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Quantifying sustainability in architecture

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Abstract: Sustainability has since the Brundtland report in 1987 been defined as “*a development, which fulfills the existing needs, without compromising the needs of the future generations*” [1]. In relation to this report the concept of sustainability were divided into three main columns: Environmental, Social and Economical, of where they all are weighed equally [1]. The past years the focus upon sustainability has increased worldwide, as sustainability is a broad topic, research in sustainability had to be focused within the different realms of knowledge. In Civil engineering the main focus has been the reduction of fossil based energy consumption for operating indoor climate of buildings. The design processes designated to achieve this was developed and labeled: “Integrated Energy Design” method (IED) [2]. After the development of the IED method the certification systems for sustainable buildings have been developed and are currently occupying major part of the discourse on sustainability in buildings. In 2012 the Danish version of a German sustainability certification system was launched; DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen) [3]. This indicates a shift from the focus of IED to a much broader notion of sustainability in the building industry. The central research question here is how to broaden the span of sustainability issues in the building industry, without losing the quantification manifest in IED. IED had a main focus on the early design phases, as many crucial decisions are made here and thereby will have a large influence upon the final building [2]. Another research question is how the focus on the early design phases can be expanded to integrate quantification at all levels of the design process. This last mentioned research question is closely related to the ideas behind BIM (Building Information Modeling).

The purpose of this study is to quantify sustainability in architecture by using the known sustainability parameters from the DGNB DK and thereby improving the design process towards more measurable sustainability in architecture and still maintain excellence in architectural quality. The method of this study will be based on a mapping of the IED method and the DGNB criteria's. Hereby it will be possible to compare and see how the two methods are connected and get an initial idea of how the design process will change when using DGNB's criteria as framing for the design process.

References:

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