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## Securing the Flow of Information in Renovation Projects

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### Abstract

Continuous flow of information is a paramount importance for the success of a renovation project. This has been a clear statement in several researches, clearances, publications and press releases in Finland. Tampere University of Technology (TUT) studied Finnish state supported mold renovations in three independent researches between 2010 and 2016. First one brought out that the observations made in the condition investigation weren't always taken into account in the implementation of the renovation. Next two researches focused to study the additional state grant processes, where the external review procedures were helping the flow of information. However, the processes still had some shortcomings and therefore the research team developed a form based method that property owners and builders can utilize for a successful removal of the indoor air problems. This paper describes the outlines of the form as well as the principles and methods for securing the flow of information from condition investigations to the renovation design and quality assurance of the building project. Project planning and monitoring measurements are also taken into account in the method.

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### 1. Introduction

This paper introduces a method that aims to secure the success of a renovation project. The method relies on a form, which was developed in the latest research that studied the Finnish state supported mold renovations. Research was a follow-up for the studies that Tampere University of Technology (TUT) had begun in 2010, thus in total the method is based on five years experiences about the state supported renovation projects. Fundamental ideas of the

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method is to make sure that the condition investigations are carried out thoroughly and the renovation design takes into account all the defects that are found out in the investigations.

The next section introduces a brief background of the paper and the third section describes the research projects behind the form based method. In the third section the findings and conclusions from the researches brings forward the reasons for developing a new form that is introduced in the fourth section. The paper describes the essence of the form and focuses to the principles of the method, but the examples are better shown in the presentation at the conference. The fifth section discusses about the method and the last section concludes and summarizes the paper.

## **2. Background**

Many buildings in Finland have issues with indoor air quality (IAQ). Previous studies have brought out that many renovations have failed to remove indoor air problems or the outcome of the renovation had been poor otherwise<sup>1,2</sup> (Kero 2011, Haverinen 2008). Building stock forms a significant part of the Finnish national property, almost half of it, and the continuation of the indoor air problems, i.e. constant need for repairs can cumulate significant expenses in the national scale. The overall need for the repairs in Finnish building stock has been rising during the last decades. It is estimated that the neglects of proper maintenance and timely repairs has cumulated 25 billion euros expense in Finland during the last couple of decades. Prolonged indoor air problems can also cause serious health issues and over stress the Finnish health care.

Every unsuccessful renovation is waste of resources and economically unsustainable. Therefore, the Finnish Government required quality assurance procedures with the terms and conditions of the additional state grants that were handed out from the supplementary budgets of 2012 and 2013. Meaning of the measures was to secure successful outcomes in removing the indoor air problems of the buildings and also to help Regional State Administrative Agencies in allocation of the grants.

## **3. Research behind the method**

Tampere University of Technology (TUT) studied the benefits and impact of the additional state grant procedures in two individual research parts. The first part<sup>3</sup> in 2012 and 2013 studied the process for the supplementary allowance of 2012 and the follow-up research<sup>4</sup> studied the process for the supplementary allowance of late 2013, but the allocation process took place in 2014 and the research ended at the end of 2015. Both additional state grant procedures leaned on different types of external reviews by experts. In the first additional state grant procedure, for the supplementary allowance of 2012, the external evaluation procedure was carried out by 4 person group of experts, which was too laborious process for over 150 applications. In the second additional allowance process the applicants acquired experts' opinions them self. The results and methods of the second research part are presented in the next subsections. Both allowance processes had a positive impact to the quality of the renovations, but the future development was still needed.

### *3.1. Research methods and data*

The form was developed in workshops by the research group in late 2015 at the end of the follow-up research about the state supported mold renovations. The research studied the state grant allocation process of 2014 mainly by analyzing the experts' opinions. The objective in the research was to gather data from a significantly large sample. More than 200 municipalities were asked to send data from their projects and 130 projects was listed in the database with some documents provided. All of them didn't provide enough documents for the analysis, but more than 100 expert opinions were analyzed. Especially the experts' reports were analyzed with a numeric scale. Criteria for the evaluating were based on the terms and conditions of application, which were set by the Finnish Government with the regulation. Scale was carefully selected for every individual aspect of evaluation.

Also questionnaires were carried out in the research about the state grant process of 2014. Short questionnaire, with a possibility to open answers, was send to all the Regional State Administrative Agencies that were handling the state grant applications. Applications were processed in nine different offices and the questionnaire got six responses. Geologically the responses were divided between every administrative region of Finland. Three

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