

Suitability of Project Alliancing for a Customary Apartment Renovation – A Case Study

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Abstract

Frustration felt toward the opportunism inherent in traditional contracting has made the construction sector to develop new collaborative project delivery models globally. This is especially true in Australia, where Project Alliance has been introduced as a solution to the experienced problems. This model has been applied mostly in road, rail and water infrastructure projects. The building and real estate sector has hardly used the mode and exceptions include predominantly only few uniquely demanding landmark buildings involving a lot of uncertainty.

More recently, owners in Finland have started to utilise Project Alliance. In addition to a few infrastructure projects one relatively standard/common apartment renovation project has been implemented in accordance with alliancing practices. The study will focus on this building project and experiences gained from it. More precisely, the objective of the study was to find out whether it makes sense to use Project Alliance in more common projects and on what conditions it benefits building construction involving more parties (i.e. technical experts and subcontractors) than a typical infrastructure project. Interviews with project's participants had a role in the study and results from a survey to parties to the project were analysed broadly.

In the presented case, key features of the Project Alliance contributed for high levels of collaboration between participants and enabled achieving very positive results. Thus, this research work allows concluding that the alliance was definitely worth applying at this relatively small renovation project, although several suggestions for modifications could be identified and should be incorporated in future projects.

Keywords: project alliance, procurement systems, renovation, collaboration, survey

1. Introduction

Construction industry is typically slow in adapting to changes, especially when it comes to construction management, organizational and cultural changes (Naoum, 2003). However, due to the increasing demand for more efficient and integrated approaches, alternatives to the traditional practice are finally being developed. Barnes (2000) supports this by saying that civil engineering management in the next century will be dramatically different from the last, thanks to a growing and long-overdue realization that the traditional forms of contract have had their day. One of the novel collaborative delivery models is Project Alliance (PA), which has its background in Australia where it has been a successful approach for many years in infrastructure projects (Lahdenperä, 2009).

This research work will focus on these innovative delivery models, particularly in a PA in the public sector context in Finland. The purpose of this research is to contribute for a better understanding on the application of a PA to a relatively small building construction project, which is not the most common target of application for PA which has been mostly applied in large infrastructure projects. The main research question is the identification of key PA features and their confrontation with the collaboration and performance levels registered at a specific construction project. In this sense a case study will be considered and several interviews and project surveys conducted will be reported in order to support the exploratory work.

2. Literature review

2.1 Traditional delivery models

Traditional practice can be characterized by models in which the owner and the contractor have a relationship without any degree of objectives alignment or any sort of improvement in work processes (Thompson and Sanders, 1998). Basically, this is the way many construction projects are still executed. This kind of environment can also be described as highly fragmented and individualistic, as involved parties focus on achieving individual objectives and maximizing their profit margins, without a sense of others or the consequences that might result from this adversarial behaviour. As Naoum (2003) describes, most of the traditional procurement systems are adversarial as they still rely much on contractually explicit procedures rather than on mutually agreed methods to achieve financially sound objectives for all the team. Also, this kind of arrangements and projects develop in a transactional and competitive environment that includes the characteristics that can be seen in Table 1.

Table 1: Typical adversarial environment characteristics (Thompson and Sanders, 1998).

▪ <i>No common objectives; they may actually conflict</i>	▪ <i>Little or no continuous improvement</i>
▪ <i>Success coming at the expense of others; win/lose mentality</i>	▪ <i>Single point of contact between organizations</i>
▪ <i>Short-term focus</i>	▪ <i>Little trust, with no shared risk</i>
▪ <i>No common project measures between organizations</i>	▪ <i>Competitive relationship maintained by coercive environment</i>

Often, this type of mind-set leads to conflicts, litigation and eventually, disastrous projects (Thompson and Sanders, 1998). Another fact about traditional delivery models is related to the inflexibility of their contracts and clauses. That happens because these contracts try to reduce uncertainty, minimize opportunism, and predict and specify every possible contingency by assigning responsibilities and liabilities for each specific project participant in case of change. Knowing that it is impossible to predict and plan every possible event, this sort of traditional practices increases transactional costs and leads to adversarial relationships when anomalies occur emphasizing best-for-individual culture instead of best-for-project culture, and its best example is individuals focusing on protecting their profit and having no interest in collaboration to optimize project performance, with customers and contractors becoming greedy and often assuming a bullying position (Naoum, 2003; Sakal, 2005).

The traditional practice and its compensation models also focus on individual party's performance instead of the overall success of a project. Once again, this leads to individualistic and opportunistic sorts of behaviour. These traditional models might be suitable for slow, simple and fixed scope projects, but the same is not likely to happen for complex projects involving uncertainty and in need of innovation and flexibility.

2.2 Collaborative and relational delivery models

Collaborative and relational delivery models are a powerful tool to fight against inefficiencies of traditional delivery models (Wu et al., 2010; Löfgren and Erikson, 2009). By using both formal and informal measures, these approaches intend, most of all, to achieve a more collaborative joint-development environment among all the key participants of a construction project, ideally involving sub-contractors and suppliers, which are still, unfortunately, often ignored (Bygballe et al., 2010). The formal ones include all the clauses and structure of contracts and teams and all the procedures related to decision-making. The informal ones include more subjective aspects, such as how efficiently entities communicate, how committed they are to achieve overall project success and how they trust and understand each other's individual expectations and values.

Literature refers several types of delivery models, methods, approaches and contracts but there is no consensus among authors. Several mixed interpretations can be found among recent research works. Yet, in the last 20 years there has been an evolution towards a more convergent terminology. For example, Cheung (2010) described that partnering, strategic partnering (see Lu and Yan, 2007), project alliance, strategic alliance (see def. in Cheng et al., 2004), public-private partnership (see Tang et al., 2010) and joint venture (see Walker and Johannes, 2003) are the six major types of relational and collaborative contracting methods. In this research work the PA type has been considered.

2.3 Project Alliance

An alliance is an agreement between actors and has the purpose of integrating goals and operations. As defined by Lahdenperä (2011), PA is a project delivery method based on a joint contract between key parties to a project whereby the parties assume joint responsibility for the design and construction of the project to be implemented through a joint organization, and where the parties share both

positive and negative project's risks and observe the principles of openness in cost monitoring and information accessibility in pursuing close cooperation. It should be mentioned, that an alliance has been commonly used in the European context as a general concept to describe collaborative arrangements in general, and not PA and its characteristics in particular (Lahdenperä and Petäjäniemi, 2012).

PA can be defined as an approach comparable with design-bid-build, design-build and construction management into some extent, which has a contractual structure forming a virtual organization with a joint risk approach, differing from traditional risk-allocating frameworks (Lahdenperä, 2012). Characteristics that distinguish PA from other kinds of arrangements include a multi-party contract with joint liability (and risk-sharing) and eventually a co-location arrangement which expects to have the team working at the same place (DTF, 2010). It has been designed to foster collaboration and innovation and enhance levels of efficiency. Based on literature, general alliance principles and characteristics can be structured in five key features which can be seen below in Table 2.

Table 2: Alliance's key features

<i>Features</i>	<i>Key references</i>
▪ <i>Joint agreement and joint organization</i>	<i>DTF (2006), Jefferies et al. (2006), Lahdenperä (2011)</i>
▪ <i>Joint decision-making and problem-solving</i>	<i>DTF (2006), DIT (2011)</i>
▪ <i>Open-book and communication</i>	<i>DTF (2006), Jefferies et al. (2006), DIT (2011)</i>
▪ <i>Team-building: meetings and workshops</i>	<i>Jefferies et al. (2006), Yeung et al. (2007), Bresnen et al. (2010)</i>
▪ <i>Monitoring performance and job satisfaction</i>	<i>DTF (2006), Jefferies et al. (2006)</i>

First PA construction projects took place in Australia in the late 1990s but the actual breakthrough of PA took place only a few years later and since then hundreds of projects have been implemented using this method. Alliance approach has been evolving and developing significantly from project to project. Projects using this approach include mainly road, rail and water infrastructure projects, with only few exceptions including construction of buildings (Lahdenperä, 2012).

PA was introduced in Finland a few years ago and since then a number of projects applying alliancing practices have been launched. Yet, only three pure PA projects have progressed to the implementation /construction phase so far, and the case project of this study is, in fact, the only one where the construction has been completed and the overall experiences can be examined. In the following sections, further attention will be given to the application of PA in this renovation project.

3. Research method

The paper presents a glance at a research (Amaral Fernandes, 2013) that took place in Finland and included a case study with interviews and project survey analyses. The interviews were formulated based on literature review, the documentation of the case study project and the feedback of the participants in the project. A total of six semi-structured interviews were conducted and they included owner's, contractor's and designer's representatives in equal numbers.

The project survey was initially developed by the parties to the construction project to measure and assess levels of project's performance and satisfaction. The intention was to determine such key result areas (KRAs) on which the incentive system of the commercial model was dependent. By using those survey results descriptive and statistical analyses were made to test/validate research findings.

4. Case project

4.1 Building project

The targeted property (at Vuolukiventie 1b) (Fig.1) was built in 1968 in the Pihlajamäki neighbourhood in north-eastern Helsinki and it is owned by the University of Helsinki. The building was initially designed as a retirement home and had no major renovations since its completion. The case project consists of renovation of the existing, protected buildings (incl. the construction of additional apartments on previously unused space on the basement floor; i.e. stages 1–6) and construction of a new building (stage 7; Fig. 2) on the same plot (adjacent to the street in Fig. 1). The objective was to provide quantity of small, modern apartments (arriving at 306 in old blocks and 27 in the new construction) for international students and researchers at the University of Helsinki.



Fig. 1: Property overview prior to the start of the construction project.



Fig. 2: New building preview (from the yard side; by SARC Architects).

The project by itself is not different from others in general, but precisely because of that, it was considered a good opportunity to test a new procurement approach that intended to maximize the performance and efficiency through collaboration and innovative procedures. The owner's main objective towards this project was to achieve a result that best serves the final use of the facilities and to improve the economic efficiency of the property's use by also involving project's parties in the warranty period of the project. In that regard, the alliance will be responsible for the design and

construction of the project, while their liabilities also extend over a 5 year warranty phase. All the contractual parties to the alliance share project-related risks and benefits.

4.2 Establishment of alliance

The selected procurement procedure was the ‘competitive dialogue’ (see Act, 2007; Directive, 2004). The competitions to award design and construction works were combined and both the designer and the contractor were selected as a team. The selection phase had two stages. In the first stage the client (owner) called for candidates and shortlisted the three most suitable tenderers. In the second stage those three candidates were invited to make their proposals. So, candidate teams submitted global designs for the project which were then taken into account in the comparison, in addition to team capability and independent estimator’s estimate on those bases, for instance. The owner’s budget was also efficiently tied to the selection method to guide the proposal compilation. The most advantageous tenderer was then selected in the alliance. Fig. 3 depicts the selection phase and its steps in more detail.

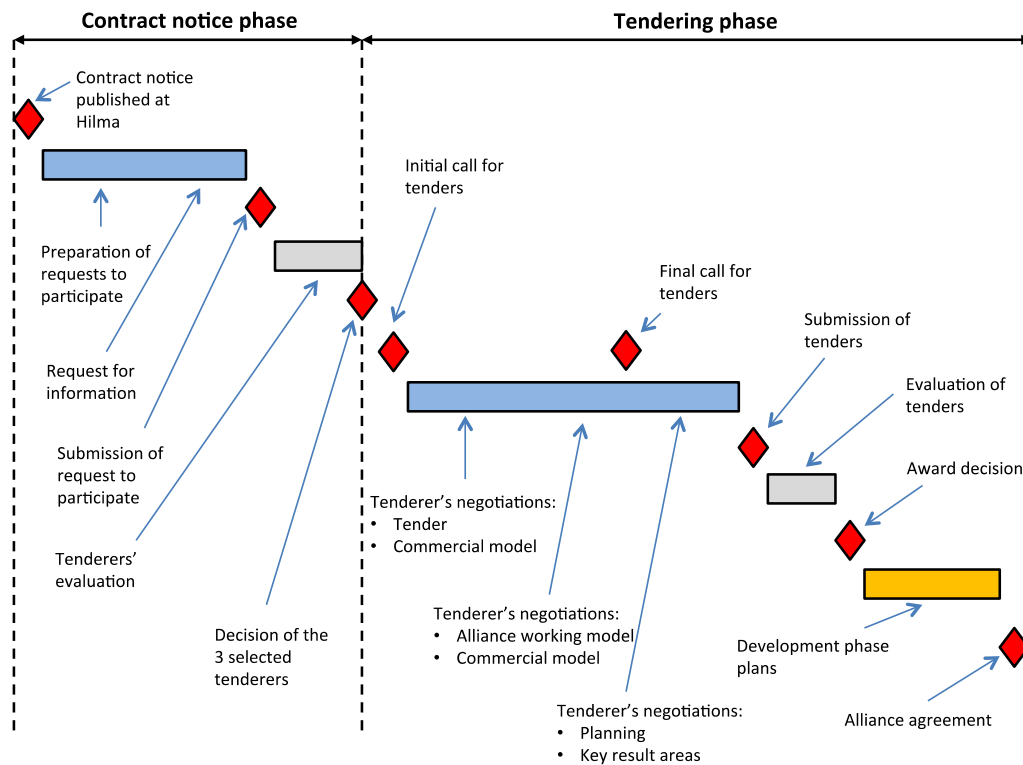


Fig. 3: Selection phase overview.

Alliance was formed by the project owner, main designer and main contractor. Unlike in most forms of traditional contracts, in the alliance model the client and service providers are to reach common understanding on the project costs and KRAs and the corresponding targets are jointly defined and agreed during the project’s development phase. During the implementation phase, positive and negative risks are common to alliance parties.

The project had one alliance agreement covering the development, construction and warranty phases of the project. The generation of the alliance agreement started initially with a draft made by the client which worked as the basis for negotiations during the selection process. After being set up, the agreement included also organisational details, the commercial model of the project (the target cost, KRAs and their price impact, etc.), and the warranty period plan.

5. Results

5.1 Interview results

The results from the interviews completed as a part of the study are summed in Table 3 per party, and classified according to the alliance features deducted in section 2.3 above (see Table 2).

Table 3: Parties' views on the renovation project alliance.

Key features	Owner's view	Contractor's view	Designer's view
<i>Joint agreement and joint organization</i>	<ul style="list-style-type: none"> - Closer interaction between participants allowed establishment of common goals and fostered commitment and collaboration - Heavy and slow selection phase - Early involvement seen as essential for good working routines 	<ul style="list-style-type: none"> - High levels of commitment between stakeholders - Best-for-project solutions - Selection phase was a heavy and time consuming process for contractor - Early involvement fostered collaboration 	<ul style="list-style-type: none"> - Time-consuming - Unclear objectives - Better collaboration with the contractor thanks to early involvement - Owner's objectives were sometimes unclear to designers - Minor decisions should be taken individually
<i>Joint decision-making and problem-solving</i>	<ul style="list-style-type: none"> - Owner shares decision responsibility with other parties - Too small decisions had to be unanimously taken - Owner does not have the final word - Prompt and effective problem solving 	<ul style="list-style-type: none"> - Difficulties achieving mutual agreement with owner and designers - More solutions studied than traditionally - Time spent studying solutions not always led to optimal solutions 	<ul style="list-style-type: none"> - Required more time than traditionally since the decision group was wider than traditionally - Flexible process since designers were more involved in cost issues - More solutions were studied
<i>Open-book and communication</i>	<ul style="list-style-type: none"> - No hidden financial interests - Clear and honest communication between participants - No blaming culture 	<ul style="list-style-type: none"> - Generally positive - Contractor had some communication problems on site 	<ul style="list-style-type: none"> - Consciousness on others' concerns - Talkative environment - Everyone within the alliance had opportunity to share their ideas and perspectives
<i>Team-building: meetings and workshops</i>	<ul style="list-style-type: none"> - Fewer meetings during selection phase suggested - Workshops should be placed in outset of phases - Promoted discussion and problem-solving 	<ul style="list-style-type: none"> - More effort should be put on team-building during implementation phase 	<ul style="list-style-type: none"> - Allowed people see and openly discuss the project from a wider angle than usual - The existence of an alliance counsellor helped by sharing his insights

<i>Monitoring performance and job satisfaction</i>	- <i>KRA's, incentives and feedback meetings contributed to job satisfaction and performance improvements</i> - <i>KRA's could focus more in project's risks</i>	- <i>KRA's and incentives contributed to contractor's job satisfaction and continuous improvements</i>	- <i>KRAs made designers' more willing to make compromises and be flexible as the financial bonuses affected participants' attitude towards the project</i>
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5.2 Project survey analysis

In the study the project survey results worked as an assisting tool to help validate interview results. The survey intended to measure levels of performance throughout implementation stages. From the owner's perspective the purpose of the survey was to stimulate improvements between rounds as the areas under assessment were directly connected to the KRAs influencing on alliance members' payments. The survey had six main fields with a total of 26 positive statements in a Likert scale from 1 to 5, where 1 means "Totally disagree" and 5 means "Totally agree". The survey results consisted of seven rounds that took place at the completion of each stage between November 2012 and January 2014 (whereas the actual construction dated from June 2012 to December 2013). Average results per category can be seen in Table 4. A distribution of participants can, again, be observed in Table 5.

Table 4: Performance according to survey.

<i>Key Result Area</i>	<i>Round</i>						
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<i>1. Schedule</i>	3,2	3,8	3,8	3,6	4,0	4,1	3,8
<i>2. Site organization</i>	4,0	4,1	4,1	4,0	4,1	4,0	4,2
<i>3. Collaboration and interaction</i>	4,0	4,2	4,2	4,1	4,2	4,3	4,3
<i>4. Design</i>	3,9	4,1	3,9	4,0	4,2	4,2	4,3
<i>5. Procurement and contracting</i>	3,4	3,8	4,0	3,9	4,1	3,8	4,1
<i>6. Quality</i>	4,0	4,2	4,3	4,2	4,2	4,4	4,4
<i>Weighted Average</i>	3,7	4,1	4,1	3,9	4,1	4,1	4,1

Table 5: Number of respondents by round.

<i>Respondents</i>	<i>Round</i>						
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
<i>Alliance</i>	15	14	17	10	13	11	9
<i>Technical Designers/Experts</i>	5	5	4	5	4	3	3
<i>Subcontractors</i>	11	11	8	5	4	5	6
<i>Total</i>	31	30	29	20	21	19	18

The assessments have improved slightly since the beginning as it can be observed from Table 4. As it is possible to verify, the results are positive in overall although some reservation is due to lack of comparable data from other projects. Moreover, one of the most notorious findings comes from the different perspectives on project's course given by survey's respondents. By observing Fig. 4 it

becomes clear that technical designers and experts were generally satisfied. Alliance participants' assessment initially increased over project's course until it became approximately constant, which is believed to be related to the alliance features and continuous improvements. However, subcontractors were more critical of overall success of the project which is believed to illustrate their higher vulnerabilities and marginalization over project's planning and decisions, leading to lower levels of satisfaction when compared to other project's participants. Yet, the grade improved in the second half of the project to values closer to other respondents.

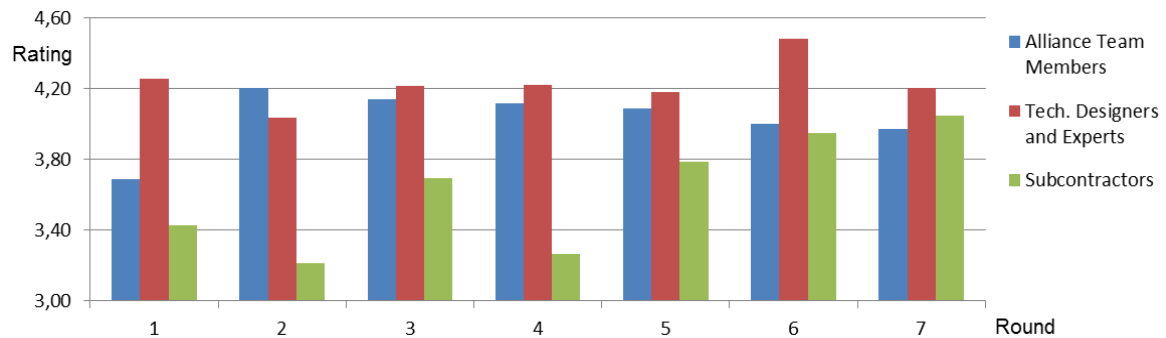


Fig. 4: Project's overall performance by respondent group

6. Discussion and conclusions

The benefits of alliancing in demanding infrastructure projects are well known and reported, but the application in customary building projects is a different question. A lot of case studies have focused on the use of alliancing in infrastructure projects but, to our best knowledge, none has done this in case of a customary building project, what makes the presented work a pertinent contribution.

In the presented case, the PA key features contributed for high levels of collaboration between participants and enabled achieving very positive results. Thus, this research work allows concluding that the alliance was definitely worth applying at this relatively small renovation project, although several suggestions could be identified and should be incorporated in future projects.

The research gave important feedback and insights over PA and its main features and experiences. In terms of project's participants' perspectives, the key features were unanimously seen as an asset and they are believed to have left a decisive impression and preparedness towards future involvement and willingness to be part of alliance projects. As expected, some weaknesses have also been identified. All the major impacts of the PA in the renovation project are presented in Table 6.

Table 6: Impacts of the PA features on the renovation project performance

Key features	Strengths	Weaknesses
Alliance agreement and organization	<ul style="list-style-type: none"> - Higher levels of commitment and collaboration - Clear, honest and open communication 	<ul style="list-style-type: none"> - Complex selection process - The formal agreement itself does not guarantee real collaboration - Participants' roles become sometimes unclear

		<p><u>Suggestions:</u></p> <ul style="list-style-type: none"> - Leaner selection phase with less workshops and meetings - Subcontractors should be included in the alliance
Joint decision-making and problem solving	<ul style="list-style-type: none"> - Well-structured and participative process; best for project decisions - Project's decisions are jointly agreed by alliance members - Problem-solving capabilities are improved by a collaborative and non-blaming atmosphere 	<ul style="list-style-type: none"> - Decision process requires more time and resources than in traditional projects <p><u>Suggestions:</u></p> <ul style="list-style-type: none"> - Decision-making process should be simplified for minor issues
Open book and communication	<ul style="list-style-type: none"> - Improved communication and face-to-face interaction - Clear and promptly available financial and technical information drives commitment and collaboration and accelerates decision-making processes - Open environment mitigates hidden financial interests 	<ul style="list-style-type: none"> - Some participants were not prepared to work under alliance principles, particularly those working only at the implementation phase <p><u>Suggestions:</u></p> <ul style="list-style-type: none"> - More effort should be put to enhance communication among participants during implementation phase especially on site and office
Team-building: meetings and workshops	<ul style="list-style-type: none"> - Smaller and more efficient project meetings - Strong commitment and proactive discussion, which improved problem-solving abilities - The existence of an alliance counsellor was inspiring and helped foster new practices 	<ul style="list-style-type: none"> - Selection phase meetings were heavy and time-consuming - Development and implementation phase workshops and meetings were sometimes excessive and misplaced <p><u>Suggestions:</u></p> <ul style="list-style-type: none"> - Selection phase meetings should be simplified and standardized to smaller Alliance projects - Development and implementation phase workshops should be introduced since the very beginning to concentrate on the major decisions in the preliminary phases of the project and its use should be limited in minor decisions
Monitoring performance and job satisfaction	<ul style="list-style-type: none"> - KRAs were considered adequately set and it is believed that the incentive system positively affected participants' attitude, encouraging better project performance, collaboration and continuous improvements - Project survey, which is directly related with KRAs, was an important tool to assess performance and job satisfaction in the project - Feedback meetings after survey rounds also helped to reinforce commitment and continuous improvements over project's course - Innovation was encouraged even though this kind of project did not have a lot of space for innovations 	<ul style="list-style-type: none"> - An excessive number of questions might have made the survey too heavy and time consuming <p><u>Suggestions:</u></p> <ul style="list-style-type: none"> - The number of survey's questions and KRAs should be adapted to the complexity of the project - Monitoring efforts should focus specially on project's risks

Another important finding was the perception that subcontractors should play a more important role in an alliance project, firstly, in terms of better contracts with adequate clauses. More importantly, subcontractors' views should also be taken into account in the decision-making process, since they can help to improve project's efficiency in terms of costs, schedule and quality by sharing their insights and know-how. It is, however, recognised that this will be a challenge since even now joint decisions took much time and effort although joint decision-making was mostly considered a positive feature. On the other hand, the idea of subcontractors stronger involvement is not totally new in alliancing while in some other parallel, relational contracting philosophies subs are often included even in multi-party contracts (cf. Lahdenperä, 2012), which therefore also supports the understanding that such an improvement could be done.

All in all, the experience in the case project indicates that involved parties recognized the benefits and limitations of PA, but most of all they unanimously agreed that it has a huge potential for future projects, under certain circumstances, as defined before. Thus, the application of PA in more customary building projects is pertinent and recommended although some further developments should be encouraged. This is not yet to say that it is for all projects, however.

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