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ScienceDirect

Procedia - Social and Behavioral Sciences 226 (2016) 100 – 107

Procedia Social and Behavioral Sciences

29th World Congress International Project Management Association (IPMA) 2015, IPMA WC 2015, 28-30 September – 1 October 2015, Westin Playa Bonita, Panama

Main challenges found in the handover of a shopping centre in Norway

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Abstract

There seems to be a common understanding that the Norwegian construction industry faces challenges concerning the presence of delays and defects in the handover process. However, little research has been found regarding countermeasures to avoid these problems. This paper forms a part of a research project on handover processes in Norwegian construction projects, initiated by the municipality of Trondheim. It is supposed to work as a pilot study for further research, and examines: 1) Consequences of delays and defects, 2) the causes of them and 3) potential countermeasures that can be implemented.

The case studied was the expansion of a shopping centre in Norway, a complex project, both structurally and organisationally. In addition to a literature review and a documentation study, nine semi-structured in-depth interviews were conducted. All of the interviews were case-specific, with client, contractor and user representatives respectively.

The consequences of delays and defects were severe and resulted in additional costs, lower quality on the final product and psychological strain for the involved actors. Short construction period, diffuse contractual relationships, lack of quality assurance and a high degree of alteration work are found to constitute the most crucial causes. On the basis of the observed challenges different countermeasures are suggested. Building commissioning, realistic project plans, control on deliveries and independent control are recommended as countermeasures.

The findings indicate a great potential for improvement by keeping the control throughout the whole project. Further experiments are needed to substantiate the recommendations of this paper.

Peer-review under responsibility of the organizing committee of IPMA WC 2015.

Keywords: Handover process;construction management;commissioning;challenges;countermeasures.

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Peer-review under responsibility of the organizing committee of IPMA WC 2015.
doi:10.1016/j.sbspro.2016.06.167

1. Introduction

The construction of contemporary shopping centre projects is typically characterised by being unique and highly complex. The construction itself is challenging because of scale, technical complexity and stringent demands from the authorities. The picture becomes further complicated by there being several parties to the contract: The client, the contractor and tenants. Additionally, a great number of actors are involved in the process, some working for the contractor and others for the tenants. Lastly, the building is highly complex in use and the user group varies from employees to customers and operation and maintenance personnel. Together, this makes it challenging to organise, plan and execute such a project.

This paper reports on experiences from the expansion of a shopping centre in Norway. This case was chosen mainly on the basis of the complexity the project represented. Three consecutive steps constitute the project: 1) A new construction containing shops (18 000 m^2), 2) a new construction in the shape of a parking structure (20 000 m^2) and 3) a refurbishment of existing construction from a parking structure to a shopping area (6000 m^2). The third step equally included a jointure of new and old building structures. The contract type was design-build and the existing part of the shopping centre was open during the construction period. The duration of the project was 2,5 years. The different tenants (shops) took over their premises from four to six weeks before the grand opening.

The findings of this study indicate that the handover process is a process where several problems appear, especially in the form of delays and defects. Used in this paper, the term handover process includes quality assurance, testing, commissioning, signing and the actual handover of the construction and its documentation.

Even though the consequences of a failed handover process often prove severe, this seems to be a little scrutinised part in contemporary construction project research. The literature study initiating this study revealed in fact that handovers in general, and the handover of shopping centres in particular, seem to be surprisingly little analysed. The authors of this paper find this surprising. Much of the literature support the fact that delays and defects is a problem, but the research on causes and countermeasures seems insufficient.

This paper reports on the handover of one specific case study and analyses the challenges involved in this process. Further, it identifies different countermeasures that can be implemented to improve the handover process.

The analysis is structured according to the following research questions:

1. What are the consequences of delays and defects?
2. What are the causes of delays and defects?
3. What countermeasures can be implemented to improve the handover?

2. Theoretical Framework

The standard “NS 8407.E:2011 General conditions of contract for design and build contracts” regulates design and build contracts in Norway. NS 8407 governs contractual relations where one of the parties (the design and build contractor) is responsible for all, or substantial parts, of the design and execution of the construction (Standard Norge, 2011). The risk and responsibility for the design and execution of the construction is transferred from the client to the contractor (Lædre, 2009). This includes coordination of subcontractors and progress planning. An essential document in the context of design and build contracts is the client’s project requirements. The client is responsible for preparations of the requirements, while the contractor must deliver the construction in accordance with these requirements and the design-build contract. Typically, the requirement document contains the client’s paramount requirements, together with a space- and functional program (Xia et al., 2011; DIFI, 2014). The contractor is free to decide the types of material, handiwork and technical solutions as long as they are in accordance with the contract and the requirements. The client is entitled to carry out inspections to ensure that the work is in compliance with the contract.

Chapter 37 from “NS 8407.E:2011 General conditions of contract for design and build contracts” standardises the practice regarding handovers of design and build contracts. This standard forms the basis of the majority of Norwegian construction projects. According to chapter 37, both the contractor and the client are obliged to attend