A Method for Holistic Evaluation of Sustainable Buildings of the Future


Project description

Interest in quantitative assessment of building performance has increased throughout the last decades with the material and technical development of sustainable buildings. Now, contrasts of a more holistic approach to sustainable buildings begin to emerge and the increasing holistic approach calls for new ways to assess and evaluate our buildings, not solely based on quantitative reviews but particularly based on qualitative reviews. The desired awareness of how we can determine and assess both quantitative and qualitative qualitative aspects of sustainable buildings without distorting the value of either of them.

Research setup

The research project consists in researching, registering, analyzing and comparing seven houses and occupants – through both quantitative and qualitative studies. The quantitative performance is assessed through measurements on the buildings' performance, such as energy consumption. The occupants are compared through measurements on occupants' registered and verbalized experiences and through observations, surveys, interviews, registrations and writing description.

Research hypothesis

Quantitative measurements on sustainable homes can help demonstrate how indoor climate and energy production is positively influenced by sustainable sources, healthy indoor climate and interactions with the surrounding environment.

Research hypothesis

Quality measurements on sustainable homes can help demonstrate that occupants experience benefits of healthier indoor climate and quality of environment through measurement and to discover increasing awareness of their energy performance.

Research hypothesis

Measuring qualitative and quantitative aspects of sustainable homes and their occupants makes it possible to identify what parameters are essential to develop sustainable buildings of the future and design a method for holistic evaluation of these homes.

How can we measure our buildings by their ability to improve our lives?

Research design and methodology

The research project builds on interdisciplinary teams related to developing sustainable buildings of the future. The research design is based on a cross-case design with a cross-company to examine the issues from different perspectives. The strategy is based on an embedded Mixed Methods Research approach (Criswell 2008) that includes both quantitative and qualitative methods.

Case Study Research (the 2008) methodology handles each house as an individual case in a triangulated and multiple case study. Often data-intensive cross-comparisons through overviews and summaries are carried out, as it is possible with mixed methods, in the data extract. The structure is intended to evaluate what parameters it is suitable to choose for the evaluation method.

How can we determine what parameters to evaluate by measuring the performance of occupied experimental sustainable homes?

What is measured? Data and information is a necessity in order to analyze and identify what parameters are central to measure and evaluate. This requires the need for identification of what methods to use for measuring quantitative and qualitative aspects of sustainable buildings. Following the Active House vision measurements will be on energy, indoor climate and environment.

Hypothesis

By compilation of methods from natural science and artistic and humanities disciplines it is possible to design a framework on how to measure quantitative and qualitative qualities in sustainable homes.

Hypothesis

It is important to acknowledge that the measurable is only the measurable, and that the unmeasurable is what they are really fighting to understand, and that the measurable is only the servant of the unmeasurable; that everything that man makes must be fundamentally unmeasurable.

Scientific objective

The scientific objective of the project is to develop a method to use for holistic evaluation of sustainable buildings of the future, this evaluation method to be used to support the development of both technical and poetic aspects of future buildings.

Using LifeTesting in 3 years, seven new experimental residential houses will be erected in five different European countries to examine how the houses perform in real-life situations, with the houses are run with an annual perspective focusing on sustainability and environmental design, high comfort and good indoor climate, while retaining minimal energy consumption. The houses are designed to connect the indoor climate and environment with the use at home and occupant. The intelligent controlling system is placed on the system that can log and extract data on energy consumption and production, analyze, and log efficiently heating and electricity, as well as on the weather and physical and behavioral indoor climate. Manual measurements on daylight can support investigations on the indoor climate and Environment.

Just imagine if the quality of our buildings was measured by their ability to improve life!

“I only wish that the first really worthwhile discovery of science would be that it recognized that the unmeasurable is what they’re really fighting to understand, and that the measurable is only the servant of the unmeasurable; that everything that man makes must be fundamentally unmeasurable.”

– Louis Kahn

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