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Towards a Scoring Methodology for Smart Buildings

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Content of this presentation

- Real estate and technology: a revolution with many questions
- Smart cities as the new urban environment of tomorrow's buildings
- Smart buildings: definition and characteristics
- Criteria and approaches for defining a norm/ certification for smart buildings
- Existing scoring methodologies for smart buildings: a selection
  - Honeywell Smart Building Score
  - Smart Readiness Index (European Commission)
  - SPIRE (US Telecommunications Industry Association)
- Beyond Environmental and Social Governance (ESG): towards a code of digital governance for the real estate sector?

Real Estate x Technology: a revolution

- For the first time in its history, the real estate sector is being disrupted by technological innovations:
  - From prehistoric caves to skycrapers: a peaceful evolution,
  - Property Technology (PropTech): US$23.4 bln in 2020.
- Real estate actors' business models are being challenged by new entrants (e.g: WeWork and co-working spaces): '*Property as a Service*' in response to demand for increased flexibility from users.
- Besides, buildings become platforms to digital, which triggers numerous unprecedented questions for the real estate sector.
- As a result, buildings occupants have pressing questions which, if left unanswered, can jeopartise trust in the built environment:
  - Buildings' ability to generate revenues from space is at stake,
  - Should occupants beware of buildings ladden with technology, and more generally the smart built environment (residential buildings, offices, stores, shopping malls, hotels, hospitals…)?

How to establish a norm/ certification for smart buildings?

Who and what?

After many years of relative inertia, a lot of activities in recent months. Many questions have to be addressed at this early stage when we are just starting to develop a norm/ certification for smart buildings.

- **Who should ideally sponsor the norm/ certification?**
  - The real estate industry, for instance through professional organizations,
  - Technology companies which provide tools and solutions used for smart buildings' technological infrastructure,
  - Public authorities (local, national, international),
  - Private companies specialised in norms and certifications for the real estate sector,
  - A consortium of all of the above (real estate companies, technology companies alongside public authorities involved in the built environment).

- **What criteria should be selected?**
  - Criteria linked to technology, e.g. telecommunications and connectivity (*Technological approach*),
  - Criteria linked to buildings' operations and cybersecurity (*Operational approach*),
  - Criteria linked to the environment, for instance by focusing on issues pertaining to energy and sustainability (*Sustainability approach*),
  - Criteria linked to occupants' wellbeing (*Humanist approach*),
  - Criteria linked to financial returns, e.g. by looking at productivity gains in an office building, or increases in sales in a shopping mall (*Financial approach*).

Existing scoring methodologies for smart buildings: a selection

The Honeywell Smart Building Score

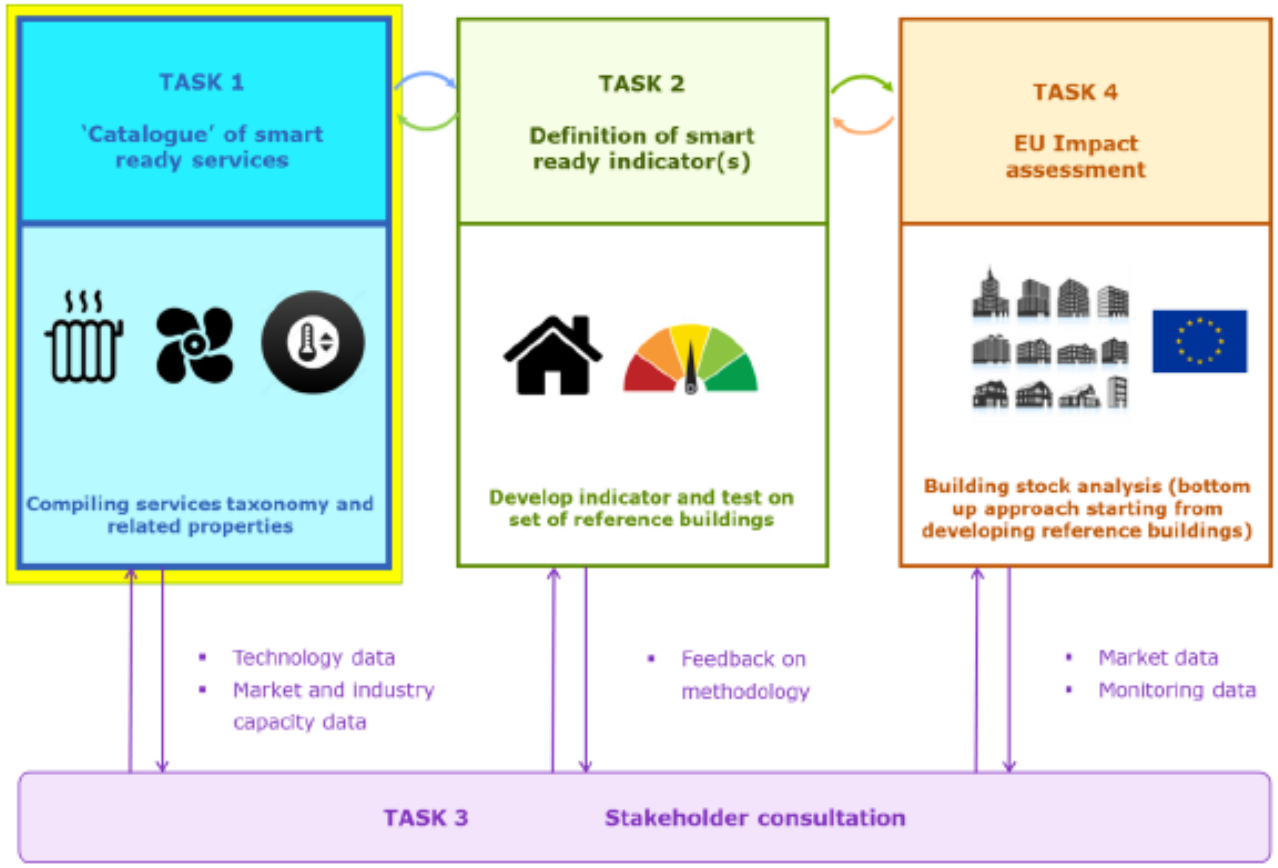
- Framework developed by a technology company provider of smart buildings solutions: online scoring form.
- A mixed approach:
  - Buildings are scored based on three categories: Green, Safe, Productive.
- Overall, 15 elements per building depending on their green, safe and productive outcomes: energy, connectivity, operations (e.g., lighting, surveillance, wireless communications, indoor environment comfort).
- Only active components of a smart building (devices/equipment or software) are considered. Passive components (architectural design, location, building materials) are not included in the score.
- Aims to apply to all stakeholders across continents and countries.

Source: Honeywell and IHS, white paper (2015)

An indicator defined by the European Commission

- In December 2018, the European Commission initiated a consultation in view of establishing an indicator for smart buildings in Europe.
- Initiative supervised by the Directorate-General for Energy in charge of the “Energy Performance of Buildings” policies.
- In September 2020, the final report was publicly released.
- The indicator known as the “Smart Readiness Indicator” (SRI) is focused on a dual approach which is both sustainable and humanist.
- The indicator measures buildings’ technological ability:
  - To interact with their occupants and connected energy grids,
  - And to operate more efficiently.

The Smart Readiness Indicator: a cooperative process



Structure of the project *Smart Readiness Indicator* (European Commission)

The Smart Readiness Indicator: definition

- Three key characteristics:
  - Energy savings and operation,
  - Response to user needs,
  - Energetic flexibility.
- Seven impact criteria:
  - Energy savings on site,
  - Maintenance and fault prediction,
  - Comfort,
  - Convenience,
  - Health and wellbeing,
  - Information to occupants,
  - Energy grid flexibility and storage.

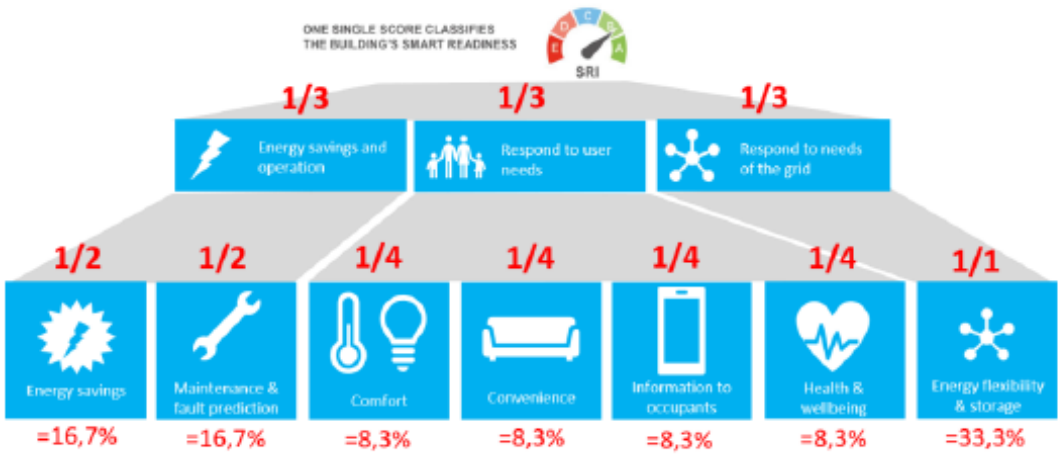


Figure 13 – Aggregation of impact scores to three key functionalities or to a single score

Source: *Smart Readiness Indicator- Final Report* (European Commission, June 2020)

SRI: a customised approach to certification

Input Information	Available Options
Building type	Residential; **non-residential**
Building usage	Single-family house; small multi-family house; large multi-family house; **office**; educational; healthcare; other
Climate zone	Northern Europe; **Southern Europe**; Western Europe; North-Eastern Europe; South-Eastern Europe
Net floor area of the building	<200 m^2; 200–500 m^2; 500–1000 m^2; 1000–10,000 m^2; **10,000–25,000 m^2**; >25,000 m^2
Year of construction	<1960; 1960–1990; 1990–2010; **>2010**; not yet constructed
Building state	**Original**; renovated

Source: Vigna, Pernetti, Pernigotto, Gasparella (2020) Analysis of the Building Smart Readiness Indicator Calculation: A Comparative Case-Study with Two Panels of Experts, *Energies*, 13, 2796.

The SPIRE programme

- Introduced in September 2020, the SPIRE Smart Building Program has been developed by the US Telecommunications Industry Association and a private company in the USA.
- Marketed as the first scoring methodology for smart buildings.
- Six key criteria of a building are included in a holistic approach: life cycle and safety, health and wellbeing, connectivity, energy, cybersecurity, sustainability.
- Allows for buildings' certifications (for payment).

Towards a code of digital governance for the real estate sector?

- A smart building certification should foster a relation of trust between the real estate sector and the public:
  - Real estate is fully dependent on buildings occupants`willingness to physically use space in order to generate revenues (empty buildings?): trust in buildings is crucial.
  - Key point: data collection and analytics require full transparency and safety.
  - Need for a code of digital governance for the real estate sector:
    - Who should spearhead such initiative?
    - What role should public authorities play in defining and applying a code of digital governance?
    - How should such a code be applied in case of international investments?
- Bottom line: to what extent should digital governance provisions lead the real estate sector to reject some (profitable) innovations in the built environment?

Final remarks

"With cyberspace, we have the opportunity to rethink received ideas of what buildings and cities are, how they can be made, and what they are for."

William J. Mitchell

City of Bits (The MIT Press, 1995)

Thank you for your attention!

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