Overview of BIM, Lean Construction and IT initiatives in construction industry

Ergo Pikas
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ENDAST

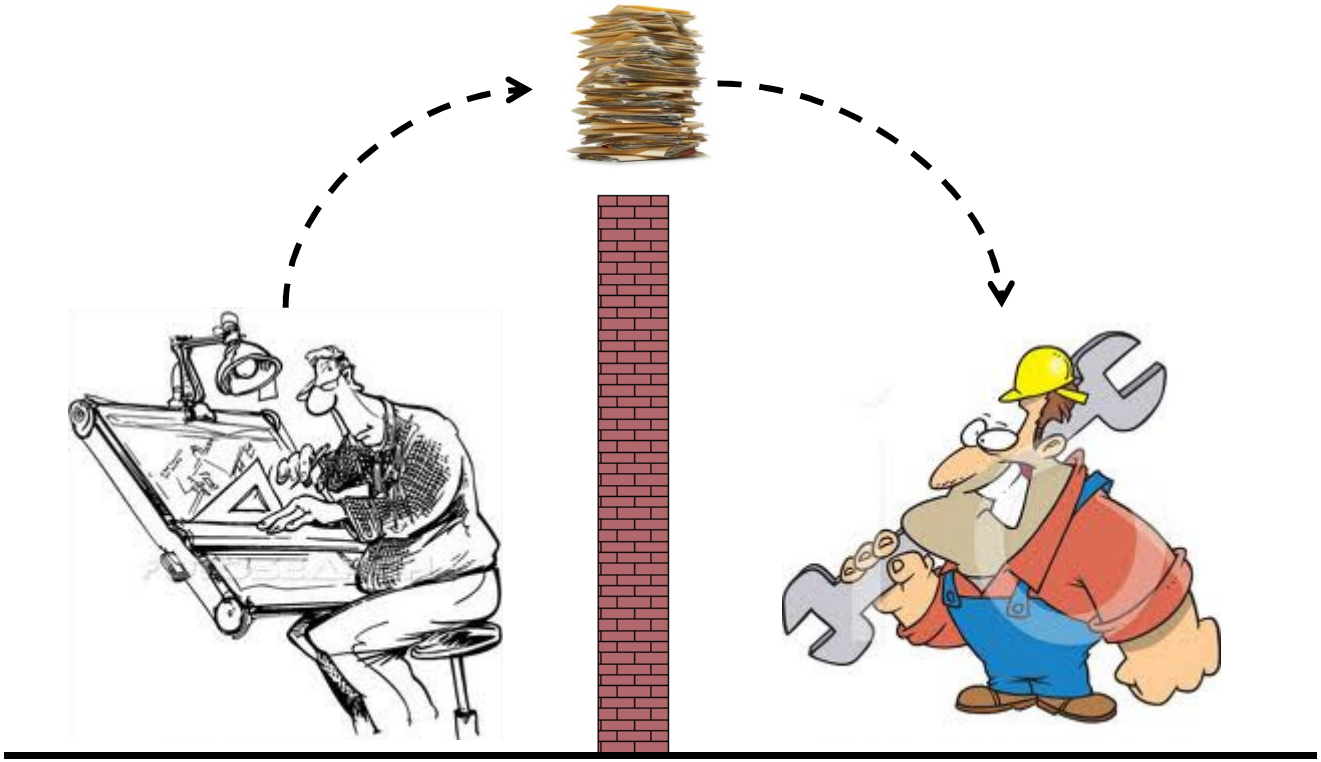
- Tallinn University of Applied Sciences
- Work experience
- UK
- Iisrael
- TTÜ and Aalto University

What are he problems related to Estonian construction industry?

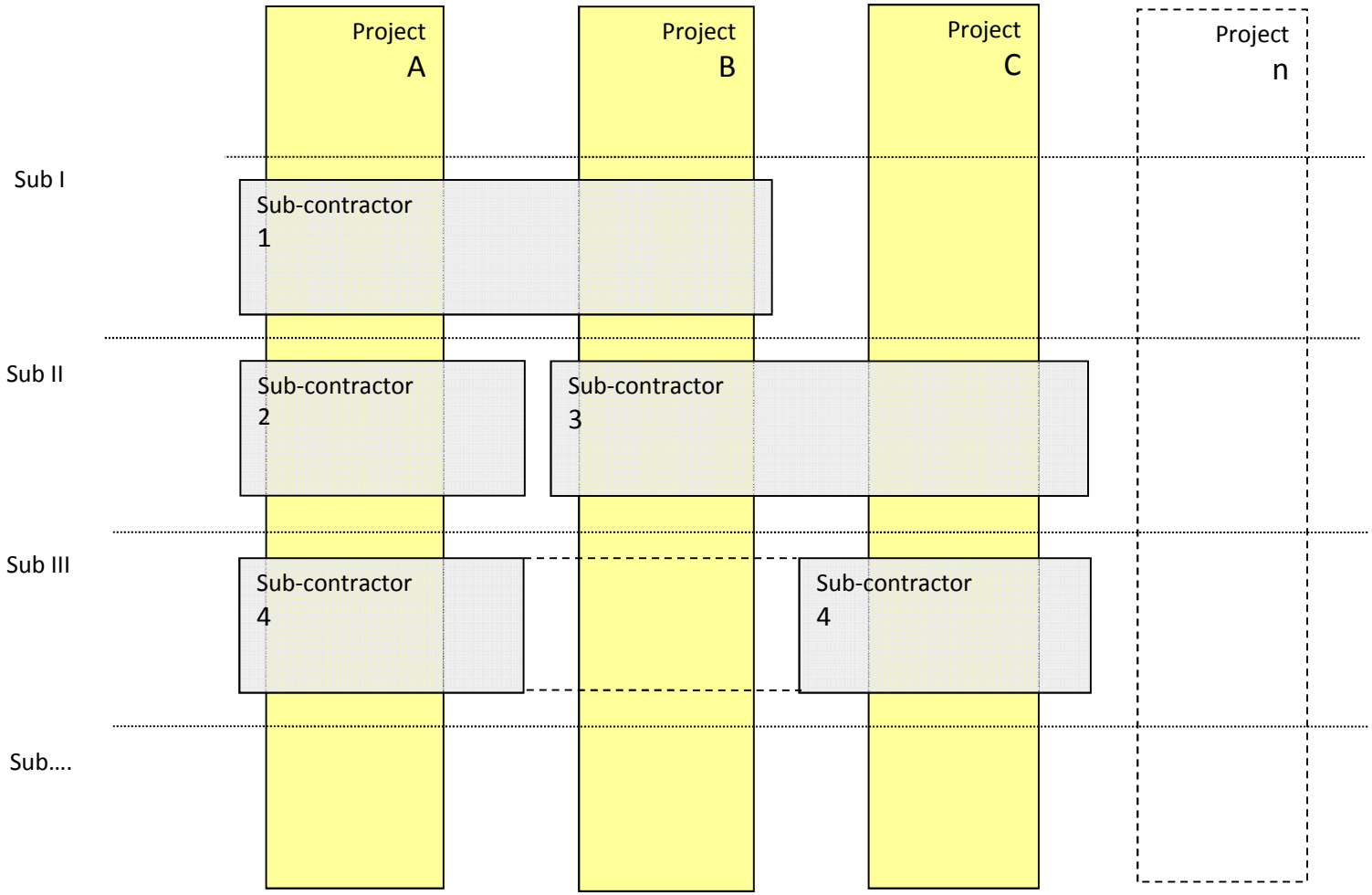
PROBLEM

- Public procurement is fragmented, projects expertise is procured stage wise, resulting in not cost-optimal, non energy efficient and partial value solutions

FRAGMENTED CONSTRUCTION PROCESS (LOOSING INFORMATION AND COMPETENCY)



CONTRADICTORY OBJECTIVES

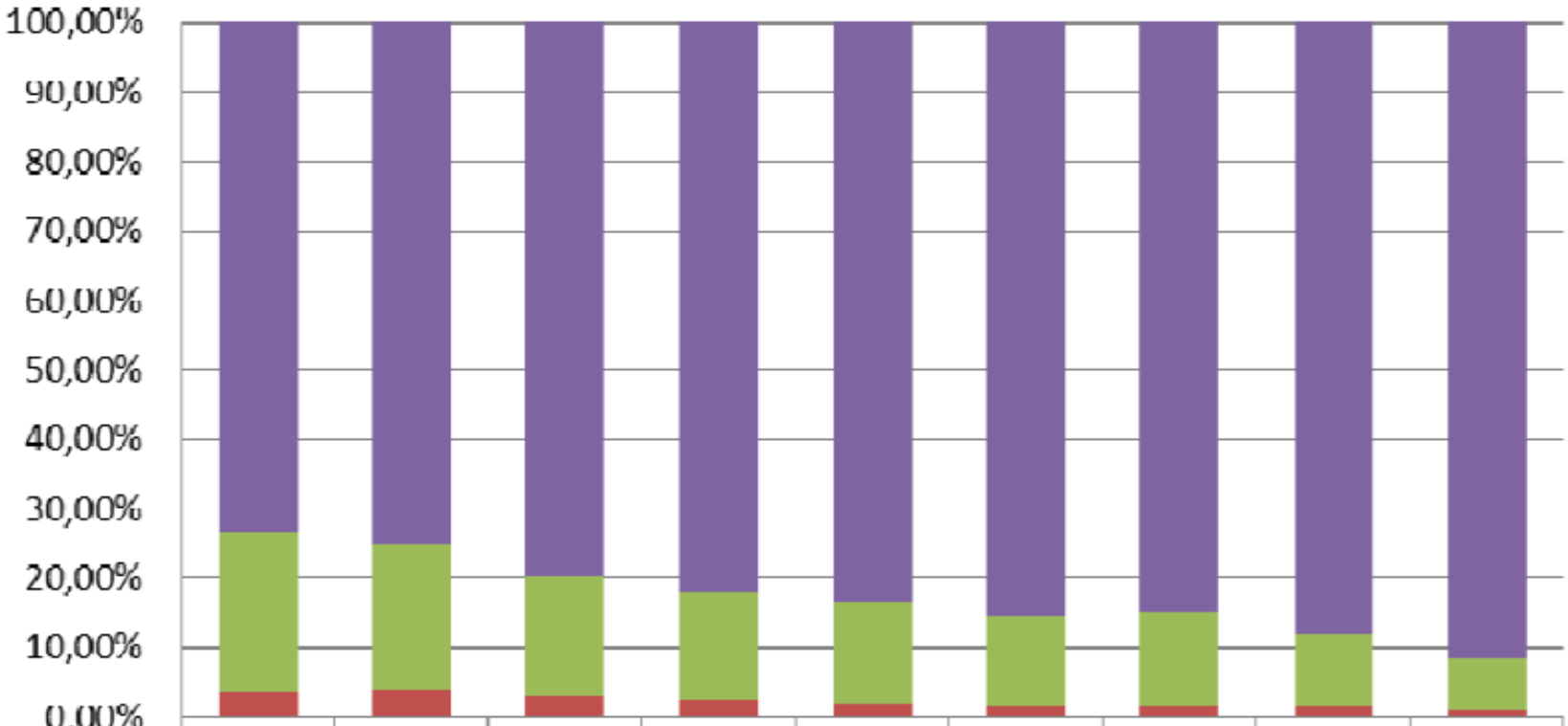


PROBLEM

- Estonian construction industry has a low capacity to R&D

DISTRIBUTION OF CONSTRUCTION COMPANIES BY THE NUMBER OF WORKERS

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY



	2002	2003	2004	2005	2006	2007	2008	2009	2010
Vähem kui 10	73,40%	75,10%	79,70%	82,00%	83,30%	85,50%	84,90%	88,00%	91,60%
10 49	22,90%	21,10%	17,20%	15,50%	14,50%	12,80%	13,30%	10,50%	7,30%
50-249	3,50%	3,60%	2,90%	2,30%	2,00%	1,70%	1,70%	1,40%	1,00%
250 ja enam	0,30%	0,30%	0,30%	0,20%	0,20%	0,10%	0,10%	0,10%	0,10%

PROBLEM

- Suppliers low level of competence for implementing new methods, technologies and concepts in construction

- Missing the standards and underlying models for digital representation of the built environment and its life cycle

So what have we done and/or doing?

IN SUMMARY

- Translation of Finish common BIM requirements (COBIM 2012)
- Research on BIM product libraries by Tallinna Tehnikaülikool and Tallinna Tehnikakõrgkool
- Developed a BIM training program for different specialties and trained around 150 people
- Initiated two working groups: BIM working group for compiling BIM strategy from public client perspective and Lean Construction working group for studying Lean Construction implementation possibilities
- Organized a training on integrated project delivery (IPD) and project alliancing (PA) methods (Lauri Merikallio) and visited IPD project in Tampere, Finland

IN SUMMARY

- We participate at the EU-wide BIM initiative instituted by UK BIM task group
- Funded by the Ministry of Economic Affairs and Communications Tallinn University of Applied Sciences is conducing a research on information classification systems and databases for unit prices and production rates
- Funded by the Ministry of Economic Affairs and Communications Estonian Association of Surveyors and EstGIS is developing national data model standard for utilities
- Ministry of Economic Affairs and Communications has hired a person for developing BIM and LC topics from the public owner's perspective.

COBIM 2012 – common BIM requirements

COBIM 2012

Common BIM requirements = COBIM 2012

- COBIM 2012 is the revised version of the BIM requirements first published in 2007 by Senate Properties (14 sections)

- **Goal:** Maximizing the benefits and the value of using BIM technology for project life-cycle
  - It establishes the minimum BIM requirements and common BIM procedures

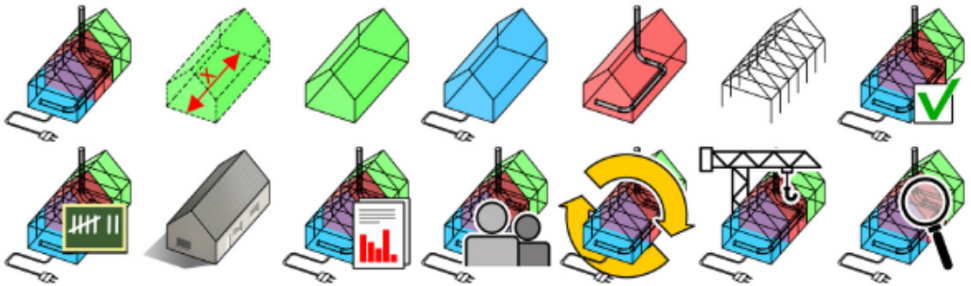
- **Publication link:** www.buildingsmart.fi

FINLAND

buildingSMART

JUHENDISARI „MUDELPROJEKTEERIMISE ÜLDJUHEND 2012”

TALLINNA TEHNIKAÜLIKOOL
TALLINN UNIVERSITY OF TECHNOLOGY



Nr	Part
1	General requirements
2	Modeling of the starting situation
3	Architectural design
4	MEP Design
5	Structural design
6	Quality assurance
7	Quantity take-off
8	Use of models for visualization
9	Use of models in MEP analysis
10	Energy analysis
11	Management of a BIM project
12	BIM for FM
13	Use of models in construction
14	Using BIM for permitting process

COBIM 2012

„Common BIM requirements in Estonia is a guideline not a standard!!!

Research on BIM product libraries

RESEARCH

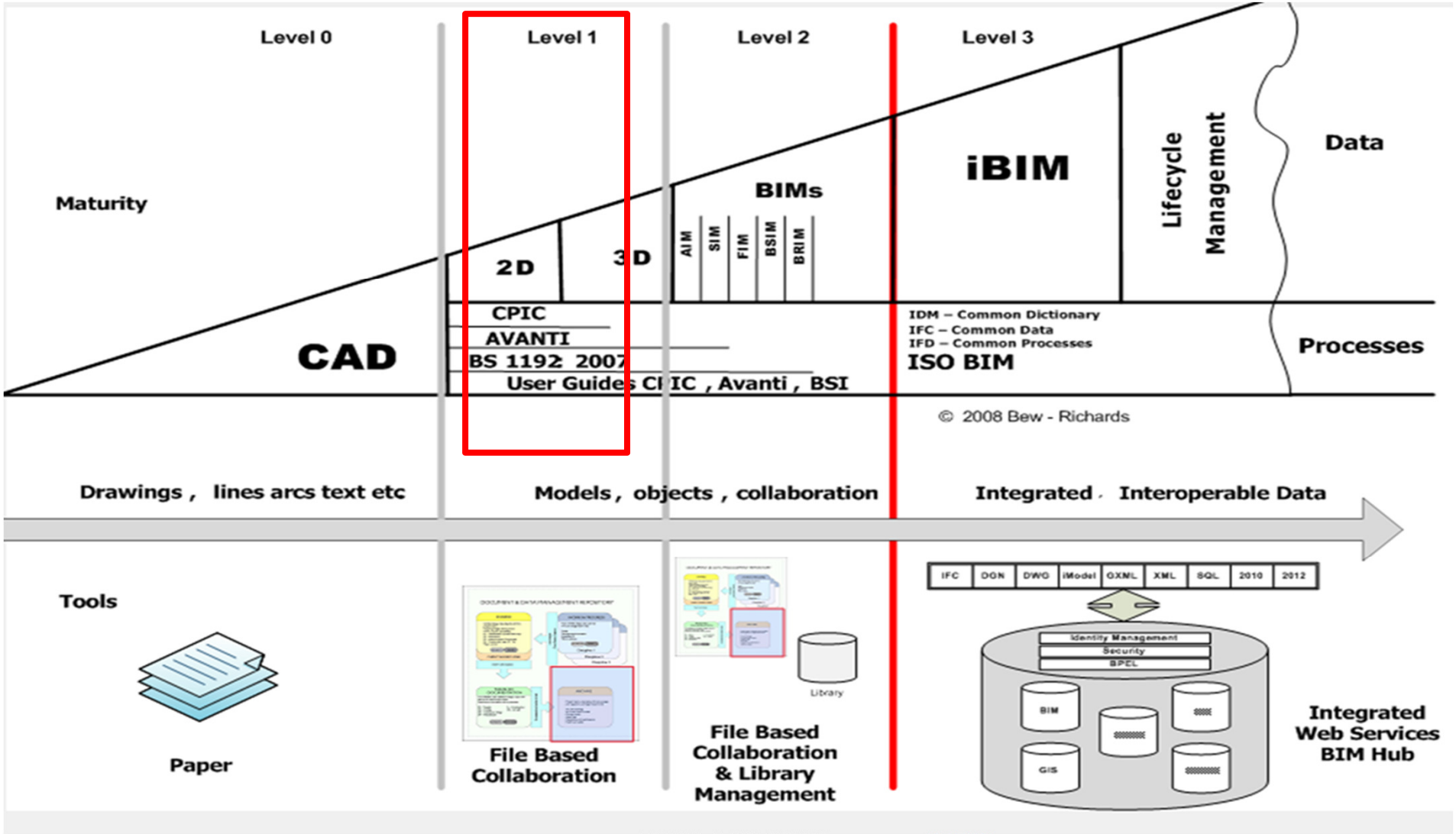
- **Client:** Ministry of Economic Affairs and Communications
- **Objective:** the goal is to develop a guideline for developing BIM content libraries and BIM elements: business model; element standards; and information requirements
- **Project partners:** Tallinn University of technology and Tallinn University of Applied Sciences

BIM working group

WHERE ARE WE NOW?

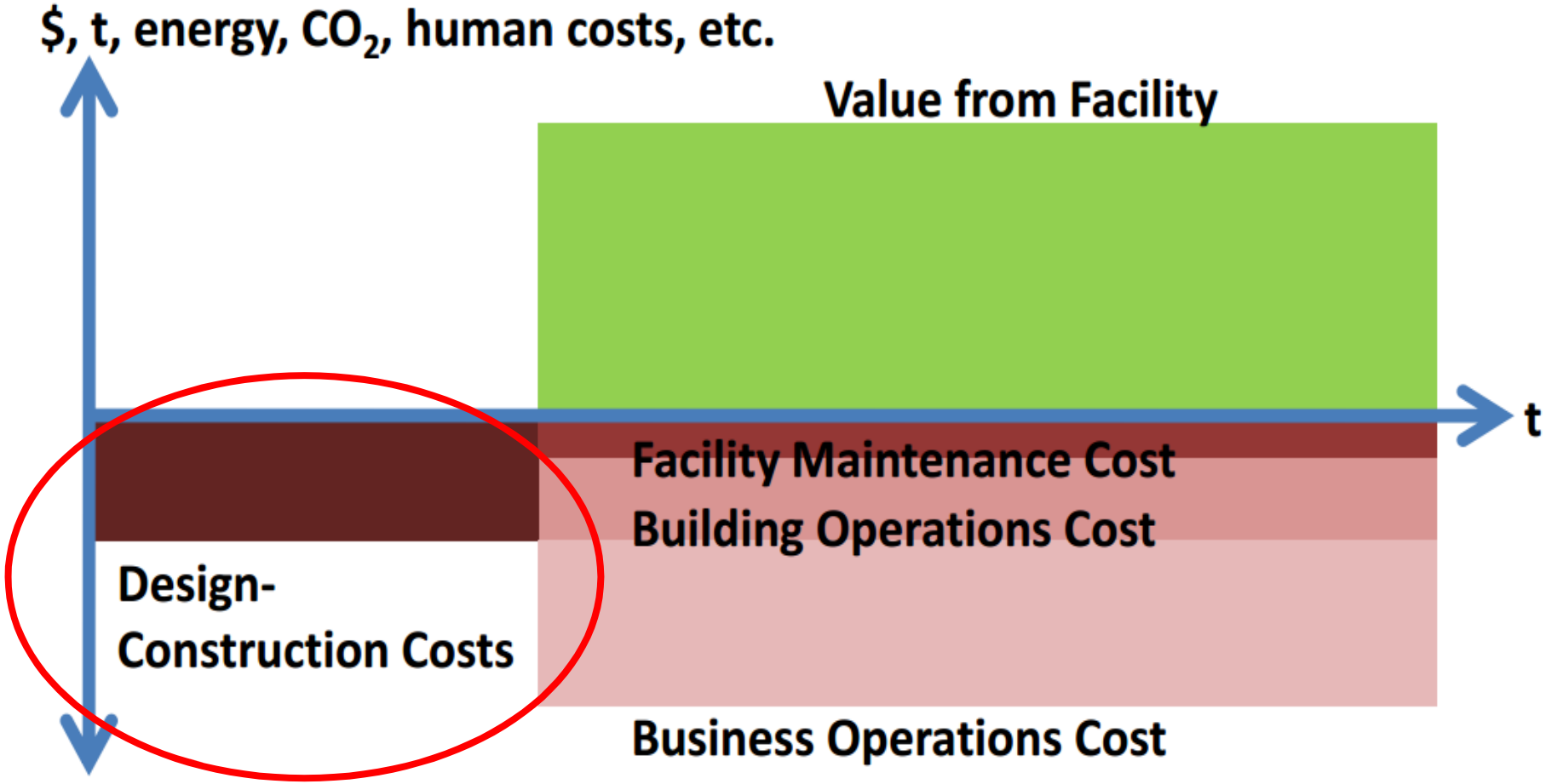
Valdkond	0 tase	1 tase	2 tase	3 tase	Kommentaar
Tellija (riik)					
Tellija (erasektor)					
Arhitektuur					
Insener					
Ehitus					
Korrashoid					

WHERE ARE WE NOW?



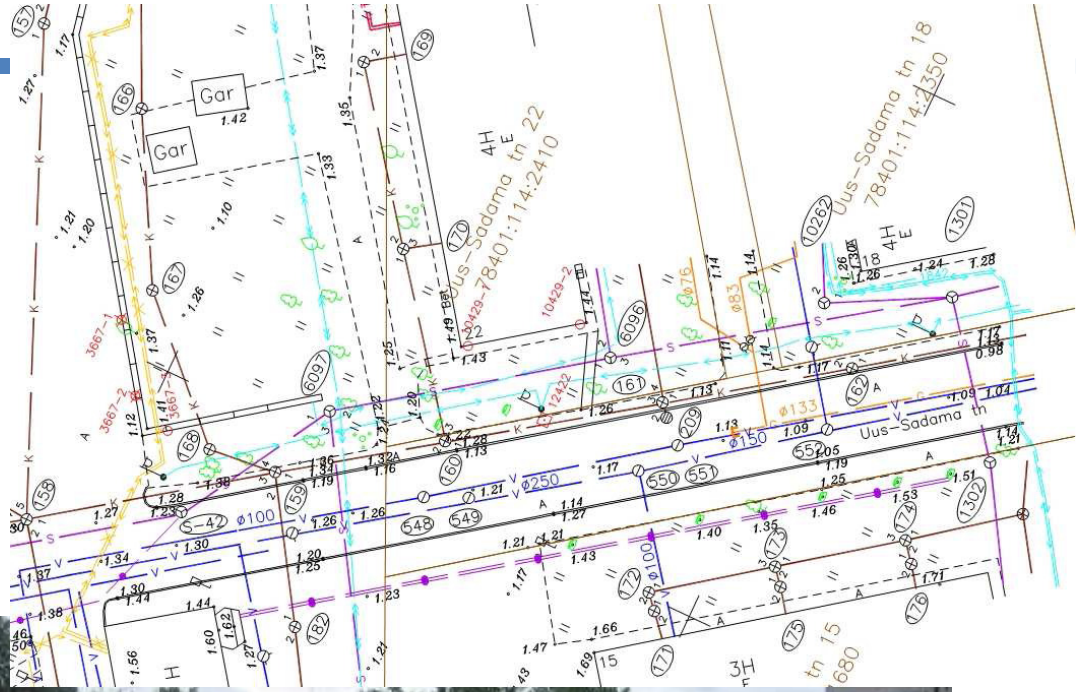
LC working group

LC IN ESTONIA



Utilities network information system

EXAMPLE OF UTILITIES



TTK et al. 2011

MOTIVATION TO DEVELOP VRIS

- Lack of general overview of existing under- and above ground utilities in Estonia, that means information is distributed between utilities owners'
- Accurate and up-to-date information about utilities is important for planning, designing and construction

Wk3

- Currently available technology enables creating a web based information system

Vilba et al. 2011

- Accurate and up to date information about utilities is necessary and unavoidable for fulfilling EU's directives and requirements

Väino Siilbek, detsember 2012

- Currently, developing a information system that covers entire Estonia (centralized database), where information about utilities is avilable in real time, is too expensive and unrealistic. Also this scatters the responsibility of utilities owners to know their assets location.

Slaid 26

Wk3 vb mitte nii otseselt, tegemist ei ole operatiivkeskkonnaga

Windowsi kasutaja; 21.11.2012

INTRODUCTION TO VRIS

- VRIS is a communication platform for stakeholders in a construction process who need information and utilities owners who have information.

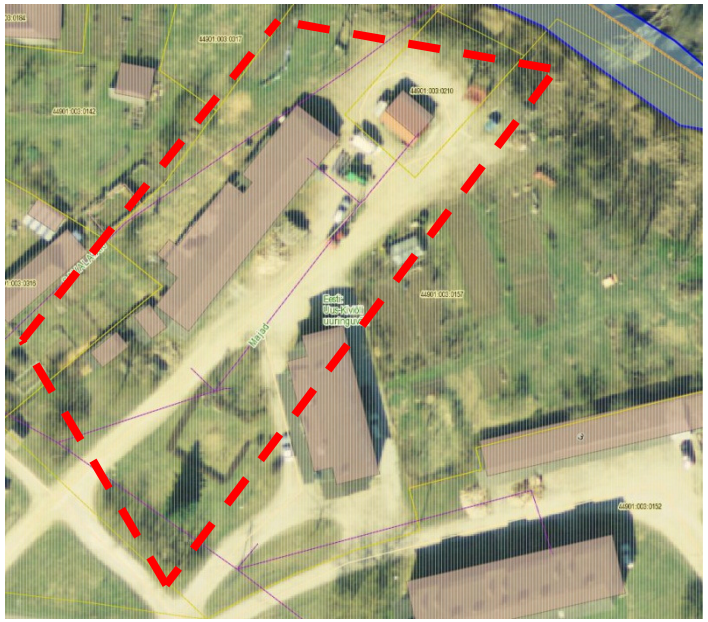
VRIS –utilities information system

PRINCIPLE OF VRIS SYSTEM

Initial concept

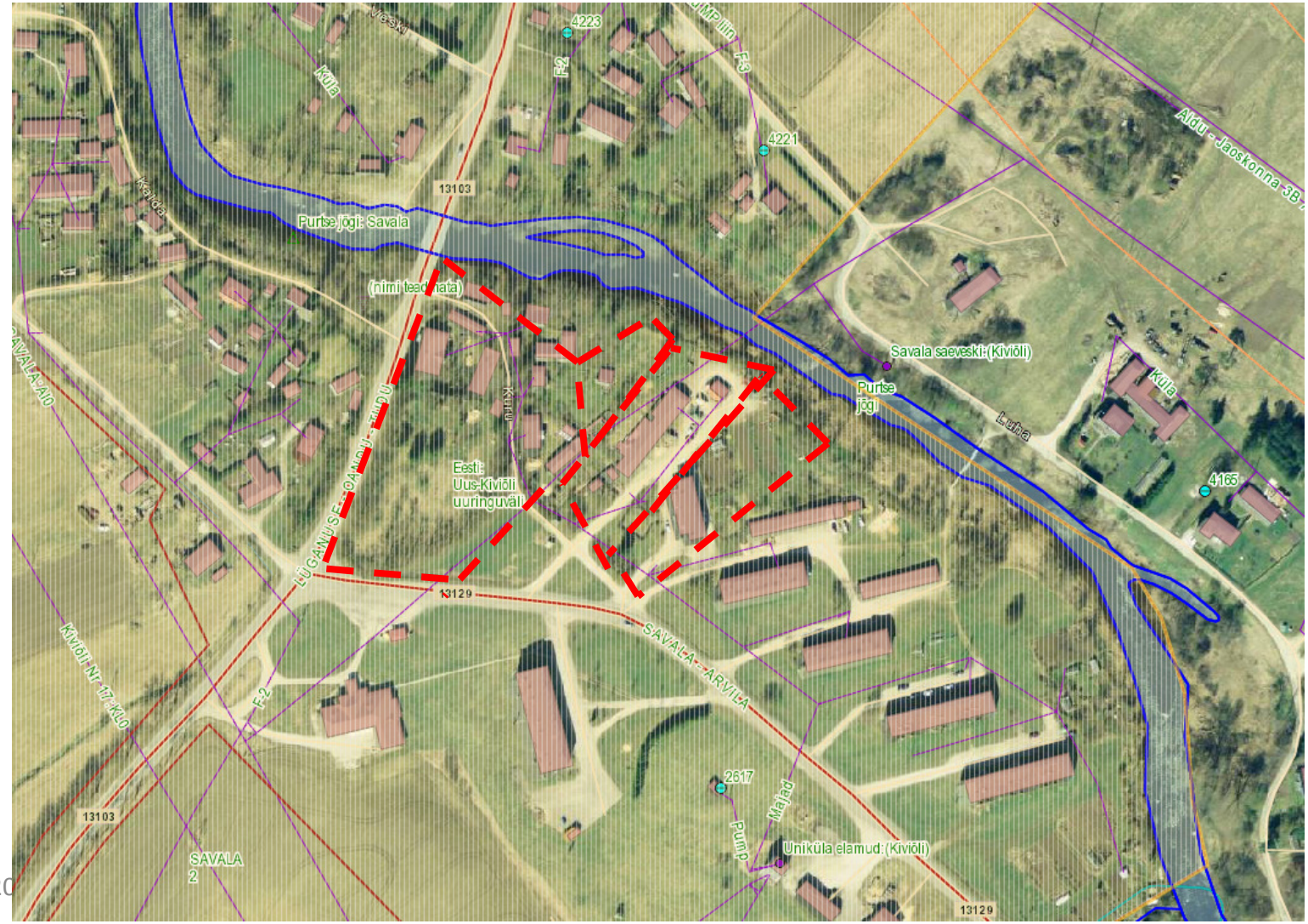
VS

Current concept



PRINCIPLE OF VRIS SYSTEM

Information amount and accuracy is increasing in time:



SUMMARY

- We have recognized the need for industry to change, however, changing construction industry is not simple
- It is important to involve the stakeholders and empower them to develop a common sense
- Public procurer has a great responsibility in terms of developing construction industry and they have the incentive to do that (more sustainable, healthy and safe built environment)

We are just at the beginning of our road!

THANK YOU AND QUESTIONS!!!???