

TEAM HEALTH: A PULSE CHECK AND PRESCRIPTION FOR THE COLLECTIVE LEARNING TOOL

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ABSTRACT

This paper provides an observation of a Southern California Integrated Project Delivery healthcare project in its use of the Team Health Assessment. This is a tool that DPR Construction has iteratively developed to identify, measure, and monitor team culture in the delivery of a lean construction project. The authors of this paper present three case examples of how the Team Health Assessment has been successfully used to identify and provide measure to subjective indices of one project's performance. Each case example provides a non-statistical correlative observation of indicative trends and how the awareness of these trends was then used to better optimize stakeholder *purpose*. The discussion concludes with identifying opportunities to further disseminate, utilize, and develop the Team Health Assessment through more traditional project delivery methods.

KEYWORDS

Language action perspective, benefits realization, people, culture, collective learning.

INTRODUCTION

This industry paper is a compliment to Muñoz et al. (2019) *Team Health: A Measured Approach to Collective Learning* as well as Cleary and Muñoz (2018) *Reaping the Rewards of Production Tracking*. In the latter, team culture was identified as a subjective and often unquantified indicator of a project's success. The value and influence of team culture through the execution of a project is typically captured retrospectively through a collection of qualitative statements. This effectively results in a postmortem understanding of the effects that team culture, or lack thereof, may have on a project, offering the team little to no opportunity to adjust toward success throughout its execution. This lapse was identified as an opportunity for continued research. Muñoz et al. (2019) further found a gap in traditional measures of lean construction in that they do not provide qualitative reasoning behind the lengths that they measure. The Team Health Assessment was presented as a tool to better identify and understand previously unquantified indices of a project's performance. That submission concluded with the recommendation to further employ the tool, at the time still in its infancy, for iterative improvement.

The body of this paper observes a DPR Construction team in its use of the Team Health Assessment on a Southern California Integrated Project Delivery (IPD) healthcare project. This submission advances the former study by expanding on the value of the Team Health Assessment in identifying both surface and underlying causes in constraint removal. In the three case examples provided, traditionally qualitative indices are quantitatively measured on a Likert scale. Positive and negative trends are then used to find root causes of successes and failures. This root cause analysis is then non-statistically correlated across multiples indices to better

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understand the depth of associated impacts. In theory, this allows a project team to more holistically understand and respond to these project impacts in near real time, providing the greatest chance for success in the ongoing execution of the project.

Beyond the case examples explored, the authors further discuss opportunities to increase the use of the Team Health Assessment and other lean construction tools beyond IPD in leveraging more widely accepted project delivery methods.

METHODOLOGY

This industry paper is the product of its authors' experiences through action learning. Westbrook (1995) provides that in action learning, the researcher is a participant, and the subject of research is the change in processes in which they are involved. McGill and Beaty (1995) find that learning emanates from reflection followed by action to solve real and complex problems. Revans (1982) provides that action learning through real and complex experiences is instrumental to iterative improvement.

BACKGROUND

IN THEORY

In a Lean Project Delivery System, a project must determine stakeholder *purposes* (perceptions, desires, needs and values), translate these *purposes* to processes, and design a system for development (Ballard and Zabelle, 2000; Muñoz et al., 2019). This cycle summates and results in a team culture (Salas et al., 2008). An effective team culture provides a climate of shared values, alignment of goals, creation of psychological safety, as well as mutual trust and respect, lending towards a project first attitude (Cheng et al., 2019). It promotes effective stakeholder engagement through encouraging participation in the process. Liker (2004) concludes that greater stakeholder participation promotes greater motivation for continuous improvement, providing for the greatest chance of project success. Holding that a project's probability of success is then, in part, determined by a team's self-awareness of its fluctuating culture, DPR Construction utilizes a Team Health Assessment to provide metrics to the qualitative indices that have been previously identified as a challenging component to measure and monitor (Muñoz et al., 2019).

IN PRACTICE

Founded in 1990 in California's Silicon Valley, DPR Construction is a global self-performing commercial contractor and construction manager that distinguishes itself by delivering measurably more *value*. In the spirit of this culture, DPR Construction's Team Health Assessment employs a survey approach to invite project stakeholders to participate in regular reflection on overall effectiveness through sharing their perceptions, desires, needs, and values as it pertains to the project. Survey frequency is a function of the project intensity. Intensity can be influenced by volume, schedule, complexity, and other factors. This provides that frequency may vary throughout the execution of a project as most appropriate for the project team.

The survey questionnaire is project specific and includes a collective of statements that support and measure the perceived effectiveness in meeting the collaboratively defined conditions of satisfaction. Survey participants are asked to provide a Likert scale response to those statements that are provided. Figure 1 is representative of the Likert-type scale on which these values are measured. Actual verbiage for each response scale is specific to the key performance indicator (KPI) that it measures; this scale is as would be presented to measure KPI No. 9: Trust. Responses are collected and the weighted value for each statement is presented as numerical KPI.



Figure 1: Team Health Assessment Likert-type Scale as Presented for KPI No. 9: Trust

KPI's are visually represented using a trendline chart. This has been selected as a standardized report format for its simplicity in comparison over time. This information is reviewed as regularly as the assessment is conducted. The more regular the assessment is conducted, the more live the data is.

The Team Health Assessment derives and provides KPI's for a multitude of qualitative fields as determined by the assessment statements. As is often the case in Likert scale methodologies, the value of this tool comes more from the conversation and behavioral changes resulting from the observation trends as opposed to actual numerical value (Kniberg, 2014). Again, the awareness of and response to issues is foundational to team culture. As such, the authors give three case examples from a Southern California IPD healthcare project, highlighting specific survey results and outcomes of retrospective.

Muñoz et al. (2019) *Team Health: A Measured Approach to Collective Learning* provides greater discussion of *what*, *how*, and *why* of the Team Health Assessments and the authors defer to that work for a more in depth understanding of the mechanics in developing the survey tool.

AUTHORS' EXPERIENCE

PROJECT BACKGROUND

The case project scope includes a 41,000sf first floor expansion on an existing behavioral health hospital located in Southern California, USA. This expansion provided an added 51 beds for inpatient and support services such as seclusion, therapy, nurse stations, administrative and staffing areas. The design and construction of this Office of State Health Planning and Developing (OSHPD) 1 permit was completed under the governance of the 2019 California Building Code.

Through an Integrated Form of Agreement (IFOA), partners for this project included the Architect, Structural Engineer, Electrical Engineer, Civil Engineer, Mechanical/Plumbing Engineer, General Contractor, Concrete/Framing/Drywall Contractor, Electrical Contractor, Mechanical/Plumbing Contractor, and the Owner.

Of remarkable note is that this project team was selected for a no-competition award. In the earliest project iteration, a competing general contractor started the preconstruction efforts but

was ultimately relieved of its responsibilities after losing the Owner's trust through repeated miscommunications and missteps. Construction on a behavioral healthcare campus is predisposed to be high stress given the increased levels of security and safety measures needed as well as the sensitivity of close quarters and program critical surroundings that come with the logistics of an existing and operating facility. To that end, creating and executing predictable flow to minimize disruptions through clear communications is imperative. The assuming team was selected for its proven acumen in operating in and around existing facilities and heralded for its effective team culture as developed and proven on prior project experiences with the Owner.

Each of the partners placed their respective profit pools at risk and were additionally incentivized with an enhanced profit pool if the project was delivered and satisfied several performance criteria. A Team Health Assessment was used monthly to monitor the effectiveness in achieving these criteria. Through an iterative process including the entirety of stakeholders known at that time, a project specific Community of Practice facilitated the identification of the KPI's and their defining statements that would make up the survey content. Refer to Figure 2 for the project specific KPI's and defining statements.

KPI Description	HELP US IMPROVE, PROVIDE HONEST FEEDBACK Completely Anonymous		SCORE 1 to 5
COMMUNICATION	1	Information is requested and transmitted in a timely manner. Right information to the right person.	
COMMITMENT	2	The Team makes reliable commitment to each other to support the project schedule.	
PROJECT DOCUMENTS	3	The Team successfully utilizes the design documents and BIM to execute the coordinated work and communicates back to the design team.	
INNOVATION	4	I am encouraged to seek out and bring innovative ideas, solutions, and processes to the project.	
COLLABORATION	5	The team is effectively collaborating to ensure all issues are brought up as soon as they arise and dealt with quickly.	
VISUAL MANAGEMENT	6	Team successfully utilizes visual control methods-dashboards, A3's, logs, drawings, etc.	
AWARENESS	7	I fully understand the construction schedule for the project and when my response is critical to the schedule.	
QUALITY	8	The team defined clear and measurable definable features of work. Quality expectations of the projects are understood and implemented by all.	
TRUST	9	Team members demonstrate trust and respect across all levels of the team.	
LEARNING	10	The project team embraces an open, collaborative learning process and implement lessons learned.	
END USER SATISFACTION	11	The Team values End User and Member experience as a priority.	
SAFETY	12	Do you feel safety is demonstrated as a top priority?	
COST	13	Are all team members consistently integrating project budget and forecast in their daily decision making ?	
PARTICIPATION	14	Do you feel openly that you have a voice and are an important member of this project team?	
TIME MANAGEMENT	15	Are we spending time in meetings that add value?	
ENJOYMENT	16	Would you chose to work with this team again?	
	17	What is the one thing you would like to see improved? (Can be anything)	
	18	What is the one thing the team is doing well and should continue to do? (Can be anything)	

Figure 2: Example of Team Health Assessment Questionnaire

The following three case examples highlight specific survey findings, responses to, and outcomes of retrospective.

CASE EXAMPLE 1

The first example was identified as an opportunity for improvement in the 1st month following the inaugural Big Room Meeting and initial Team Health Assessment. DPR Construction integrates Environmental Health and Safety (EHS) into every phase of a project, from start to finish. With a hard-set goal to have zero incidents on every project, the Team strives for no less than a weighted score of 5 as it pertains to the Safety KPI. Unfortunately, the Team did not reach this mark on its first effort; rather, it saw what its lowest mark of the project's duration would be. Figure 3 provides the weighted score for the Safety KPI through the projection's execution.

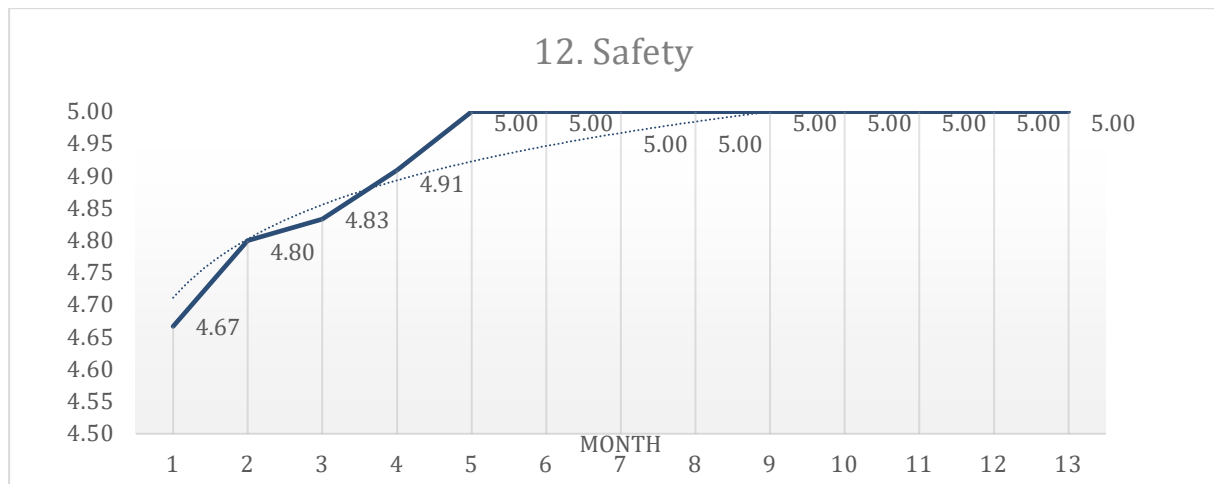


Figure 3: Actual Weighted Score for the Safety KPI

Root Cause

A 5 *Why* discussion was facilitated to explore the root cause behind this unfavorable score; a specific and singular security breach was pinpointed. As noted previously, construction on a behavioral healthcare campus is predisposed to be high stress given the increased levels of security and safety measures. Prior to full construction starting, the project scope called for minor make-ready activities. In the execution of this small-scale work, the Mechanical/Plumbing Contractor did not stow and secure its gang box while on break. This left a melody of sharp, heavy, and potentially weaponizable objects accessible to patients. Facility staff quickly found the breach, and the incident escalated accordingly.

Correlation with other KPI's

Through observing all the KPI's in that same month, the ripple effect of the noted security breach became clear. Not only could the lapse have resulted in a more serious incident for patients and staff, but the negligence behind it also undermined the Facility's confidence in the team and their overall *purpose*. In the root cause discussion behind the Safety KPI, it was noted that Communication, Commitment, Collaboration, Awareness (lagging), Trust, Learning, and End User Satisfaction (lagging) KPI's all saw, what would ultimately be, their low or near low marks as well. Figure 4 provides the scores for each KPI over the course of the 13-month project duration.

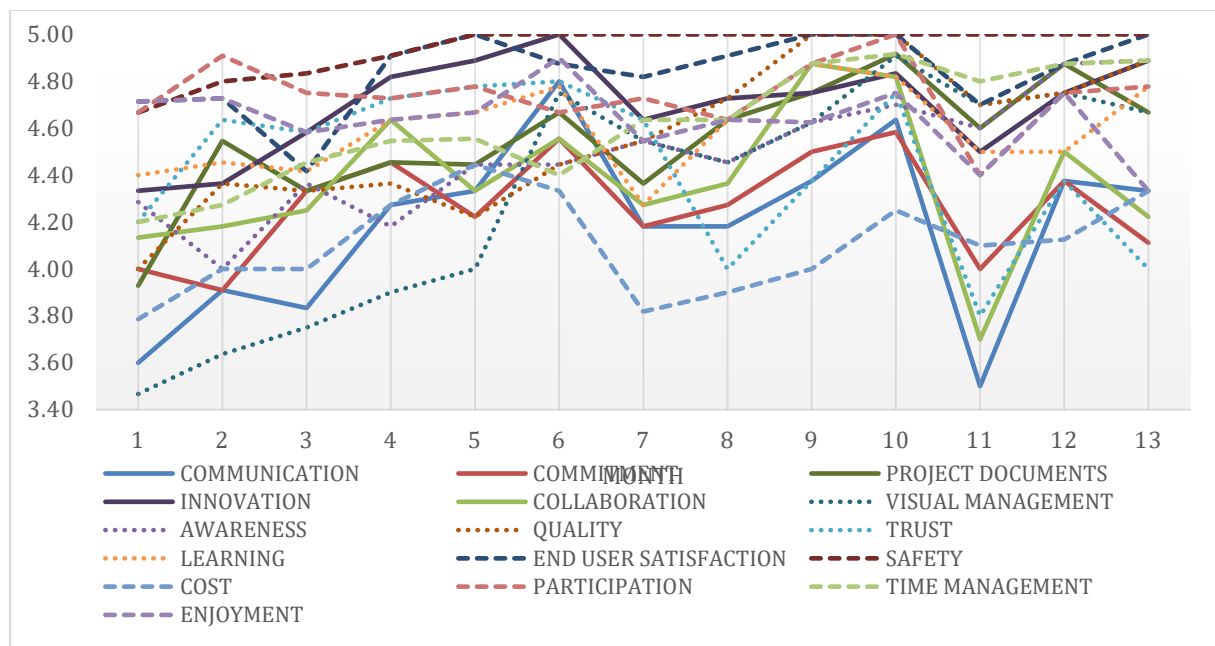


Figure 4: Weighted Score Trends of All KPI's by Month

Retrospective

This experience was used as a learning opportunity to emphasize the critical nature that security plays, even more so than typical, on a behavioral campus. The team implemented more accountable practices including logging material and equipment through transport, checking in and out as used. The reporting practice created redundant measures to better ensure no such breach occurs again. This active response and, possibly more impactfully, the team's attitudinal realignment on safety and overall *purpose* resulted in an increase in the Safety KPI in the subsequent months, ultimately reaching the desired weighted score of 5 four months later and held for the remaining nine months of the project.

The tempering effects of learning from this incident also saw trend improvements in the Communication, Commitment, Collaboration, Awareness (lagging), Learning, and End User Satisfaction KPI's; this can be seen in the Summative Average Score trend as presented Figure 5. Most remarkable was the immediate increase in Trust in the team. Unfortunately, team trust was challenged several times throughout the execution of the project.

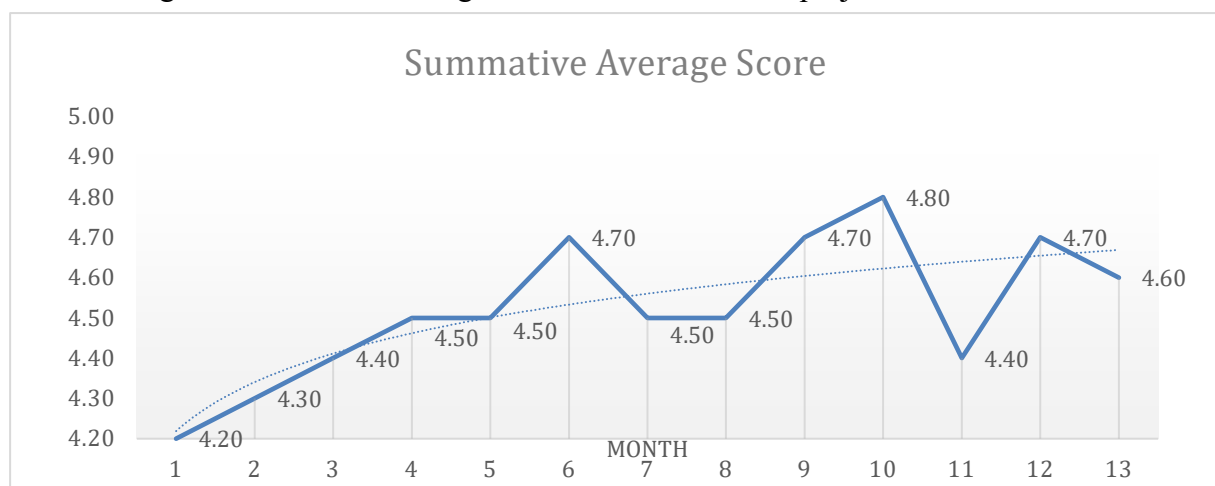


Figure 5: Summative Average Score by Month

CASE EXAMPLE 2

The second case example saw a precipice fall of 15% in the Trust KPI just seven months later (Month 8); Figure 6 highlights the case.

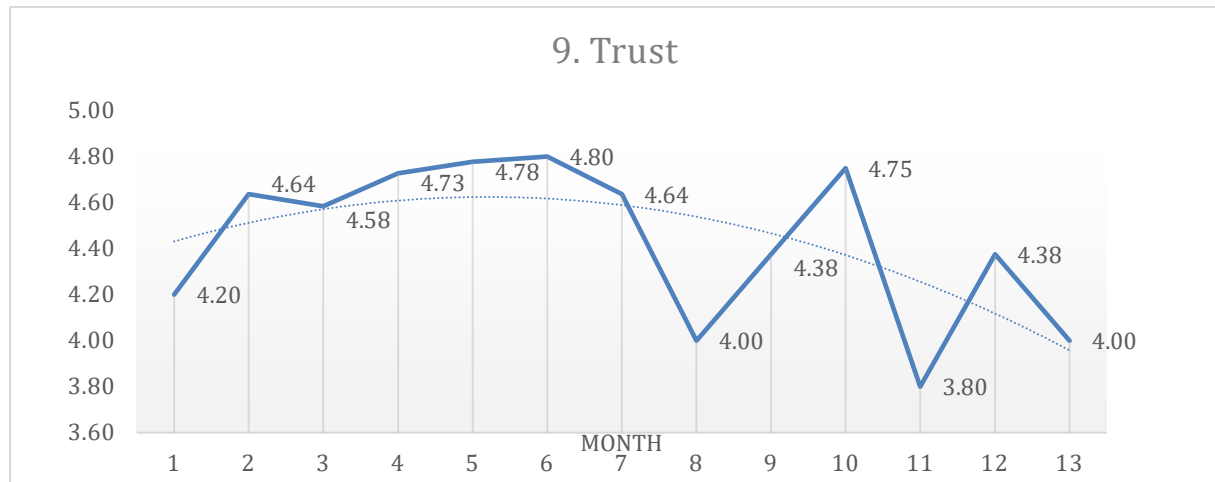


Figure 6: Actual Weighted Score for the Trust KPI by Month

Root Cause

The sudden drop in Trust followed a similar dip in the weighted score seen in the Cost KPI. As a profit-at-risk project, financial tracking and awareness of forecasting are imperative. To this end, the team employed digital production tracking and reporting as prescribed in Cleary and Muñoz (2018) *Reaping the Rewards of Production Tracking*. This required the engagement of all the self-performing trade partners: Concrete/Framing/Drywall, Electrical, and Mechanical/Plumbing. For the first seven months of the project, this process reported favorable forecasting in that the project was meeting or exceeding its financial goals. However, it was following a change in site management and leadership for the Electrical Contractors and a fresh set of eyes on its respective projections that it was realized there was a sudden and significant forecasted monetary loss – several hundreds of thousands of dollars.

Correlation with other KPI

Beyond the Trust and Cost KPI's, Communication, Commitment, Learning, and overall Enjoyment also saw a local dip in weighted scores. The collective impact could again be seen on Month 8 on Figure 5 Summative Average Score trend.

Retrospective

The 5 *Why* discussion that followed this breakdown in Trust identified two notable opportunities for improvements for the team. First, it was acknowledged that the Electrical Contractor was not employing the resources necessary to accurately track and report production. As such, the data being used for financial projections was *hopeful* as opposed to actual. The team chose to add management resources for the purpose of discovering the actual financial case of the Electrical Contractor. As evidenced in the subsequent months, this resulted in an improvement in Trust scoring.

More favorably, this experience highlighted the value in using digital production tracking and reporting correctly while productivity rates and bottom-line measure could be used as local KPI's of underlying issues that may prohibit activities in the field from productively being executed. This lapse generally invited more attention and prioritization on constraint removal, direct and indirect, to optimize the productivity of the Electrical Contractor, ultimately

mitigating actual losses. This is in part supported by the Cost KPI generally trending more positively following the reporting of this case instance.

CASE EXAMPLE 3

Trust was tried yet again at the tail end (Month 11) of the project, seeing the most significant decline and lowest weighted scoring on the whole of the project.

Root Cause

This final case example explores the unfortunate, but predictable tensions of project closeout and, mainly, the punch list activities. Clearer in retrospect, this case was particularly challenging to root cause as the project was effectively complete – operational and financial risks, as the subject of the first two case examples, were almost a non-issue at this stage. Much of the heavy lifting had been done. The lack of an objectively clear root cause invited deeper dialogue amongst the team.

Correlation with other KPI's

Like the Trust KPI, Communication, Commitment, Collaboration, End User Satisfaction, and Participation all recorded their lowest or near low weighted scores. The collective impact could be seen in Month 11 on the Summative Average Score trend; refer again to Figure 5.

Retrospective

As was the case with each breakdown, the team was challenged to have candid conversation following the Team Health Assessment. In that discussion, the team expressed disappointment that partners were disengaging from the closeout process, mainly the punch list activities. This caused a lack of alignment in the expectations of design vs construction. This lack of alignment led to questions that went unanswered, or at least unanswered in the prompt manners that the team culture established as being reasonable.

In conducting the Team Health Assessment, the performing contractors acknowledged that there is an increased sensitivity to this particularly critical stage of work. Through the open and honest dialogue that followed the Team Health Assessment, trade partners and the design team were able to best remediate the tensions presented. The team was able to more closely align with specific expectations and resource the efforts with the most effective support. This effort brought what was a collective success in the project to the finish lines.

PERCEIVED VALUE

DPR Construction holds **RESPECT FOR THE INDIVIDUAL** close to its core values. DPR is intentional in developing an understanding of team culture – holding true that it all starts with people. With this guiding value, DPR has a unique ability to leverage its skills and knowledge, and that of the larger team, in ways that create new opportunities for improvement of the whole.

The Team Health Assessment is a tool that can be used to assess the current effectiveness of a team's culture and supports figuring out what capabilities they may need to further develop to improve performance (Muñoz et al., 2019; Fowler, 2014). It effectively qualifies and quantifies stakeholder *purpose* and current level of performance through multiple KPI's. Through these indices and their representation through trend lines, a team is better able to identify what areas may be lacking or otherwise require improvement. Summarizing responses in this relatively simplistic way provides a trigger to identify areas that require greater retrospective and discussion of what could be, and is often the case, more complicated opinions or feelings. Through subsequent 5 *Why* discussions and intentional retrospective, the Team Health Assessment has been further developed to holistically identify surface and underlying causes of KPI trends.

Ultimately, this process of identifying stakeholder *purposes* (perceptions, desires, needs and values), translating these *purposes* to processes, and designing a plan to execute these processes is the three-component cycle that is foundational to establishing and building team culture (Ballard and Zabelle, 2000; Salas et al., 2008). When effectively done, the use of the Team Health Assessment helps to promote a climate of shared values and aligned goals through stakeholder engagement and participation, lending towards mutual trust and respect as commitment towards continuous improvement of the whole.

OPPORTUNITIES FOR CONTINUED DEVELOPMENT

Through exploring the three case examples of a Southern California IPD healthcare project team, this paper further highlights the value in using a Team Health Assessment to better identify, measure, and monitor stakeholder *purposes* (perceptions, desires, needs and values) and resulting team culture. From the authors' experience, the application of the Team Health Assessment has been consistently successful in IPD and other more lean centric delivery methods. However, there has been less success on more traditionally delivered projects. It is the authors' hypothesis that this is in part due to a lack of an effective team culture resulting from lesser stakeholder motivation for participation and improvement.

With an adoption rate of only 4% in the construction industry, the advantages of IPD or other lean intense delivery methods have been thoroughly explored in other research and are not the subject of this discussion; however, the authors hold true that these more lean centric delivery methods prioritize and bolster team culture. Culture is highly heralded as a key factor for implementing lean construction (Ballard et al., 2007; Gao et al., 2014; Kim and Park, 2006; Liker, 2004; Nordin et al., 2012). Hirota and Formoso (2001) find that learning through lean practices is strongly influenced by team culture. Green (1999) theorized a lack of cultural awareness and its stifling impact on advancing lean construction. Without the necessary cultural framework or, at minimum, contractual mandate for stakeholder participation, continuous improvement through learning from lean construction in using its many tools, including the team health assessment, will remain hampered.

PRESCRIPTION

There have been multiple pitfalls in the implementation of lean construction and its tools, such as the Team Health Assessment. Demirkesen et al. (2019) provide that the main barrier is in people, in their education, knowledge, and leadership, as well as lack of standardization of concepts, limiting effective use. Huaman-Orosco et al. (2022) observes that this foundation for culture, or lack thereof, begins in the earliest stages of a project (design) and spillover into construction. Notwithstanding the greater adoption of IPD or the use of an IFOA, practitioners must find and leverage opportunities to incorporate lean construction tools in more traditional and prevalent delivery methods; mainly, design-build (DB).

According to the Design Build Institute of America, design-build will account for up to 47% of construction project delivery models, by spending, in 2025. Survey studies have shown a favorable perception of this delivery model, lending towards its growth. Stakeholders have lauded DB as it enables greater team collaboration resulting in a high-quality end-result. Through early engagement of key stakeholders, a DB team is better able to identify and address an Owner's goals and objectives, resulting in a more successful team culture. As Owner's are increasingly using this delivery model, the industry is gaining exposure and experience with the DB process.

Representing 24% of all design-build projects, progressive design-build (PDB) is seen to have remarkable growing interest (FMI Consulting, 2024). According to the Lean Construction Institute, the goal of PDB is to use lean construction and its tools while operating from a more widely accepted DB contract – as opposed to a less utilized and

understood IFOA. Like IPD, PDB uses a qualifications-based selection, followed by two distinct phases of delivery: preconstruction and construction.

In the first phase, or preconstruction, the design-builder collaborates with the Owner to create programming requirements and basis of design, then advances that design. Project considerations are made using target value delivery with the design-builder providing real-time cost estimates to ensure that the Owner's budget is achievable. When the design has been advanced to a suitable level of detail, usually 40-60%, the design-builder will provide a commercial proposal (including the overall contract price) to proceed with the second phase, or construction services. If the parties cannot reach an agreement on commercial terms, the Owner may then employ an "off-ramp" option, where it holds rights to the design and can move forward with the project through another contract strategy.

As its name implies, PDB delivery is more progressive compared to traditional delivery methods. In using the more widely accepted DB contract, PDB is more prevalent than the even more progressive IPD. In their providing many of the same key benefits in the preconstruction phase, the growing adoption of PDB could serve as an iterative step toward greater awareness, familiarity, and adoption of IPD. At a minimum, PDB projects represent a thriving platform to disseminate, utilize, and further develop lean construction and its tools.

There are key synergies in employing the Team Health Assessment through PDB efforts that could significantly increase the dissemination, use, and development of this tool. The most impactful of these synergies is the perceived value of the DB delivery method and its success in developing an effective team culture and the ability of the Team Health Assessment to better identify, measure, and monitor impacts to team culture. The intentional use of this tool promotes a climate of shared values, alignment of goals, and mutual trust and respect, promoting more effective stakeholder engagement and motivation for continuous improvement. A PDB project is best served employing the Team Health Assessment in the first phase of preconstruction in that it then helps to build the foundation of a strong and successful team culture at the earliest onset, which will strongly influence the team culture and probability of successfully delivering the second phased construction services.

CONCLUSION

DPR Construction has presented the Team Health Assessment as a lean tool to better identify and provide measurement to the previously unquantifiable indices of a project's performance which collectively summate team culture. While the implementation of this tool is seen as being successful in its use on IPD and other more lean centric delivery methods, less success has been experienced on more traditional projects. With the increasing popularity and wider acceptance of PDB, there is greater opportunity to disseminate, utilize, and develop lean construction and its tools through this delivery method. The Team Health Assessment is particularly complementary to PDB in its purpose to enable greater awareness amongst the team of its own culture and how it may influence the successful execution of an ongoing project.

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Learn from the past to shape the future.

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