Future Facades of Healthcare Buildings: A User-Centered Approach

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Introduction: From Separation and Protection to Environmental Adaptability and Beyond

Facade design is closely related to ever-increasing human activities and corresponding needs as well as available technology. The development from massive exterior walls to lightweight, skeleton facade structures can be depicted in the light of increasing functionalities; starting from the primary human need for protection from harsh exterior conditions to increasing control over interior conditions regarding climate, acoustics as well as daylighting and views (Fig. 1).

As for today, besides all aesthetic architectural considerations, facade design is still substantially based on this primal need for shelter and therefore optimized according to external loads. Conceptual, technical and constructive developments in the field of adaptive facade design reflect this notion. While the performance of adaptive facades is no longer static over time, their dynamic adaptability is still triggered by loads occurring in the exterior environment (e.g. solar shading adaptability).

Fig. 1: Façade functionalities (Knaack, Klein, Bilow, & Auer, 2014)
However, with megatrends of global significance, longevity and high probability, such as “Global aging and Demographic Change”, “Individualization”, “Convergent Technologies”, as well as the ubiquitous shift towards a digital age across all industries, facades that are merely adaptable to environmental triggers do not fully exploit the existing conceptual and technological potential to support the user and increase global comfort within the built environment. This discrepancy is of particular significance within the built environment of (rehabilitation) hospitals.

**Research Question: User Specification and Standardized Individualisation**

Given the background of disruptive technological advancements, changing social needs, and the necessity of supportive healthcare environments, this research project raises the question how the existing functional scope of a façade can sophisticatedly be complemented to increase global comfort in terms of physical, functional and psychological comfort (Vischer, 2008) of various user groups within buildings of rehabilitation centres and hospitals? Triggered by the predominance of “individualized standardization” in our everyday life, such as e.g. in the case of smartphone applications (Fig. 2), the thesis’ underlying hypothesis states that future facades need to be adaptive – adaptability not only to environmental factors, but more particularly to the user(s).

Conceptual façade design must be conceived from within the building and attuned to the user; taking into account temporally, occupationally and personally differing user(s) needs and diverse abilities. From a visionary point of view: Future facades support the user’s tasks within the building’s interior by providing an enhanced and refined functional scope as well as design features that concurrently meet usage- as well as user-specifications.

**Research Objective: Performance Specification for Product Development**

As input for subsequent industrial product development of future facades, the research’s objective is to compile usage- as well as user-driven performance specifications for healthcare buildings and their translation into future façade functionalities and/or design features. Within the compilation, (sub-)distinctions between characteristic user groups as well as functional areas of rehabilitation centres and hospitals are made.

**Method: Grounded Theory and Design Thinking**

While the derivation of new functionalities can be triggered by technology or design approaches (e.g. universal design), the thesis’ underlying hypothesis plans for functionalities to originate from user needs and follows “Design thinking” as a user-centric design process. Following the methodology of grounded theory (precise application Strauss and Corbin) (Hunter & Kelly, 2008), the development of user-centered functionalities is based upon triangulation using data gathered through case studies and observations, interviews as well existing literature.

**References**


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