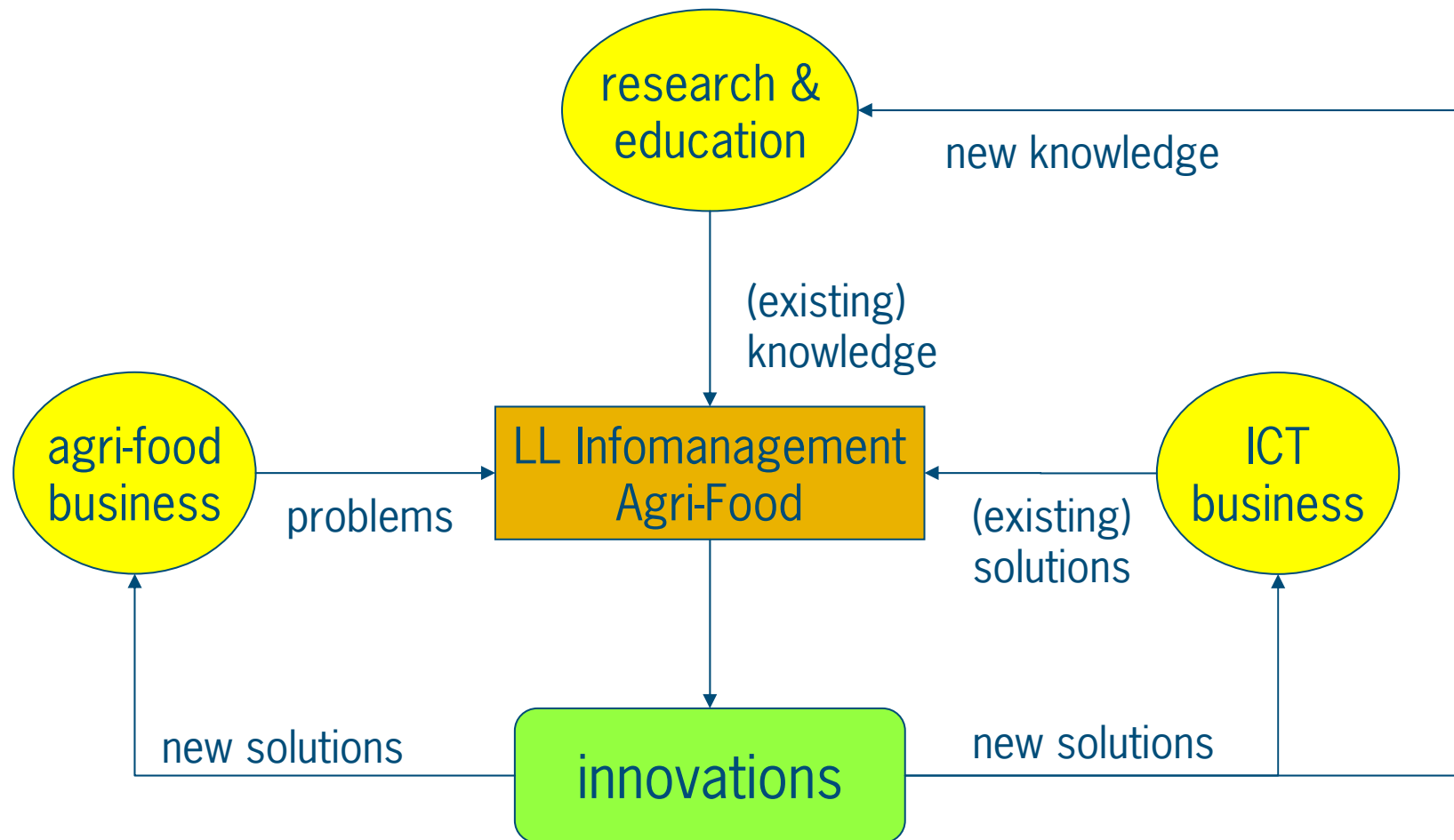




# Solving chicken-egg dilemma: a golden egg approach



# Living Lab Information Management in Agri-Food



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# Main challenges

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- How to construct **sector-specific SOA-architectures**, adopting worldwide cross-industry standards and building upon **existing industry standards**?
  - How to use **business process management (BPM)** concepts, including 'best practice' models, to allow flexible configuration of specific processes integrations?
  - How to organize **broad commitment** (including the end of the chain!), to embed developments in sustainable institutional arrangements, and to **let it grow organically**?
- **Concerted Action** is needed for coordination and knowledge exchange in different sectors and in different countries at the European level

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# agriXchange

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- Group of people, working on harmonization of agricultural data exchange at a European and global level
  - animal focus group
  - arable group with temporarily a special focus on spatial data → SDIC for the INSPIRE directive
- Founded in Hamburg, november 2007
- Supported by EFITA and CENAgro
- Next meeting 13 May 2008 in Praha, embedded in the International Conference on Information Systems in Agriculture and Forestry
- Aiming at setting up a EU concerted action project (or SCP)

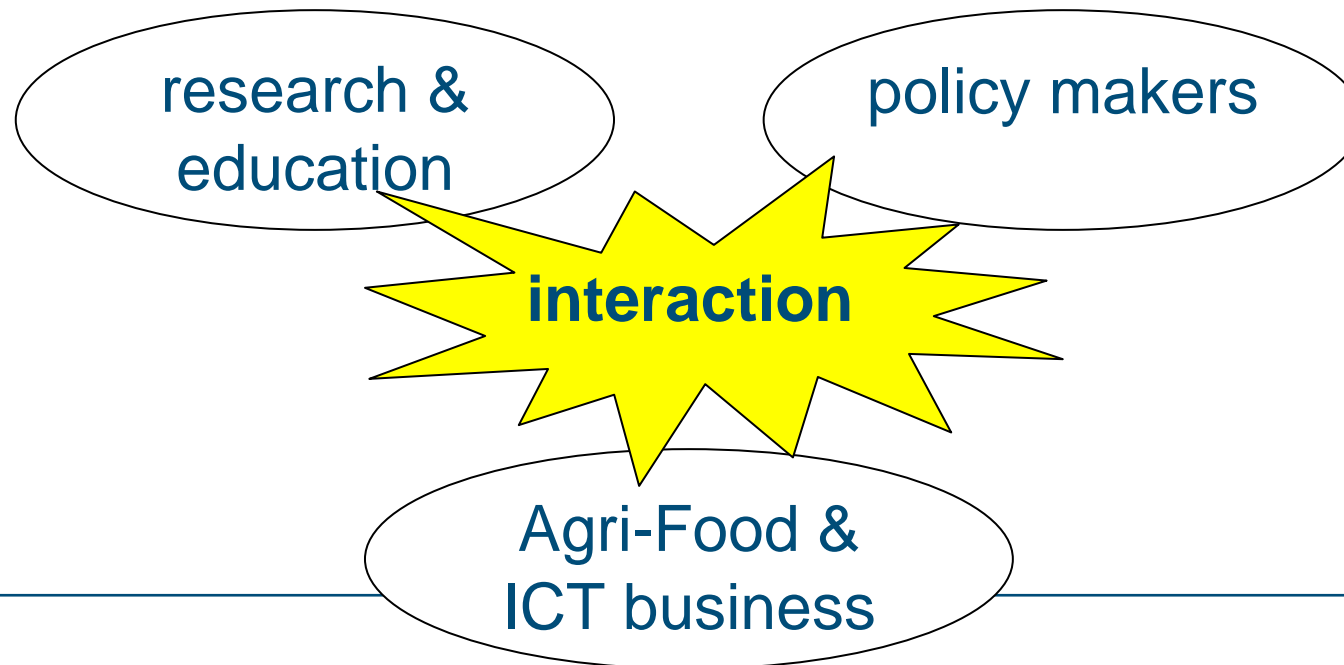


# Joint International Agricultural Conference

6, 7 and 8 July 2009, Wageningen



- Call for abstracts: expected in April/May '08
- Look at [www.jiac2009.nl](http://www.jiac2009.nl)



# Thank you for your attention!

## Business (process) is leading!

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*For quality of life*