

Key lessons learned from adopting relational principles in the public sector: a case study in California.

Principales lecciones aprendidas al adoptar principios relacionales en el sector público: un estudio de caso en California.

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Abstract

Alternative project delivery methods that support collaboration are gaining significant attention in the public sector in the U.S., with increasing examples of owners that transform their traditional delivery methods into ones that reflect relational contracting principles. These approaches are new and despite their proven benefits, their widespread is hindered by the novelty and unfamiliarity nature. The aim of this paper was to contribute to bridge this gap. The key elements associated with relational principles were drawn from the literature and discussed in the light of an empirical case in California. This successful case study provides evidence that these elements can work, even with the limitations commonly observed in the public sector. The paper discusses observed best practices and reveals some practical insights from a project team that was implementing relational elements in the public sector for the first time. The findings of this study will hopefully contribute to the widespread of these practices, and inspire academics and practitioners to initiate or continue their journey towards more collaborative project delivery methods in the construction industry.

Keywords: *Relational Contracts; Integrated Project Delivery; Collaboration; Public Sector.*

Resumen

Los métodos alternativos de ejecución de proyectos que fomentan la colaboración están ganando una atención significativa en el sector público de los EE. UU., con cada vez más ejemplos de mandantes que transforman sus métodos de ejecución tradicionales en otros que reflejan los principios de contratación relacional. La difusión de estos nuevos enfoques, pese a sus beneficios comprobados, se ve obstaculizada por su novedad y la falta de familiaridad. El objetivo de este artículo fue contribuir a cerrar esta brecha. Los principales elementos asociados con los principios relacionales se extrajeron de la literatura y se discutieron a la luz de un caso empírico en California. Este exitoso estudio de caso proporciona evidencia de que estos elementos pueden funcionar, incluso con las limitaciones comúnmente observadas en el sector público. El artículo analiza las mejores prácticas observadas y revela algunas ideas prácticas de un equipo de proyecto que estaba implementando elementos relacionales en el sector público por primera vez. Se espera que los hallazgos de este estudio contribuyan a la difusión de estas prácticas e inspiren a académicos y profesionales a iniciar o continuar su viaje hacia métodos de ejecución de proyectos más colaborativos en la industria de la construcción.

Palabras clave: Contratos Relacionales; Gestión integrada de proyectos; Colaboración; Sector público.

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1. Introduction

Recently, the concept of Integrated Project Delivery (IPD), with its principle of relational contracting, has highlighted the importance of collaboration in construction projects (Ling, et al. 2015), (Memon et al. 2015), (Jelodar et al. 2016). IPD is based on recognizing mutual benefits and win-win scenarios through more cooperative relationships between contracting parties. Relational contracting theorizes that collaborative working arrangements occur in “mutual reciprocity” and therefore consider the interests, needs, expectations, and constraints of contracting parties (Macneil 1974). Previous research has identified this type of arrangement as an appropriate way forward to provide the necessary flexibility in smoothening contractual relationships and overcoming transactional barriers to team building (Rahman and Kumaraswamy 2002a).

Despite the popularity of IPD and the increased advocacy for more integrated ways of working, there has been plenty of research demonstrating remaining challenges with the widespread adoption of IPD in countries less familiar with its strategy. One study that explored the adoption of integrated forms of agreement in South America is the research conducted by (Toppi et al., 2015), which analyzed the implementation of Integrated Project Delivery (IPD) in Brazil. The study concluded that IPD is not widely adopted in Brazil due to a lack of awareness of the delivery method. Nevertheless, the authors advocate and highlight the potential benefits of IPD, including improved communication and collaboration, better decision-making, and improved project outcomes.

In a study conducted by (Regis et al., 2021) also in Brazil, the adoption of IPD and shared risk and rewards structures were analyzed. The study found that the IPD can facilitate collaboration and communication among project stakeholders, resulting in improved project outcomes and reduced conflicts. The study also highlighted that the lack of familiarity with shared risks and rewards approaches is the main barrier for their lack of implementation.

The barriers for South America's increased adoption of IPD are similar to the barriers encountered by other regions where IPD is still emerging, i.e. Canada (Poirier et al., 2022). Despite the belief that IPD would improve communication, collaboration and improve project outcomes, the novelty of this approach and lack of capabilities to manage projects using unfamiliar types of agreements remain the main barrier for its widespread adoption.

In the public sector, these barriers are even intensified, as agencies have less freedom to choose their contracting methods and those who adopt relational principles have to flex traditional rules and make adaptations within a still traditional environment.

These alternative routes to project delivery that support collaboration have gained significant attention as an alternative approach to more traditional contracting approaches in the public sector in the U.S., with increasing examples of owners that transform their yet traditional delivery methods into ones that reflect the collaborative principles of IPD. Within this context, there is an increasing need for research, to address the specific complexities and nuances of implementing relational contracts within the public sector construction context and to identify the success factors and best practices to do so. The aim of this paper is to contribute to bridge this gap by highlighting the elements associated with relational principles that contribute to increase trust and transparency in public projects delivered in California, while reviewing their limitations and best practices observed around the adoption of each one of these elements.

The pledge for increased integration and collaboration

Maximizing value at the project level is difficult when the selection process is based on price and increased value, quality, and speed are only considered for a premium. In addition to that, the type of contract generally inhibits coordination, stifles cooperation and innovation, and rewards individual contractors for reserving good ideas and optimizing their performance at the expense of others (Matthews and Howell, 2005).

Collaborative construction project arrangements that use relational contracting principles have been the subject of many development efforts in response to the frustration toward the opportunism inherent in traditional contracting (Lahdenperä, 2012), (Hietajärvi et al., 2017). Relational contracting underpins various approaches. One of them is the IPD, commonly used in the USA. Different types of agreements are used under IPD to relay its principles: (a) the Integrated Form of Agreement (IFoA), developed for Sutter Health projects in California and used by other healthcare providers; (b) ConsensusDocs 300 (USA) - a derivative of IFoA; (c) AIA C191-2009 Standard Form Multi-Party Agreement for IPD; and (d) AIA C199-2010 Standard Form of Agreement Between Single Purpose Entity and Contractor for Integrated Project Delivery.

Several studies have examined the benefits of a relational approach to project delivery. In a study sponsored by the Construction Industry Institute (CII) - (Leicht et al., 2016) - it was found that IPD projects had a higher level of satisfaction among team members and owners, as well as a lower number of claims and disputes. The study also found that IPD projects had a higher level of productivity and a shorter project schedule.

In addition to these contracts, there has been an increased use of CMAR and DB types of contracts modified to incorporate relational principles. Those are typically used in the public sector by agencies with less freedom to choose their contracting methods. These alternative methods have gained significant attention as an alternative approach to more traditional contracting approaches in the public sector, as a means of fostering long-term collaboration and improving project outcomes. While the specifics may vary depending on the contracting approach, the following principles are typically found in these collaborative project arrangements:

Early Involvement of Key Stakeholders:

Integrated forms of agreements emphasize the early involvement of key project stakeholders, including owners/clients, designers/architects, contractors, and major subcontractors. These stakeholders collaborate from the early stages of the project to jointly define project goals, objectives, and strategies.

Shared Risk and Reward:

Integrated agreements often include mechanisms to share both risks and rewards among project participants. This encourages collaboration, as all parties are incentivized to work towards the project's success and manage risks collectively. This may include shared savings or incentives tied to meeting project milestones or achieving performance targets.

Joint Decision-Making and Collaboration:

Integrated forms of agreements promote collaborative decision-making processes among project participants. The stakeholders work together to make informed decisions, solve problems collectively, and find the best solutions for the project. This collaborative approach helps foster trust, improve communication, and enhance project outcomes.

Open and Transparent Communication:

Effective communication is a fundamental aspect of integrated agreements. Stakeholders actively share project information, including design details, cost data, and construction schedules, to enable better coordination and decision-making. Open and transparent communication helps build trust and aligns the stakeholders' understanding of project objectives.

Integrated Project Teams:

Integrated agreements often involve the creation of integrated project teams, where representatives from different stakeholders work together as a cohesive unit. These multidisciplinary teams collaborate throughout the project lifecycle, allowing for cross-functional expertise and streamlined communication.

Continuous Improvement and Learning:

Integrated agreements embrace a culture of continuous improvement and learning. Stakeholders actively seek feedback, monitor project performance, and implement lessons learned to enhance future projects. This focus on continuous improvement fosters innovation, efficiency, and quality throughout the project.

Early Conflict Resolution:

Integrated forms of agreements typically include mechanisms for early identification and resolution of conflicts. By establishing a cooperative environment and emphasizing open dialogue, stakeholders proactively address conflicts and disputes to minimize disruptions and maintain project momentum.

Performance Measurement and Evaluation:

Integrated agreements often incorporate performance measurement and evaluation mechanisms to assess project progress and outcomes. Key performance indicators (KPIs) may be defined to track various aspects, such as cost control, schedule adherence, quality, and client satisfaction. Regular evaluation allows stakeholders to identify areas for improvement and take corrective actions.

By incorporating these common elements, integrated forms of agreements aim to promote collaboration, efficiency, and improved project outcomes by aligning the interests and efforts of all project participants (Lichtig, 2005). These agreements facilitate a more integrated and collaborative approach to project delivery, emphasizing shared goals and collective decision-making.

Although the principles remain the same, their adoption will vary depending on the context and owner's freedom of choice. In this paper, we will explain how these principles were adopted in the analyzed context and what were the main lessons learned.

2. Research Methods

In order to achieve the objectives of this research, a case study approach was taken. This approach was chosen as it allows for a deep understanding of the subject (Yin, 2012). The aim of the case studies was to collect empirical data that could support the evaluation of the different elements that constitute a collaborative environment.

The chosen case was for a public owner that had limited ability to introduce mechanisms to support collaboration (i.e. multi-party agreements, shared financial structure).

Even with those limitations, the project was delivered within the expected timeframe and generated savings that was distributed among participating companies. The project was also situated in the heart of a major city in the U.S. and benefited from a very participatory process of stakeholder engagement throughout its development, including representation from the city, from the multiple client user groups, from community representatives, local workforce development, etc. The project overcame all the challenges of its complex environment and was delivered meeting the expectations of all stakeholders involved.

Data from the case study started to be collected in 2016 when the client organization was starting to plan the project and study which delivery method would be more appropriate. Data collection continued through the years until 2023, when the project reached its completion. The methods used to collect data included direct participation on the project, focus group discussions, document analysis, and interviews. This paper reflects on the data collected and insights gained over the years.

3. Findings

Early Involvement of Key Stakeholders:

It was the early engagement that allowed companies to collaborate and jointly define project goals, objectives, and strategies that were aligned with their interests and constraints. The project had a very participatory process of engaging owner stakeholders in the design process and the presence of the trade partners throughout this process was fundamental to understand the limitations and consequences of owner requests, analyze and thoroughly understand constructability aspects within the development phase of design and ultimately understand limitations and define as an integrated team (owner, architects, general contractor) the conditions of success for the project.

Some of the limitations in the public sector are related to the use of traditional contracting methods, when full IPD is not a possibility. A modified DB was used in the project and the GC developed a strategy to bring subcontractors in relatively early. This early engagement allowed the project team to develop agreed targets for the project. Those targets included safety, quality, people and cultural aspects, and financial performance. Many strategies were collectively developed to achieve those goals, with the general contractor often leading their implementation in collaboration with subcontractors and design team.

The early engagement of trade partners, GC and owner with designers allowed for a better-informed design process, avoiding some of the rework observed in more traditional delivery practices where design-detailing-construction are done in a very sequential manner, with a hard hand-off. Often this collaboration led to less time spent on design options that the team would rate as unfeasible at the early start, as constraints and the boundary of solutions were discussed even before spending much effort in drawing.

Shared Risk and Reward:

The major benefit of a shared risk and reward strategy is to encourage collaboration, as all parties are incentivized to work towards the project's success and manage risks collectively. However, often in the public sector, agencies cannot have a regime of shared risks and rewards. Within these limitations, some projects adopt a partial shared rewards program, and the management of risks is allocated to the party with the best ability to manage them. This was the case of the analyzed project. It took the client a long time to draft the contract and define a compensation structure that would reflect the relational principles and yet be compliant with their restrictions. A large part of that process was to understand what is possible in terms of shared risks and rewards. The project had a partial regime for shared savings, which included a limited number of subcontractors. It was the first time the client had used this approach.

In this regime, increased profit could be accomplished if direct costs of construction were reduced. The team then adopted an approach of continual monitoring the project's health and active implementing countermeasures in case of deviations. This allowed participants to discuss opportunities and risks and who is in the best position to manage them. The chart below (Figure 1) shows the financial performance of the project, where the actual performance was slightly better than the forecast. The team successfully achieved the target cost, splitting the savings with the client at the project conclusion. The chart was built collectively by the general contractor and trade partners and discussed with the owner monthly. Risks, opportunities and use of contingency being the main topics of conversation.

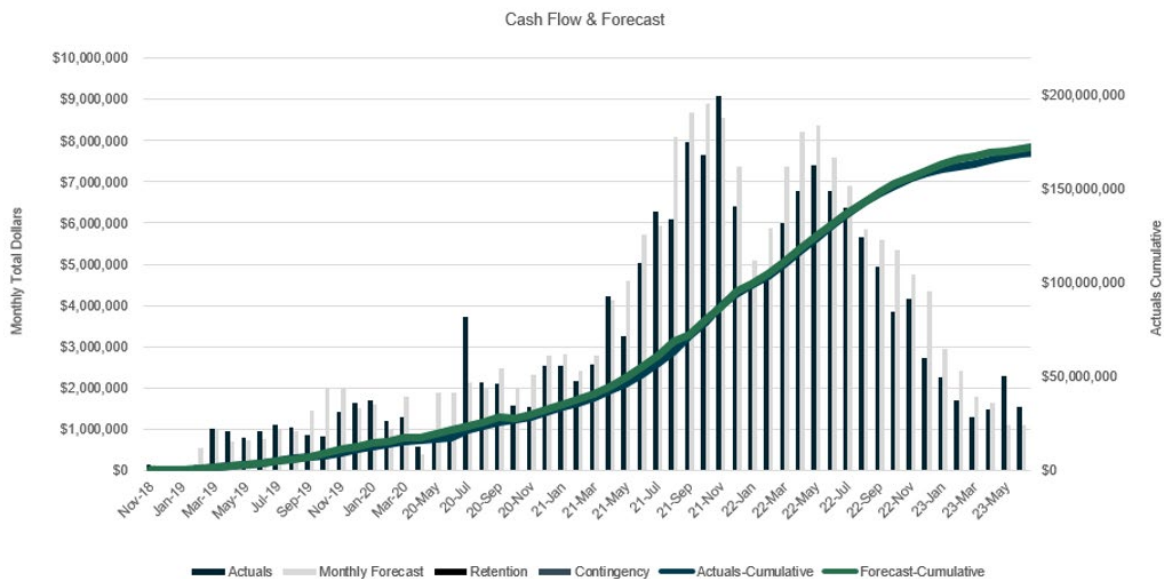


Figure 1. Project's financial performance dashboard

Joint Decision-Making:

Joint decision-making is a key element in allowing "mutual reciprocity" to happen, as decisions are made in light of the interests, needs, expectations, and constraints of each contracting parties. It allows the stakeholders to solve problems collectively and find the best solutions for the project as a whole.

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Due to the traditional contracting structure adopted in the project, subcontractors were not part of the joint decision-making process, being instead represented by the general contractor. One effective observed way to mitigate subcontractor absence in decision-making is the ability to mimic the joint decision-making structure between GC and subcontractors, monitoring and discussing opportunities and risks in a collective manner. Another practice observed is to mimic some of the contractual requirements, i.e., transparency and open communication to subcontracts.

The example below (Figure 2) shows the process established by the general contractor to support joint decision making using a choosing-by-advantages approach. Subcontractors, general contractor and architects collaborate in developing potential solutions for the project and those are presented and discussed on a weekly basis by the Project Management Team (PMT). The PMT met every week and the Senior Management Team (SMT) met once a month. The PMT made most of decisions in the project, escalating to the PMT whenever a decision could not be made, or the decision represented a major impact on cost and schedule targets.

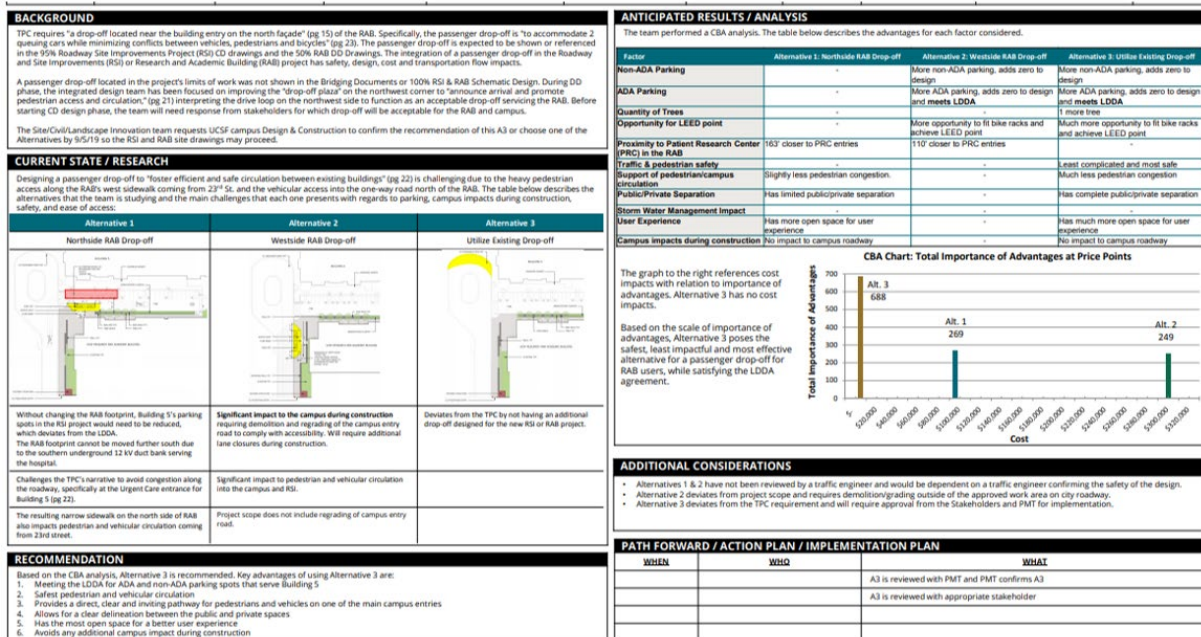


Figure 2. Choosing-by-advantages template for joint decision-making

Open and Transparent Communication:

Open and transparent communication helps build trust and aligns each company's understanding of project objectives and how the team is performing against them. Early involvement, or even a fully integrated agreement does not necessarily implicate in increased trust and transparency directly. The likelihood that companies will successfully work together may be also tied to the previous relationship of participants, their ability to work with companies they trust, their ability to openly discuss performance and mediate when expectations are not met. One aspect that contributed to the easy engagement in the project was the previous relationships that existed among some of the subcontractors and general contractor, and their experience working in collaborative projects together before.

The example below (Figure 3) shows an instance where the subcontractor was not part of the risk and reward approach (was in a lump-sum contract) but accepted to share its estimates associated with execution of work in the field and implement a strategy suggested by the general contractor to achieve increased productivity – resulting in cost and schedule savings. The strategy required the subcontractor to re-sequence its plan for executing work, and that saved the project 15 working days from the schedule. Even though the subcontractor was not part of the risk and reward structure, this was a win-win scenario, where the project saved on overall schedule and the costs associated with it and the subcontractor saved on labor-hours. It initiated, however, with a transparent and open conversation about how the subcontractor was planning to execute work and how much they estimated it would cost.

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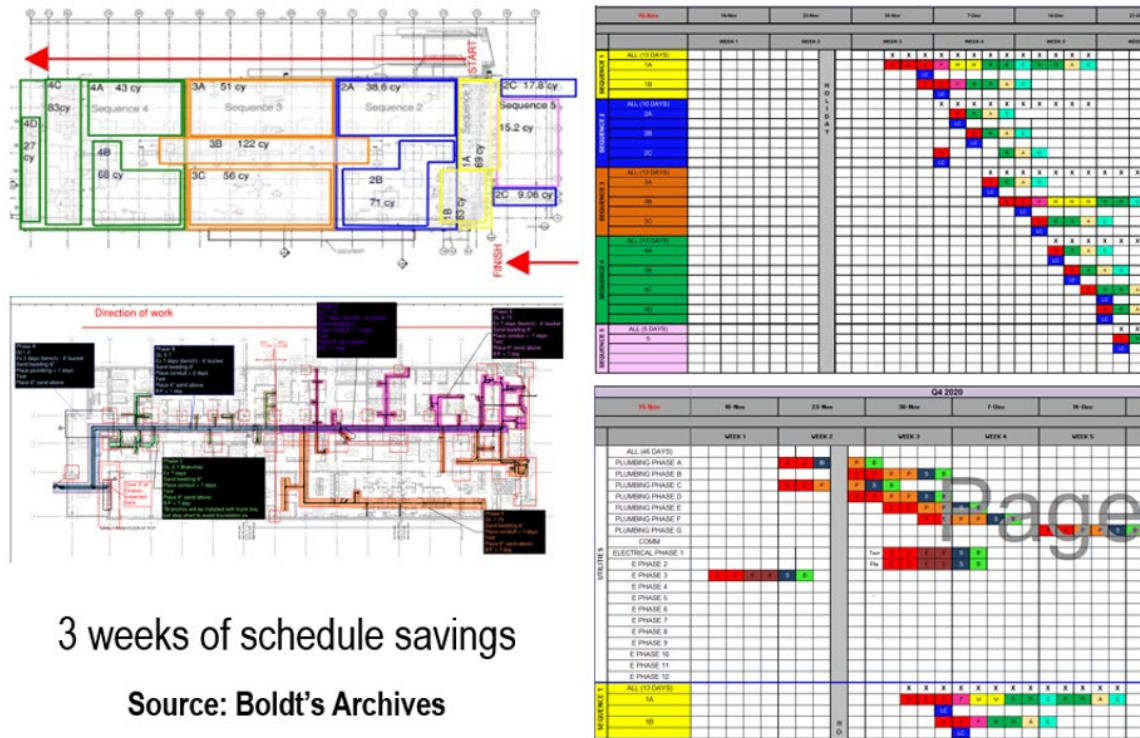


Figure 3. Example of opportunity proposed by general contractor and implemented by subcontractor.

Integrated Project Teams:

Integration is the ultimate goal of relational type of contracts, it is to have a cohesive team that works towards the same goals regardless of their parent company. That sense of partnership and unity is what impacts positively on the project outcomes.

The limitations of the public sector to achieve integration are the traditional contracts. However, based on observations in the case study, it was not the contract that determined how unified was the team. Other factors also influenced how the team worked together. Firstly, the contractor and subcontractors had previously worked together and had a trusting relationship among themselves. The team also invested in an approach to intentionally manage their culture. Such an approach included defining not only the goals for the project collectively but also determining “how we will behave” to achieve these goals.

The culture management approach used in the project included the establishment of desired behaviors and then a monitoring process. The team established a strategy to nurture the desired behaviors through feedback, recognition, and storytelling. Also, a team pulse survey was distributed and discussed every month. A performance indicator related to culture was developed, which was the number of peer-to-peer recognitions formally submitted through the culture program. The goal of this program was to create a positive and unified culture, which would mimic the environment of a single company. The peer-to-peer recognition program was very successful and highly praised, achieving over 20 recognition cards submitted per month. At a certain period of time, the team incorporated a lunch voucher to be raffled by those submitting those cards. The voucher would allow both the person recognizing and the one being recognized to have lunch together.

Continuous Improvement and Learning:

Integrated agreements embrace a culture of continuous improvement and learning. Stakeholders actively seek feedback, monitor project performance, and implement lessons learned to enhance future projects. This focus on continuous improvement fosters innovation, efficiency, and quality throughout the project.

As mentioned before, this was the first time this team implemented this type of agreement with this compensation structure and partial incentive program. The problems and challenges that arose were discussed openly and in a transparent manner. The team established a set of key indicators and goals to achieve. Those were tracked and discussed monthly. The indicators are presented in the Performance Measurement and Evaluation section of this paper.

Early Conflict Resolution:

Integrated forms of agreements typically include mechanisms for early identification and resolution of conflicts. By establishing a cooperative environment and emphasizing open dialogue, stakeholders proactively address conflicts and disputes to minimize disruptions and maintain project momentum.

In the project, one of the subcontractors did not meet the performance expectations. There were problems with quality and also with the pace of installation. The fact that the team had a proactive way to monitor and discuss performance allowed them to surface issues and make decisions on how to solve them in a collective approach. The subcontractor remained on the project, finished its scope and helped find a way forward that was accepted and agreed by all teammates.

Performance Measurement and Evaluation:

Integrated agreements often incorporate performance measurement and evaluation mechanisms to assess project progress and outcomes. Key performance indicators (KPIs) may be defined to track various aspects, such as cost control, schedule adherence, quality, and client satisfaction. Regular evaluation allows stakeholders to identify areas for improvement and take corrective actions. The following KPIs were defined collectively by the project team and tracked till project completion (Table 1):

Table 1. KPIs and goals set by the team.

KPIs	Goals
Safety	Zero recordable incident per month Zero first aid incident per month 10 safety improvement ideas submitted per month 12 safety observations recorded per month
People	30% of local workforce hired for the project 100% covid vaccination and mask compliance 5 cards of teammate recognition submitted per month
Quality	100% inspection pass rate
Schedule	Zero substantial completion variance
Production	70% weekly production plan complete
Financial	5% variance on cash flow and financial forecast > 2% project contingency 5% savings from innovation 10% manpower savings

A dashboard was then created and discussed every month. The picture below is the front cover of the dashboard, which contained a detailed section for each one of the indicators and a snapshot summary of current performance (Figure 4).

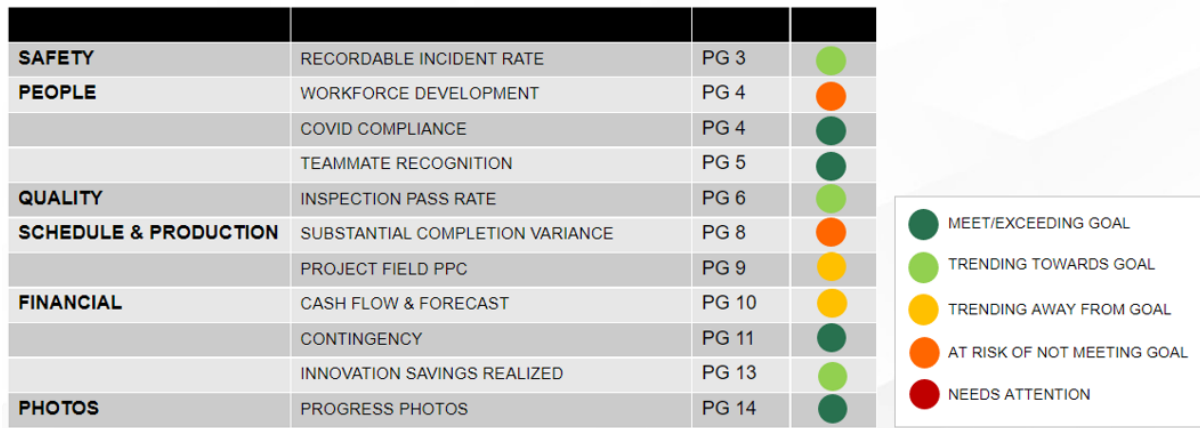


Figure 4. Example dashboard used in one project.

Agreed upon processes and ways of working (added by the authors):

It was a contractual requirement that the project team should use lean methods and techniques for design and construction. The premise was to develop a common ground among project participants and enable the multidisciplinary team to collaborate in a more effective manner.

From the early start, the project team defined not only the strategies and processes they would be using to achieve the established goals, but they also spent considerable time discussing the desired behaviors and desired project routines to support collaboration.

These processes and routines established were inspired by lean design and construction principles, techniques and tools, which the general contractor had vast experience with. As a result, they were able to initiate and lead the implementation of all processes and routines. Examples include but are not limited to: (a) use of choosing-by-advantages to support joint decision making, (b) use of target value design approach to steer design towards the agreed target cost, (c) use of the last planner system to support collaborative work planning, execution and monitoring, and (d) culture management routines and processes, including strategies for peer-to-peer recognition, and feedback.

4. Discussion

According to (Macneil, 1974), collaborative working arrangements occur in “mutual reciprocity” and therefore consider the interests, needs, expectations, and constraints of contracting parties. This is the premise of relational contracting. The observations from this case study provides evidence that the adopted contractual approach was effective to establish an environment of collaboration even with the limitations of the public sector in California. A modified design-build contract was used in lieu of a multi-party agreement with a full regime of shared risks and rewards.

Most of the barriers to adopting collaborative approaches in the public sector related to the lack of familiarity with these approaches. In the observed project, there was certain familiarity with full-IPD projects, with the general contractor having previously participated in those along with some of the subcontractors. However, they didn’t have experience implementing these principles in the public sector. It was a different contracting method, different relationship among parties and especially, different compensation structure with distinct incentives. Similarly, the client was for the first time implementing this contractual approach. As observed in this case study, most of the answers to the unknowns were found through a process of open communication and joint problem-solving, and the team was able to successfully navigate all the unknowns of this environment.

As observed in previous studies i.e. CII 2015, collaborative projects generate a higher level of satisfaction among team members and owners, lower number of claims and disputes, higher levels of productivity and a shorten project schedules. With the exception of a shortened project schedule, all other positive outcomes were also observed in this case study. In addition to that, this study corroborates with other studies done in full-IPD projects, in which increased

communication, collaboration and improved project outcomes were observed.

It was observed in this case that the contractor's experience with lean was an important factor in establishing effective processes for collaboration in the project. The contractor played a leading role in processes implementation. These processes enabled the multidisciplinary team to collaborate in a more effective manner. This is not an element always explicitly prescribed in the literature about IPD or relational contracting, but found to be extremely impactful in the success of the project. Thus, an additional element was added to the discussion of this paper: "Agreed upon processes and ways of working". It is important to note that it included also working on the culture of the team and implementing strategies that bring positive behaviors. In the literature, relational contracting is advocated as the main component to support team building. Based on this case study, it is argued that relational contracts remove some of the barriers for collaboration and help set the right intention and expectations to the project team. However, as observed in this study, establishing common processes, adopting culture management strategies, and actively engaging in candid conversations to bring up and solve issues are fundamental elements that can determine the success of these collaborative approaches.

The table below summarizes the elements analyzed in this case study, their level of implementation compared to a full-IPD method in the private sector and how impactful they were to achieve success in the project, based on the authors observations (Table 2).

Table 2. Summary assessment of elements observed in the project.

Elements of Relational Contracts	Was it implemented?	Did it impact success?
Early Involvement of Key Stakeholders	Partially	High impact
Open and Transparent Communication	Yes	High impact
Shared Risk and Reward	No	Low impact
Integrated Project Teams	Partially (subs through GC)	Low impact
Joint Decision-Making	Yes	High impact
Continuous Improvement and Learning	Yes	High impact
Early Conflict Resolution	Yes	High impact
Performance Measurement and Evaluation	Yes	High impact
Agreed upon processes and ways of working	Partially (Owner and GC led)	High impact

5. Conclusion

Alternative project delivery methods that support collaboration are gaining significant attention in the public sector in the U.S., with increasing examples of owners that transform their traditional delivery methods into ones that reflect relational contracting principles. These approaches are new and despite their proven benefits, their widespread is hindered by the novelty and unfamiliarity nature. Thus, there is a growing need for research that can address the specific complexities and nuances of implementing relational principles within the public sector construction, and that can provide evidence of its benefits, as well as identify success factors and best practices. The aim of this paper was to contribute to bridge this gap. The key elements of associated with relational principles were drawn from the literature and discussed in the light of an empirical case in California. This successful case study provides evidence that these elements can work in the Public sector. The paper discusses

some of the limitations and also observed best practices that can help project teams overcome some of the challenges observed in the public sector. The paper reveals some practical insights from a project team that was implementing these relational elements for the first time and hopefully the paper will inspire academics and practitioners to help the industry to overcome some of the challenges related to its novelty and unfamiliarity, advocating for more collaborative approaches in our industry. This case study also demonstrates that adopting relational contracting principles in the construction industry lacks a standard approach for success. It is context dependent and evolutionary, based on the collective lessons learned by the team and their ability to discuss and overcome problems. The quality of the relationships among participants matter and an understanding that the contract is just a starting point to remove barriers for collaboration.

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