ISO/TC 211 International seminar
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What is Smart Built Environment?

- A 12 year strategic R&I programme 2016 – 2028
- One of 17 such programmes aiming at strengthening industrial competitiveness
- 100 + 100 MSEK (~12 + 12 MUSD) for the starting period 2016-2018
- About 40 companies and organisations are partners
Strategic innovation programmes

- Cross-border cooperation to renew Swedish areas of strength
- The actors set the agenda
- Joining resources and competence
- Long term effort
- Open for all
What can digitalisation create?

- Optimize solutions – analyze 100s of alternatives
  - better buildings, roads, railroads
    - Geographic location, demographics, climate impact, structural strength, accessibility, energy efficiency, cost, time…
- Reduce errors in planning, design and construction
  - lower cost, reduced time
    - Visualization for decision support, collision control, logistics management, cost control
- Experience and learning
  - make use of platforms for efficiency and flexible solutions
    - Technical platforms, process platforms, IT platforms
- New methods of working, roles and business models
  - More actors to collaborate from early stages, incentives for focusing the final product and the end users
Programme goals – 2030

The industry sector:
- Annual investments > 300 billion SEK
- More than 500 000 employed
- More than 20 000 companies, many SME, 290 municipalities
- From initial planning to finished project > 8 years
- Housing and service – 40 % of the total energy demand in Sweden

- 40 % less environmental impact in construction and renovation
- 33 % less time from planning to finished project
- 33 % less construction costs
- A renewed business logic
  New value chains and business models
Open calls and strategic projects

Open calls
- Broad approach
- New constellations
- Many proposals

Strategic projects
- Targeted efforts, strategic
- Long-term
- Benefits to many actors
- Building infrastructure

100 + 100 MSEK until 2018
50 % co-funding
Time schedule for the first programme period 2016-2018

- SP: Standardization
- SP/OC: Innovation lab
- SP: Research platform
- SP/OC: Lifecycle perspective
- OC: Legal & organization
- OC: New applications
- SP: Knowledge boost
- OC: Business models

Year:
- 2015
- 2016
- 2017
- 2018
- 2019
- 2025
Focus area: Standardization
Standards: facets and layers

Three facets of information standards:

- **Concepts** make up the common language that makes information sustainable and understandable to various parties and IT systems.
- **Process** is the common way of managing information to share and exchange it in efficient and quality assured ways.
- **Technology** makes it possible for IT systems to communicate and function together.

Three layers that complement each other to make standards useful in practice:

- **Framework standards**, often international
- **Application standards**, national or international.
- **Implementation support** consisting of guidelines and tools for practical use. Testing and verification.
Four projects

**Started 2016**
- National Guidelines for BIM and GIS
- Smart Planning for Construction

**Starting 2017**
- Product and environmental data for production
- Product and environmental data for use and maintenance
17 ongoing Strategic Innovation Programmes

1. Innovair (air&space technology)
2. Graphene
3. Smarter elektronics systems
4. Internet of things
5. BioInnovation
6. SWElife (life science)
7. Mining and metal processing
8. Lightweight
9. Process industry IT and automation
10. Produktion2030
11. Metallic materials
12. INFRASweden2030
13. Automated Transport Systems
14. RE:Source – resource and waste management
15. Smart Built Environment
16. SIO Medtech4Health
17. Smart and sustainable cities
Project: Smart Planning for Construction
Integrated information flow
- requires knowledge and mutual understanding of the respective roles in the lifecycle
Our challenges!

- We work with 3D city models for planning, presentation and visualization.
- We have developed routines specific to different municipalities and system vendors for
  - surveying
  - archiving and
  - delivery
  (even if we partly use existing standards like City-GML and others)
- We spend a lot of time transforming and adjusting data that we receive from and deliver to external parties.
- Data are often not used by other parties due to lacking standards compliance.
- BIM- models can not be used and reused by the municipalities in their processes.
We must explore at the interfaces
We miss!

- Recommendations and standards for 3D geodata
  - Gathering and surveying
  - Storing and archiving
  - Access and delivery

- Knowledge about the integrated use of BIM models

- A common process for all actors involved for the entire workflow from conceptual idea to maintenance and use
External models
Optimizing to a building shell – manual labour

Högdetaljering, original
Polys: 62,000

Lågdetaljering, manuell modellering
Polys: 3,700  Arbetstid ≈ 4h
Current process

Regional plan
2D

Concept planning
3D

Town planning
2D

Property registration
2D/3D

Design
3D

Building permit
2D

Construction
3D

Maintenance
2D

Vision: Fully model based and 3D
What will the project do?

- formulate guidelines for coordinated information models with GIS and BIM – geometry and attributes, based on Svensk Geoprocess and CoClass.
- describe desired content and exchange format for prioritized interfaces
- illustrate judicial/regulatory obstacles and propose solutions
- chart the demands on storage and sustainable access
- verify the applicability of the proposed measures by testing in realistic cases
- disseminate the results of the activities and promote their further application
An uninterrupted flow of geodata
- requires that the threshold are overcome, using standards and specifications, plus dialogue
How is the project organized?

- Five working groups based regionally.
- 3-4 months is scheduled for each group.
- Before handover to the next working group, tests and verification is performed, to be taken into account for the next phase.
- Working group leaders and the project support team are responsible for communication and coordination between the working groups.

1. Product package
2. 3D town planning
3. BIM and property registration
4. BIM and building permits
5. Storage and sustainable access
Smart Built Environment – Intern organisation

Approx. 40 Partners, and growing

Annual meeting

Board

Office
Programme director, programme manager, communications

Advisory group

External assessment group(s)

Strategic project pkg 1
Process manager

Strategic project pkg 2
Process manager

Open call 1
Process manager
Our activities

**Project portfolio**
- Strategic projects: 50%
- Open calls: 50%

**Allocation RDI**
- Research: 25%
- Development: 25%
- Innovation: 50%
Strategic base for the programme

Business driven applications
Integration of processes
Information infrastructure

Innovation and new applications
Business models
Knowledge boost
Innovation lab
Research platform
Legal and organisation
Lifecycle perspective
Standardization
Bli part i programmet

- Påverka programmets inriktning, strategiska projekt och utlysningar
- Medverka i styrelse eller välj in representanter
- Ta plats i partsnätverket och medverka i programmets aktiviteter
- Stöd programmet genom eget arbete eller kontant finansiering
- Nyttja programmets resultat och skapa förändring

Det är avgiftsfritt att bli part!
Parter i programmet

1A Konsult  
AKADEMISKA HUS  
ÅKEJ  
BOKLOK  
BonaCordi  
RISE  

ByggPartner  
CEMENTA  
HEIDELBERGCEMENT Group  
CHALMERS  
SWEDISH INTERACTIVE  
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SYMETRI  
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TRAFFIKVERKET  
TYRÉNS  
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