



# Future trends and main concepts of adaptive facades

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## ABSTRACT

- Understanding of current and future adaptive façade technologies: the most used, strengths, weaknesses and limitations.
- Highlighting of future trends and main concepts of adaptive facades.
- Qualitative research approach with in-depth interviews and semi-structured questionnaire.
- Adaptability, energy efficiency, comfort, control, and occupant uptake and understanding are keys concepts.
- This study is dedicated to academics and industrials with core specializations related to adaptive facades.

## KEYWORDS

Building, Smart Technologies, Energy Efficiency, Occupants, Comfort, Future Technologies, Experts

## PROBLEM

- Industrials have to face multiple challenges at European and world scale.
- This industry is conservative and fragmented.
- Real and serious competition with Asian companies.
- The sector need to reorganize and prepare the façade industry for a future market transformation in order to realize its full potential.

## OBJECTIVE

- Interview a representative sample of adaptive facades experts in the world.
- Create a report which document their ideas and insights.
- Analyze experts opinions and elaborate a framework that address the main concepts and future trends of adaptive facades.

## AUDIENCE

Façade consultants, façade engineers, façade architects, façade owner, façade manufacturer, façade manager

## RESEARCH QUESTION

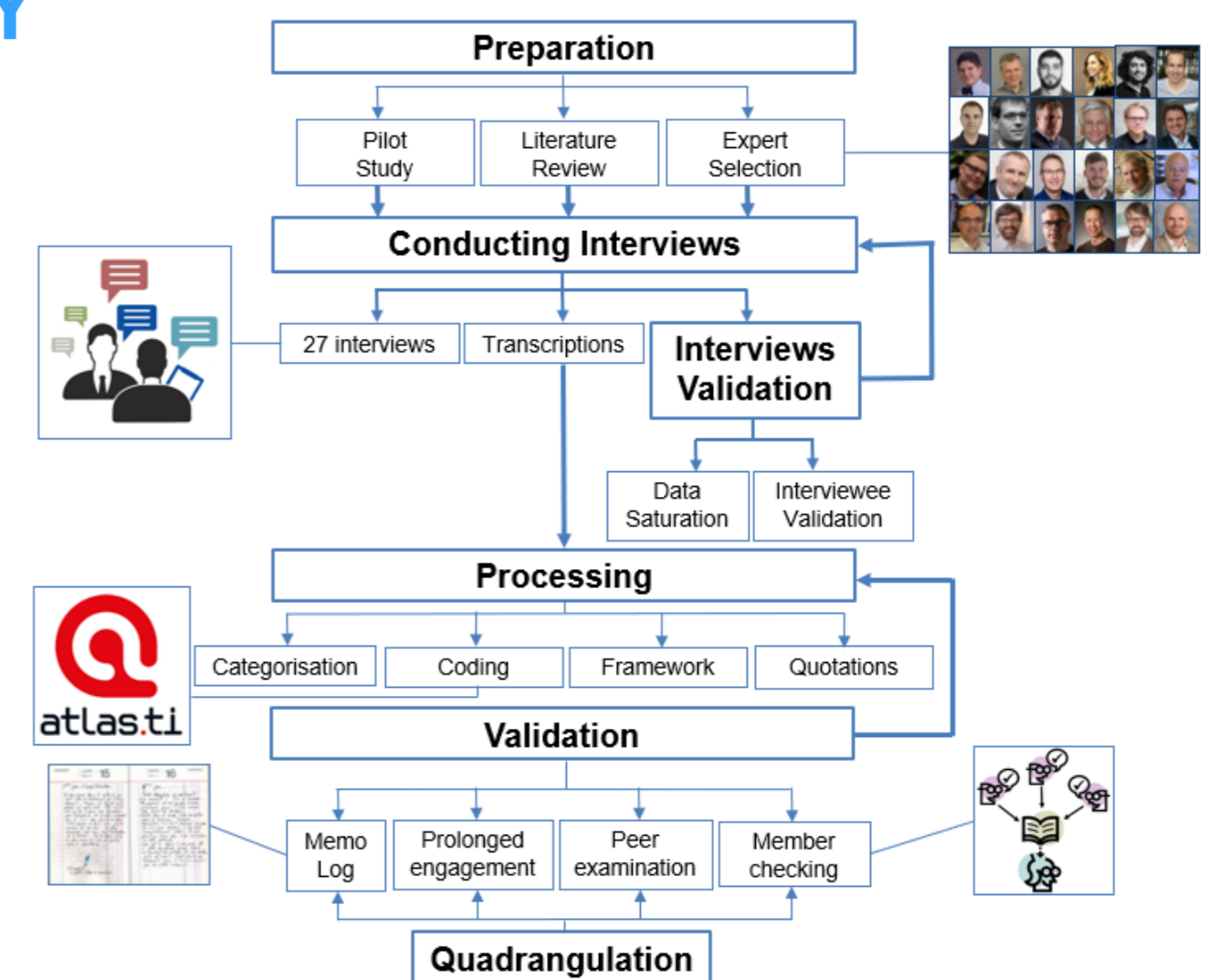
How can the façade industry provide consistent and robust façade systems in the world?

## ORIGINALITY

- Approach/Methodology: link with experts and getting insights.
- Identification of future trends and main concepts of adaptive facades.
- Diverse sample of expert interviewed: industrials and academia from a broad variety of countries.
- Discussed topics: adaptability, smartness, control, link with occupants.

## METHODOLOGY

- Four chronological steps methodology.
- Beforehand interview preparation.
- Conducting in-depth interviews.
- Interview answers processing.
- Study validation.

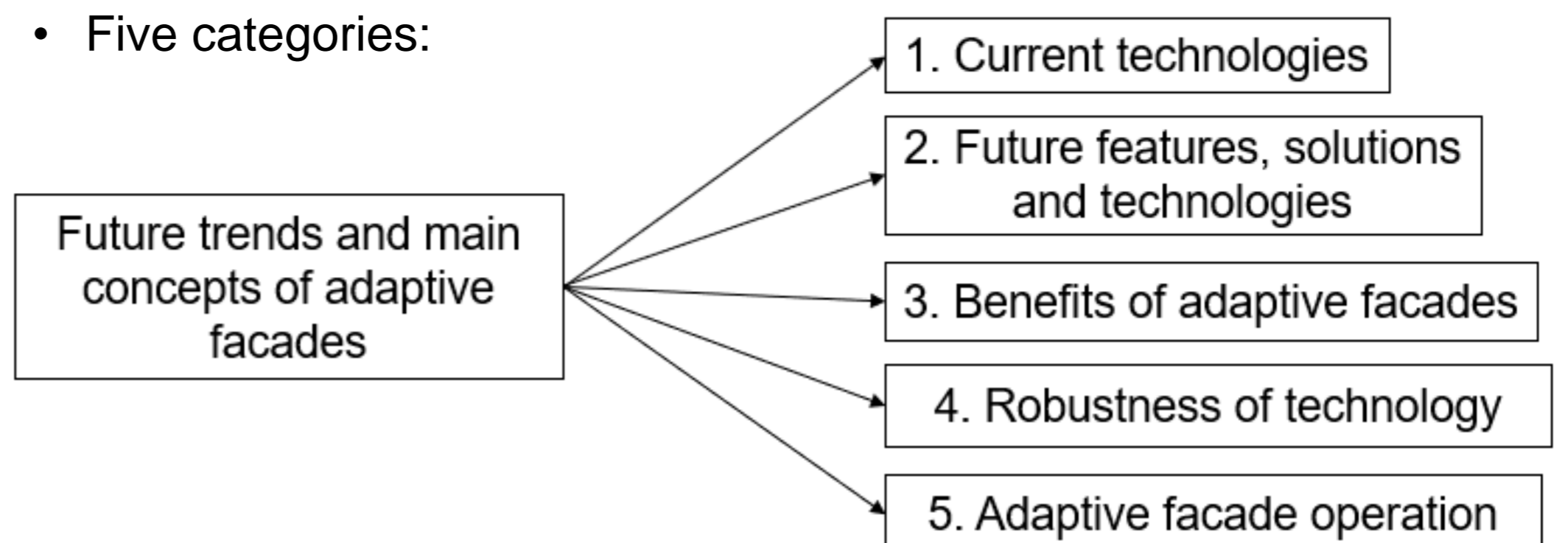


## RESULTS

- Thirty-one codes:

Codes		
Adaptability	Control	Performance indicators
Performance	Weaknesses	Life expectancy
Energy	Maturity	Testing
Comfort	Maintenance	Heating
Risk	Future of adaptive façades (features, solutions, technologies)	Examples of project
Education/Understanding	Cost	Aesthetic
Environmental factors (wind, glare, temperature)	Intelligence	Reliability
Current features, solutions, technologies	Service provider	Ventilation
Link/Interactions with people (occupants)	Connected systems	Evaluation
Standardization	Automation	Cooling
	Customization	

- Five categories:



## CONCLUSION

- Energy efficiency, comfort, control and occupant uptake are the keys of adaptive facades.
- Adaptability is the characteristic which the most describe adaptive facades: the ability to move, change their appearance and adapt their properties .
- Strengths and weaknesses of current technologies and robustness of emerging smart technologies were drawn. Some mature current technologies are doing well but the uptake of some new ones will allow to globally perform better.

## RESOURCES

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