



# **Perspectives of BIM implementation in Romania**

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**2017 Annual Conference of the European Society of Construction Law  
University of Fribourg Switzerland**



# CONTENT

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1. BACKGROUND
2. BIM IN EUROPEAN UNION
3. BIM IN ROMANIA



# *BACKGROUND*

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Building Information Modelling (BIM) is a set of technologies, processes and policies enabling multiple stakeholders to collaboratively design, construct and operate a Facility in virtual space.

As a term, BIM has grown tremendously over the years and is now the 'current expression of digital innovation' across the construction industry.

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|--------------|--|
| 1. Australia | 10. Malaysia                             |
| 2. Benelux   | 11. Nordic (Finland, Denmark and Sweden) |
| 3. Canada    | 12. Norway                               |
| 4. China     | 13. Singapore                            |
| 5. France    | 14. Spain                                |
| 6. Germany   | 15. Switzerland                          |
| 7. Italy     | 16. United Kindom and Ireland            |
| 8. Japan     | 17. USA                                  |
| 9. Korea     |  |

*Russia*

# 17 Chapters

# STANDARDIZATION

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ISO 16739:2013

Industry Foundation Classes (IFC) for data sharing in the construction and facility management industries

ISO 29481-1:2016

Building information models -- Information delivery manual –  
Part 1: Methodology and format

ISO 29481-2:2012

Building information models -- Information delivery manual –  
Part 2: Interaction framework

ISO/TS 12911:2012

Framework for building information modelling (BIM) guidance

ISO 12006-2:2015

Building construction -- Organization of information about construction works  
Part 2: Framework for classification

ISO 12006-3:2007

Building construction -- Organization of information about construction works  
Part 3: Framework for object-oriented information



# *BIM IN EUROPEAN UNION*

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# BIM IN PUBLIC PROCUREMENT

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Directive 2014/24/EU

«For public works contracts and design contests, Member States may require the use of specific electronic tools, such as of *building information electronic modelling tools* or similar»

# BIM TASK GROUP

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21 Countries



AIM: deliver a common European network aimed at aligning the use of Building Information Modelling in public works

RESULT:

EU BIM Handbook (under development)

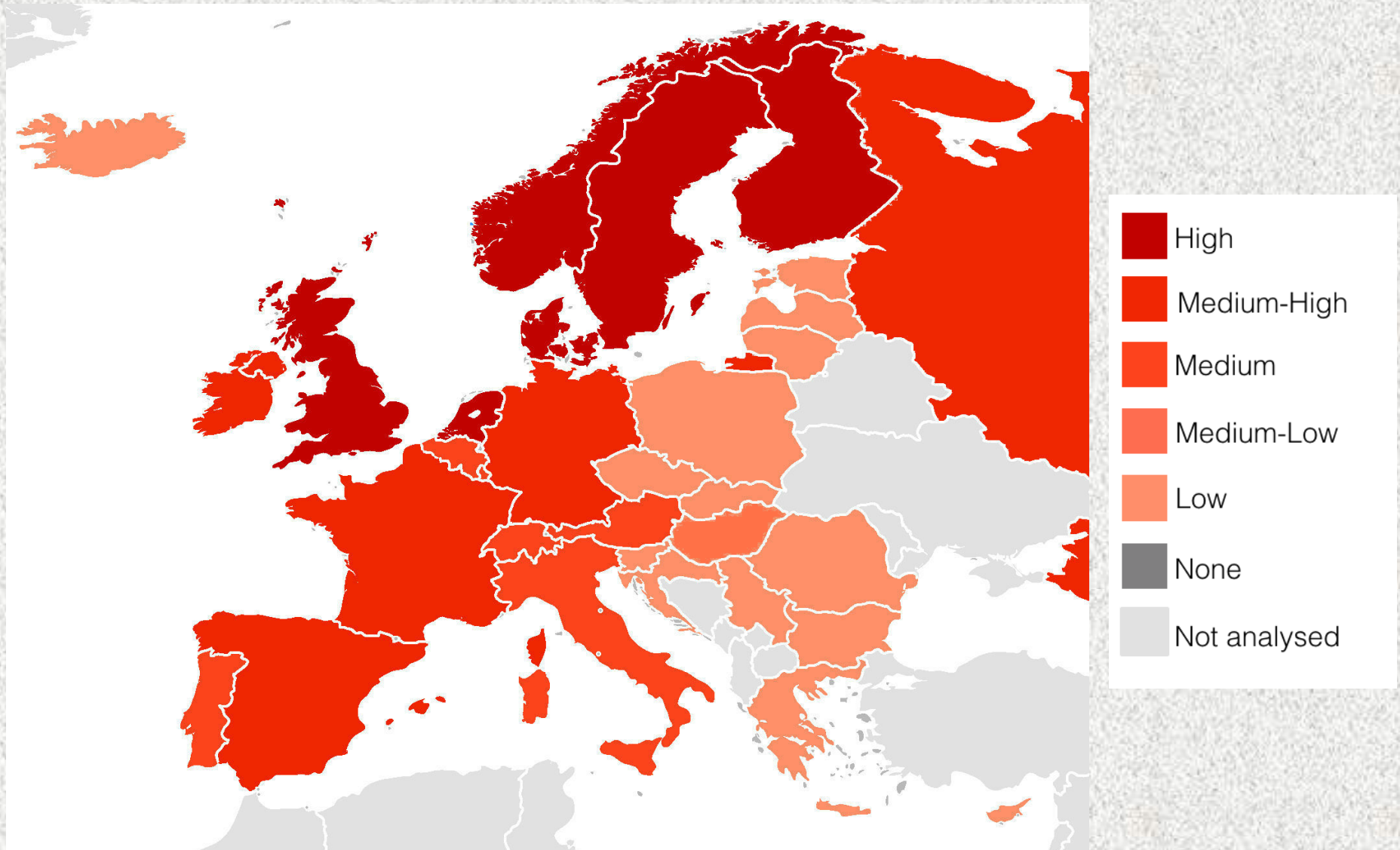
# European Committee for Standardization

## CEN TC 442 | Building Information Modelling (BIM)



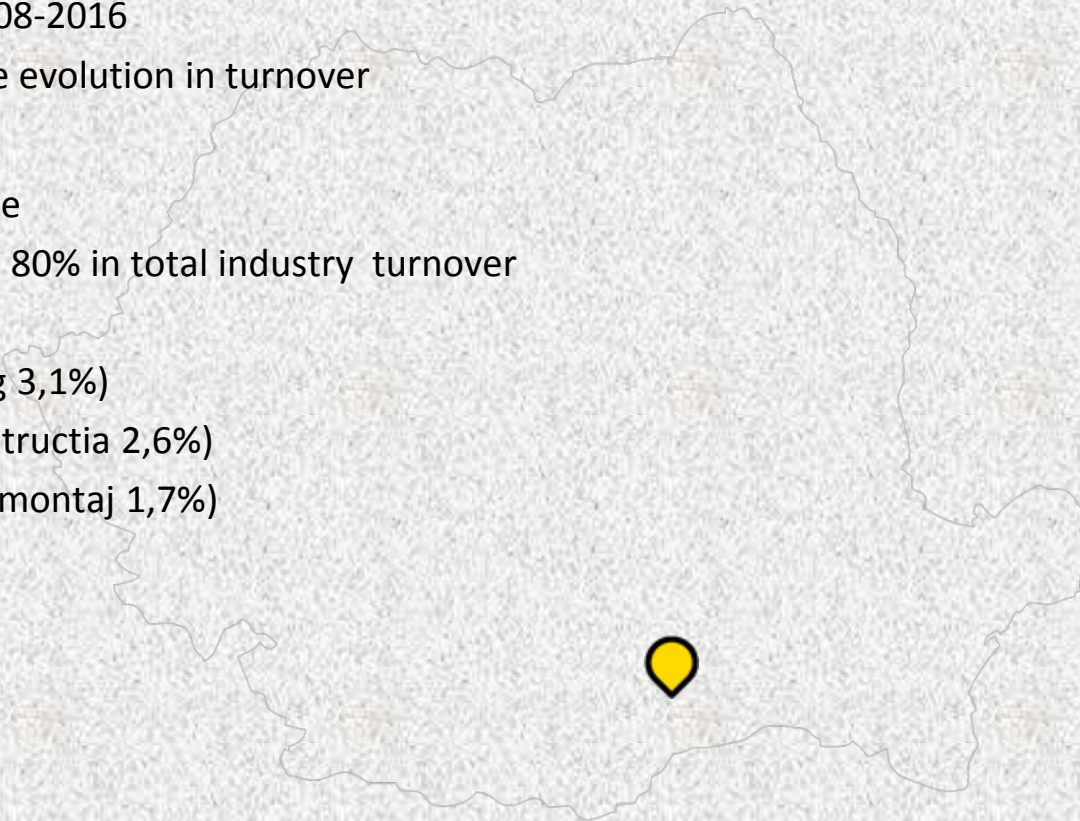
# BIM IMPLEMENTATION IN EUROPE

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# Analysis of contraction field in ROMANIA

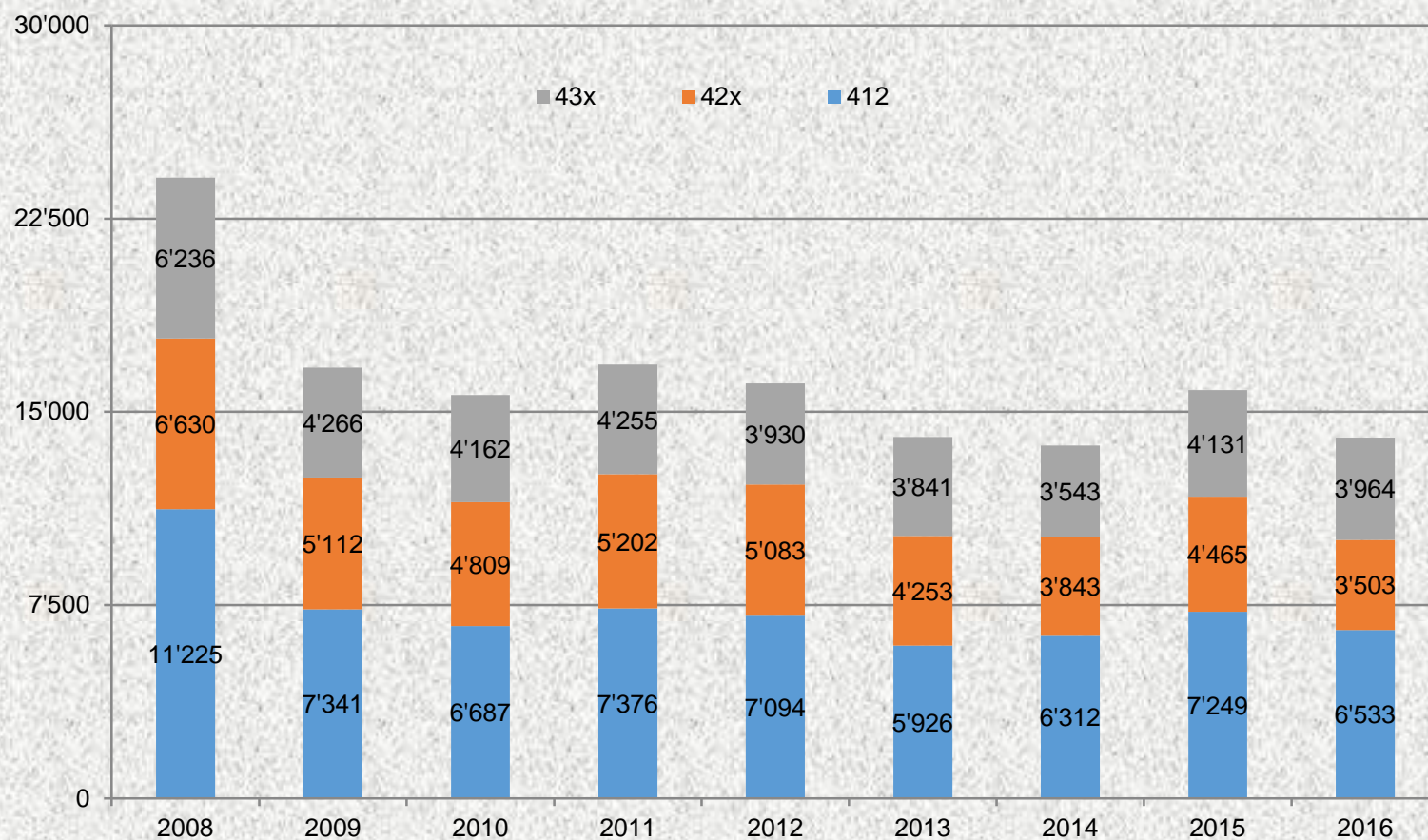
- Severe decreasing after the crisis
- Important growth potential (today is 65% from 2008 level)
- First industry which enter into the crisis and the last sector which go out from crisis
  - Minus 6% average anual sales evolution 2008-2016
  - Large volatility: only 2011 and 2015 positive evolution in turnover
- Level of competition remain above the average
  - The most important 10% from companies = 80% in total industry turnover
  - Top 10 reprezenta
    - Around 12% in total sector #412 (Strabag 3,1%)
    - Over 19% in total sector #42x (Hidroconstructia 2,6%)
    - Around 11% in total sector #412 (Energomontaj 1,7%)



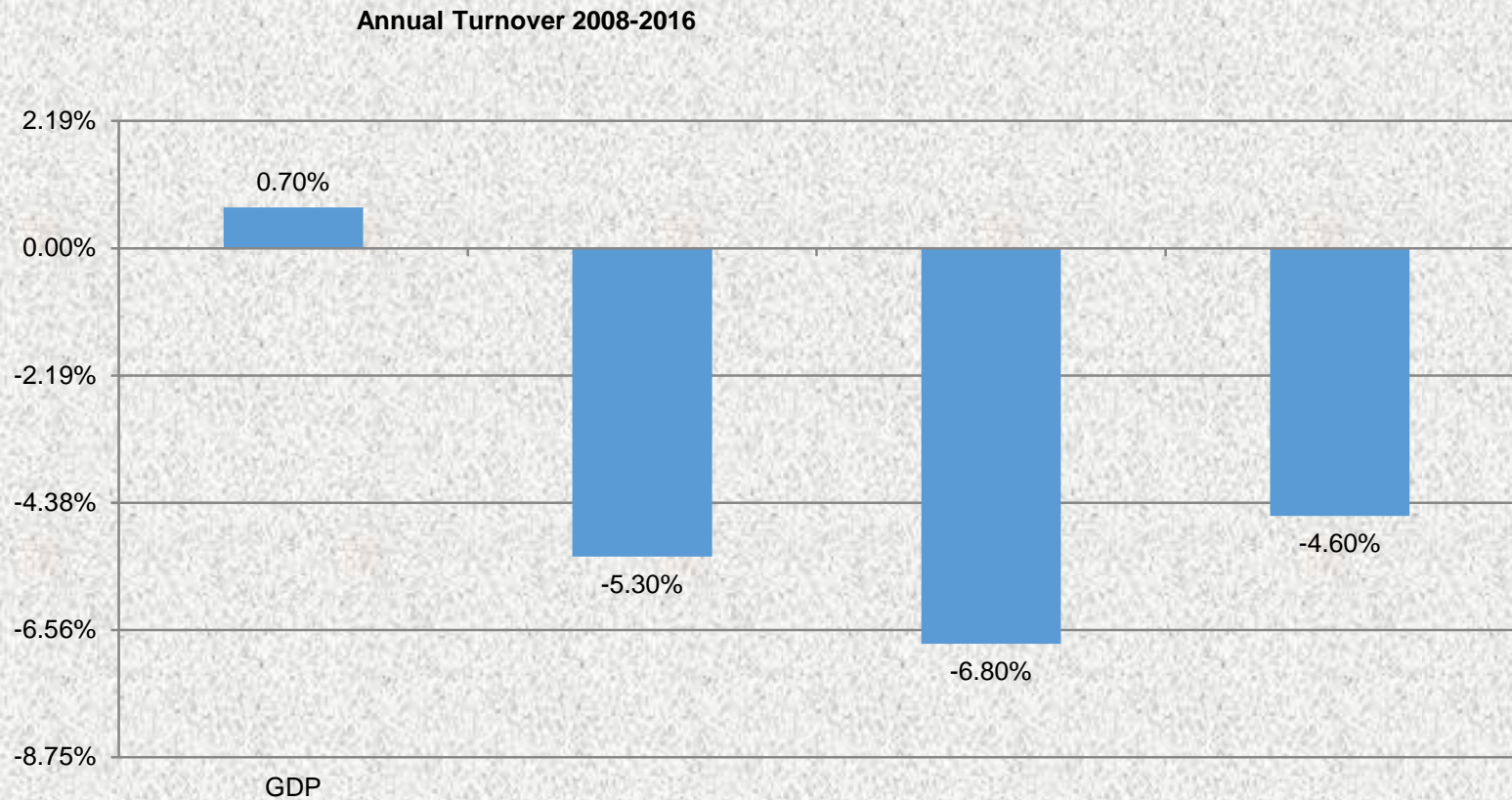


## A2. General presentation of the sector (#construction)

(mil Euro turnover)

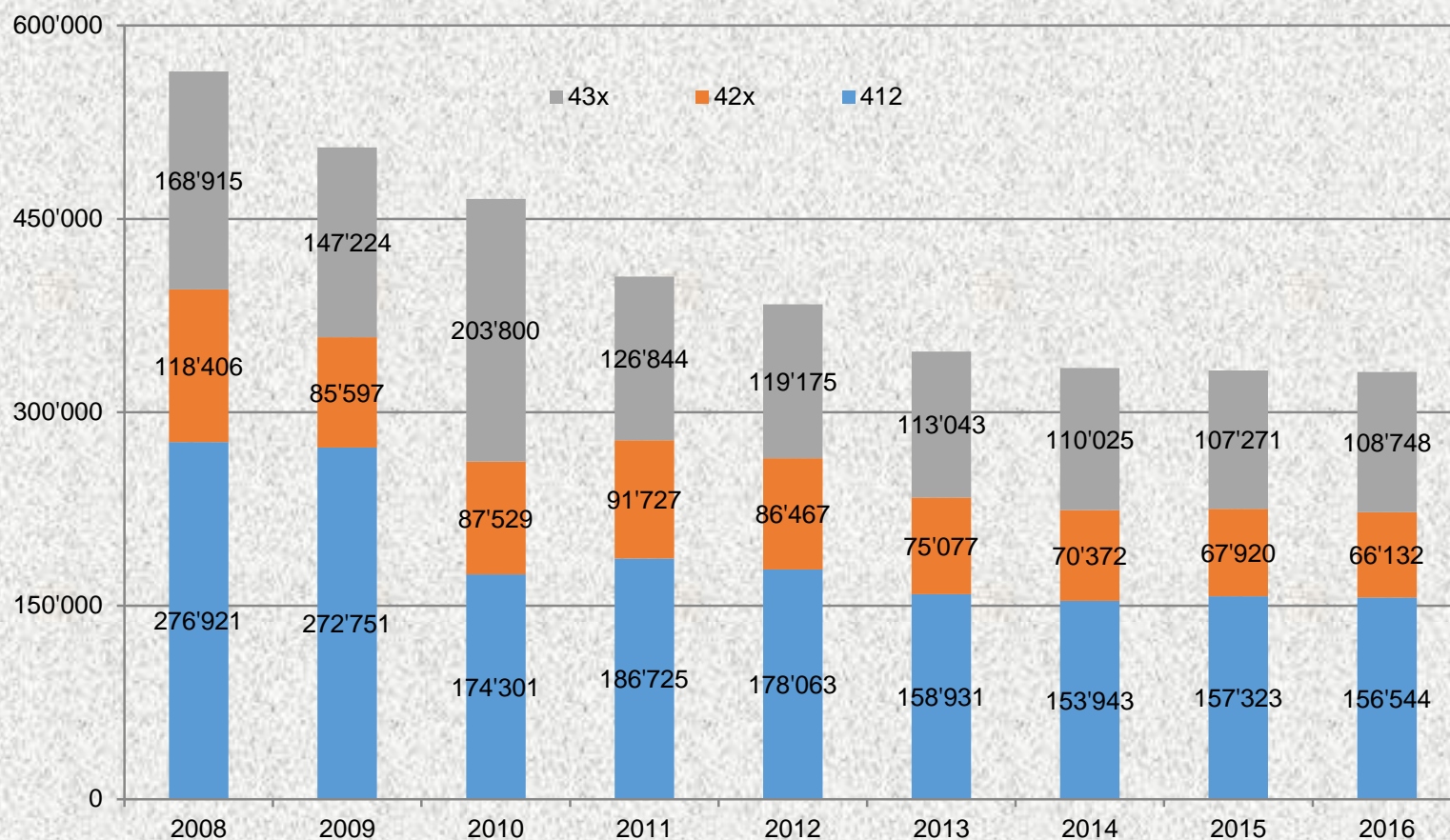


# Average turnover dynamic (%)

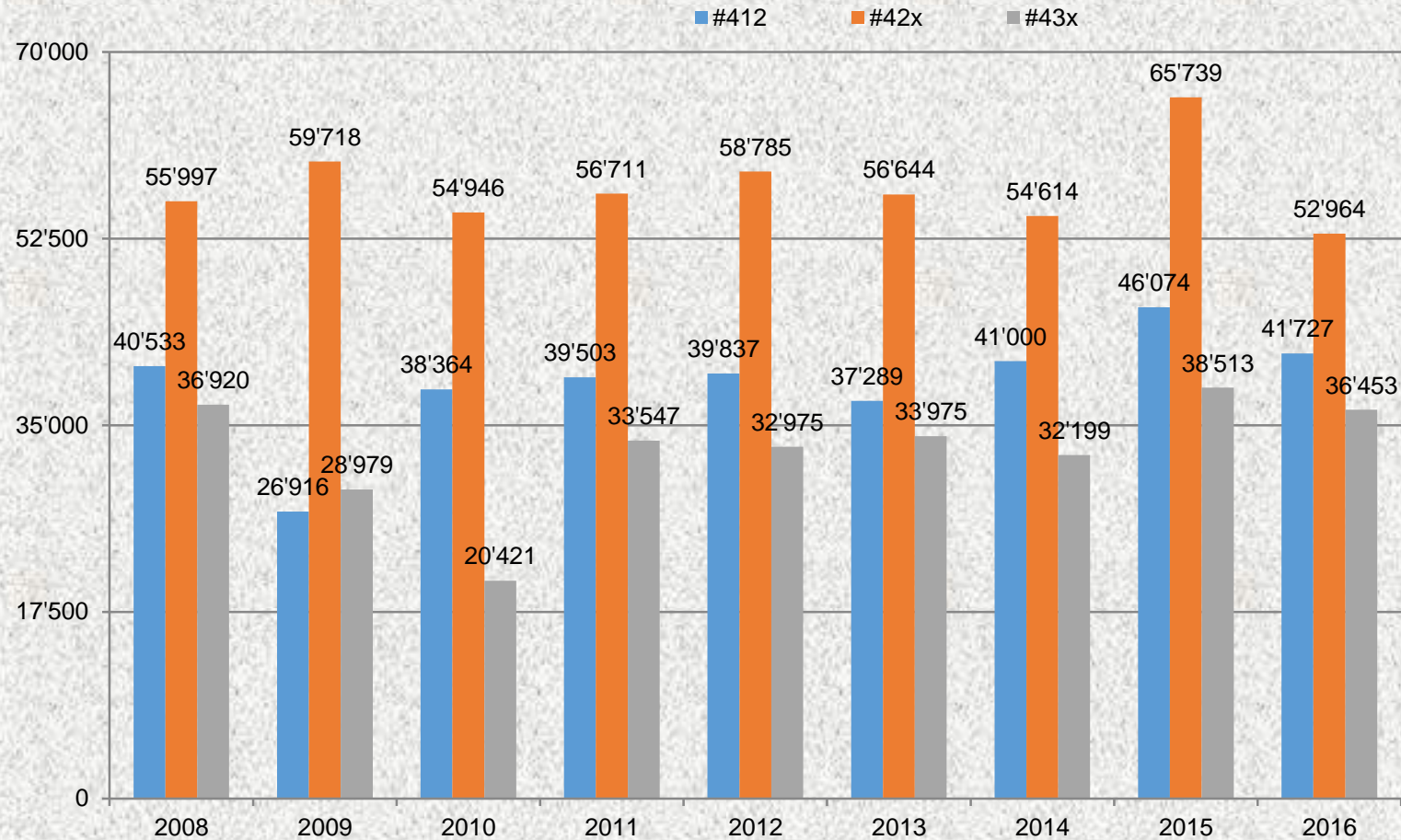


# A3. Number of employee (#construction)

(no.employee)



### A3. Productivity of labour (Turnover/Employee– Euro/year)



# BIM IMPLEMENTATION IN ROMANIA

- The legislation regarding public procurement adopted in the implementation of Directive 2014/24/EU has no provision on BIM
- Ministry of Regional Development and Public Administration is developing a construction code with BIM provided, but it is unclear how it will be.
- Ministry of Transportation started using BIM in the management of some projects, but still waits for results in order to require in other projects
- Most of the BIM usage comes from private projects where either the developers (foreign investors mainly) as a requirement from the consulting company or the General Contractors (mainly the foreign ones) are requesting all the involved parties to implement a certain stage of BIM





# STRADARDS ADOPTED IN ROMANIA

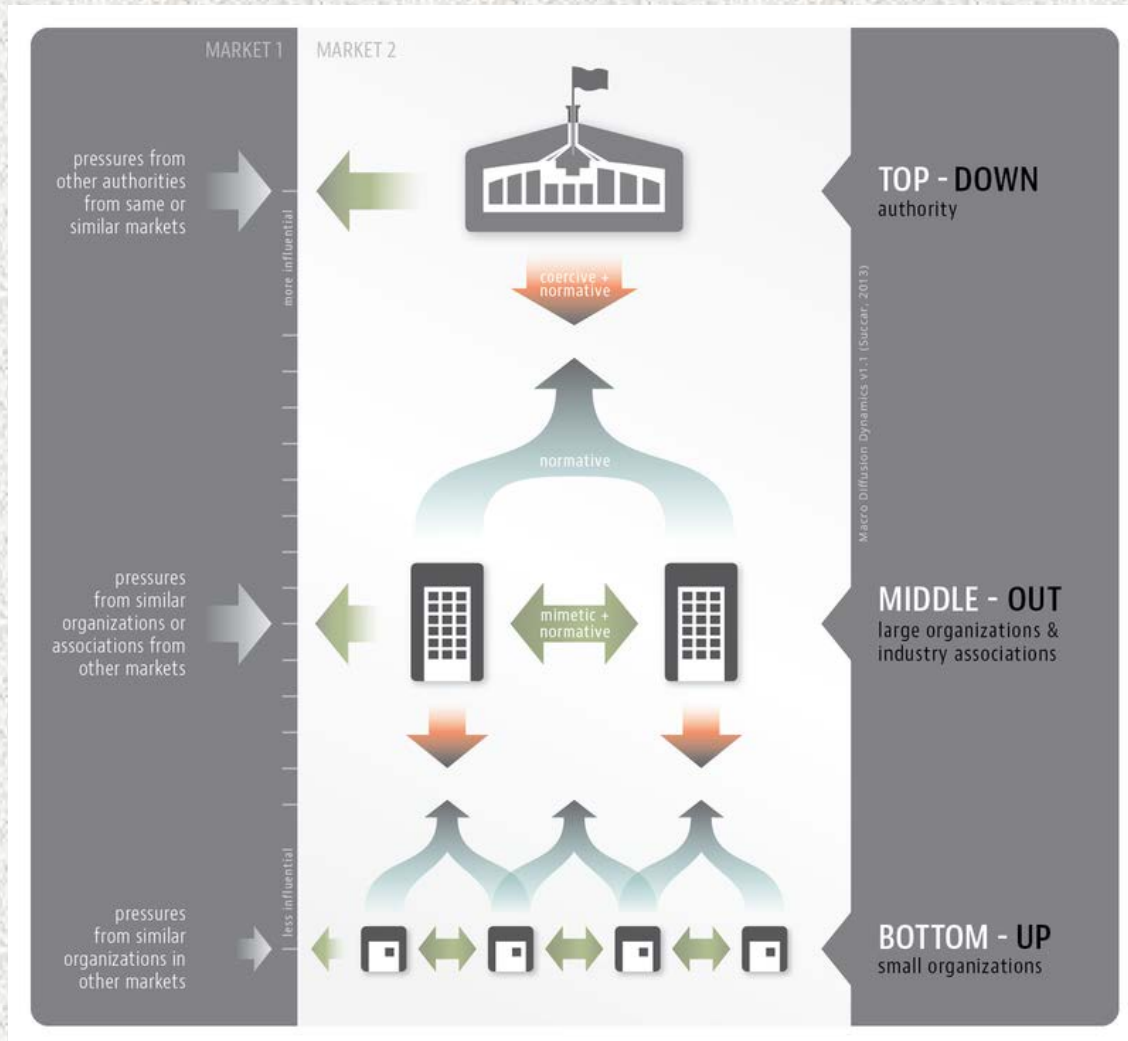
**ASRO/CT 335** → CEN/TC 442 Building Information Modelling BIM  
→ ISO/TC 59 Buildings and civil engineering works

- **SR EN ISO 16739:2017** Industry Foundation Classes (IFC) for splitting up information between construction and facilities management
- **SR EN ISO 29481-2:2017 Informational models of buildings**  
Part 2: Collaboration
- **SR EN ISO 12006-3:2017** Execution of Works. Collecting and organizing information related to works.
- Part 3: Information related to the execution of works
- **EN ISO 29481-1:2017** Building information models - Information delivery manual - Part 1: Methodology and format (ISO 29481-1:2016) in 2018

## PLANS IN ROMANIAN BIM STRANDARDIZATION

- prEN ISO 19650-1 Organization of information about construction works - Information management using building information modelling - Part 1: Concepts and principles (ISO/DIS 19650-1:2017)
- prEN ISO 19650-2 Organization of information about construction works - Information management using building information modelling - Part 2: Delivery phase of assets (ISO/DIS 19650-2:2017)
- prEN ISO 16757-1 Data structures for electronic product catalogues for building services - Part 1: Concepts, architecture and model (ISO 16757-1:2015)
- prEN ISO 16757-2 Data structures for electronic product catalogues for building services - Part 2: Geometry (ISO 16757-2:2016)
- prEN ISO 21597-1 Organization of information about construction works - Information container for data drop (ICDD) - Part 1: Container
- prEN ISO 21597-2 Organization of information about construction works - Information container for data drop (ICDD) - Part 2: Dynamic semantics
- prEN ISO 19650-5 Organization of information about construction works -- Information management using building information modelling -- Part 5: Specification for security-minded building information modelling, digital built environments and smart asset management

# Macro-Diffusion Dynamics model





# How do you implement?

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PASSIVE

VS

ACTIVE

*Require*

*Adopt*



# PASSIVE

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Directive 2014/24/EU



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United Nations



Nations Unies

United Nations Office at Geneva  
Switzerland

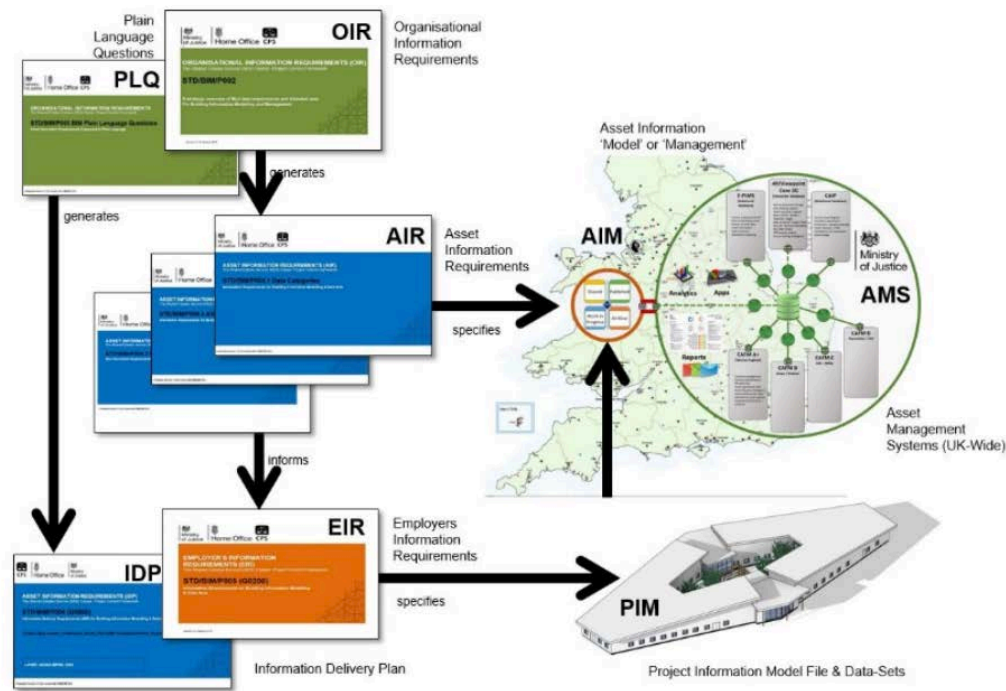
For a reference project to be considered relevant, four of the following seven minimum characteristics must be met for each of the three projects:

- i. Multi-story, minimum three-stories, concrete building structure with integral heating / cooling systems;
- ii. Office building with high-end finishes of 15,000 square meters minimum open office space with modular furniture, partitions, and contemporary data and power distribution system;
- iii. Conference / meeting rooms with contemporary audio visual systems;
- iv. Façade composed of full floor height curtain walls 4,000 square meters minimum;
- v. Planted green roofs requiring specialized water-proofing;
- vi. LEED, BREAAAM, Minergie, or similar green building certification level of LEED NC 'Silver' (or equivalent) or higher;
- vii. Use of Building Information Management (BIM).



# ACTIVE

## UK *Ministry* of Justice



# BIM & RSCL



## Seminars on BIM

- ◆ National Conference on BIM implementation in public projects





## Solutions - Conclusion

- Importance of working on Policies beside Technologies and Processes
- The Middle-out approach is the most successful one for BIM diffusion in markets
- Focusing and applying the several EU and International initiatives and standards
- Ask for BIM in Tenders in not enough
- Need of Active BIM Clients
- Need of Training (internal and external)
- Need of a Strategy for the entire Industry





# Thank you for your attention!



**RSCL** Romanian Society  
of Construction Law



European Society of Construction Law

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