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Fast and simple – Cost efficient façade refurbishment

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Abstract

Energy performance improvements in existing buildings are the next step towards energy efficiency according to the EU directives. Especially buildings built in the sixties or the seventies, before the energy crises, provide potential for improvements. The facades of these buildings are often in a need of a refurbishment. One major issue is that these buildings must be refurbished at low cost, not to increase the rents too much. The refurbishment process should be conducted with limited disturbance of the tenants. Existing façade renovation methods can be improved to decrease inefficiency and risk for contractors. The business situation is unclear, due to unclear means for refurbishment. One aspect of this problem is that there is a need for new business models. This paper studies the market and process optimization and proposals for information management aspects considering the need for developed business models in refurbishment. The study is part of a larger project about façade renovations with prefabricated wooden elements. The main contribution in this paper is to propose a new business model with standardized products, logistics and project management, discussing different aspects of efficient business models. There is a need for clear distribution of risks for the business partners and a clarification of potential co-benefits. Basically we propose a contract model with a contractor taking the full responsibility towards the client, including the detailed refurbishment design and project management.

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1. A fast and simple need is found

Improvements in energy performance in existing buildings are the next step and the more complicated step on the roadmap towards energy efficiency according to the EU directive. Especially buildings erected in the seventies, before the energy crises, provide a massive potential for improvements in energy performance. The facades of these buildings are often need a face-lift. Building and renovation of sustainable cities and communities with attractive living environments is a global challenge and requires a holistic approach in urban planning based on resource management, good architecture and technical innovation. Refurbishment and especially the need for improved energy efficiency tend to push the limits of the economy of both housing companies and tenants and in less attractive areas even making a refurbishment impossible.

The wood based prefab industries are well established but are mostly SMEs and don't have the resources to develop new innovative products and larger business concepts. This is generic for the Nordic countries and in most of Europe. There have been joint European research projects where technical requirements and methods for renovation of facades have been studied and developed and major refurbishment programs in all Nordic countries [17, 4]. In other words, there are a lot of results and solutions but industrially manufactured building components have not yet entered into the market. Some of the reasons for this are found in the absence of business concepts, in the lack of an overview of customs and regulation requirements and due to the fact that the chain of actors for renovation in the Nordic- and European market is obscure and based on historical traditions for refurbishment projects.

Today, renovation, upgrading and extension (added floors) are often conducted in the form of on-site construction. One major problem is that these buildings must be refurbished at low cost, in order not to increase the rents too much. Mostly the refurbishment process must also be conducted with limited disturbance to the users/tenants. Existing façade renovation methods seem inefficient and the risks are too high for the contractors, making it difficult for the clients to find tenderers. The business situation is too unclear to open up this market, due to lack of lean methods for refurbishment projects. The challenge in this project is to unite technical knowledge, business and entrepreneurship into cost-efficient and sustainable building envelope solutions and construction processes.

1.1. Objective and Limitations

The main interest in this work is to compare existing models in the Nordic countries, Sweden, Norway and Finland and present a useful business model for the Nordic area. We thus propose a new business model with standardized products, logistics and project management. There is a need for clear risk sharing model for the business partners and a clarification of potential co-benefits. Soikkeli et al. [17] propose a contract model with a contractor taking the total responsibility towards the client, including the detailed refurbishment design and project management as a means to ensure that cost and quality goals can be met.

2. The construction market and business models

Major parts of the construction process are project-based and characterized by one-of-a-kind setups [19]. The construction process has been described as a project-base industry whose unique characteristics come from the production set-up, site and temporary organizations [6]. The construction process is characterized by multiple process steps including multiple actors in different parts of the system. Construction projects are often complex and include multiple actors, and therefore the communication in the process is extensive and complex [3]. The main reason for communication in the traditional construction process is coordination of efforts and implementation of time planning. Communication focuses on concrete questions of a problem-solving character and with a short-term focus. Other significant reasons for communication are to transfer information and documentation, often to inform other actors about changes, mistakes and delays. The information flow in the building process is fragmented because the building process is fragmented. The communication process suffers because information does not flow easily between the different actors. The process has been criticized, at least in Sweden, for insufficiently durable housing production at too high a cost.

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