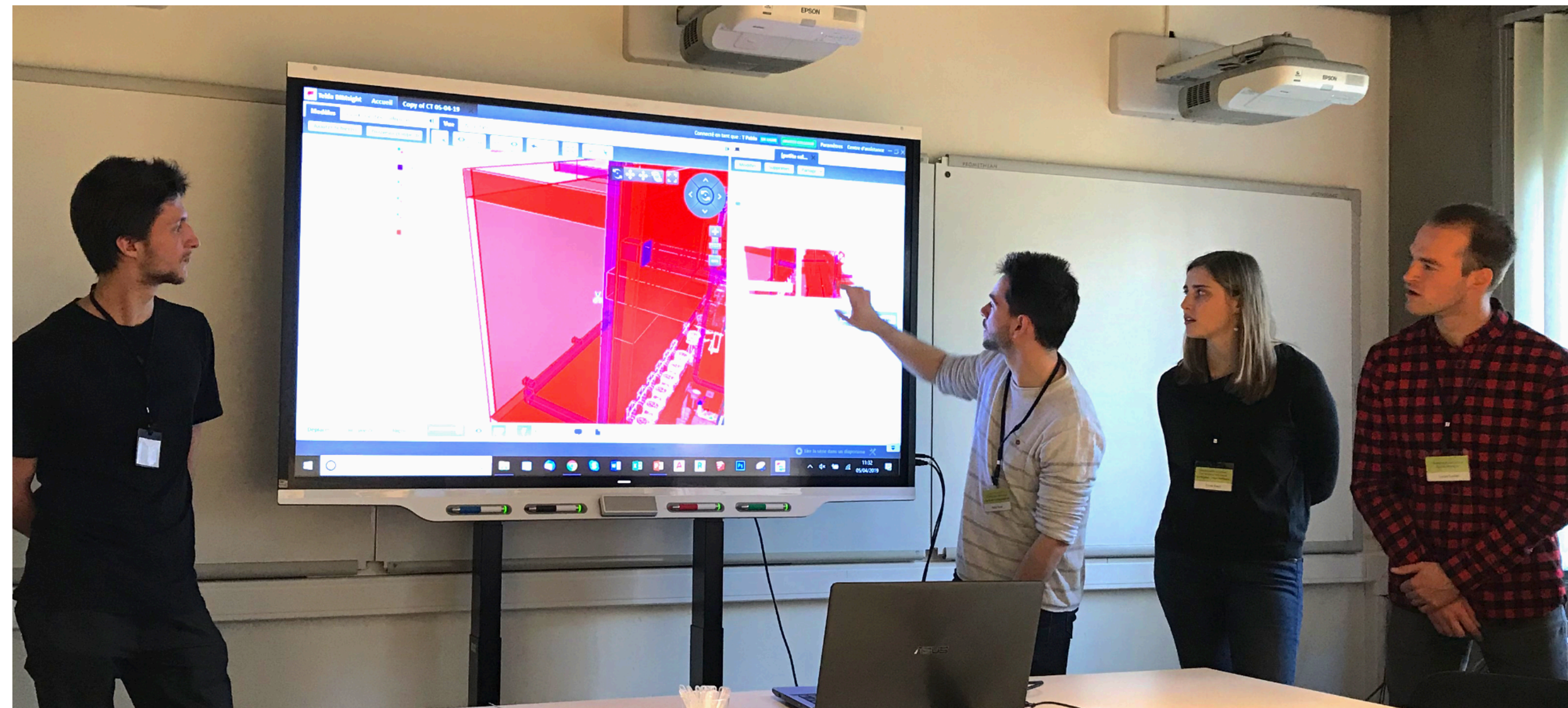


Information management in BIM Collaboration. Renovation Projects.

Anabelle Rahhal, Architect Engineer, PhD Student in Science Engineering.
Co-promoters : Prof. Pierre Leclercq (ULiege) et Prof. Samia Ben Rajeb (ULB)



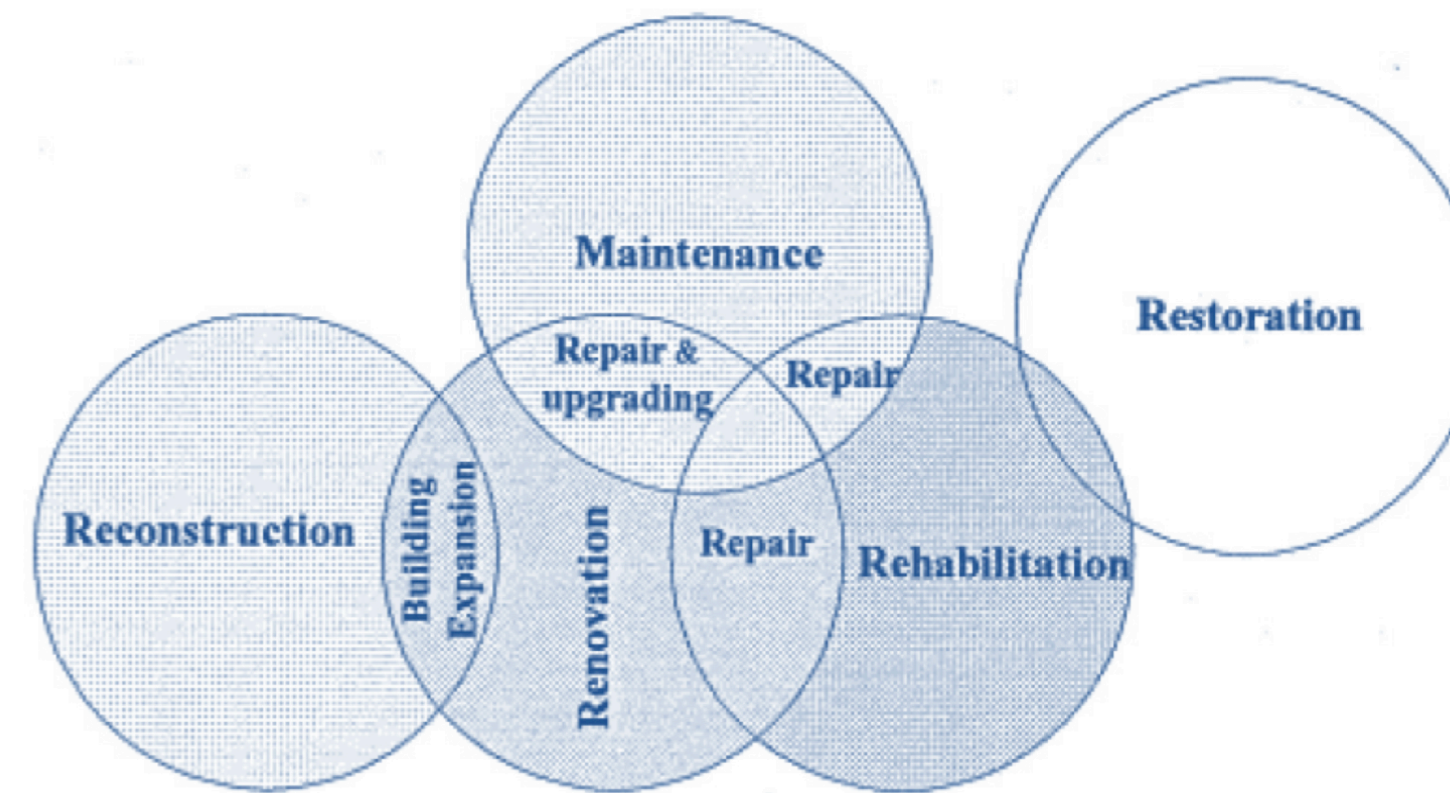
Why Renovation Sector ?

Context of renovation

(Joblot, Paviot, et al., 2017)

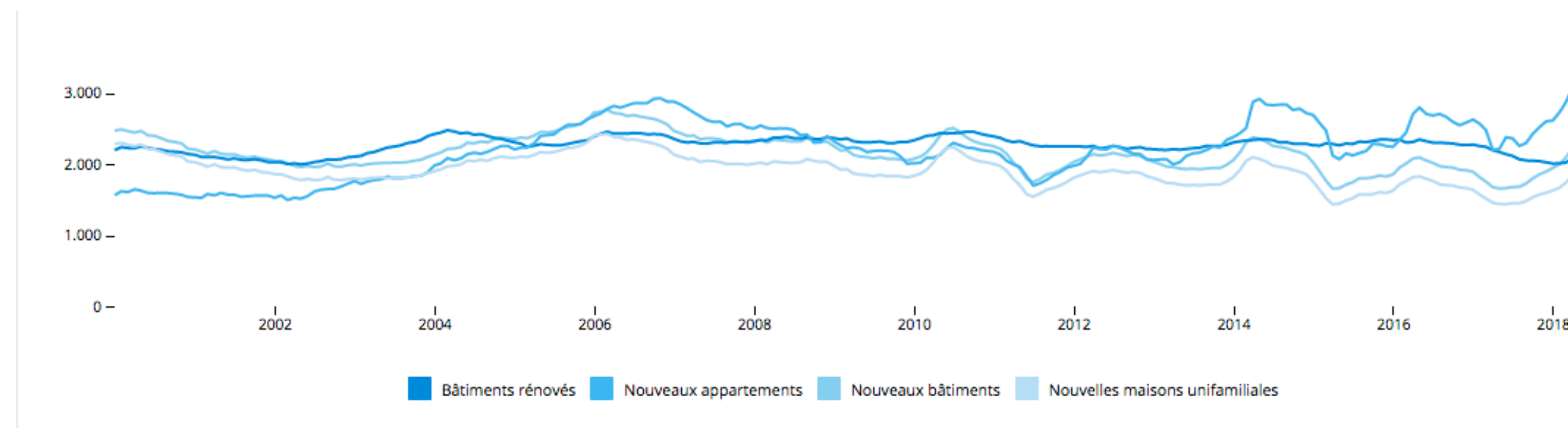
Multiple terms used in renovation

(Rosenfeld & Shohet, 1999)



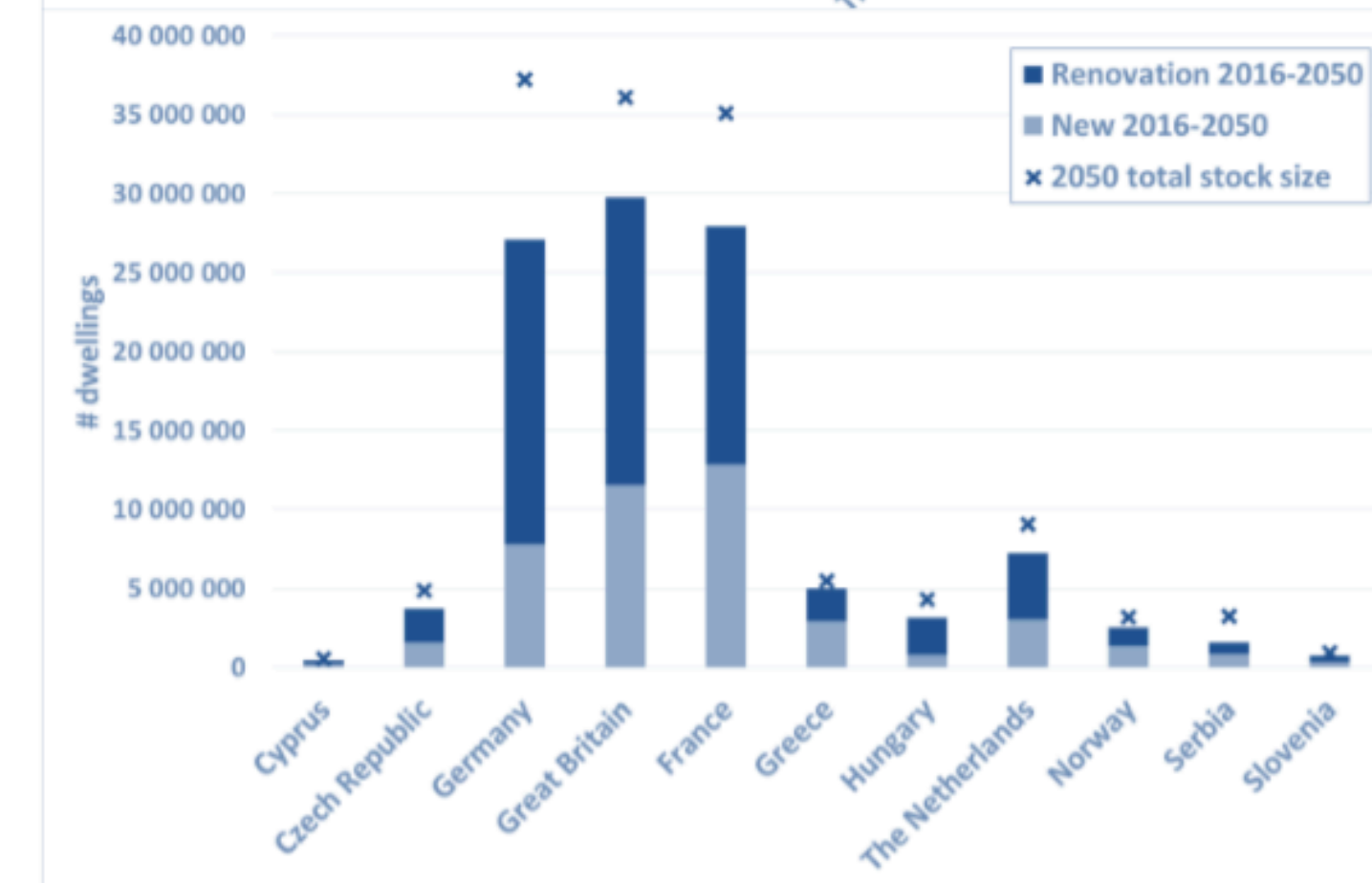
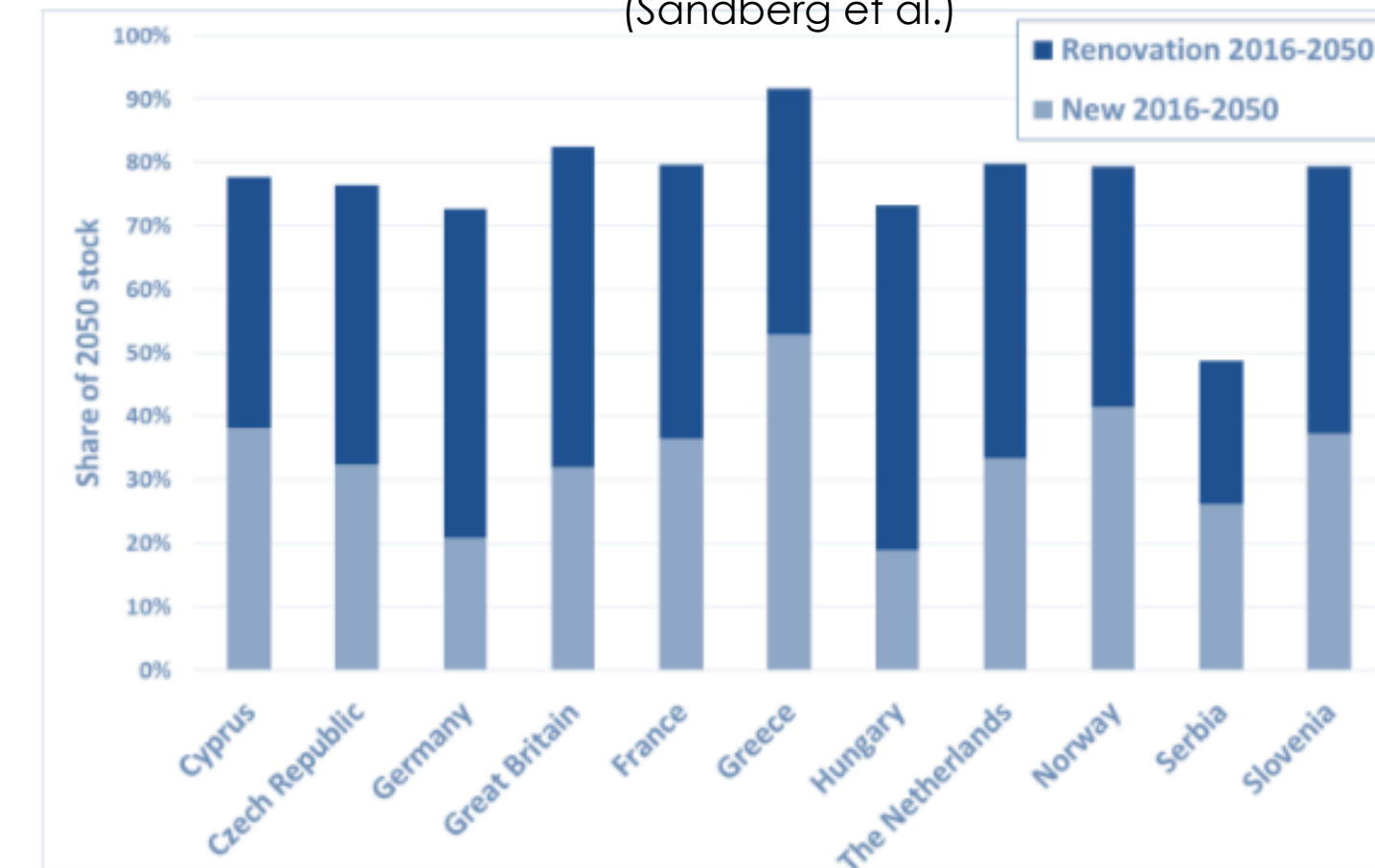
Granted building permits 2002-2019

(Statbel, Belgium office of statistics)

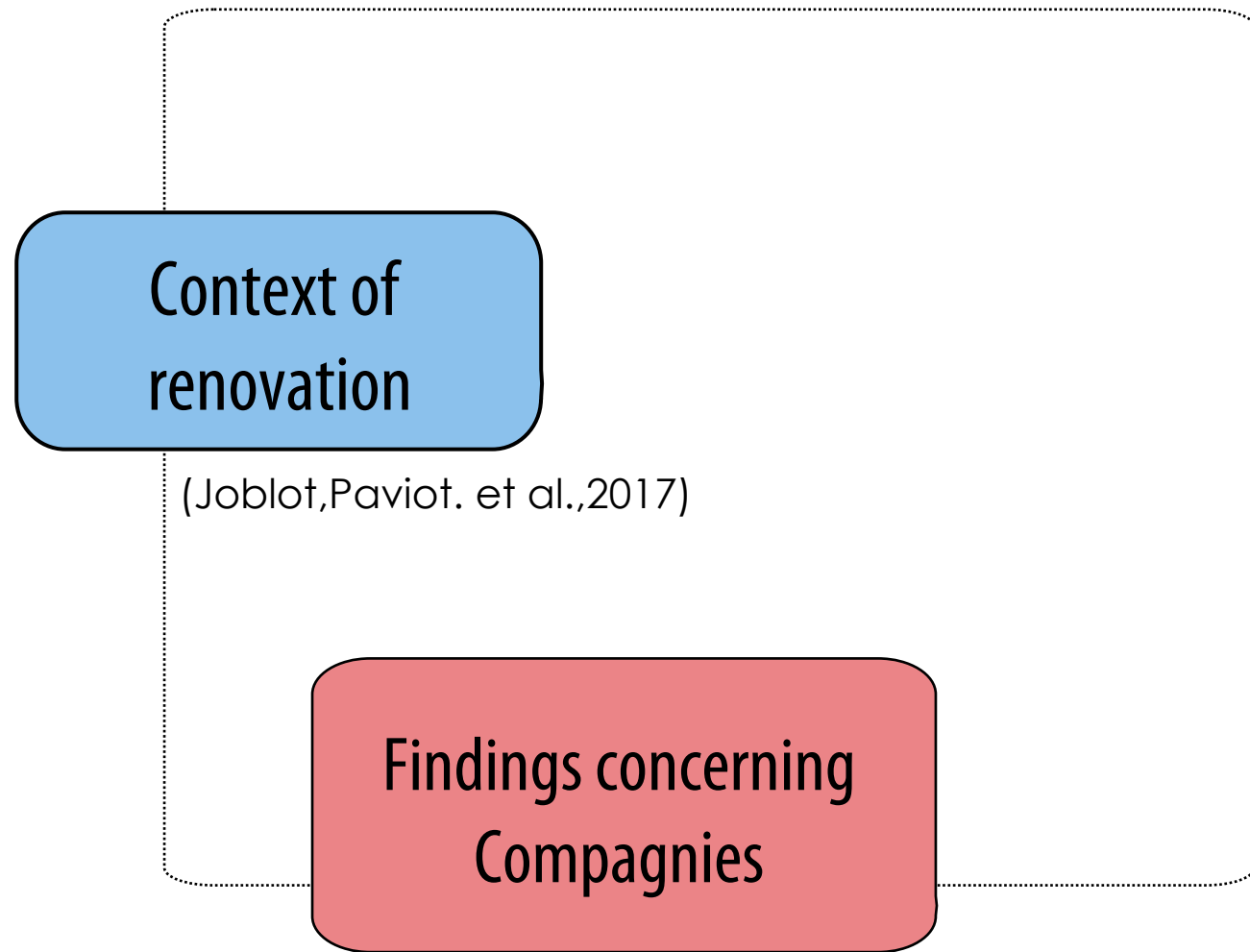


Housing built / renovated 2016-2050 in Europe

(Sandberg et al.)



Why Renovation Sector ?



(Joblot, Paviot, et al., 2017)

(Joblot, 2019)

(Santos, Costa et Grilo, 2017)

Loss of information during the various stages of the project

Complexity, multitudes of exchange

Several ICT management and organization solutions

Flaw and fragility at the decision node

Lack of BIM maturity of companies

Exceedances of deadlines or financial issues

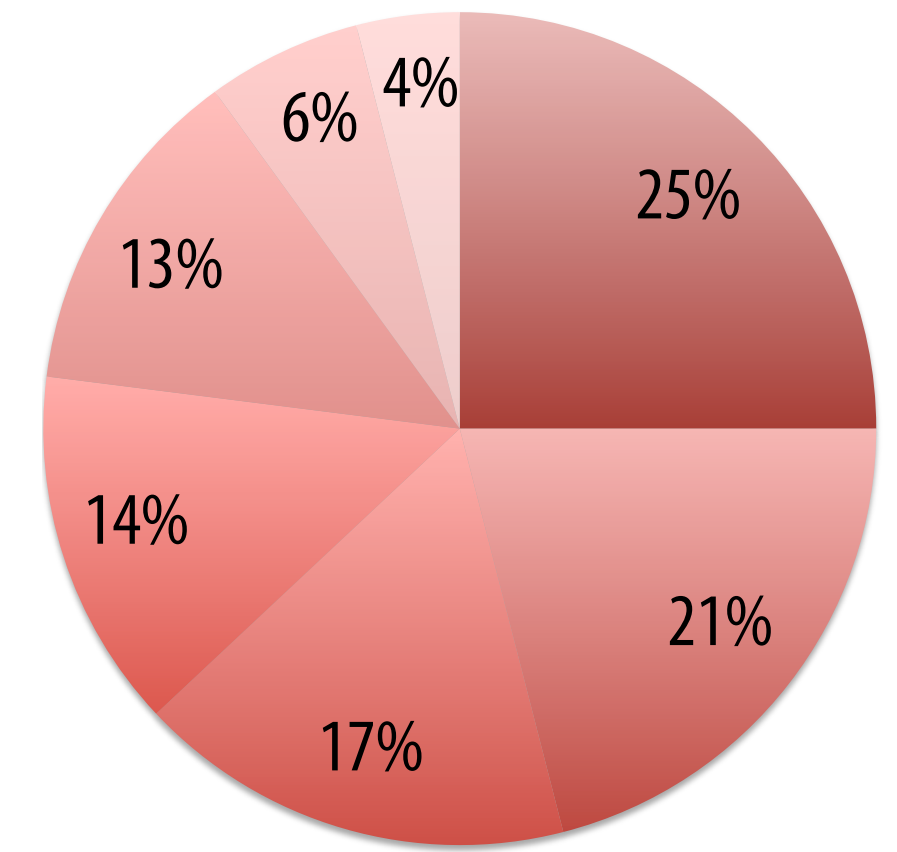
(Khaddaj et Srour, 2016)

(Redwood et al., 2017)

Attention to bring to Micro businesses and SMEs in the Renovation sector!

- Masonry Tiling
- Painting Glazery Coatings
- Roofing Plumbing Heating
- Electrical and electrical equipment
- Carpentry
- Insulation and Plaster
- Ironwork Metalwork

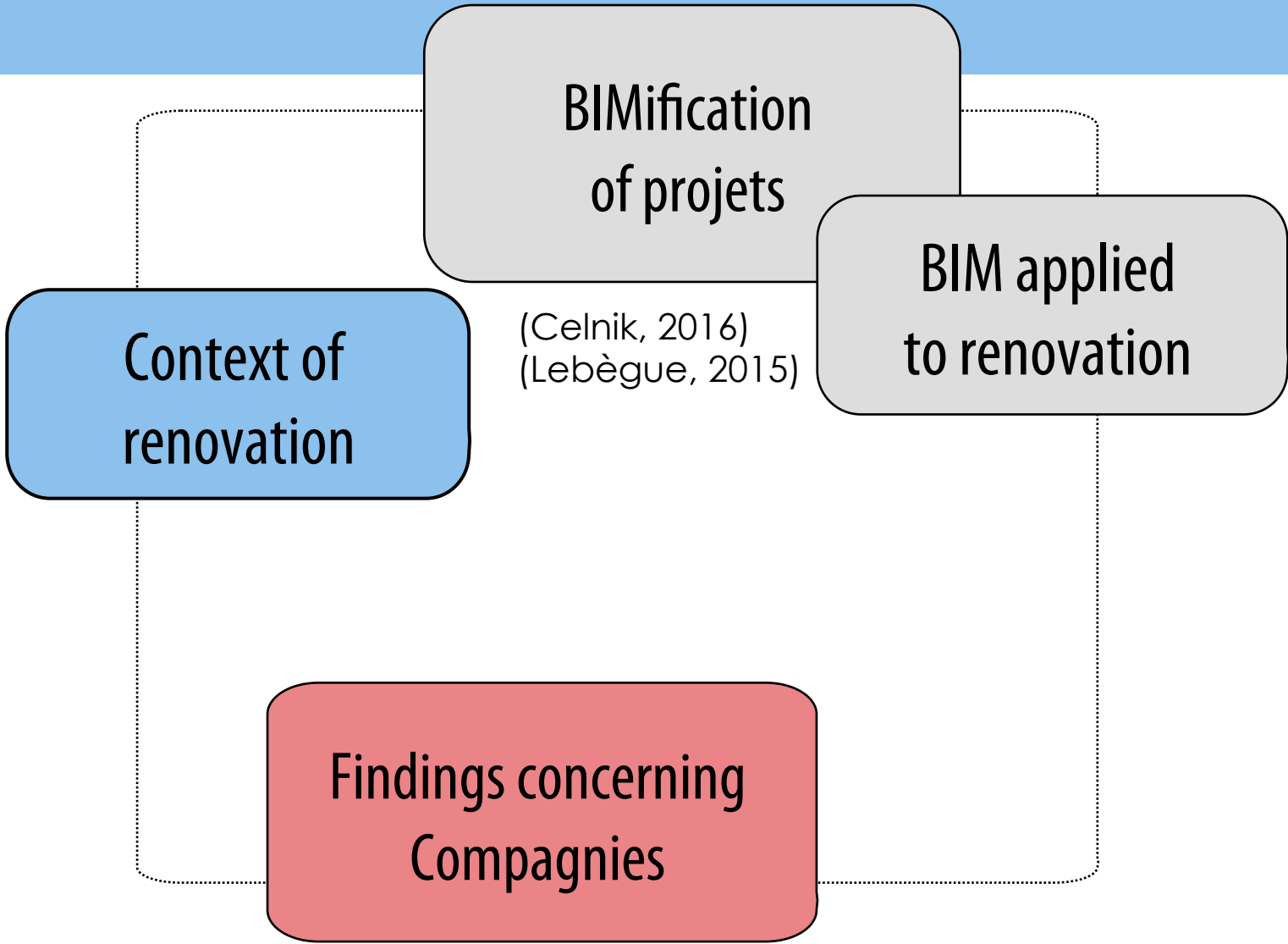
Activity sectors 2015
(CAPEB France)



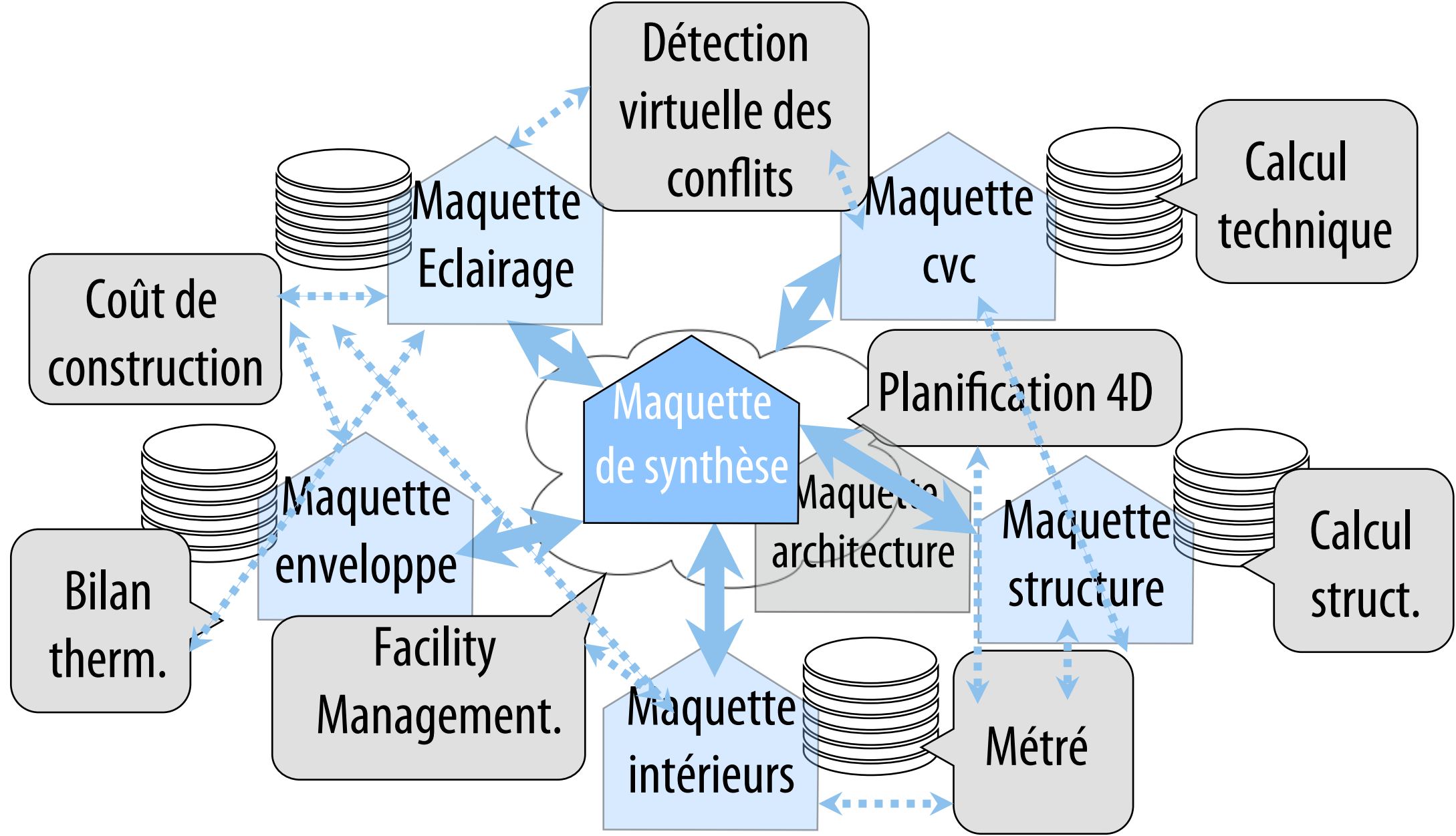
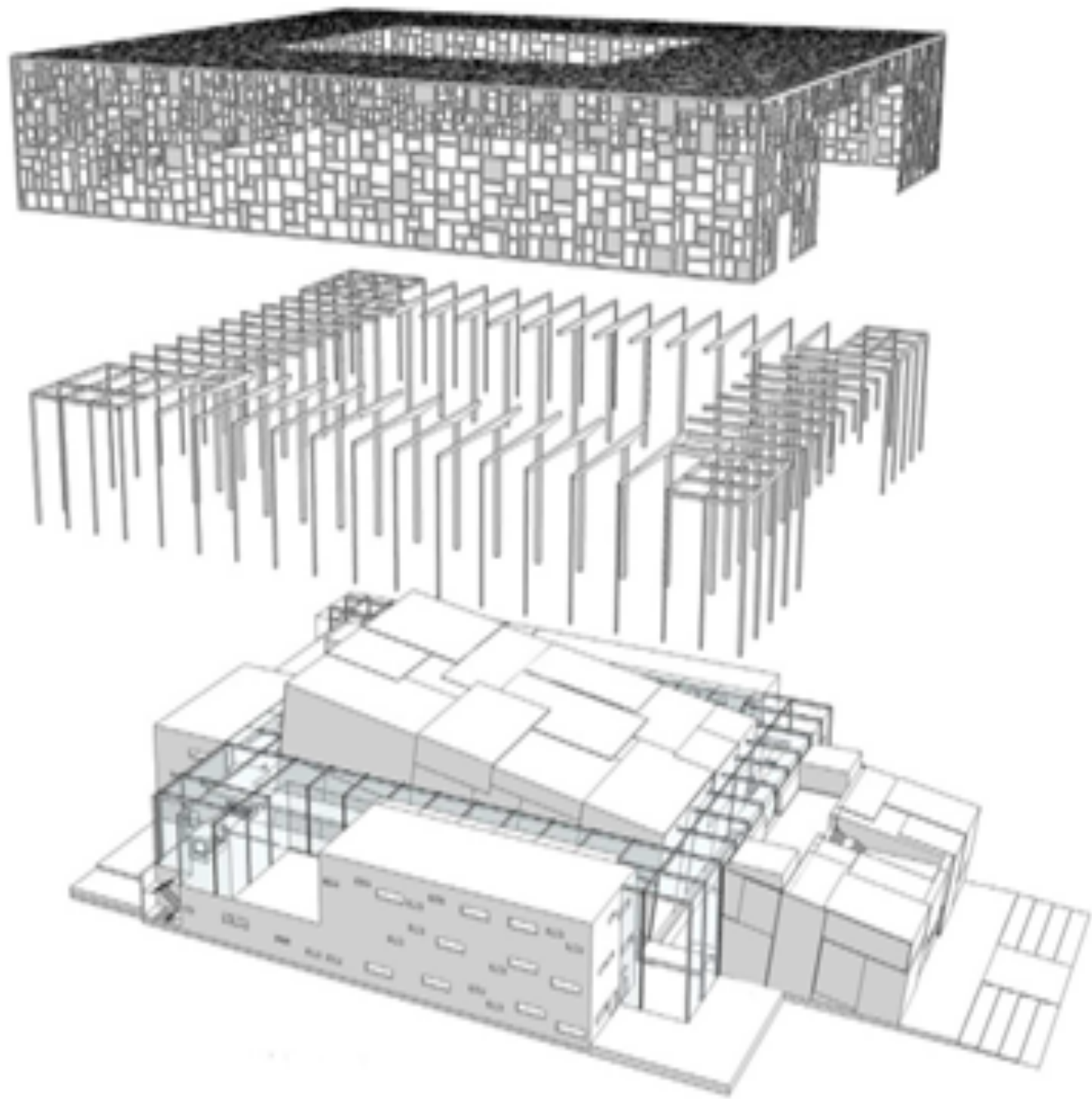
Statistics on the structure of construction companies 2016
(Statbel, Statistics Belgium)

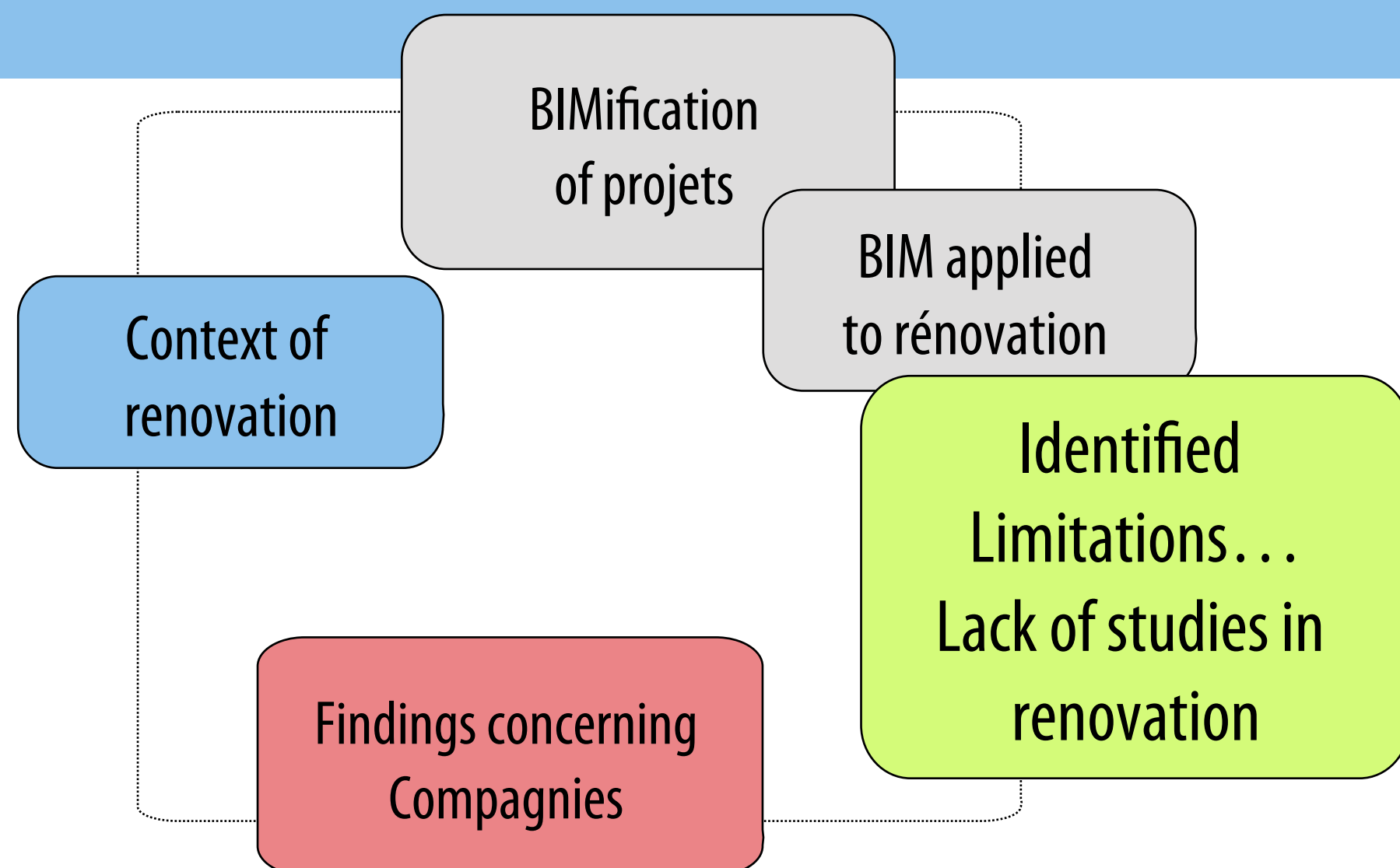
Section	Job class	Turnover (ca)	Values of production	Goofs and services	Productivity
+ ↓ F Construction	Between 0 et 9	33.295.601	32.613.606	26.376.682	42
	Between 10 et 19	6.820.293	6.673.567	4.778.163	56
	Between 20 et 49	8.490.494	8.276.173	6.091.943	59
	Between 50 et 249	13.425.812	13.475.360	10.395.815	70
	250 and beyond	8.409.248	8.220.180	6.440.276	78

Why BIM (Building Information Management & Modeling) ?



- **AN ANSWER** as needed in 3D models to effectively manage the building process, visualization, evaluation, documentation and maintenance of a building.
(Holness, 2006) (Hichri N., 2013)
- **BENEFITS AND USES** similar as in new construction.





"50 scientific articles on BIM applied to renovation until 2019"

"75% of SMEs are non-BIM and work on 2D plans"



Large amount of metric information or Lack of information

(Helander et Singh, 2016)
(Kim et Park, 2016)

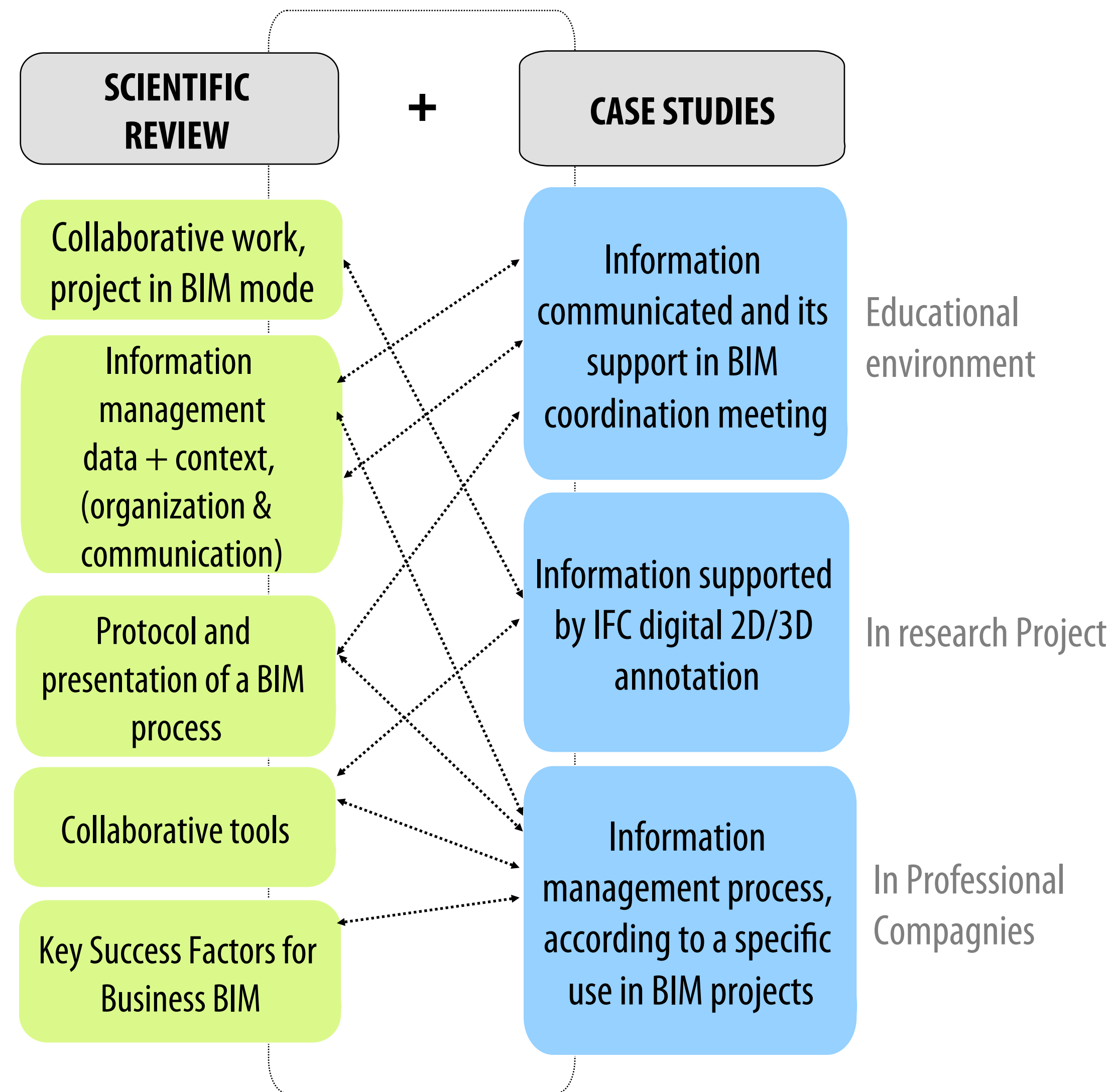
Maintain the use of 2D documents and other complementary and non-integrated graphics as a support for information

(Landrieu, 2013)
(Ghaffarianhoseini, 2016)

Laborious and expensive manual procedures modeling and risks of errors

(Pärn et Edwards, 2017)

- Despite its advantages in new construction, **BIM does not attract enthusiasm in the sector of renovation ...**
Risk of disappearance of some companies without a change towards the BIM ...
(Harty, Kouider et Paterson, 2015)
- **Develop LEVERS to accelerate BIM diffusion** within the sector
- **Need SOLUTIONS easier** to implement
- **Need of METHODOLOGY to develop,** systemic approach



1. Propose **recommendations** to the actors of the renovation sector to carry out their BIM projects
2. Taking current practices into account by integrating, for example, **the 2D / 3D numerical annotation** on a digital model
3. Improving the **efficiency of the BIM process** in renovation projects (dataflow and workflow between the various stakeholders)

THANK YOU FOR YOUR ATTENTION