



## **Extended Abstract**

### **Collaborative and Performance-based Delivery Models**

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## 1. Introduction

In recent years construction sector has been focusing more and more on performance issues such as developing new delivery models and collaborative procurement procedures [1]. This might require certain pre-requisites and adaptations both from public procurement authorities and from typical stakeholders such as owners, contractors, designers and subcontractors. These parties shall adapt to changes and gain management and organizational skills in order to successfully commit into demanding projects where integration of several different parties into a common organization might occur. This requires a natural cultural change towards a more collaborative and open environment, not only in terms of cultural changes, but also in joint decision-making, risk sharing, and open book and best-for-project principles supported by adequate incentive systems [2].

The core of the research is to confront project alliance features with the collaboration and performance levels registered at a specific construction project and also understand project alliance positioning within construction industry and public procurement contexts. Research questions include understanding if using project alliance was worth it at case study project, understand if its features work as expected and access experiences from project's participants.

## 2. Literature review

### 2.1. Traditional delivery models

Traditional delivery approaches are usually described as models in which owner and contractor have relationships without any degree of objectives alignment, efficiency or any sort of improvement in work processes [2]. Basically, this is the way many construction projects are still executed. Construction is also highly fragmented and individualistic project-by-project industry. This mindset induces parties on achieving individual objectives and maximizing their profit margins, without a sense for others or the consequences that might advent from this adversarial behavior.

As Naoum [1] describes, most of the traditional procurement systems are adversarial by design and 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 typically includes the following characteristics present in Table 1.

Table 1. Traditional adversarial characteristics [2]

▪ No common objectives	▪ Little or no continuous improvement
▪ Win/lose mentality	▪ Single point of contact between organizations
▪ Short-term focus	▪ Little trust, with no shared risk
▪ No common project measures between organizations	▪ Competitive relationship maintained by coercive environment

Often, these type of attitudes leads to conflict, litigation and eventually, disastrous projects [2]. In this context, companies started looking for an alternative to the traditional adversarial roles. Relational contracts and delivery models intend to answer to some of the flaws that have been detected in the traditional approach. Another fact about traditional contracts is related to the inflexibility of its contracts. That happens because these contracts try to reduce uncertainty, minimize opportunism, and predict and specify every possible contingency and assign responsibility and liability for a specific project participant in case that change occurs. Knowing that is impossible to predict and plan every possible event, this sort of traditional

practices increase transactional costs and often leads to adversarial relationships when anomalies occur emphasizing the “best for individual” culture instead of the “best for project” culture. Its best example occurs when individuals focus on protecting their profit disregarding collaboration that could potentially optimize and maximize project’s performance [1, 3].

For complex and risky projects the result of applying traditional contracts is likely to be a disaster in terms of project outcomes. Once again, this happens because these sorts of contracts are written in a biased manner protecting the drafter and working as a legal shield, ignoring project outcomes and the creation of a good framework alongside the development of a collaborative environment between the project participants [3]. Additionally, traditional practice and its compensation models usually focus only on individual party’s performance instead of overall project’s success.

## 2.2. Project Alliance

As defined by Lahdenperä [4], 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. An alliance is an agreement between actors and has the purpose to integrate goals and operations. Project Alliance in particular can be defined as a single project approach comparable with design-bid-build, design-build and construction management into some extent, which has a contractual structure that differs from traditional risk-allocating frameworks [5]. Key goals intend to enhance levels of efficiency and foster collaboration and innovation. Lahdenperä [4] defines three main structural features for alliance presented in Table 2.

**Table 2. Alliance's structural features**

Feature	Description
Joint agreement	Tasks of an alliance include project planning and implementation tasks and eventually ones related to them and to the promotion of the project traditionally performed by the owner, which parties are now jointly responsible for. The parties enter into a single joint multi-participant contract instead of several bilateral contracts.
Joint organization	Alliance organization includes people from all partner organizations, including the owner’s. Decisions on project implementation are taken jointly by the parties. The cost estimate covers all related tasks and people. The project target cost is normally defined correspondingly and is consequently the total cost of the project.
Risk sharing	Alliance partners share the risk of project implementation including both positive and negative risks. Therefore, the reward of service providers is also based on the success of overall project implementation, not on their performance of their own tasks. The practice requires observing the principles of openness in cost monitoring.

There are also collaborative features in Alliance that involve subjective concepts such as trust, commitment and cooperation. By having project’s participants working together since an early stage, as an integrated, collaborative team, in good faith, acting with integrity and making unanimous, best-for-project decisions, higher levels of innovation and management all risks of project delivery jointly, and sharing the outcome of the project can be reached. This is made using a joint agreement and a joint organization which are basically a single joint multi-actor contract and team, differing from the traditional several bilateral contracts and independent actors. It incorporates organizational concepts aiming to reduce project costs and enhancing profits for all projects participants [6].

### 3. Research methodology

The undertaken research took place both in Portugal and Finland, and included a case study project, interviews and survey analysis. Case study research began in January 2013 and was completed in September 2013. Case study was selected in January 2013 according to the research questions raised for the study. Subsequently, interviews were developed based upon literature review, case study project's documentation and participants' feedback. Interviewees were chosen by the author with project's owner collaboration and contacted by e-mail or telephone in the same period. These interviewees were six and included owner, contractor and designer's representatives taking place between February and March 2013.

In between April and September 2013, project's survey results were statistically and descriptively analyzed along with interviews' results. Interviews were developed to investigate characteristics of the first Alliance construction project in Finland such as its general experience, features and in particular project's performance and its collaboration levels. In that way, interviews were semi-structured, flexible to allow free comments and opted to follow pre-established guidelines.

Project survey was initially developed by project's representatives to measure and assess levels of project's performance and satisfaction. The intention was to determine key result areas (KRAs) of which an incentive system was dependent of at project's commercial model. Using those survey results it was made a descriptive and a statistically significant analysis to support possible findings. Some feedback was given from project's representatives to complement and validate results. At last, results were analyzed from author's critical perspective and major findings were discussed. Research methodology was not purely sequential, since research approach and research questions were developed in an interdependent iterative process. Fig. 1 presents the research approach considered.

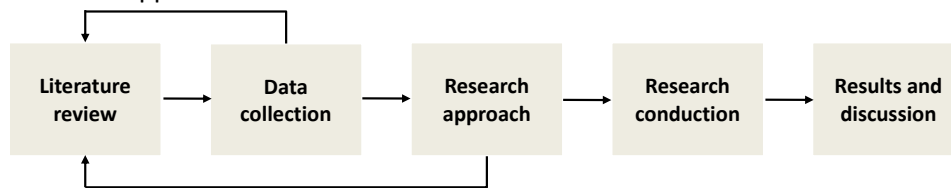


Fig. 1. Research sequence

### 4. Case study: The Vuolukiventie 1b project

#### 4.1. Motivation and description

In 2011, the University of Helsinki showed interest in testing project alliance at a suitable project. The chosen project consisted of a renovation and construction of new blocks of dormitories at Vuolukiventie 1b. 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 is intended to maximize the performance and efficiency through collaboration and innovative procedures. Another reported motivation consisted of owner's desire of participants' early involvement in the project in order to improve designer-contractor cooperation.

The aim was also to improve the economic use of the property by also involving project's parties in the warranty period of the project. In this regard, the alliance will be responsible for the design and construction of project, and also their liabilities extend for a 5 year warranty phase. Additionally, all contractual parties in the project have joint project-related risks and benefits. Project's target cost was set in 18.3 million Euros and project's service life goal was estimated in 30 to 40 years. The project has 4 phases as illustrated in Fig. 2.

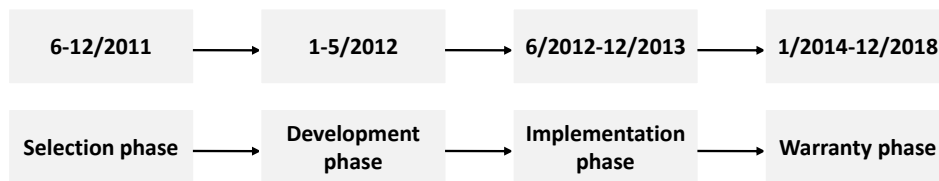


Fig. 2. Project's phases

#### 4.2. Selection phase

The objective of the selection phase was to establish a competitive dialogue procedure capable of gathering the best possible organization to form an alliance with the client for the Vuolukiventie 1b renovation project under the most economically advantageous award criteria. That kind of procedure was found appropriate given the complexity of the contract, and the specific requirements for an alliance project. The competition for designers and contractor was made at the same time. At this project selection phase had 2 phases. In first phase the owner called for candidates and evaluated the 3 most suitable tenderers. After that, the second phase consisted of inviting those 3 candidates to make their offers and later evaluate and select the awarded offer. Each tenderer had 3 individual rounds of negotiations, organized and focusing in the following aspects:

- The first round of negotiations focused on the initial invitation to tender and its appendices and in the description of the selection process;
- The second round discussed on the content of the alliance model agreement, the commercial model and in interiorizing the necessary competences for the alliance organization;
- The third round of negotiations discussed the provider's development phase plans and the contents of the project plan.

In order to select the most capable tenderer, the ability to collaborate and problem-solving skills were assessed during negotiations and workshops. Cooperation during selection phase resulted in project's content for development, implementation and warranty phases. The awarding criteria consisted of three main criteria: alliance skills, value for money and reward.

#### 4.3. Development of alliance

The alliance project is described as being a collaborative and cooperative project by nature. Main principles of alliance consist of emphasizing trust, defining a set of common objectives and assuring commitment between alliance parties and enhancing project collaboration. Alliance's members can be seen in Table 3.

Table 3. Alliance members

Entity	Status
University of Helsinki	Owner
SRV Rakennus Ltd	Main contractor
SARC Arkkitehtitoimisto Ltd	Main designer

The alliance intends to ensure the formation of a joint organization by mutual agreement from all parties, where there are jointly shared positive and negative risks. Its agreement has both collaborative and structural features which are fundamental for alliance project course. Collaborative and structural features are described in Table 4 and Table 5, respectively.

**Table 4. Alliance's collaborative features**

<b>Feature</b>	<b>Description</b>
Confidence	An essential principle between the alliance parties. Without confidence and trust it is difficult to bear common risks and implement transparency principles. Confidence between the client and the service providers is born during the negotiations and workshops.
Commitment	A fundamental principle for the alliance since it fosters teamwork and the establishment of a common set of objectives. Once project participants are committed, then it may be possible to internalize common goals and problem-solving efficiently, encouraging innovation and producing "value for money".
Cooperation	Gathers project's partners into the collaborative agreement, establishing the scope and ways to improve and increase the levels at which parties shall cooperate and interact.

**Table 5. Alliance's structural features**

<b>Feature</b>	<b>Description</b>
Alliance Agreement	A common agreement to all alliance parties covering the development, implementation and warranty phases of the project.
Common organization	Consists of having all alliance parties working under a common organization. The organization will appoint responsible people according to the best-for-project principle. All the alliance decisions must be unanimous and follow organization's principles.
Joint risk-sharing	Mutually agreed upon in advance and it applies to the procedures including both positive and negative risks. The success of the project as a whole (and not own parties success) determines the reward and bonuses received by the parties. The procedure requires all parties to follow the open cost control culture: open-book principle.

Unlike most forms of traditional contracts, in the alliance model the client and service providers reach common understanding and there was an agreement on the project costs, KRAs and their objectives were jointly defined and agreed during project's development phase. During the implementation phase, positive and negative risks are common to alliance parties. Risk is jointly shared between parties in accordance with the alliance agreement since one of the most important features of alliance is the implementation of a "win together or lose together" principle, where overall project success determines the amount of reward and bonuses or penalties parties shall get.

## **5. Research findings and results**

Next there will be a general description of interviews and project survey analysis. After, results and discussion will be organized in project's main features as reported by Alliance's members. There will be also a comment on alliance's external parties positioning in the project and a general comment over project's phases and their consistency.

### **5.1. Interviews**

As mentioned before there were a total of 6 interviews equally distributed between owner, contractor and designer's participants. Interview process tried to be as neutral as possible and biased information was eliminated. Major findings from interviews consisted of separate opinions of each of Alliance's parties focusing especially on project's experiences and features and a more general view over Alliance's potentialities. It was interesting to observe common perspectives from different sides and to try to understand and explain differences shown at common topics.

### **5.1.1. Project's features**

The experience at the Vuolukiventie 1b project has been globally positive. However, it became clear that participants did not always share the same views on project related issues. In that regard, the major project features will be discussed below.

#### Alliance agreement and organization

The alliance organization and agreement were the very first start and the most innovative feature of this project's identity. It was responsible to set proper selection criteria to ensure a professional and capable project group, and it was also in charge of setting proper common goals and guidelines to ensure high levels of commitment and collaboration between participants. Alliance structure and agreement were also responsible to spread collaboration along all project levels and to foster a clear, honest and open communication atmosphere between project's participants.

Some weaknesses were considered relevant, and they include the fact that alliance contractual clauses proved insufficient to guarantee unanimous decisions in all situations. Additionally, the agreement itself failed to make collaboration a reality and participants' roles were sometimes unclear. Also some expectations were too high in the beginning and that contributed negatively to some suspicion under the project approach.

#### Joint decision-making and problem-solving

Decision-making was a well-structured process in which owner did not had the final word deciding on what is best for project. That can be seen as a strength or weakness, but given the active role of participants under an alliance, that is mostly considered a positive feature. All decisions were highly discussed and owner side had more representatives than in a traditional project. This requires high levels of preparation, since owner role is not limited to client and supervisor, but also an active participant deciding and taking part of all project issues. That requires time and resources to spend in order to gain competencies and skills to work under Alliance. Project's decisions and solutions were jointly agreed by alliance members and that was possible working as a group in an open communication environment. This was possible due to high levels of commitment and collaboration that grew from early involvement since selection phase and by selecting a suitable team during that stage. Some suggestions over decision-making process include relegating minor issues to individual parties, instead of being jointly agreed.

On the negative side, quite often decisions took too much time since each party had different views on what was best-for project giving birth to difficulties achieving mutual agreement. At last but not least, even small decisions had to be made by entire alliance group which leaves the idea that the organization should relegate minor decisions to individual parties instead.

Problem-solving was an asset at this project since all issues were promptly discussed in an efficient non-blaming atmosphere. Discussion to solve those issues included all alliance representatives and it was a process that continuously improved during project's course.

#### Open-book and communication

Clear and promptly available information on financial and technical project specifications are believed to be driving forces for participants' commitment and collaboration as it aids decision-making process and promotes a positive working culture. Also, the information on costs has been promptly available and solutions have been discussed under a fixed budget. These features were believed to contribute for mitigation of hidden financial interests.



Project's communication was clear, honest and open. It was referred that communication between designers and contractor was better than traditionally. Also, it has been reported that communication with technical designers was higher than traditionally. Working environment and communication have been open since everyone took into account each other's expectations and concerns through a clear and honest talkative approach. Reasons for higher levels of communication can be linked to a more face-to-face interaction and also by informal aspects such as having coffee breaks and informal meetings, which proved to eliminate communication barriers.

It became clear that participants working together from early stages did not have particular problems concerning commitment and collaboration. However, participants working only at implementation phase were sometimes not prepared to work under alliance principles leading to some communication barriers between people working in office or site.

#### Team-building: meetings and workshops

Project's meetings have been smaller and more efficient and similarly had the aforementioned pros and cons of joint decision-making process. The atmosphere was of strong commitment and everyone participated with own ideas and views. In part, it is believed that the existence of an alliance counselor (some sort of an alliance guru) sharing his experiences on alliance and its virtues were responsible for inspiring and fostering a positive culture within meetings and project. In the same line as meetings, workshops also promoted discussion and problem-solving since one of its objectives was to enhance understanding of project's requirements, specifications and opportunities. It is suggested workshops should be introduced in the beginning of design procedures, since it could promote all the opportunities that come out of those events. Also, it is believed reduction of workshops and meetings at selection phase could reduce heaviness at this stage in terms of costs and time. However, it is not clear if the benefits that come from early involvement would vanish with fewer workshops and meetings.

#### Monitoring performance and job satisfaction

KRAs were unanimously considered properly developed by the alliance members. In author's perspective, even though sufficient information on KRAs was not provided, participants' behavior towards them and their relation with the incentive system was found adequate. For that, it contributed the fact that participants were not obsessively thinking in getting rewards or penalties. Instead, they were focusing on global project success and project's constraints. In this regard, an adequate development of KRAs is believed to positively affect participants' attitude, encouraging better project performance, collaboration and continuous improvements.

Project survey was an important tool to assess performance and job satisfaction in the project. It is directly related with KRAs but the most significant innovation was that participants were an active part of the assessment process. It is believed participants were more critical on their own and others work and that enhanced continuous improvements and fostered regular discussion after each survey round. Feedback meetings after survey rounds also helped reinforce commitment and continuous improvements over project's course. Innovations could also be encouraged even though this project did not have a lot of space for technical or process innovations.

It was suggested the number of survey's questions and KRAs could be reduced in number and focus more in project's risks. An excessive number of questions could make the survey too heavy and increase its chances of having redundant and correlated answers.

### **5.1.2. Subcontractors' role**

From interviews and survey analysis it became clear subcontractors had an important role and different views on project's issues. Subcontractors often felt excluded from project decisions and that is believed to have a relation with their clearly different views on project's survey fields.

The satisfaction levels of subcontractors were highly conditioned by reported decisions made against their interests and most of all by the fact of not having an opportunity to discuss beforehand on those issues. These issues included aspects such as technical ones or definition of own schedules. As an example, it was reported that recorded information of meetings was not available to some subcontractors. Also, it should be added procurement of subcontractors was only based on lowest price criterion and their contractors remain in the same format as traditionally, which again did not contribute for innovations regarding this group of participants. In this regard, it was perceived subcontractors in general did not feel as an active asset for project.

Integration of subcontractors in the Alliance is definitely something challenging that should be studied in a future Alliance project. It is believed development of subcontracting procedures such as new contract models with proper incentives and a closer participation in project planning and decision-making process could be in favor of subcontractors and also foster best-for-project results. The aforementioned integration of subcontractors with a more important role in/with the Alliance is certainly challenging but it is believed to enhance project's results in terms of costs, quality and time.

It became clear subcontractors were still the more fragile project participants. This is believed to have a connection to their higher risks and the low involvement in decision-making.

### **5.1.3. Project's phases**

Regarding project's phases it is interesting to observe the expectations and dynamics of the very first stage and the ongoing stage at the time of the research: selection and implementation phases respectively. Selection phase was responsible for early involvement between participants which is believed to be one of the main features that allowed good collaboration and commitment from participants as it has already been described before. It is not redundant to reinforce that selection phase allowed good working routines to grow and foster over project which led to a better interaction between participants during this phase. To make it a reality, proper criteria were set to award tenderers and tenders. In particular, there were subjective criteria regarding the organizational skills of tenderer to work under an alliance organization. Regarding tendering process it was stated by most interviewed parties it was a heavy and slow process. Early involvement of parties lead to an effective decision-making process, which however was time-consuming, since all decisions were made together and unanimously accepted. On the other hand, flexibility of decisions and solutions was seen as an asset for project. Time and costs were largely responsible for some inefficiency at selection phase. Later in the development and implementation phases, there were some reported mismatch between selection criteria and development requirements. It is believed that the client had more interest in selecting a capable team than concerning too much on the technical specifications during selection phase. It is suggested that a possible way to develop that should either make design and costs specifications more flexible or simply make it clearer on what are the requirements the client is looking for. Implementation phase has been closer to traditional practice than previous project's phases. Alliance was present with participants involved from early stage. Workers involved only at this stage did not feel all the organizational changes and features that alliance introduced. Procedures on site were still the same as traditional ones. There is no clear suggestion on how these procedures should or could change in order to maximize project's performance and alliance's collaboration. Also there were no clear major benefits of alliance in particular during implementation phase, since basis of work were already set and applied from

selection and development phases. Reportedly, decision-making process and the existence of a project survey were main innovations comparing to participants' previous experience and that is believed to have contributed for a more collaborative and performance-oriented work.

At high levels of decision-making collaboration was still remarkable during implementation phase. However, it was stated collaboration levels slightly decreased during this phase. In this regard, it is recognized there are still a lot of challenges to surpass which involve change of culture among participants and development of efficient ways to naturally foster collaboration and trust across all project's workers at implementation phase.

Most notorious strengths in performance at implementation phase included continuous improvements in cost-savings, design and quality. Drivers for those improvements could be attributed to a better decision-making process over time which is believed to be related with a better mutual understanding between project's participants.

## 5.2. Project survey analysis

The project survey results worked as an assisting tool to help validate interviews' content. Its results are given in a Likert scale from 1 to 5, where 1 means "Totally disagree" and 5 means "Totally agree". The survey results consisted of four rounds that took place between November 2012 and August 2013.

In order to understand the significance of survey's results there were conducted some statistical tests such as Person's correlation test to determine if each of 26 questions of the questionnaire were correlated or not in their respective answers. The other conducted tests consisted in the Kruskal-Wallis ANOVA test and it was used to statistically validate differences between survey rounds and between groups of respondents.

Project survey intended to measure levels of performance throughout implementation stages. The purpose of the survey was to stimulate improvements in between rounds as the areas under assessment were directly connected with the KRAs influencing only Alliance members' incentive system. The survey had six main fields with a total of 26 questions. Average results can be seen in Table 6. A distribution of participants among rounds can be observed in Table 7.

**Table 6. Performance according to survey**

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

**Table 7. Survey's respondents by round**

Respondents	Round			
	1	2	3	4
Alliance	15	14	17	10
Technical Designers/Experts	5	5	4	5
Subcontractors	11	11	8	5
<b>Total</b>	<b>31</b>	<b>30</b>	<b>29</b>	<b>20</b>

General levels of areas under assessment have developed over project's course as it can be observed from Table 6. However one of the most notorious findings comes from the different perspectives on project's course given by survey's respondents. By observing Fig. 3 it becomes clear that technical designers and experts were generally satisfied. Alliance participants' assessment generally increased over project's course, which is believed to have relation with alliance features and continuous improvements. However, subcontractors showed a decrease towards overall success of project which is believed to illustrate their higher susceptibilities and marginalization over project's planning and decisions, leading to lower levels of satisfaction when compared to other project's participants.

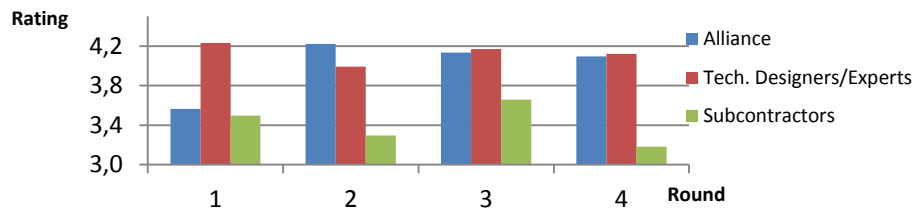


Fig. 3. Project's overall performance by respondent group

## 6. Conclusions

### 6.1. Final considerations and major contributions

Throughout this research work, a comprehensive study was conducted over collaborative and performance aspects on an alliance case study project. Aspects regarding their potential and limitations were identified and some unexpected findings were made. Early involvement of participants and the selection phase in particular are definitely differences and assets for PA when compared to traditional practice.

Major features are seen as necessary for PA implementation and they differed from traditional approach features and practices. It is author's belief that major features of alliance contributed for high levels of collaboration between participants and achieving better results (see Table 8).

Table 8. Major alliance's features

- 
- Alliance agreement and organization
  - Joint-decision making and problem solving
  - Open-book principle and communication
  - Team-building: meetings and workshops
  - Monitoring performance and satisfaction
- 

This research work allows concluding that the alliance was definitely worth applying at this project. First of all, it gave important feedback and insights over PA and its main features and experience in a construction project in Finland. This is from a pure theoretical view. In terms of project's participants' perspectives, key features were unanimously seen as assets and they are believed to have left a decisive impression and preparation towards future involvement and willingness to be part of alliance projects.

The author has strong belief that one of most important findings was the perception that subcontractors should play a more important role in project alliance, both in terms of better contracts with adequate clauses, but more importantly, subcontractors' views should be taken into account in the decision-making process, since they can help improve project's efficiency in terms of costs, schedule and quality by sharing their insights and know-how.

It is not expected that interest towards PA would come at first from construction industry. Yet, it is believed that legal authorities and academics should be the ones fostering discussion over new delivery models across practitioners. This project's experience indicates 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.

Limitations at this study include the fact that the research was conducted initially in Tampere, which is about 180 km far from case study project in Helsinki. That was a limitation in terms of availability to visit the site as often as could have been desirable. After that initial period, research was conducted in Portugal, except in August when the author went to Finland to get more feedback on project's developments. Other limitations include the fact that some project documentation was unavailable at the time of this study, limiting the

scope and depth of the research in certain stages. At last, the action research nature of this study might have influenced some results, which allied to the qualitative nature of the study, led only to general findings since minor findings could not be extended out of project's borders.

## 6.2. Future developments

There is a multitude of further developments that can be done regarding collaborative and performance-based delivery models. One of major developments includes the elaboration of a general framework of procedures for PA in EU. Aspects from selection phase to implementation and warranty models should be considered. Structural features such as decision-making and joint risk could also be studied with examples on ongoing projects.

Future developments might also focus on understanding in terms of willingness and legal framework the availability of Portuguese public procurement authorities to experiment these kinds of collaborative delivery models. For that, more studies should be conducted by both academics and legal authorities. Another prospect development could be to study the application and feasibility of alliance contracting in building projects, as most of the current alliances in the construction sector were made for water and transport infrastructures. Also, it should carry out a study of the advantages and disadvantages that might arise from the application of that sort of alliance in the nature of such projects.

In short, optimization of Alliance procedures and challenging ideas for collaborative and performance-based delivery models include:

- Development of a framework of PA procedures for EU;
- Engagement of EU public authorities into discussion over new delivery models;
- Standardization and development of leaner selection procedures;
- More time for big decisions and improve efficiency over small decisions;
- Clearer view on responsibilities over decision-making process;
- Extending PA to external members with common goals and liabilities;
- Performance monitoring and development of incentive systems;
- Development of subcontracting procedures;
- Allowing change of individual roles without organization's growth;
- Development of a general set of KRAs or KPIs for PA.

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