

This is an electronic reprint of the original article. This reprint may differ from the original in pagination and typographic detail.

Procurement of Collaborative Project Teams

Bølviken, Trond; Nwajei, Una Obiose Kriston; Hellström, Magnus Mikael

Published in:

Proceedings of the 31st Annual Conference of the International Group for Lean Construction (IGLC31)

DOI:

[10.24928/2023/0237](https://doi.org/10.24928/2023/0237)

Published: 26/06/2023

Document Version

Final published version

Document License

Publisher rights policy

[Link to publication](#)

Please cite the original version:

Bølviken, T., Nwajei, U. O. K., & Hellström, M. M. (2023). Procurement of Collaborative Project Teams: a Literature Study. In *Proceedings of the 31st Annual Conference of the International Group for Lean Construction (IGLC31): Lille, France, June 26 - July 2, 2023* (Proceedings of the Annual Conference of the International Group for Lean Construction). The International Group for Lean Construction.
<https://doi.org/10.24928/2023/0237>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

PROCUREMENT OF COLLABORATIVE PROJECT TEAMS – A LITERATURE STUDY

Trond Bølviken¹, Una Obiose Kriston Nwajei², and Magnus Mikael Hellström³

ABSTRACT

In construction the procurement phase is the connection between the definition phase and execution. Thereby it establishes crucial preconditions for success (or failure) in execution by establishing a shift from competition to collaboration as the fundamental logic in the relationship between customer and supplier. The paradox of the procurement of projects in general and collaborative projects in particular is its aim of establishing collaboration through means of competition.

The paper presents a literature study of methods used in the client's procurement of teams in collaborative project delivery models such as Integrated Project Delivery (IPD), Alliancing and others. Five procurement methods are identified: Direct Negotiations (DN), Team-Based Procurement (TBP), dual Target Outturn Cost (dTUC), Competitive Dialogue (CD) and Best Value Procurement (BVP). Three methods for comparing alternatives are also identified: Weight Rating Calculating (WRC), Best Value Selection (BVS) and Choosing by Advantage (CBA).

The paper discusses public procurement, procuring the team in one or several steps, early or late setting of targets related to Target Value Design (TVD), the use of qualitative and quantitative evaluation, the need to adjust the procurement method, and the need for information and training. The possibility of procurement based on design solution is also presented.

KEYWORDS

Alliancing, Collaborative contracts, Integrated Project Delivery, Procurement, Relational.

INTRODUCTION

Construction is a commercial activity (business) and, as such consists of customers (buyers) and suppliers (sellers). A construction project consists of chains of customers and suppliers where most suppliers also have sub-suppliers for whom they are customers and side-suppliers for whom they are not. In the relationship between customer and supplier, the customer is the principal, defining if, what, how, and when to buy; in contrast, the supplier is an agent supplying something (information, a production process, or a physical thing) to the principal and acting on the order and behalf of the principal (Eisenhardt, 1989). In the construction industry, the customer, initiating and buying the entire project is often referred to as the client, while the parties using the constructed object (the clients of the client) are often referred to as end-users.

¹ Professor, Faculty of Engineering and Science, Department of Engineering Sciences, University of Agder, N-4846 Grimstad, Norway, trond.bolviken@uia.no, orcid.org/0000-0003-4834-2408

² P.h.D Student, Department of Engineering Science, University of Agder, Jon Lillutens Vei 9, 4879, Grimstad, Norway, una.nwajei@uia.no, orcid.org/0000-0002-6979-4430

³ Professor, Faculty of Science and Engineering, Åbo Akademi University, Henriksgatan 2, 20500 Åbo, Finland, Magnus.Hellstrom@abo.fi, orcid.org/0000-0002-3851-0503

The relationship between customer/buyer/principal and supplier/seller/agent undergoes three generic phases. In the first initial phase, often referred to as the definition phase, the customer defines if, what, how, and when to buy. He/she acts on their own behalf and has not entered a commercial relationship with the supplier, who holds no formal or binding position (although he/she might of course try to promote himself to the customer). The second phase establishes the formal and binding relationship between the customer and the supplier. The customer decides from whom he/she will procure, and the commercial terms are agreed between the parties. Taking the customer's perspective, we will refer to this as the procurement⁴ phase. In the third phase, execution, the delivery takes place.

By passing on the need and intents of the customer to the supplier, the procurement phase is the connection between the definition phase and execution. Thereby it establishes crucial preconditions for success (or failure) in execution. It also establishes a fundamental shift from competition to collaboration as the fundamental logic in the relationship. By competition, we mean that the customer, in one form or another uses the presence of competing suppliers to gain an advantage for himself, while the suppliers try to exploit their strengths. Procurement occurs in a market where the parties look after their own commercial interests. This is done through different forms of direct and indirect competition. By direct competition, we refer to competitive tendering and parallel negotiations, and by indirect competition, we refer to the option for the customer to terminate exclusive negotiations and contact an alternative supplier. Through the procurement phase, the competitive relationship between the customer and several potential suppliers is replaced with an exclusive relationship between the client and the one chosen supplier for the execution phase. This makes collaboration between the two a fundamental requirement in the relationship within the execution phase (even though there will also be conflicting issues and a need for control)⁵.

It is, however, commonly agreed that the levels of conflict are often too high and value creation too low in construction. Both public and private clients have traditionally, to a large degree, used transactional contracts awarded by low-bid tendering, taking only price into consideration. These traditional project delivery models have been seen as a major obstacle to improvement and have resulted in an increasing interest in the development of new collaborative project delivery models, such as Integrated Project Delivery (IPD). They are all based on relational contracting (Nwajei, 2021)⁶ and aim at high levels of collaboration and the elimination or reduction of the principal-agent problem (Nwajei et al., 2022).

The reasoning above leads us to the formulation of the fundamental paradox of the procurement of projects in general and collaborative projects in particular: it aims at establishing collaboration through means of competition. A good start is often crucial for the success of a project, as in the expression “well begun is half done”. This is the reason why, according to Klakegg et al. (2021), procurement is one of the key elements that constitute a

⁴ In their book *Collaborative Project Procurement Arrangements* Walker & Lloyd-Walker (2015) use the term procurement in a different way, referring to Project Procurement Arrangements and Relationship-Based Procurement (RBP), what we would call Project Delivery Models and Collaborative Project Delivery Models (Nwajei et al. 2022). In this paper we see the procurement process as consisting of three phases: 1. the design of the process. 2. the procurement process, (identifying and comparing alternatives and their differentiating features), leading up to 3. the actual procurement (the decision of whom to engage and the closing of the agreement with the chosen party). Our paper is related to phases 1 & 2 as the specific phase by which the relationship between the client and his supplier(s) is established.

⁵ This balance and the fact that the parties must pursue both the interests of the other party and the interests of their own, is called the principal-agent problem and is the topic of agency theory (Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management review*, 14(1), 57-74.

⁶ In literature and different parts of the world, variants of these models are named Integrated Project Delivery (IPD), Partnering, Alliancing, Lean Project Delivery, Collaborative Contracting, Relational Contracting, and probably others. The differences between these variants are not the topic of this paper, and we will for ease refer to them all as IPD.

project delivery model. Lahdenperä (2012) describes a need to balance between early collaboration and competitive tension. One of the key issues in agency theory is the risk of adverse selection of a supplier (agent) (Eisenhardt, 1989). We could therefore expect the new collaborative project delivery models to have a high emphasis on how to approach procurement, that is, how to carry out the competitive selection of the team in a way that, instead of hindering, facilitates collaboration in the execution phase. This turns out not always to be the case. Research has to a large degree, focused on the collaborative processes in the execution phase, typically through observation of case projects. Nwajei (2021) points out that gaps exist from the limited empirical evidence on this subject and suggests further empirical examination of procurement and its effect on the relationship between the parties. Nwajei et al. (2022) summarise how the central components of collaborative project delivery models are described in literature and find that the selection and formation of the team is addressed as one of the fundamental functions of IPD in only two out of eight referred articles.

This lack of attention leaves researchers with limited overview of the procurement methods used and hardly any knowledge of the consequences of the different procurement methods both for the procurement and subsequent development and execution phases. This paper is part of a Ph.D. research project addressing these questions through understanding how IPD projects are, could, and should be procured. The paper presents the results of the first step: a study of how procurement is described in existing IPD-related literature. First, we describe the method used in the study. Then we present and discuss the identified procurement methods related to IPD. The goal is primarily to identify and give an overview of the methods, not to discuss their pros and cons.⁷ The second step will be to expand and include empirical data in a journal article that will address the paradox of IPD procurement.

METHOD

The paper presents the results of a systematic literature review, of the procurement of a team in IPD contracting in construction. The review is based on Booth et al. (2016) guide to conducting a systematic and rigorous process and is in accordance with PRISMA reporting standards.

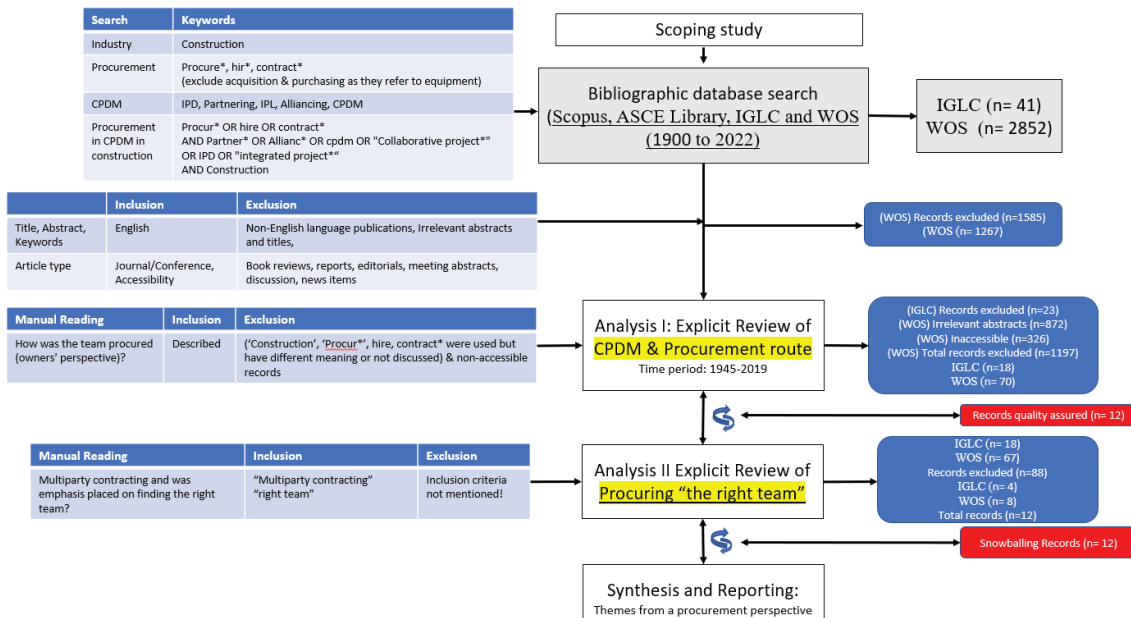


Figure 1: Flow chart of the literature search

⁷ Walker & Lloyd-Walker (2015) discuss pros and cons regarding some of the procurement methods we identify in this paper.

This search, see Figure 1, followed the following steps: 1. A systematic search in scientific databases, and 2. Snowballing from identified articles in combination with direct mail to some of the main contributors to the IPD literature asking about the literature on procurement of IPD they may be acquainted with.

SELECTING JOURNALS AND PAPERS

The review involved searching for ‘peer-reviewed journals’ in the World of Science database (WOS) and the International Group for Lean Construction database (IGLC) from 1900 to June 2022. A total of 2852 articles from WOS and 41 articles from IGLC were identified that had abstracts, title and keywords containing: ‘Construction’ in combination with: ‘Procure*’ OR, ‘hir*’ OR ‘contract*’ OR ‘IPD’ OR ‘Partnering’ OR ‘IPL’, ‘Alliancing’ OR ‘CPDM’ as shown in the flow chart, Figure. 1.

The search results were cleaned, excluding false positives (literature on a different or unrelated topic), non-English language publications, book reviews, reports, editorials, meeting abstracts, discussions, and news items, (WOS = 1585, IGLC = 0). Second stage cleaning, checking the title, abstract, keywords, and, if necessary, the full publication, identified irrelevant abstracts (WOS = 872, IGLC = 23) and inaccessible articles (WOS = 326, IGLC = 0). Articles were rejected if one of the words ‘procure’, ‘hire’ or ‘contract’ was used in a different meaning or not discussed.

Third-stage cleaning validated the efficacy of the exclusion criteria by double-checking the results resulting in 12 new admissions to WOS articles. Further cleaning reduced 100 articles to 85 articles (67 WOS and 18 IGLC), by examining the significance of the articles in discussing ‘procuring the right team’.⁸ Subsequently, this number (85) was further reduced to 24 articles by only retaining articles relevant to multiparty contracting (IPD, alliancing, consortium or multiparty contracting’).

In line with the approach taken by Booth et al. (2016), the quality of the articles was appraised. Therefore, articles and publications not included as part of the search were instead used as a starting point for additional citation searches (snowballing). In total, we ended up using a total of 24 documents (articles, handbooks/guides and books), of which 8 came from the WOS search, 4 from the IGLC search and 12 were snowballed documents.

PATTERN OF PUBLICATIONS

Compared to the total amount of publications on IPD, the number of publications addressing IPD procurement is limited, figure 2. Guide/handbooks and were the most useful sources of information figure 3. The publications on IPD procurement typically describe one or more procurement methods; some also give advice. However, only very few discuss the consequences of the different procurement methods for the procurement process itself. More important than the effect on the procurement process is the effect on the subsequent development and execution phases, and as a result, for project success and outcome. We have, in our search, found no publications discussing this and no publication giving an overview similar to the one we present in this paper.

⁸ After the search, we analysed the papers categorically into descriptive (describing how IPD teams are procured) and prescriptive (giving advice and describing how IPD teams should or could be procured). This turned out to be unsatisfactory, the reason being that some papers contained a mix of the two, while in other cases it was somewhat unclear to what degree the presentation actually was descriptive or prescriptive. We have, therefore, not included the coding in the presentation of the search.

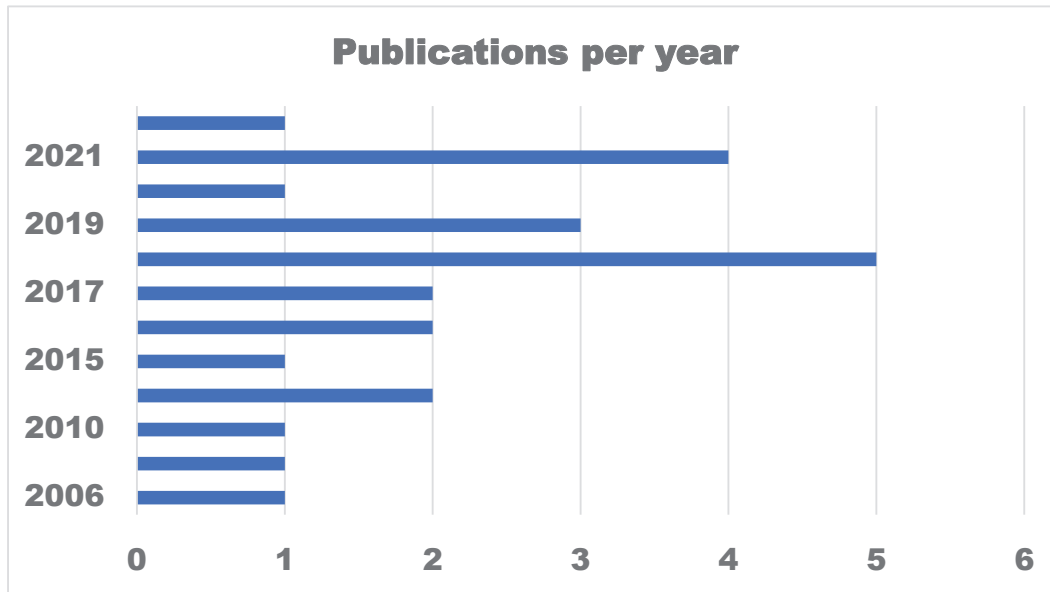


Figure 2: Number of publications per year from the identified literature

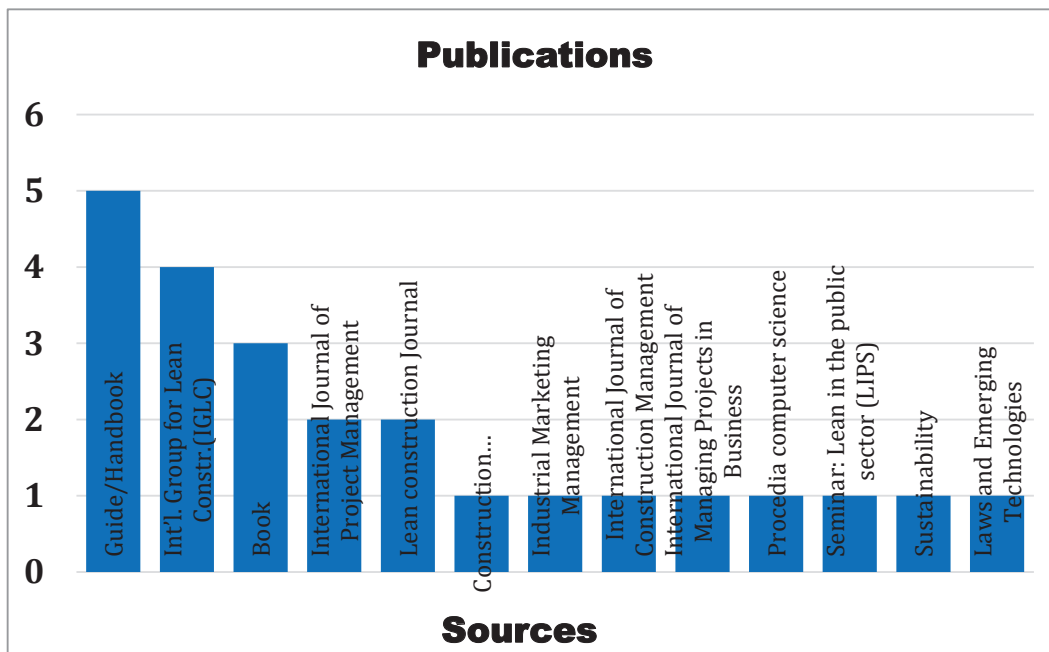


Figure 3: Number of reference sources from the identified publications

PROCUREMENT METHODS

In general, a project proposal might address the following components: solution, process, team, price, and commercial arrangements (Department-of-infrastructure-and-regional-development, 2015). Several authors emphasise that collaborative project delivery models like IPD cannot be based on price alone and require a procurement process based on competence, qualifications, and (product and process) value (e.g. (Heidemann & Gehbauer, 2010; Lahdenperä, 2012; Mesa et al., 2019; Schöttle et al., 2015). According to the Department-of-infrastructure-and-regional-development (2015), a selection process that optimises the opportunity for innovation and

differentiation between the proponents should result in better Value for Money (VfM) for the client.

All procurement methods identified in our literature search evaluate the team using techniques like interviews and workshops. In addition to the team, price, or value (related to product or process) other factors are taken into consideration in several of the methods. We have found no example of procurement methods related to IPD focusing only on price or value.

DIRECT NEGOTIATIONS

Some clients might have established relations with design and construction companies they prefer to work with. Crespin-Mazet et al. (2015) refer to this as “relational congruence in the project network”. When this is the case, the client might, instead of evaluating several companies, simply choose to enter into direct negotiations with their preferred partner (Allison et al., 2018; Crespin-Mazet et al., 2015).

TEAM-BASED PROCUREMENT

Several authors (e.g. (Allison et al., 2018; Department-of-infrastructure-and-regional-development, 2015; Fischer et al., 2017; Frydinger et al., 2016; Mesa et al., 2016, 2019) describe what we in this paper call Team-Based Procurement (TBP) approaches. In the first phase, two or more teams are evaluated, leading to selection of a preferred team. In these approaches, only the team is evaluated, looking at factors like qualifications, competence, previous experience, cultural congruence, alignment with the client’s goals and ambitions, and relational and collaboration skills. Prices or product characteristics are not factors.⁹ After selection, the preferred team works with the client to develop the product, the corresponding target price, and other commercial conditions. If this succeeds, the IPD agreement is signed. If not, the client must try all over again with another team (Fischer et al., 2017).

The single Target Outturn Cost (sTOC) process is an Australian variant of Team-Based Procurement. In sTOC there is a pre-qualification process before two or three contenders are qualified to undertake a selection workshop in which they present and discuss their proposed team and ideas for design solutions. They may also, in some cases, be required to offer a fee structure, expanding the parameters beyond the evaluation of the team. (Department-of-Treasury-and-Finance, 2006; Ross, 2009; Walker & Lloyd-Walker, 2015; Walker & Lloyd-Walker, 2020).

DUAL TARGET OUTTURN COST PROCESS

The dual (also referred to as multiple) Target Outturn Cost (dTUC) process is a variant of the single process described above (Department-of-Treasury-and-Finance, 2006; Ross, 2009; Walker & Lloyd-Walker, 2015; Walker & Lloyd-Walker, 2020). The difference is that the competitive elements (regarding team, price, and value) have more emphasis in the dual process. The client workshops in parallel with two preferred teams, and both teams calculate a target price. Both team, price, and value are evaluated in the final selection of one of the two competitors. The goal is to select the best-priced solution with the most attractive team skills package (Walker & Lloyd-Walker, 2015).¹⁰

COMPETITIVE DIALOGUE

As Competitive Dialogue (CD) is presented by Fernandes et al. (2018), the procurement process is divided into two phases, the contract notice phase and the tendering phase. In the contract

⁹ The Department of Infrastructure and Regional Development (2015) therefore calls this procurement approach “Non-price selection”.

¹⁰ The Department of Infrastructure and Regional Development (2015) calls this Full Price Selection. If only fees and not total costs are evaluated, they use the term Partial Price Selection. They do however warn against the latter. Mesa et al. (2016) use the terms Best-value total and Best-value fee

notice phase, the client prepares the request. Based on this, the suppliers submit a request to participate in the competition. The client then selects a limited number (approx. 3) of tenderers through a prequalification process. In the tendering phase, the client has individual parallel rounds of negotiations with all tenderers. During the negotiations, product, process, and commercial-related issues are discussed before the client makes an updated and final call for proposals, and the tenderers prepare and submit their final tenders. Finally, the client evaluates the tenders and awards the contract.

Hietajärvi et al. (2017) present a variant of dTUC and CD (without naming it so). In the first phase, the client prepares the tendering document, which includes goals, budget estimates, and evaluation criteria. Based on this, competing consortiums are established and prepare to present a first tender. The client then selects 3-5 consortiums to continue to the next phase, the negotiation phase. In the negotiation phase, the client and each consortium have workshops where they work collectively to develop content for the proposed project. Based on these workshops, the client evaluates each consortium and selects two to continue the process. These two then update their tenders, including price. Finally, based on the updated tenders and workshop experience, the client selects the winning consortium, with whom they sign a contract for the next phase - development.

Also, Jobidon et al. (2021) present a procurement method that seems to be a variant of dTUC and CD. This method is used in Canada.

BEST VALUE PROCUREMENT

Best Value Procurement (BVP) is founded on the understanding of the supplier (the contractor) as an expert and allows the client to be a non-expert (within the profession of the supplier). The idea is early contractor involvement (ECI) in value creation and risk reduction from the client's perspective in combination with an effective procurement process. The process is divided into four phases: preparation, selection, clarification, and execution. In the preparation phase, the client makes a core document describing project objective and scope, the selection criteria and their weighting, and a maximum price (budget ceiling). Pre-qualification is recommended. In the selection phase, each competing supplier prepares a tender consisting of three two-page documents, in total six pages: in the Level of Expertise document, the supplier describes and documents their capability to fulfil the client's requirements; in the Risk Assessment document they identify the most important risks from a client perspective and a risk mitigation plan, in the Value-Added document the vendor presents recommendations that can increase value for the client. Based on the three documents, price, and interviews with core members of the vendor's project leadership team, the client selects a preferred vendor. In the clarification phase, the preferred vendor prepares and presents technical documentation, a project schedule, and key performance indicators. Finally, the contract is negotiated and, if the parties agree, signed. In the execution phase, the risk management plan and periodic risk reports are dynamic documents (Narmo et al., 2018).

BVP has been used in the procurement phase for a IPD road construction project in Norway (Johansen et al., 2021). Wondimu et al. (2018) compare CD to BVP, but not in relation to their applicability in IPD project.

METHODS FOR COMPARING ALTERNATIVES

While the procurement methods describe the entire procurement process, the methods for comparing alternatives focus only on the part of the process (how to compare the alternatives). This means that a method for comparing alternatives will be part of a procurement process and that a procurement process might use different methods for comparing alternatives from case to case. Schöttle et al. (2015) describe and compare three methods (for comparing alternatives- in our case, tenders. They compare the three methods through simulation in a constructed case

(based on a real turn-key project). The simulation demonstrates that the size of the differences in scores and the tenders' ranking depends upon the method used.

WEIGHTING RATING CALCULATING

Weight Rating Calculating (WRC) is also referred to as Weighted Sum, Scoring System, Ranked Scoring or Utility Analysis. In WRC, the bid price is one of several factors. The weighting of factors and attributes is done directly and indicates the importance of each factor for the client.

BEST VALUE SELECTION

Best Value Selection (BVS) is also referred to as Best Value Scoring Analysis. BVS is based on WPC but differs in the evaluation of the bid price. In BVS, all factors apart from price are calculated as a value/qualification score. The bid price is then divided by the value/qualification score. The smaller this ratio is, the better is the proposal (high value-for-money).

CHOOSING BY ADVANTAGE

In Choosing by Advantage (CBA), the advantages of the alternatives are compared to decide their importance. What is important in CBA is to identify which factors will reveal significant differences between the alternatives, not what factor (in the abstract) will be important in the decision.

DISCUSSION

Through our literature review, we have identified seven unsettled issues, unexplored solutions, and recommendations to team selection in collaborative projects. These are discussed below.

PUBLIC PROCUREMENT

When procuring, public clients are bound by regulations, motivated by considerations of anti-corruption, fair competition, and effective use of public money (value-for-money). They demand the use of objective criteria defined before tendering starts and to be able to document the procurement process. This requires a stable framework and limits the client's ability to adjust during the process. Otherwise, bidders can make claims, complicating the process, forcing the client to pay compensation, or even nullifying the results (Schöttle et al., 2015). The different considerations might pull in different directions, e.g., fairness might interfere with value-creation in the procurement process (Jobidon et al., 2021). Private clients are in a different formal position, with few or no constraints on formal competitive procurement (Lahdenperä, 2012).

It is claimed that a shift to new procurement and project delivery models will require a change in public regulations (Cohen 2010, (Cohen, 2010; Ghassemi & Becerik-Gerber, 2011; Heidemann & Gehbauer, 2010; Rodrigues & Lindhard, 2021), but this is obviously not always the case, and the situation differs between countries: the mood and interpretation of the regulations is gradually changing (Walker & Lloyd-Walker, 2015) and we have in many countries seen new models being promoted and used by public clients also within the framework of existing regulations. In Australia, Alliancing and related procurement processes are well established in public projects. (Department-of-infrastructure-and-regional-development, 2015; Walker & Lloyd-Walker, 2015).

According to Jobidon et al. (2021) dysfunctional regulations and the absence of clear directives and guidelines regarding collaborative models create “a normative fog” (p. 5) that causes uncertainty and complexifies the pathway for public clients as well as tenderers.

Schöttle et al. (2015), discuss the different methods for comparing alternatives that have specific potential challenges when it comes to compliance with public procurement regulations.

PROCUREMENT IN ONE STEP OR THROUGH A SUCCESSIVE TEAM EXPANSION?

Fischer et al. (2017) argue that instead of procuring the entire IPD team in one step, one should start out with a small team and expand it with new participants along the way. This view is supported by Rodrigues and Lindhard (2021). According to the Department-of-infrastructure-and-regional-development (2015) the decision of one or successive¹¹ steps should be considered from case to case. Both Crespin-Mazet et al. (2015) and Mesa et al. (2019) describe two cases, one where the entire core group was selected at the same time and one case where the parties were selected in two or three steps. Successive selection of new partners could in principle be done using any of the methods described above.

As for the IPD contract, a successive team expansion can be handled in two alternative ways, a sub-agreement approach where the new parties enter a separate agreement linked to the existing agreement, and a joining agreement approach where the new parties join the existing agreement (Fischer et al., 2017).

SHOULD TARGET PRICE BE SET BEFORE, DURING OR AFTER THE PROCUREMENT PROCESS?

Target Value Design (TVD) is a concept related to IPD. In TVD, the target price is set early (before the start of the design process) and used as a constraint to maximise customer value (Ballard, 2011). The alternative to this approach is to set a target price during or after design. In the first case, the target is set solely by the client; in the two latter cases, in dialogue and negotiation between the client and the team of designers and contractors. The procurement methods described above have different approaches to this. In Best Value Procurement (BVP), the target is set by the client as a precondition that the tenderers must accept if they want to participate in the competition. In dual Target Outturn Cost (dTUC) and Competitive Dialogue (CD) the target is set as part of the procurement process, while in Team-Based Procurement (TBC) it is set after the team is selected.

Johansen et al. (2021) discuss early versus late setting of the target price. They argue that if the target is set early, it must be adjusted during or after procurement. This leads them to recommend that the client should set an allowable price early, but that the target price is set in dialogue with the chosen team during or after procurement. References to an Australian debate on a single versus a dual Target Outturn Cost process can be found in Ross (2009).

SHOULD PROCUREMENT BE BASED ON QUALITATIVE OR QUANTITATIVE EVALUATION?

Apart from some possible variants of Competitive Dialogue (CD), all identified procurement methods have a high degree of qualitative evaluation. Such qualitative evaluation cases can be transformed to a quantitative expression through one of the methods for comparing alternatives presented above, or they can be handled purely qualitatively. From the procurement methods identified, the decision to enter Direct Negotiations (DN), will normally be taken based on a purely qualitative judgement. In contrast, dual Target Outturn Cost (dTUC) and Best Value Procurement (BVP) use a quantifying method. Team-Based Procurement (TBC) might use both approaches.

COULD PROCUREMENT BASED ON DESIGN BE AN ALTERNATIVE?

In traditional design competitions, the client evaluates design proposals (mainly qualitatively), and the preferred proposal is selected to be further developed together with the client. In design and price competitions, alliances of designers and contractors present design proposals with a

¹¹ The Department of Infrastructure and Regional Development (2015) uses the term “progressive”.

lump sum price. In this case, the client makes a (qualitative and quantitative) evaluation of the proposals and selects the best value-for-money alternative.

We have in literature found no example of design-based procurement related to IPD. Could this be an alternative in some cases?

THE NEED TO ADJUST THE PROCUREMENT METHOD

In a procurement strategy for an IPD project, the client must answer several questions: What is of importance (value) for us as a client? What is to be evaluated in the procurement process, teams, product proposals, process proposals, prices and/or commercial arrangements? Should the entire team be procured at once, or should we use a successive approach? Should there be competition between teams/companies, or should we negotiate directly with one preferred partner? Should the evaluation be based on qualitative and/or quantitative parameters? How should the parameters be compared and weighted? For example, if we are going to evaluate prices, should this be fees, unit prices and/or aggregated prices for parts of or the entire object? Should aggregated prices be targets or maximums?

The combined answers to these questions create a potential number of procurement methods far beyond the limited number identified in this literature review. According to Department-of-infrastructure-and-regional-development (2015); Lahdenperä (2012); Walker and Lloyd-Walker (2015), the procurement method must therefore be adjusted and specified in each project. This is a situation different from procurement of unit-price or lump-sum contracts in open hard bidding. Here identical strategies and methods might be used from project to project. Especially in public projects, this makes the procurement process more challenging. In addition, it increases the risk of alleged or actual breach of rules and, consequently, potential complaints.

THE NEED FOR INFORMATION AND TRAINING

Selection criteria should be practical and easy to understand in an unambiguous way by both clients and tenders. New procurement methods are unfamiliar to people, more complicated, and harder to grasp than traditional price-only procurement. We must also expect the procurement method and IPD to be new to many participants. Several authors see training of both client and potential teams as important for success in the procurement process (e.g. (Hietajärvi et al., 2017; Narmo et al., 2018; Walker & Lloyd-Walker, 2015).

CONCLUSIONS, LIMITATIONS, AND FURTHER RESEARCH

We have in this paper presented the procurement methods related to IPD that we have identified through a systematic literature review. The goal has been to give an overview, not to go into detail regarding the different methods.

Some of the presented papers are purely descriptive, describing procurement methods used. Others are prescriptive, advising on how procurement of IPD teams should or should not be done. Others, again, are a mix of the two. A few contributions discuss consequences of the different procurement methods for the procurement process (Department of Infrastructure and Regional Development 2015, Walker & Lloyd-Walker 2015). The most important is the effect of the procurement method for the subsequent development and execution phases, and as a result, for project success and outcome. In the introduction, we formulated what could be called the paradox of IPD procurement: it aims at establishing collaboration through means of competition. In our literature search, we found no papers discussing this, neither theoretically nor empirically. This paper contributes to the core conceptual conversation and advancing insight on procurement of collaborative construction deliveries in order to push forth discussions and debates in neglected strands of the construction management and organization field.

IPD is often presented as a game-changer in construction. This is contrasted by its slow uptake. If IPD is a game changer, why is it not changing the game quicker? In IPD procurement, the procurement process is more complex and demanding for the client than in traditional price-focused procurement. At the same time, the client has limited security for what he will actually get when he enters the contract. Can this be part of the reason for the slow uptake of IPD? Based on this literature review, the plan is to address these questions in the next step in our research project on IPD.

There are two main limitations in the type of literature search used: the terms used in the search and the presence of the relevant literature in the databases used. To compensate for this, we have snowballed from identified papers and asked some of the main contributors to the IPD literature for relevant references. The snowballing and direct requests resulted in several relevant papers but didn't change any of the main findings. We see this as an indication of that the search method used has given us a relevant and representative overview of the literature.

REFERENCES

- Allison, M., Ashcraft, H., Cheng, R., Klawens, S., & Pease, J. (2018). *Integrated project delivery: an action guide for leaders*.
- Ballard, G. (2011). Target value design: current benchmark. *Lean Construction Journal*, 6(1), 79-84.
- Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review*. Sage.
- Cohen, J. (2010). *Integrated project delivery: case studies AIA* (California Council in partnership with AIA, Issue).
- Crespin-Mazet, F., Havendvid, M. I., & Linne, A. (2015, Oct). Antecedents of project partnering in the construction industry - The impact of relationship history. *Industrial Marketing Management*, 50, 4-15. <https://doi.org/10.1016/j.indmarman.2015.07.018>
- Department-of-infrastructure-and-regional-development. (2015). *National Alliance Contracting Guidelines: Guide to Alliance Contracting*. Department-of-infrastructure-and-regional-development
- Department-of-Treasury-and-Finance. (2006). *Project alliancing practitioners' guide*. Department of Treasury and Finance.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management review*, 14(1), 57-74.
- Fernandes, D. A., Costa, A. A., & Lahdenpera, P. (2018). Key features of a project alliance and their impact on the success of an apartment renovation: a case study. *International Journal of Construction Management*, 18(6), 482-496. <https://doi.org/10.1080/15623599.2017.1344913>
- Fischer, M., Khanzode, A., Reed, D., & Ashcraft, H. W. (2017). *Integrating Project Delivery*. Wiley. <https://books.google.no/books?id=RojDgAAQBAJ>
- Frydinger, D., Tim, C., Vitasek, K., & Bergman, J. (2016). *Unpacking Relational Contracts: The Practitioner's Go-To Guide for Understanding Relational Contracts*.
- Ghassemi, R., & Becerik-Gerber, B. (2011). Transitioning to Integrated Project Delivery: Potential barriers and lessons learned. *Lean Construction Journal*.
- Heidemann, A., & Gehbauer, F. (2010). Cooperative project delivery in an environment of strict design-bid-build tender regulations. Proc. 18th Ann. Conf. Int'l. Group for Lean Constr.(IGLC-18),
- Hietajärvi, A.-M., Aaltonen, K., & Haapasalo, H. (2017). What is project alliance capability? *International Journal of Managing Projects in Business*.

- Jobidon, G., Lemieux, P., & Beaugard, R. (2021). Building information modeling in Quebec's procurement for public infrastructure: A case for integrated project delivery. *Laws*, *10*(2), 43.
- Johansen, A., Engbo, A., Torp, O., & Kalsaas, B. T. (2021). Development of target cost–By the owner or together with Contractors-Target Value Design. *Procedia computer science*, *181*, 1171-1178.
- Klakegg, O. J., Pollack, J., & Crawford, L. (2021). Preparing for successful collaborative contracts. *Sustainability*, *13*(1), 289.
- Lahdenperä, P. (2012). Making sense of the multi-party contractual arrangements of project partnering, project alliancing and integrated project delivery. *Construction management and economics*, *30*(1), 57-79. <https://doi.org/https://doi.org/10.1080/01446193.2011.648947>
- Mesa, H. A., Molenaar, K. R., & Alarcon, L. F. (2016). Exploring performance of the integrated project delivery process on complex building projects. *International Journal of Project Management*, *34*(7), 1089-1101. <https://doi.org/10.1016/j.ijproman.2016.05.007>
- Mesa, H. A., Molenaar, K. R., & Alarcon, L. F. (2019). Comparative analysis between integrated project delivery and lean project delivery. *International Journal of Project Management*, *37*(3), 395-409. <https://doi.org/https://doi.org/10.1016/j.ijproman.2019.01.012>
- Narmo, M., Wondimu, P. A., & Lædre, O. (2018). Best Value Procurement (BVP) in a mega infrastructure project. Proc. of the 26th Annual Conference of the International Group for Lean Construction,
- Nwajei, U. O. K. (2021). How relational contract theory influence management strategies and project outcomes: A systematic literature review *Construction management and economics*, *39*(5), 26. <https://doi.org/https://doi.org/10.1080/01446193.2021.1913285>
- Nwajei, U. O. K., Bolviken, T., & Hellstrom, M. M. (2022). Overcoming the principal-agent problem: The need for alignment of tools and methods in collaborative project delivery. *International Journal of Project Management*, *40*(7), 750-762. <https://doi.org/10.1016/j.ijproman.2022.08.003>
- Rodrigues, M. R., & Lindhard, S. M. (2021). Benefits and challenges to applying IPD: experiences from a Norwegian mega-project. *Construction Innovation*. <https://doi.org/https://doi.org/10.1108/CI-03-2021-0042>
- Ross, J. (2009). Alliance Contracting: lessons from the Australian experience. *Ponencia presentada en el seminario de Lean in the public sector (LIPS)*.
- Schöttle, A., Arroyo, P., & Bade, M. (2015). Comparing three methods in the tendering procedure to select the project team. 23rd Annual Conference of the International Group for Lean Construction,
- Walker, D., & Lloyd-Walker, B. (2015). *Collaborative project procurement arrangements*. Project Management Institute.
- Walker, D. H. T., & Lloyd-Walker, B. (2020). *Routledge Handbook of Integrated Project Delivery* (1st ed.). Routledge.
- Wondimu, P. A., Klakegg, O. J., Lædre, O., & Ballard, G. (2018). A comparison of competitive dialogue and best value procurement. 26th Annual Conference of the International Group for Lean Construction,