Funding

- Interreg Nord [www.interregnord.com](http://www.interregnord.com)

- Priority Area 2 Entrepreneurship with special target for enhancing the cross-border business
- EU funding 65% (Nord, via Norrbottens länstyrelse) + national funding 35%
- Budget breakdown structure (total 1,27 M€)
  - Personnel costs
  - Office and administration cost, or instead 15% flat rate of Personnel costs
  - Travelling and accommodation costs
  - External expertise and service costs
  - Equipment cost

[https://www.icnb.eu/](https://www.icnb.eu/)
BIM in SME Competence Building

- Lack of accurate and valid documentation
  - causes excessive expenses, low quality and extended schedules in building industry including renovation and life cycle maintenance
  - reject to achieve high energy efficiency
- Building regulation differences in the northern countries reject cross-border services and industrial co-operation
- Lean construction is a way to achieve continuous improvements to gain customer satisfaction

- Building information modeling (BIM) is becoming largely in use for managing building process
  - some public authorities force the actors to use BIM to manage their operations
  - to be competitive and capable in the changing environment both building industry and public authorities need to raise their knowledge and skills to use BIM, for example to optimize the production process BIM is almost the must
- By combining Lean and BIM construction SMEs can raise their competence gradually and be competitive in cross-border and European market
  - Lean for continuous improvements
  - BIM for technological capabilities
ICNB Activities and results

- Building regulation differences in Northern countries will be included in the BIM process
- State-of-the-Art of open data models for buildings is collected and presented
- Using of open data models for managing and exchanging building information will be proposed and demonstrated
- Methods to provide actors in building process with accurate and up-to-date information by using BIM are developed and demonstrated
- The situation of using BIM in northern building industry is analysed
  - the most potential development points for supporting SMEs in building production and renovation are selected for further use
  - energy efficiency is considered carefully (renovation)
- Activation of Lean principles and processes in SMEs
- Using of BIM models for building production and renovation is developed and demonstrated
Impact

- Cross-border business in building industry and public sector services are increased by higher interoperability of information systems of different actors, thus resulting more efficient use of Northern resources and more competitive in European building renovation market.

- Knowledge of using standard methods and open data models in building and facility management is increased, thus enabling higher quality and shorter project schedules.

- More compatible methods and systems help harmonising building regulations between countries and vice versa – snow ball effect.
Impact

Value of buildings will increase when renovation is designed and implemented in appropriate principles covering the whole life-cycle.

Knowledge of public sector, supervision of building etc., for renovation will increase so that they can more effectively supervise and control design and implementation of building renovation to gain the energy efficiency requirements, thus saving energy resources.

Knowledge of energy consumption of individuals will increase and further the ability to react reasonably in different energy usage situations makes it possible to behave in more economic way, thus saving energy.
BIM as a sociotechnical system

Institutional and cultural framework

Coordinated work practices

Synchronous Collaboration

Information management

Intelligent models

3D CAD

Technical Core

Social Parts
<table>
<thead>
<tr>
<th>WP name</th>
<th>Resp</th>
<th>Participants</th>
<th>Tasks</th>
</tr>
</thead>
</table>
| WP1 Communication                            | OUAS | LTU, UU, UiT, OBSO | T1: Seminar planning  
T2: Workshop content planning  
T3: Communication to public audience  
T4: Communication to professionals  
T5: Social media communication               |
| WP2 Management                               | OUAS | LTU, UU, UiT, OBSO | T1: Content management  
T2: Financial management  
T3: Steering group, Project group and work meeting organization  
T4: Final reporting                           |
| WP3 BIM use and implementation for sustainable building: Mapping opportunities for SMEs | LTU  | UU, UiT, OBSO, OUAS | T1.1: Orientation of BIM technology, process and policy fields  
T1.2: Interviews with representatives of local authorities  
T1.3: Interviews with representatives of relevant trade organisations as well as SMEs, -AECs and SME real estate holding and maintenance enterprises  
T1.4: Synthesis of results from T1.1-3.  
T2.1: Cross-analysis of BIM opportunities  
T2.2: Online three-country workshop gathering representatives of local authorities  
T2.3: Workshops gathering stakeholders cooperating in on-going building projects.  
T3.1: Synthesis and reporting of results at an online seminar inviting local authorities and building sector SMEs, including AECs and real estate holding and maintenance enterprises |
| WP4 Energy efficiency management in model based building information | UIT  | UU, OUAS, OBSO | T1: Integration of energy measurement and simulation data with BIM  
T2: Use of construction and energy performance simulation in renovation projects  
T3: Using BIM as tool for efficient building operation  
T4: Dissemination and learning tools; Synthesis of T1-T3 |
| WP5 Piloting and good practices evaluation   | OBSO | UU, UiT, OUAS, LTU | T1: Building code difference analysis and requirements to BIM models  
T2: BIM operated planning permission pilot  
T3: Practices in BIM operated building projects and management  
T4: Evaluation of the experienced practices |
Autodesk ReCap:
Simplifying and removing unnecessary points from the point cloud

Creating a 3D model with Revit

Export to Autodesk Revit as

BIM model for the constructor to use. Model is also used as a recording for the archives of National board of antiquities

Project Åström
New building which was designed as 2D drawings with AutoCad.

3D building model was created based on those drawings. BIM model was used as reference for structure designer's plans.

Model was also used as a reference for a separate OUAS's students HVAC related final thesis.
Goal is to 3D print a simple residential building (however in 1:20 scale)

Associated with a American University of Sharjah

Multiple field of studies working together (Construction Architecture, Civil Engineering, Mechanical Engineering, IT)
Old school building of Karjasilta is preserved for historical importance and can't be completely demolished.

The building will be fully renovated by using the latest modern technologies. Architects needed a source data model of the existing building where to start planning.

In this project we studied what useful can and can not be done inside ArchiCAD regarding to BIM.
Project partners and roles

**Oulu University of Applied Sciences (OUAS)**
Coordinator
Development of usage of BIM in SMEs

**Umeå University (UU)/ Umeå City Building supervision department**
BIM use and implementation: Mapping opportunities of Lean and BIM technology, process and policy fields in building projects

**Luleå University of Technology (LTU)**
BIM in northern building industry; BIM for sustainable building: a multiple stakeholder perspective

**City of Oulu, Building Supervision Office (OBS)**
BIM-model for building permissions, Dissemination

**Arctic University of Norway (UIT) Alta Campus**
Energy performance design as a part of BIM
Associate partners

Rakennusteollisuus RT ry - Finland
Smart Construction Cluster, Alta
Alta Kommune Norway

Rakennus Miilukangas Oy
GroupBuilder Oy, Kaskipuu Oy
Lemminkäinen Oyj Finland

GK Inneklima AS, T. Jespersen AS
Microkonsult AS – Norway
Itid Tarinfo Ab - Umeå, Sweden
Thank you!

Kimmo Illikainen
+358 50 511 8068
kimmo.illikainen@oamk.fi

Antti Haapalahti
+358 40 637 6445
antti.haapalahti@oamk.fi

Eveliina Tackett
+358 50 577 2963
eveliina.tackett@ouka.fi

Heidi Tauriainen
+358 40 630 3563
heidi.tauriainen@ouka.fi