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Research Article

Early Stakeholder Involvement in the Project Definition Phase: Case Renovation

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Relational project delivery methods (RPDMs) have been widely offered as a solution to increasing holistic project value creation. Furthermore, early stakeholder involvement has been emphasized as one of the cornerstones of RPDM. The purpose of this paper is to examine who the stakeholders are that should be involved early in the project definition phase. This paper discusses the process and nature of the project definition phase in RPDM, with the main focus on early stakeholder involvement. The results are derived from the analysis of the literature and an empirical study (interviews). The stakeholders, their roles in the renovation project, and at which stage they should each be involved in the project definition process are determined. The findings show that projects cover different levels of stakeholders, whose requirements and purposes must be considered and managed. Early involvement allows room for creative solutions and the intensive exchange of ideas. Thus, it leads to procedures that run in phases, which in turn change the project's value creation to holistic value cocreation. This article facilitates and contributes to early stakeholder involvement and the creation of integrated teams by identifying and consolidating the different levels, roles, responsibilities, and objectives of the stakeholders.

1. Introduction

Traditionally, construction projects start from the premise that the customers know what they want and what they need. Value creation is, however, more than implementing an extensive set of features. Customers do not seek products or services in themselves, they want solutions that support their processes and create value when used [1]. Therefore, during the project definition phase, the task of project management today is to challenge the customer's self-understanding about the project's objectives, reveal conflicts between the customer and the other stakeholders, and confront the customer's desires by exploring alternatives that were not previously considered [2]. Consequently, new approaches help to expose the customer to alternative means of accomplishing their purposes beyond those they have previously considered and help the customers understand the consequences of their desires [3]. Moreover, early stakeholder involvement enables projects to utilize the knowledge base of the stakeholders [4].

Relational multiparty contracting and methods have been widely offered as a solution to increasing value creation, not only for the customer but for the other project stakeholders as well. In addition, it has been noted that creating integrated project teams has had a positive impact on project outcomes [5, 6]. In recent years, there has been growing interest in applying relational multi-party contracting to construction projects. In particular, firms in the renovation sector have expressed much interest, because the number of such projects is increasing significantly, but unsettled and fragmented modus operandi increases the risks of budget and schedule overruns, plus low productivity and low customer value.

However, relational contracting has mostly been used in big projects, where the budgets have often been tens, even hundreds, of millions of dollars, while the budgets in typical renovation projects are only a couple of million dollars. Consequently, the procedures of relational contracting are somewhat unfamiliar to many organizations in the construction industry. However, it has already been emphasized that early stakeholder involvement during the project definition phase is one of the cornerstones of value creation [7]. Overall, there is a lack of research about who the involved stakeholders should be and why they should be involved [2, 8]. It is also

vital that the number of key stakeholders is manageable, since complexity increases along with the number of stakeholders.

This paper employs content analysis to introduce the process of the project definition phase in relational contracting. The main objective is to examine who the key stakeholders are that should be involved in the project definition phase in order to maximize value creation by identifying the different roles, liabilities, and objectives of the project stakeholders, especially the major ones. In order to achieve this objective, the following research questions (RQs) must be answered.

RQ1: How does early stakeholder involvement affect value creation?

RQ2: What are the stages in the project definition phase?

RQ3: Who are the stakeholders that should be integrated into the project definition phase?

The paper is structured as follows (Figure 1). In order to increase our understanding, we start with a literature review of relevant research, which has two main objectives: to bring out the challenges of value creation in traditional fragmented project delivery methods and to point out how value creation changes when the stakeholders are involved as early as possible. This is followed by an introduction to the project definition process in relational contracting, in order to concretize the content of the project definition process by dividing it into separate stages. A case study was conducted of a renovation project where the project stakeholders were mapped through snowball sampling. Then, the stakeholders were interviewed in order to reveal their roles in the renovation project and to determine which stage each should be involved in during the project definition phase. The last part of this paper contains a discussion, proposes managerial implications, and critically evaluates the study.

2. Early Stakeholder Involvement and the Project Definition Process in Relational Contracting

At the moment, an "over-the-wall" practice prevails in the industry. In such a practice, the plans are given to the next designer or "customer" in the process until the plans are ready. Because no one seeks to support each other, this practice leads to suboptimization, where the stakeholders just strive for optimizing their own performance [9]. Furthermore, there is a tendency to rush into the details of the design without a proper understanding of the premises.

Relational multi-party contracting challenges the traditional system by contrasting the customers' purpose and what they want against the means (how is it done) and constraints (e.g., money, regulations, and time). Consequently, this new approach helps expose the customer to alternative means of accomplishing their purposes beyond those they have previously considered and helps the customers understand the consequences of their desires [3, 4]. Figure 2 summarizes the differences between traditional project delivery and relational project delivery methods.

Probably, the most well-known relational project delivery methods are project alliancing and integrated project delivery (IPD). Project alliancing is a procurement model of major capital asset delivery where the customer and nonowner stakeholders work together as an integrated, collaborative team in good faith, acting with integrity and making unanimous, best-for-the-project decisions, managing all project delivery risks jointly and sharing the outcome of the project [5, 10].

IPD is a project delivery method distinguished by a contractual agreement between the owner, design professional, and builder, at a minimum, where risk and reward are shared, and stakeholder success is dependent on project success [6, 11]. The method integrates people, systems, business structures, and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction [12]. The previous definitions are examples among several definitions, but they put across the collaborative nature of the models and the involvement of the project stakeholders. Later in this paper, we use the term "relational project delivery method (RPDM)" to illustrate these new relational-based approaches.

2.1. The Value of Early Stakeholder Involvement. The possibilities of influencing project success are seen to be best during the early project stages, because decisions made early reduce unnecessary changes during later development stages and even the total life-cycle costs [13, 14]. According to several studies [15, 16], early stakeholder involvement yields at least the following benefits.

(i) Early involvement leads to a lower likelihood of developing poor designs.

(ii) Early involvement in the design stage leads to a higher likelihood of a more effective design, improved construction operations, and less scrap.

(iii) Early knowledge about the end-users leads to higher customer satisfaction regarding the product's function and usage.

(iv) The more the stakeholders know about the customers' or end users' actual usage of the products, the more efficient the stakeholders' operations are in terms of meeting the buyer's needs and purposes.

(v) The more the stakeholders know about the exact objectives of the design specifications, the more the stakeholders are able to meet or revise those specifications by adjusting their capabilities.

(vi) Early involvement allows room for creative solutions and the intensive exchange of ideas.

(vii) Early involvement leads to procedures that are synchronized and run in phases.

There are few examples of applying early stakeholder involvement to construction projects, whereas in the manufacturing industry, the different aspects of the stakeholders of

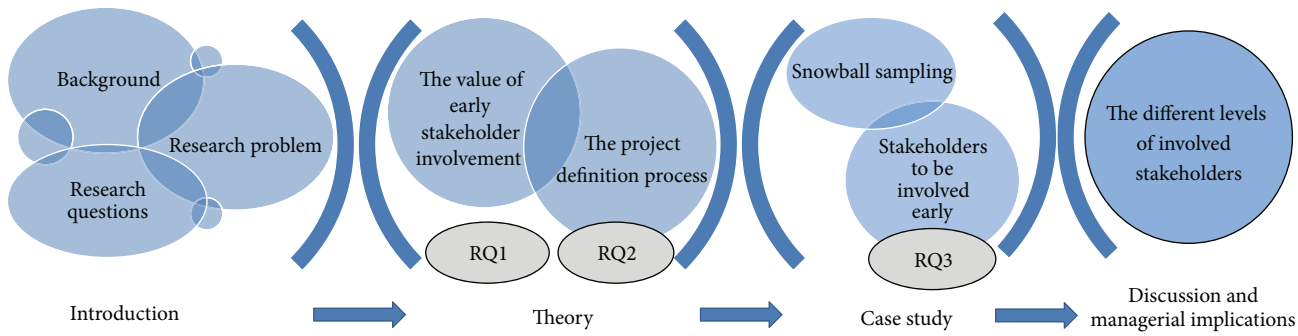

Figure 1: The structure of this paper.

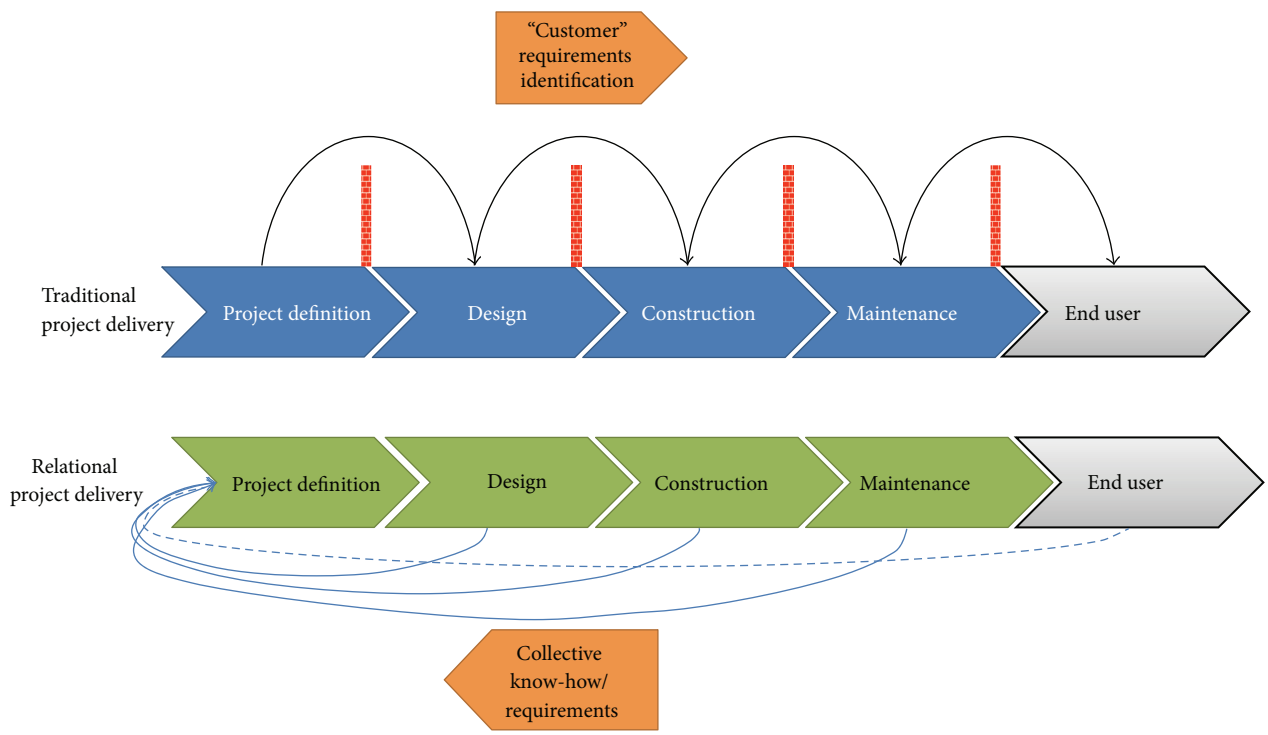

Figure 2: The ideological difference between traditional and relational project delivery.

early product development have been addressed by utilizing the Design for X (DfX) methodology. DfX is a structured approach to systematically addressing early product development, functional integration, and enabling capability creation. In DfX, the X stands for an aspect or a stakeholder under consideration, such as manufacturing, environment, maintenance, supply chain, and cost. [13, 14, 17]. Basically, the same Xs exist in the construction industry as well, but the names can be different. Therefore, the DfX analogy remains the same, and it is essential to take stakeholders and their opinions into account in the construction industry, just like in product development.

2.2. Project Definition Phase in RPDM. The problems in construction are confronted especially during the project definition phase, which defines the project's purposes to meet the stakeholders' and project's needs. The project definition answers the question "what," and the process contains three stages: determining project purposes, translating those purposes into criteria for assessing alternative designs or solutions, and generating alternative design concepts [18]. This research concentrates on the first stage.

The project definition phase process in RPDM is a multistage process, with seven separate stages: (1) feasibility, (2) initiation, (3) procurement strategy, (4) request for proposals, (5) evaluation and selection of suppliers, (6) negotiating an agreement, and (7) finalizing the agreement. The process is illustrated in Figure 3. This process complies with the theory and project definition process that are familiar from the IPD and project alliancing methods.

The project definition phase contains two major phases; the first five stages form the first phase and the last two stages form the second one. The first phase is primarily managed

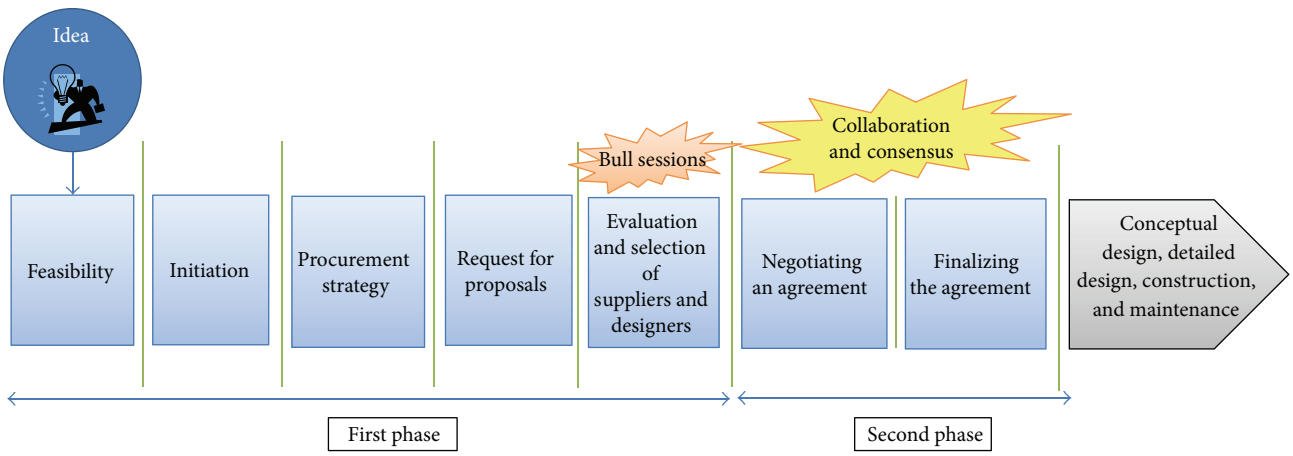

Figure 3: An overview of the RPDM project definition process.

and steered by the customer, while the second phase is performed along with the other selected project stakeholders, such as the designers and contractors. Although the phases are steered by the customer and the major stakeholders, there are many other stakeholders that should be involved in the different phases of the project's definition.

2.2.1. Idea and Project Feasibility. The feasibility study is the beginning of the project, and it examines if the project is applicable and feasible for the customers. At this stage, the idea for the project is explored and elaborated, in order to find out the nature and scale as accurately as possible. The customer should, in addition, evaluate if the nature and possible execution of the project are familiar to them and to the suppliers, or if they are exceptionally complex with a lot of uncertain issues. If the nature of the project seems to be familiar in every way, it will probably be easier and more natural to use traditional project delivery methods instead of RPDM.

On the other hand, if the customer finds that the project will be special and multidimensional in some way, which would most likely require the deep involvement of multiple stakeholders and the utilization of their competence as a means of maximizing value creation, then using RPDM is recommended. At this point, the customers should write down their own purposes and objectives for the RPDM project, such as: the ultimate purpose of the project, the kind of benefits that using RPDM is expected to achieve, and the constraints that need to be taken into account. In addition to the customer's purposes, RPDM's general purposes are [19, 20]

(i) to increase collaboration between the stakeholders, especially between the customer and the design and construction teams;

(ii) to make the plans for the different project phases within the integrated team;

(iii) to manage the project as networks of commitments;

(iv) to optimize the end result, not the pieces;

(v) to focus on continuous improvement by linking learning into every action.

2.2.2. Initiation. The initiation stage concentrates on evaluating the project's feasibility from the perspective of the different stakeholders. Therefore, it is crucial that the customer identifies and analyzes the possible project stakeholders who can have a positive impact on the project's value creation and who can bring some special competencies to the project. Naturally, those who can impose constraints must be identified as well.

Usually, RPDM projects contain lots of contingencies compared with traditional projects. Decisions are made concerning who is going to carry out the project, who the stakeholders to be involved are, and whether the project has an adequate base of support among those who are involved. In addition, questions are asked about the positions, interests, influence, interrelations, networks, and other characteristics of the stakeholders, with reference to their past and present positions but also their future potential [21, 22].

In the initiation stage, the project stakeholders enter a temporary relationship with each other, and thus, it is extremely important for all stakeholders to emphasize the effort and engagement required for successful project completion. Typically, in the initiation stage, misunderstandings arise because the involved stakeholders have different expectations and alternatives. However, it is important to work out these disputes in order to avoid complications later in the project.

2.2.3. Procurement Strategy. The axiom of RPDM is that suppliers are mainly evaluated and selected according to their capabilities and "RPDM competence." In other words, the aim is not to find the cheapest option, but the most economically advantageous one, and therefore, the selection criteria emphasize softer factors than just hard cash.

The selection process and evaluation criteria are adjusted to suit the particular circumstances for each project. Nearly always, the evaluation criterion is a combination of capability and price, where capability plays a bigger role than price

(i.e., 75% versus 25%). The capability of a company can be evaluated in several areas, for example [23], their

(i) financial capacity;

(ii) legal obligations;

(iii) sector and RPDM competence;

(iv) technical capability;

(v) references;

(vi) organizational and project management procedures.

Another important issue of the procurement strategy is to make a decision in principle about the agreement types and tendering. This decision must be made because it affects how tendering is managed and what it encompasses. Tendering can be handled in two ways: partner organizations can be invited separately to tender or the proponents can be asked to form a consortium, which includes the most critical stakeholders for the project's execution.

There are also two different ways to make an agreement: bilateral or multi-party. A bilateral agreement means that the developer makes separate agreements with the general contractor and the main designer (architect). A multi-party agreement is a single agreement that is signed by both the general contractor and the main designer. The latter is more typical and recommended because a multi-party agreement is less prone to inconsistency. Moreover, the process of negotiating an agreement jointly deepens each party's understanding about the other's interests and increases the commitment to jointly defined goals [20, 24].

Due to the diverse nature of RPDM projects, it is very typical that the proponents form a consortium that can take care of the whole project. Thus, it is in the customer's interest to give the industry as much information as possible about their intention to use RPDM, because then the proponents can start identifying and building their team before the customer issues the request for proposals. For example, the information can contain estimates of the project scale, scope, and timeframe [10].

2.2.4. Request for Proposals. The development of the request for proposals (RFP) starts with establishing a selection panel; the ideal number is between three and six people, depending on the size of the project. Usually, the panel members are prospective members of the customer's RPDM team, because they are likely to be more interested in the project and to get to know the people they are likely to be working with. To ensure objectiveness, typically, the customer appoints an external advisor as a member of the panel.

In addition, the panel must confirm the previously outlined selection and evaluation process and the criteria to be announced in the RFP. Naturally, the criteria must be aligned with the project objectives in order to get suitable proposals [10].

2.2.5. Evaluation and Selection of Suppliers and Designers. In traditional project delivery methods, the proponent selection process is usually based on the written submissions only. In RPDM projects, the evaluation of the tender is just the first step. Once the submissions have been received and evaluated, the selection panel decides on a few proponents to invite to the next round, which is usually carried out by interviews or workshops. It is also possible for both to be arranged, with only the best proponents proceeding to the workshops.

The main purpose of the selection interviews is to offer the selection panel an opportunity to meet the proponents, and hence, the panel gets better understanding about them. At the same time, the panel has a chance to assess the proponents against the criteria more accurately, and thus, the ambience of the interviews should encourage an open discussion. If the customer has also decided to have the workshops, the panel usually selects the two highest ranked proponents to attend them [10].

The basic idea behind the selection workshop is the same as with the interviews: to bring the customer and proponents together. However, the workshops are conducted on the assumption that the participants will eventually deliver the project and form an integrated project team. Basically, the project has already started during this workshop, and therefore, the workshop's main objective is, in effect, to identify the proponent team with the greatest potential [10, 24].

2.2.6. Negotiating an Agreement. Once the preferred proponent has been selected, the customer and proponent start negotiating an agreement. However, the negotiations are not about the agreement's language, but about finding the alignment of the stakeholders' (proponents') interests. Therefore, finding common interests is the first step in collaborative negotiation. The exchange of the agreement's language comes second. If the agreement's language is exchanged first, it can divert attention away from the project's fundamental issues [10, 24].

The negotiation process contains two sections. It begins with defining what outcomes and objectives the stakeholders want to achieve and any constraints lying behind those objectives. Then, the processes and rules needed to achieve those objectives must be determined. The processes may include building information modeling (BIM) and lean tools, such as Big Room, Last Planner, set-based design, standardized work, and target value design [11, 24]. The common rules are

(i) speak freely and express your thoughts,

(ii) listen to other people and respect their opinions,

(iii) encourage towards innovativeness,

(iv) commend when deserved,

(v) challenge yourself and others,

(vi) accept the consequences of your actions.

2.2.7. Finalizing the Agreement. The agreement structure is tightly bonded to the project objectives [24], which are concretized through a commercial framework and terms. The commercial framework culminates in the target cost estimate and risk/reward share arrangements. Typically, the customer bears 50% of the risk/reward, and the other 50% is

distributed among the other formal stakeholders (contractors and designers) [20]. The common terms in RPDMs are [11, 20, 24]

(i) the team has a mutual focus and objectives; everyone wins or loses together;

(ii) collective responsibility for performance; pain/gain sharing;

(iii) decisions are made "best for the project";

(iv) a "no-blame" culture; reduced liability exposure;

(v) open-book accounting and transactions;

(vi) joint project control.

Despite the type of the agreement (bilateral or multi-party), usually, the customer, general contractor, and main designer form the project core group that has the final responsibility for the project and its decisions. However, there are plenty of other stakeholders in the project as well. In RPDM, they can be involved and incorporated into the agreement in order to energize and spur them on.

According to Ashcraft [24], there are two methods for incorporating stakeholders: a subagreement and a joining agreement. In a joining agreement, the key subcontractors and consultants execute an agreement that amends the RPDM agreement to add them as parties. The risk/reward provisions are amended with each added party to reflect the amount of compensation the added party has placed at risk.

In a subagreement, the key RPDM terms flow through the prime agreement (designer or contractor) into the subagreement (subcontractor or consultant). The risk/reward compensation is a portion of the risk/reward compensation of its respective prime. Usually, the subcontractors and consultants have no voting rights at the project management level. However, their opinions are listened to and considered as per the common rules of the RPDM. After the agreement has been signed, the project proceeds to the development phase. The development phase now contains different levels of designs and more accurate budgeting and scheduling.

2.3. Theoretical Summary. Negative iterations and conflicts caused by the limitations, constraints, or requirements of downstream systems cannot be prevented if the project stakeholders do not know the other stakeholders and their requirements or limitations. When problems or constraints are discovered late in the design or construction process, more upstream value will be wasted, and more decisions may have to be changed.

Early stakeholder identification and involvement are highlighted as two of the cornerstones of value creation in RPDMs [5, 25, 26]. The key stakeholders should become involved at the appropriate time, when their involvement will benefit the project. This is almost always earlier than traditional delivery methods, and thus "early" points out this change in practice [24]. Early involvement should take place during the project definition phase, when the project purposes are being developed and determined by the key stakeholders, who have their own needs and interest.

The project definition process in RPDM aims to facilitate the early involvement and creation of integrated project teams. In particular, it aims to optimize value creation and project outcomes by identifying and consolidating the different roles, responsibilities, and objectives of the stakeholders. The process provides a step-by-step procedure for gathering and analyzing the needs, objectives, and competencies of the customer and the other stakeholders and for preparing a contract.

3. Early Stakeholder Involvement in a Renovation Project

A large part of the Finnish suburbs and apartment buildings that were built in the 1960s and 1970s are reaching the age that they need to be renovated in order to enhance their levels of housing and safety and also energy efficiency. The case project is a renovation project located in the city center of Joensuu in southeast Finland. The subject of the case study is a private housing company that contains two interconnected four-story buildings (19,600 cubic meters) built in 1971. One building serves as business offices (39 offices) and the other one as an apartment building (19 apartments).

So far, no major or comprehensive renovations have been done in these buildings; during the past ten years, only the windows and plumbing have been changed, and the heating system has been adjusted. However, the board of the housing company and many shareholders have expressed their interest in renovating the buildings and even build two additional floors on top of the buildings. In addition, the local city is striving to develop the city center, and thus, they have usually supported initiatives like the case project.

The main purpose of the empirical study was to find out who the stakeholders that should be involved in the project definition phase were and at what stage of the project definition. To achieve that purpose, the project stakeholders were identified, and their different roles and liabilities were explained. Furthermore, the main challenges of the renovation project were identified in order to see whether they had an impact on both the roles and the involvement of the stakeholders. The stakeholders were identified by using snowball sampling, while more accurate data was collected by interviewing the identified stakeholders.

3.1. Snowball Sampling and Face-to-Face Interviews. The stakeholders were identified by using snowball sampling. This is a technique where the existing study subjects provide the names of the other representatives who will fulfill the research criteria. The researcher approaches these representatives and asks them to participate. Each one who agrees is then asked to provide additional names. The process continues for as many times as needed until saturation is reached; therefore, the sample group appears to grow like a rolling snowball. Basically, the process continues until no new representatives or information appears [27].

In the case project, 13 different stakeholders (individuals or groups) were identified by using snowball sampling. Because there were other authorities or bureaus that did not

have any role in this project and the competitors of the main contractor were not connected with the project at all, it was decided to exclude those two from the analysis of the results.

After the snowball sampling, eight face-face interviews of the identified stakeholders were performed. In the last two interviews, no new information appeared, so it was presumed that interviewing the remaining stakeholders would not provide new information either. Therefore, eight interviews were considered to be an adequate number. In addition, the plans and the whole project were still in an embryonic stage, and hence, all of the identified stakeholders were not known and thus could not be interviewed. One interview per stakeholder was performed, except for the customer, where the chairman of the board and one shareholder were interviewed. Thus, a better understanding of the project and the customer's attitudes towards the project was believed to be reached.

Figure 4 illustrates the identified stakeholders of the case project. The green circle means that a representative of that stakeholder was interviewed. The red circle means that a representative was not interviewed. The reason for this was that those representatives were not known yet. The arrows illustrate that the interviewee mentioned a stakeholder who was not mentioned in the previous interviews. While interviewing the neighbors' representative, it turned out that he was also a construction consultant, and therefore, he could answer questions from that point of view as well. The dashed line illustrates this connection.

3.2. Interview Results. A stakeholder always has some "official" role and liability in the project. Table 1 represents the project stakeholders, as well as their roles and primary liabilities in the case project from the customer's point of view. The descriptions of the "official" roles and liabilities are quotes from the interviews, and thus they describe the perceptions and opinions of the interviewees.

Renovation projects face huge problems when it comes to defining and completing projects, and therefore, in reality, the stakeholders' roles and responsibilities are not always as plain and unequivocal as Table 1 suggests. The problems reflect the fact that the roles get mixed up, and therefore, the roles and responsibilities vary and differ from the "official" ones. According to the interviewees, the common problems of this renovation project are (1) the customer's organization has a vague decision-making process, (2) customers are rarely experts in construction and building, (3) the inadequate collection of source information and customer needs, (4) unclear roles and responsibilities of the stakeholders, (5) differing objectives and purposes among the project stakeholders, and (6) a lack of comprehensive renovation concepts and practices.

Many of the problems have come from using the wrong methods, because the renovation does not have established practices, and therefore, the project cannot be managed effectively. However, many of the problems occur because the customer's special status is not understood. The customer organizations (housing companies) in renovation are rarely an expert in construction, and they do not necessarily know their ultimate needs. Furthermore, the customer's vague decision-making process causes the project to not have a clear direction, and it is not concretized at all. Thus, it is possible that the other stakeholders do not know what is wanted, who is responsible for what, who takes care of what, and who has the competency to perform the task. The aforementioned problems create a treadmill where the project's purposes and objectives are often defined without the customer having a voice.

Often, stakeholders stick too much to conventional roles. This may lead to a situation where the wrong solutions or means are exploited, because there is a lack of information and knowledge. If a difference between the official and the practical roles occurs, this may cause problems during the project. Table 2 illustrates those differences in the case project. In addition, the table points out why each stakeholder should be involved early in the renovation project in order to avoid problems. The descriptions are quotes from the interviews.

Actually, differences in the roles and responsibilities and the unestablished practices should be the main reasons why stakeholders should be involved early. For example, the customer's primary role is to be the final decision maker, but typically, the customer's organization (housing company) consists of shareholders who are residents or private lessors. Therefore, the customer does not often have a sufficient understanding of what the short- and long-term effects of the different options are, or the customer has unrealistic impressions about the project and its outcomes. Because customers rarely have experience in project management and completion as a whole, they must involve stakeholders who have the expertise. In addition, renovation projects contain a lot of uncertainty (i.e., preexisting hidden conditions or the absence of the old designs) compared to new construction production. It is a challenge to find stakeholders and solutions that fit well on a project. Naturally, complexity and unforeseeability increase the risk of rising costs, which in turn complicate the customer's decision making, further increasing the need to involve experts.

There are many reasons why different stakeholders should be involved in the early phases of projects. Basically, renovation projects cannot be initiated without a customer, but there are many others to be involved as well. As mentioned, the customers are rarely experts in construction, and thus, the construction consultant is usually the first one hired. Because of that, the customer, consultant, and property manager act together as a developer, where the customer expresses the practical needs and the consultant transforms them into the requirements. The property manager provides accurate source information and a maintenance viewpoint.

On the other hand, some stakeholders can remain unnoticed during the early phase of a project. This does not mean that the project will fail in that case, but the solutions and the outcomes might have been better if those stakeholders were involved. A good example of this is the main contractor and the structural engineer. The main contractor can help the designers to use solutions that have been proven to work in practice. In turn, the structural engineer can have a very vital role in a renovation project. For example, in Joensuu,

Table 1: The roles and liabilities of the project stakeholders.

Stakeholder	"Official" roles and primary liabilities
Customer	Owner, end customer, and the final decision maker.
Construction consultant	Mostly project manager as well. Project management and coordination with the customer. An essential link between the customer and other stakeholder groups.
Property management	Operating the property, information management, and preparation of matters. Looks for opportunities to develop the housing company.
Planning division	Key public authority. Sets frames and constraints for the project.
Architect	Main designer. Responsibility for and overseeing of the architecture and designs completed by the design team.
Main contractor	Has the greatest responsibility for the practical implementation.
Other designers (incl. structural)	Responsible for their own core competencies and fields. Creation of different alternatives.
Neighbors	Under the influence of the project.
Subcontractors	Hired by the main contractor. Implementation of small sections.
Sponsors	Provides capital for the project's implementation. Usually not very interested in the project's design and implementation.
Material/solution suppliers	May offer design and/or building solutions that differ from traditional solutions (i.e., modular construction).

Table 2: Why should stakeholders be involved early?

Stakeholder	Roles and responsibilities in practice	Why involve early?
Customer	The board and the shareholders can have different views on the company's future and development. In the Finnish housing companies, decision making requires unanimity or at least two-thirds majority.	Renovation projects are mainly started by the customer. The project fulfills and puts the customer's needs in practice, and therefore, the needs should be mapped right in the beginning.
Construction consultant/project manager	Should go according to the interests of the customer, but sometimes consultants fall into a trap of self-interest.	Typically, housing companies are not experts in construction, and therefore, a consultant can help with his expertise.
Property manager	The same property manager can work in the same post for several housing companies, which can cause a conflict of interests.	A property manager usually has the best knowledge and information about the property and what we are trying to achieve. Provides source information for designing.
Planning division	No difference. Works under the law and regulations.	Frames and constraints set for the project are binding, which must be obeyed if the project is carried out.
Architect (main designer)	As the main designer, the architect can push design solutions that are not optimal relative to the project.	The main designer is in charge of the completion of the designs and the project. The main designer must find the most economical solutions, which are prefaced in the early phases of the project.
Main contractor	If they stick to their role as a builder, there is no chance to innovate or express their practical experience.	The good and bad experiences (i.e., solutions, constructability) gained from the previous project are the most useful things to be exploited.
Other designers (incl. structural)	Renovation projects can be very complex, and if the designer does not have enough expertise the solutions can be bad.	If it is presumed that some specific competence is required, then early involvement should be considered (i.e., the structural designer is a key stakeholder if there is no precise information about the foundations).
Neighbors	Showing sympathy for the project can have a positive impact on their own prospective projects and vice versa.	It is necessary to check that the requirements and objectives are not inconsistent with each other.
Subcontractors	No big difference. In some cases, they could express their core competencies.	If it is presumed that some specific competence is required, then early involvement is important.
Sponsors	No difference.	Access to credit should be checked if external funding is needed.
Material/solution suppliers	No big difference.	If the proposed solutions are state of the art, they could express and bring out their experience and expertise better.

Figure 4: The case project's stakeholders and interviewees.

the soil is a former riverside, and its texture is very unstable. Hence, the structural engineer emphasized that the carrying capacity of the foundations must be carefully examined and the solution must be dimensioned accordingly.

On the whole, the importance of the source information is emphasized in renovation projects, because otherwise the designs and the solutions do not reflect reality. This leads to redesign and/or changes and, ultimately, rising costs. In addition, renovation projects are usually of such a nature that the designs cannot be finished off at a clip, because there are always surprises revealed during the project. In particular, that is why the majority of the interviewees stressed that renovation projects offer favorable opportunities for stakeholder integration, because the detailed designs are many times advanced simultaneously with the project's implementation. If the uncertainty of the renovation project supports stakeholder integration and collaboration, then early involvement ensures that the project gets the best possible project team. Best of all, the expertise can be utilized right from the start.

3.3. The Current Perceptions of the Stakeholders That Should Be Involved Early. In the interviews, the project definition process (Figure 2) was introduced to the interviewees. The basic idea of RPDM was introduced in order to make sure that they understood the difference between the traditional and integrative project delivery methods. After that, they were asked to place the identified project stakeholder in the stage that they felt was the first moment that the contribution of the stakeholder would be proper. In addition, we took advantage of the other interview material to derive results that were as reliable as possible. The results are shown in Figure 5.

The results show that the renovation projects touch various stakeholders that should be involved early in order to find out their constraints or contributions. The deviation between the interviews was small. Generally, only the main designer's (architect) and the other designers' positions caused some deviation. If an alteration of a city plan is sought in advance, there is no need to involve the main designer in the first stage, because the construction consultant should have enough know-how to carry out the first stage. If there is not an alteration of a city plan, the main designer must be involved in the first stage, because he/she draws up the amendments to the city plan. Because rezoning can take a long time (sometimes 1-2 years), it is recommended that the alteration is requested long before the project begins.

The positions of the "other" designers caused some confusion. However, if some matters need special planning or notifications, the expert in that field should be involved. For example, in the case project, the instability of the local soil caused the structural engineer to be included in the project.

The late involvement of sponsors and other authorities was slightly surprising, because it could be supposed that their opinions should be checked at least tentatively during the project definition. Apparently, the customer supposed that the planning division would inform them if other authorities might be interested in the project. In addition, according to the interviews, a common impression was that getting the funding was not a problem in the current market situation. These results align with the previous studies [25] that found that the customer, main contractor, and main designer are the most salient project stakeholders. Basically, they are the ones who form and set up the big picture, which is then combined with the contributions of the other stakeholders.

When it came to the project definition process itself, the interviews almost unanimously stated that a project definition process (or the whole project delivery process) that strictly follows the original IPD or alliance processes would probably not work in small projects, or at least, they were not willing to participate in such projects. They found that the biggest problems were connected with finalizing the agreement, because the multi-party agreements have relatively tightly bound participants executing the project together. Therefore, the interviewees hoped that the agreement would be more like a letter of intent, where the customer and the other contracting parties commit gradually to execute the project by following the terms, rules, and process of the RPDM, with the condition that the parties can pull out of the project if they are not capable of working on it.

The interviewees stated that if various stakeholders are wanted to be involved in the project definition, the time and resources that they expended on the project must be compensated for with "a consulting fee"—at least for those who were not ultimately selected for the actual project implementation. This would encourage and motivate the stakeholders to join in the project definition process, even if they were not selected for the rest of the project.

Generally, most of the interviewees saw that better possibilities of creating and defining value streams are essential. It was also believed that if the key stakeholders are identified and committed to the project as early as possible, synergic benefits can be achieved. That is why they perceived that RPDM could be worth trying, because it seriously seeks a "win-win" situation and enables natural and fair collaboration. However, there are culture-bound problems (i.e., accustomed habits, prejudice, and mistrust) prevailing in the construction industry that slow down the change towards RPDMs.

4. Discussion

Typically, construction project deliveries today are mostly optimized for the least exposure to each player in the process, and thus, the projects are "produced" in silos of design, construction, operation, and maintenance with a large number of players, customers, and suppliers who exhibit low interdependency and integration [28]. This activity inevitably harms the outcome and consumes vast resources with a lot of waste. Ultimately, the customers bear the brunt of waste, such as construction errors, broken schedules, and budget overruns, as well as high long-term operational and maintenance costs.

The theoretical [4] and empirical findings revealed that renovation projects contain many challenges. It may be possible that those challenges even emphasize the typical challenges of the construction industry. Thus, it is argued that shifting the project delivery methods towards RPDMs and integrated teams through early stakeholder integration would be reasonable. The project stakeholders' expertise is rarely a problem; the major problem is the ability to involve the right stakeholders and coordinate their diverse potential and know-how. Due to the low interdependency and integration of the stakeholders, typically, the stakeholders define the objectives that are consistent with their own interests. In reality, the customer's requirements and constraints should be figured out first, after which the constraints of the other stakeholders are mapped. Finally, the designers and contractors should endeavor to find a solution that best meets the requirements as well as the constraints.

There are no comprehensive practices for completing and maximizing value in complex renovation projects. However, customers have increasingly started to demand the best possible value from the stakeholders, and there is a realization that the lowest price does not achieve that task [28]. The customers are seeking the freedom of choice to interact with firms and define choices in a manner that reflects their view of value [29]. Hence, the construction industry can no longer afford to view customers and other stakeholders as the passive recipients of products, services, and deliveries. There should be more emphasis on value-adding activities within the value streams and considering the whole lifecycle of the end product; therefore, the construction industry would benefit from stakeholder-led processes.

In value streams, firms no longer solely create value, and therefore, they want to insert themselves into the chain and open up the possibility of contributing to value creation with their own activities. According to Ramaswamy and Gouillart [29], value cocreation is something more than listening and

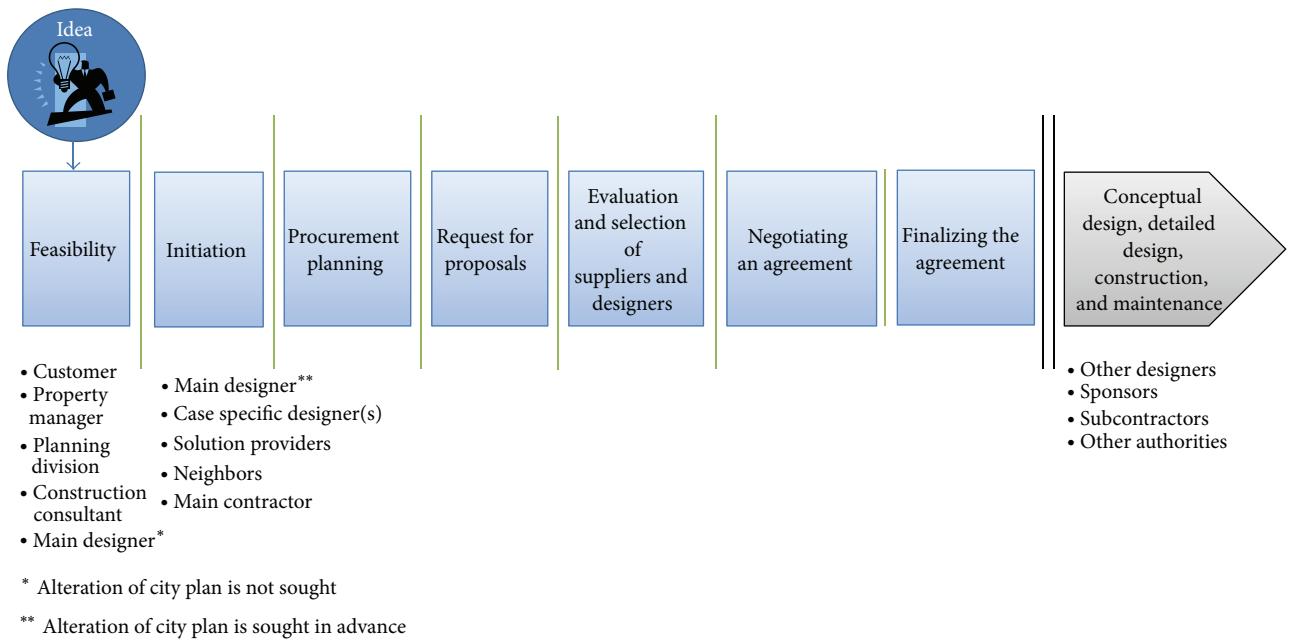

Figure 5: Early stakeholder involvement in the case project.

feedback; it is about redefining the process and methods and redefining how organizations involve stakeholders by bringing them into the value stream and value creation process and involving them in it. Basically, this means that the mindset shifts from a traditional "subsystem delivery" to "system ensemble and experience co-creation."

If it is desired that the mindset and practices change towards value co-operation, early stakeholder involvement and integration play a central role. However, stakeholder integration and involvement are not always easy, and thus, several studies have been carried out in order to find out what the critical success factors are. Communication among all involved parties is essential, because a stakeholder's increased knowledge is more likely to result in more interaction, sharing, and involvement on the part of the stakeholder. Other success factors include ensuring that the partners contribute as expected, creating the perception of equal benefits among the partners, and building trust between the partners [30, 31].

In addition, several studies [19, 32] have emphasized that there might be a need for contractual agreements in collaboration with stakeholders. Especially this concerns the construction projects where are typically operated within the agreements. Although agreements are frequently considered as an essential part of projects, the tight definition of the legal boundaries of the agreement is not sufficient to obtain the desired outcome. On the other hand, the RPDM agreements have been developed with this issue in mind. However, the results of the study showed that in small-scale projects, the stakeholders, especially the customers, were not willing to make agreements that were too binding in the project definition phase; they wanted an agreement that was more like a letter of intent.

4.1. Implications for Stakeholder Involvement. The RPDMs are a way to make value co-creation more effective in the construction industry [6], while early stakeholder involvement has been named as a cornerstone for creating integrated teams that deliver that value [4, 31]. Early involvement in the project definition process aims to maximize the benefits and contributions received from management, engineering, design, and building capabilities [33]. Furthermore, the stakeholders who work directly in integrated teams can provide insights into the building process required by the design requirements. The stakeholders can also help to identify solutions that can be most efficiently and effectively fit to the end product. In addition, early involvement allows the stakeholders to anticipate the upcoming project and make preparations, which can lead to a reduced cycle time.

The findings emphasize that one starting point for stakeholder involvement is to evaluate and understand the stakeholders from the perspective of the customer or to determine their relevance to the project. In carrying out this analysis, questions are asked about the positions, interests, influence, interrelations, networks, and the other characteristics of the stakeholders, with references to their past and present positions and also their future potential.

Construction projects are very similar to complex product systems that produce highly customized, engineering-intensive goods, which often require several producers to work together simultaneously [34]. In such systems, it has been found that integrated solutions are an effective way to deliver products. Integrated solutions are combinations of products and services that address a customer's unique requirements throughout the life cycle, from development and design to systems integration and maintenance [28]. The challenge of moving into integrated solutions is to create project delivery systems that can package and deliver solutions to meet customer needs [35].

System integrators are able to ensure that the designers and contractors can produce designs and solutions that

conform to the overall customer and stakeholder needs [34]. Construction has two separate system integrators: the main engineer in the design phase and the main contractor in the construction phase. Furthermore, while the main engineers typically display capabilities in the regulatory framework and customer requirements, they often do not have the skills to integrate the subsystems and construction into a total system [28, 36]. Therefore, it is essential to involve the main contractors early in the project, because they are able to contribute to the design solutions, but they can also integrate the design solutions into the practical solutions and total system. In addition to the main engineer and contractor, there are multiple various stakeholders that have an impact on the project or are impacted by the project. Many of those stakeholders would have something to offer during the project definition process as well.

In our case project, there were 11 separate stakeholders connected to the project (Tables 1 and 2). Furthermore, the results show that 8 or 9 (if a "special" designer is needed) must be involved right from the beginning of the project definition phase. However, involvement may range from simple consultation or facilitation on design ideas or constraints to making the stakeholder fully responsible for the design of the systems, processes, or ensembles they will supply [37]. Furthermore, one involved stakeholder may contribute to one project phase only, while another one may have a key role throughout the entire project's completion.

Due to the different roles and liabilities, various types of stakeholders can be identified. Based on the theoretical and empirical findings, we were able to recognize five different levels of stakeholders: primary, secondary, system integrators, tertiary, and external (Figure 6). The arrows in Figure 6 represent the main information flow between the levels.

The primary stakeholders consist of those stakeholders who are the direct recipients of the project, which would ultimately resolve a high-priority need [38]. In our case, the customer is the natural representative of the primary level. The property manager and the construction consultant belong to the secondary level, which is composed of stakeholders who deliver or provide services to the primary level [38]. In renovation projects, the primary and secondary levels comprise the development team (the grey circle on Figure 6). Briefly, the levels indicate that the customer has the high-priority needs, the property manager has the constraints (based on the accurate source data), and the construction consultant is the expert in project management.

In between the secondary and tertiary levels are the system integrators who must ensure that the specifications for each component, solution, subsystem, and interface in the whole project are compatible and align with the customer's needs. Therefore, the system integrators must be carefully selected, because they must be cooperative, and their position is crucial during the project's entire life cycle. In addition, this key role emphasizes the importance of early involvement. Our results indicate that the main contractor and main engineer are the ones who should act as the system integrators in renovation projects. In RPDM projects, there is always the core group, who possesses the greatest power in the project and its management. According to our results, we suggest that the development team and the system integrators should form the core group (the red and grey circles on Figure 6). They are also the parties who must sign the multi-party agreement.

The tertiary level focuses on the resources and input put into the project and solutions. In renovation, public authorities (especially the planning division), other engineers, subcontractors, and material suppliers are good examples of tertiary-level stakeholders. Because the tertiary level includes the most project resources (subcontractors and other engineers), it is probably the level that should be managed most carefully and wisely. Such resources may cause serious problems in bad situations. In addition, the large number of stakeholders and complicated tasks involved in the project definition process (e.g., project definition, consensus building, and objective setting) place heavy demands on facilitation and project management skills.

Moreover, there are external-level stakeholders in complex projects. The external level does not have direct control over resources, which is the difference between the external and the tertiary levels. However, the external level has the possibility of influencing the project positively or negatively [39]. For example, the neighbors can support or resist the project. Sponsors, in addition, can have some effects on the project funding.

In summary, the major managerial implications of this study are that the project stakeholders should be identified and involved early in order to maximize value co-creation. On the other hand, it is crucial to understand that the projects contain different levels of stakeholders depending on their salience in the whole project. Therefore, they should be coordinated differently, but also given the opportunity to act as they see fit in a way that is best for the project. This especially emphasizes the importance of the system integrators. The findings also indicate that the benefits of early involvement cannot be fully exploited if the construction industry does not start to use RPDMs, which tend to improve collaboration between design and construction by their nature.

5. Conclusion

Construction projects are complex undertakings that require competencies from a wide range of disciplines. Nowadays, single firms do not possess all the required competencies; a significant part of them must be acquired from several sources. Due to this complex nature, the project networks contain a large number of different stakeholders and a high level of interdependencies between them, which makes value creation and management a challenging issue.

The RPDMs are highlighted as a possibility of enhancing value co-creation, reducing costs, and improving quality in construction projects. In particular, it can help with early stakeholder involvement and creating integrated teams. This study concentrated on finding the stakeholders that should be involved in the project definition phase in renovation projects. The study suggests that the project stakeholders should be identified and involved as required during the

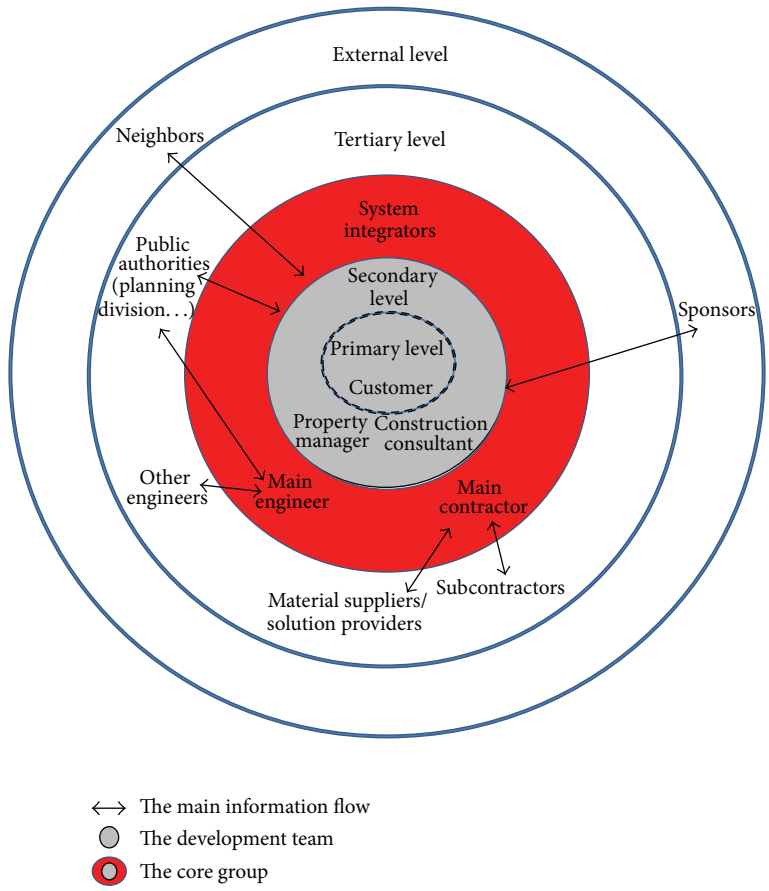

Figure 6: The different levels of stakeholders.

project definition phase in order to bring together construction and design knowledge and skills. Although early stakeholder involvement is crucial, different stakeholders should be managed differently depending on their roles, liabilities, and salience in relation to the whole project.

From a practical perspective, a weakness of the study is that RPDM and early stakeholder involvement are relatively new concepts in construction. Thus, it is possible that the interviewees' perceptions of these concepts do not completely reflect reality, and therefore it is possible that these perceptions have skewed the results. Most likely, conducting interviews in another renovation project would help to improve the reliability of the results. Furthermore, the interviews were conducted before the case project started, and therefore we only have a good "guess" of who the stakeholders would be. Thus, it would be worth studying how and to what extent stakeholder involvement was really executed after the case project is completed.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this article.

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