



A Better Way to Build and Commission Smart Buildings

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Agenda



**SMART
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CERTIFICATION**

- The current state of “smart”
- The Smart Building Certification
- Hausmanns Hus - one of the world’s smartest buildings
- Lessons learned & best practices
 - Sustainability
 - Indoor environmental quality
 - Safety
 - Return on Investment
- Final Thoughts

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400 years ago the first smart building was invented by a Dutch inventor by the name of Cornelis Drebbel. It involved a chicken coop that regulated temperature and air flow automatically. The coop was created to increase egg production





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Fast forward 395
years....



The Current State of Smart



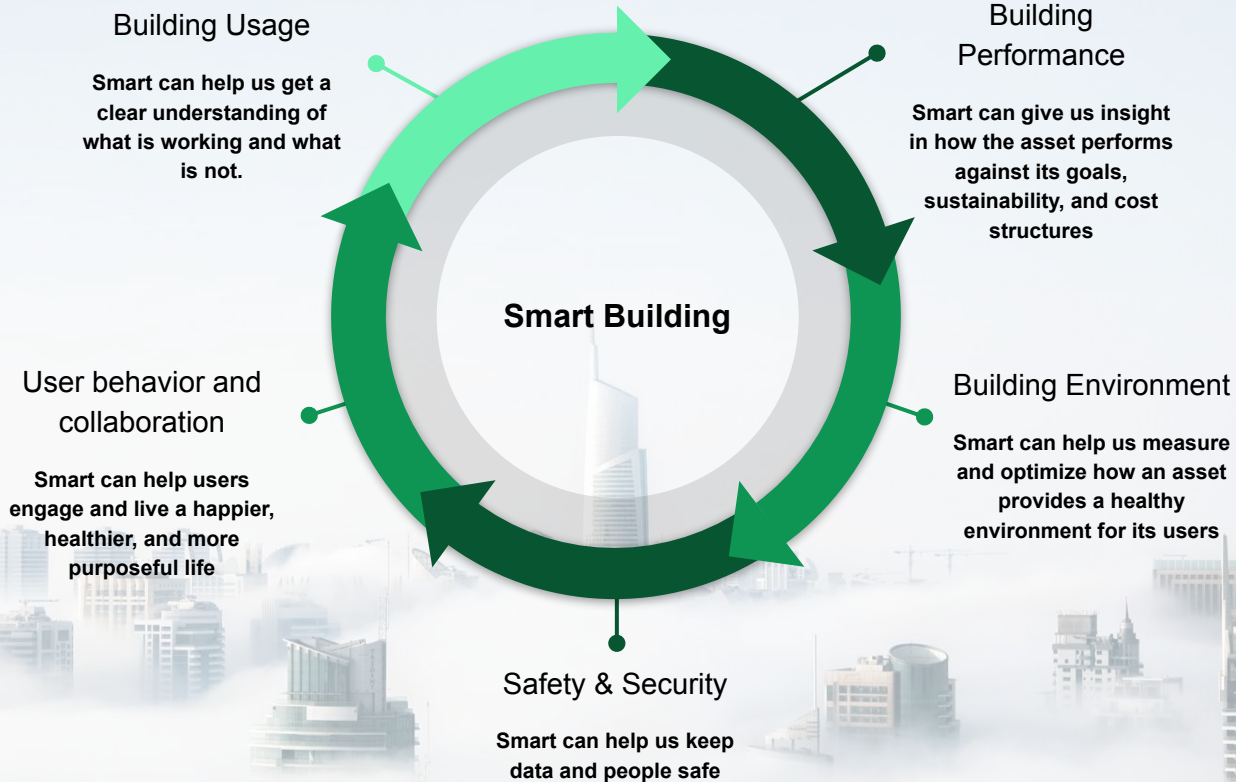
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- What is a smart building and what is it not?
 - It is NOT the technology itself, the wiring of the technology or the potential of the technology
 - *A smart building applies data to drive autonomous controls through an integrated design approach, connecting systems and processes together, to deliver improved health/wellness, human performance, comfort, efficiency, safety, and security.*
- Is “smart” over-used terminology?
 - Everyone is claiming smart, but is it actually true (smart-washing)?

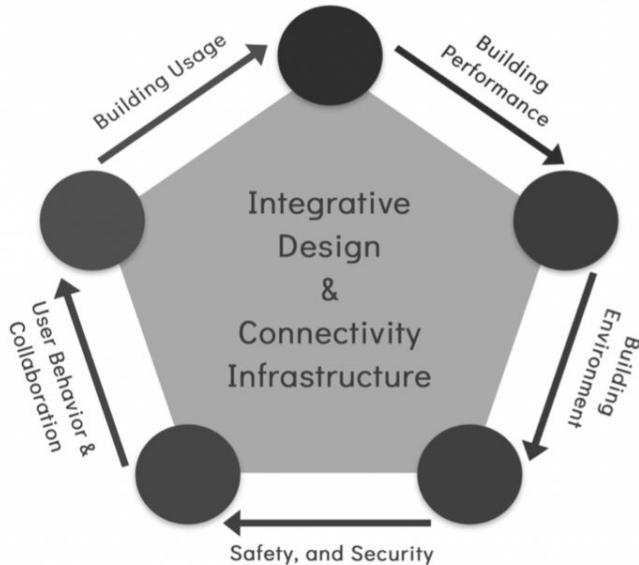
The Smart Building Certification



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Certification Overview- Quantitative Measurements



Building Usage

How people use the building informs the decisions of what space, amenities, and adjustments are required to better serve the needs of the users. If the needs of the user can be more effectively met, improvement to performance and cost base can be more easily realized.

Building Performance

Visibility into a building's ability to perform allows optimization of operations and eliminating unnecessary costs to optimize investment, minimize environmental impact, and improve efficiencies.

Building Environment

The physical environment of the building has never been more important than it is now. Healthy environments and more importantly data proving that environments are healthy will increasingly be required by users, building owners, and even governments.

User Behavior & Collaboration

Smart Buildings are intrinsically connected to their function and the people inside of them. Technology supports maximizing the true value and purpose of the space.

Safety & Security

Technology is the only way we know if buildings are compliant with health and safety standards and truly capable of keeping users safe. Safety is a basic human requirement that all other aspects are built upon.

Connectivity & Infrastructure

Smart building and business continuity is dependent on internet connectivity levels within the building. This section explores connectivity in detail.

Certification Overview- Qualitative Measurements

Governance

Governance models are very specific and contextual to the situation. Assessors will look at governance and assess on the following criteria:

- Leadership involvement
- Process embedment
- Strategy and planning
- Business case and measurement

Integrative Design & Technology Landscape

Smart buildings, smart solutions, and how they are put together varies greatly across the spectrum of real estate. There is no wrong answer, just better ways of doing things. Assessors will look at the technology landscape and assess on the following criteria:

- Complexity
- Ease of use
- Reliability



Outcomes

In the end, it is all about outcomes. What is trying to be achieved with the smart building and is it actually doing that. Assessors will support analysis and recommendations in these areas:

- User experience
- Health and wellbeing
- Sustainability ESG
- Building maintenance and management



Hausmanns Hus - A Truly Smart Building



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- Originally built in 2000
- Undergoing retrofit/renovation; to be completed Q1 2023
- Office building
- One of the smartest buildings in the world (Smart Building Certification level Platinum)

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Business as Usual



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- The “normal” building
- The standard approach to smart
- Hathon’s approach
 - They own all their buildings long-term
 - Goal was to make the building deliver the functions people want/expect while making it easier to manage - wanted it to function properly from the first day
 - Quality & sustainability were the goal and smart was the way there

The Hathon logo, featuring a white horizontal line above the word "Hathon" in a white serif font, all set against a dark green rectangular background.

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Sustainability



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- The “normal” building (Europeans will spend 36 years in the workplace)
- Some of the first smart features of buildings were implemented to improve sustainability (specifically energy efficiency)
- Often there is a gap between energy use in the design and during operation*
- The smartest buildings are also the most sustainable
- No smart buildings we are seeing are ignoring sustainability
- The standard approach to smart
- Hathon’s approach - Sustainability was a given
- Examples from SBC

*Geng et al., 2019



Indoor Environmental Quality



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- The “normal” building (US has highest # of people planning to quit their jobs) WEF
 - Health is a luxury but being pushed by individuals
 - *Weekly average CO2 levels during classes ranged from 1286 to 5546 ppm (median 2776 ppm) while average ventilation rates ranged from 0.8 to 3.6 (median 1.8) litres per second per person**
 - *Children are believed to be more susceptible than adults to the adverse health effects of poor indoor air quality (IAQ) because their higher metabolic demands and higher minute ventilation rates increase their exposures (Bluyssen, 2016; Mendell & Heath, 2005). Children spend approximately 65 to 90% of their time in indoor environments, with a large portion at school**
- Sensor placement is very important
- Systems must be installed properly and regulated
- CO2 is a versatile measurement
- Hausmanns Hus - displaying real-time measurements of air quality informs building users (technology feedback)

<https://www.weforum.org/agenda/2022/08/jobs-work-quit-great-resignation/>

Safety



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- The stigma of safety - who is it for?
- Transparency is important
 - Explain to users what the safety features are for and why they are needed
 - A building that has the feeling of “watching” you instead of benefitting you will not have happy tenants
- Hausmanns Hus - can use security cameras for different purposes (occupancy, security, smart warnings based on data, or actions in the BMS) maximize value while streamlining technology

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The business case behind smart....



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Health

Sustainability

Performance

Overall Efficiencies

Real Estate Value

Real Estate Cost

Real Estate Revenue

Reporting (ESG)

Ease of Certification

What about building users?



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- The “normal” building (what is the why?)
- ROI of smart office buildings (QR code)
 - Benefits to the users (employees) with respect to productivity satisfaction, sick leave, retention, attracting talent
- Hausmanns Hus began with user in mind
 - Satisfied for as long as possible with the space



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Final thoughts



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- Smart is solving a problem or optimizing something, it's not a technology
- Smart and sustainable doesn't have to be new- retrofit
- Not all smart buildings are the same
- The level of smartness can't be captured in a checklist
- Start with the end goal in mind when designing and developing a smart building
- Smart is an ongoing experiment - be a scientist

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We are open to collaboration!

Contact: elizabeth@smartbuildingcertification.com
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Sharing Knowledge

Talk at one of our events

Creating New Knowledge

Work with one of our buildings (i.e.: Hausmanns Hus)

Collaborate on a research project or grant with our collective

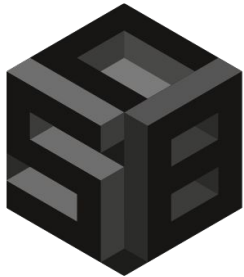


Become a research affiliate



Become a partner

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