

Factors Contributing to Success: Self-Performing Framing and Drywall Scopes on a Construction Project

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Abstract

Completing construction projects successfully on time and on budget is extremely critical for survival of construction firms. Not every construction firm can do this, and several researchers identified various factors that contribute to the success of the projects. However, more construction firms have started opting to self-perform certain scopes of the projects as they see it as an opportunity to improve safety, quality, and profits of the projects. In this changing trend, it is important to understand factors that contribute to the success of self-perform scopes of a construction project and there is currently no literature available. This research bridges that gap by performing qualitative interviews with case study construction project personnel from both general contractor and self-perform teams. The results identified that effective communication between general contractor and self-perform teams, effective planning and scheduling from general contractor, dedicated supervision efforts from self-perform team, hand-on experience of general contractor superintendent on self-perform trades, and trustworthy relationship between the general contractor and self-perform teams play an important role in the success of self-perform scopes of the projects. Understanding self-perform project success factors helps contractors in gaining new insights to achieve improved efficiencies and profits on construction projects.

Keywords

Self-Perform Scope, Construction Success Factors, Effective Communication, Construction Planning and Scheduling, Contractor Relationship

1. Introduction

This case study was requested by the general contractor self-performing the framing and drywall hanging and finish because the project had been successful. Since not all projects self-performing framing and drywall in the division had been as successful, the company wanted to identify best practices. This project was a negotiated project with the general contractor's project fee set at 2.25%. Since it is rare that the fee can be increased on a project with a Cost Plus with GMP (Guaranteed Maximum Price), the general contractor wanted to self-perform the framing and drywall. Since the owner and the general contractor had a long-standing, trusting relationship, the owner did not ask for competing framing and drywall bids. At the end of the project, the general contractor's total project fee was 3.25%, which is a 44% increase over the original fee. This fee increase was directly attributable to the self-performed framing and drywall scope. This study identified the best practices that facilitated project success as identified by the project participants. The results of this study are not

generalizable to any other project or population because the sample is small, and these data are limited to this case study only.

1.1 Research Aim and Objectives

The purpose of this research is to identify factors and best practices that contribute to the success of self-perform scope of construction projects by adopting a case study interview methodology from a particular renovation construction project in the mid-west region. Specific attention was placed on the aspects of the project team (both general contractors' team and self-perform team) and actions or practices of the general contractors and self-performing team that are crucial in the success of a self-perform aspects of the construction projects scope.

2. Literature Review

In a dynamic industry like construction, contractors strive to understand the different factors contributing to the project success. Project success is defined as minimizing risks, completing on budget, on time and making profits for the contractor. Generally, in the construction industry, the general contractor's hire subcontractors or trade partners to do all the trade work. Reasons why general contractors choose to use specialized subcontractors (Mincks & Johnston, 2017, p. 260):

- Specialized labor for construction tasks: Skilled craftspeople trained in the specific assembly perform the task correctly, enhancing quality of the installation and completing the task efficiently, minimizing invested man-hours.
- Lower cost for subcontract work: As the labor for the subcontractor is specialized and only a narrow range of work is accomplished, subcontractor costs are generally less.
- Reduced risk for the general contractor: Several areas of risk are reduced by subcontracting work rather than accomplishing the work with the general contractor's own direct hire forces. The risk of labor productivity is shifted to the subcontractor.

Reducing risk has been a primary factor in the general contractors' decisions to subcontract most of the work on a project. The various aspects of risk include productivity and/or cost control, from the estimate to the project's completion; lack of expertise in specialized areas, control of potential liquidated damages; cash flow; poor quality from lack of experience or having the right craftspeople; and cleanup, warranties, and other aspects of the general conditions (Mincks & Johnston, 2017).

For these reasons, some commercial buildings projects are "100% subcontracted" (Mincks & Johnston, 2017, p. 4). It seems that the trend of general contractors subcontracting 100% of the work is changing. FMI Corporation, a construction industry research and consulting firm since 1956 stated that "In a 2015 study published by FMI, 45% of survey respondent across the construction industry indicated that they plan to increase the amount of work they self-perform in the future, with another 20% responding that they are considering expanding their capabilities" (Esler & Newcombe, 2016, p. 16). The FMI study went on to explain that "increasing the amount of self-performed work comes with its own risks – including hiring, training and retaining talent – but firms see the benefit of increased control over the project's schedule and quality" (Esler & Newcombe, 2016, p. 16). Several studies in the past have researched project success factors for general contractors, however, there is no existing literature available regarding the success factors that contribute to the success of self-perform work of the general contractors. This study interviews project participants to understand the factors

that contributed to the success of self-perform scope on one project project for an anonymous technology company in the mid-west region.

2.1 Self-Perform Work

Self-performing work means the lead general contractor uses in-house skilled labor and equipment for certain constructions scope such as concrete, electrical, plumbing, framing or carpentry. Often, self-performing particular scopes of work can benefit a project. More importantly, self-perform capabilities add value for all stakeholders (Brasfield & Gorrie, 2022). Research shows that self-performing construction is on the rise as it benefits contractors and owners in several ways such as increasing safety, quality, efficiency while also minimizing the risks and uncertainties on the job site (Jouvenal, 2020). Self-perform also improves the profitability of general contractors, and the owners can get the project built for a lesser cost relatively (Belvins, 2022). Although it is understood that self-perform projects have several benefits both to general contractors and owner, some general contractors prefer not to self-perform work (Belvins, 2022) owing to lack of understanding related to factors that can contribute to the success of self-perform scope of the project. Currently, there are no studies that identified factors influencing the success of self-perform scope of a construction project.

2.2 Construction Project Success Factors

One of the widely accepted definitions for construction project success is completing the project on time, under budget, and according to specifications (Alzahrani & Emsley 2013). To achieve construction project success, Duy Nguyen et al. (2004) identified that having (1) a capable project manager; (2) a multidisciplinary/skilled project team; (3) dedication to the project; and (4) the availability of resources is extremely crucial. Some of the construction project success factors identified in the literature are provided below in Table 1.

Table 1. Project Success Factors from literature review

Factors	References
Effective communication between stakeholders	Yang et al. (2010)
Effective planning and scheduling	Doloi et al. (2012), Kog, Loh (2012)
Effective procurement and project management	Chan et al. (2004)
Project manager capabilities and commitment	Kog, Loh (2012), Chan et al. (2004)
Effective site management and commitment to project	Doloi et al. (2012)

3. Research Methodology

“A case study is an exploration of a bounded system or a case (or multiple cases) over time through detailed, in-depth data collection involving multiple sources of information rich in context” (Creswell, 1998, p. 61). This case study was conducted at the request of executive leadership for a nationwide general contractor. The objective was to understand and synthesize the factors or best practices that

seemed to lead to self-perform project success. The authors developed interview questions and privately interviewed project participants on a major renovation project for an anonymous technology company in the mid-west region. The self-perform scope considered for this research is framing and drywall work. According to the general contractor, this is one the most successful self-perform projects (framing and drywall) they completed as the self-performing scope of this project was finishing within budget, within schedule, and making consistent profit. Therefore, the executive leadership at the company wanted to identify the best practices and factors that contributed to the success of self-perform scope of this this specific project. Therefore, the authors developed a case study interview protocol according to DiCicco-Bloom and Crabtree's (2006) recommendations to include experience questions and knowledge questions. Seven project participants were identified, interviewed separately, and the recorded interviews were transcribed by a third-party transcription service. Table 2 shows the details of all participants.

Table 2. Participant Information

Participant	Experience(yrs.)	Role/Position
Participant 1	32	GC superintendent
Participant 2	7	Self-perform superintendent
Participant 3	16	GC project manager
Participant 4	7	GC assistant project manager
Participant 5	12	Self-perform project manager
Participant 6	16	Division project controls manager
Participant 7	19	Self-perform foreman

The participants were interviewed in the general contractor's regional office or at a neutral site away from construction projects to avoid distractions. The open-ended case study interviews were semi-structured, and the purpose of using this approach was to initiate each interview with a set of open-ended questions that would lead to a thoughtful discussion while providing the flexibility to pursue appropriate follow-up probing questions. The interview questions mainly focused on demographics, key contributing factors to self-perform project success, individual's impact on the self-perform project success, and challenges to successful completion of self-perform scopes in a project as shown in Table 3.

The interview transcript data were coded using open, axial and selective coding to allow themes (best practices) to emerge. Patton (2002) states, "Discovery and verification mean moving back and forth between induction and deduction, between experience and reflection on experience, and between greater and lesser degrees of naturalistic inquiry" (p. 67). A constant comparative approach (Bogdan & Biklen, 2003) was used after each interview was coded to "look for key issues, recurrent events, or activities in the data that become categories of focus" (p. 67). These categories of focus became central in subsequent interviews to check for consistency in the themes that emerged.

Table 3. Open-Ended Interview Questionnaire

Demographics:
1) Please tell me your name, how long you've been with the company, and your position on the subject project.
2) Please describe your role on this project and how it changed as the project progressed.
Key Contributing Factors to Project Success
1) As you reflect on the main job and self-perform teams, describe the key contributing factors for project success on this project?
Individuals' Impact on Project Success
1) As you think about all the GC jobs and self-perform personnel involved with the subject project, identify the top three individuals (and their traits specific to project success) that have contributed to project success and try to be specific as you explain why.
Challenges to the self-perform project success
1) Corporate executives are committed to self-performing various scopes on construction projects in all Regions. Describe the challenges that you've identified in the company doing more self-performed scope on projects.
2) Were these challenges experienced on this construction project and how were they overcome?

While seven interviews is a small sample, according to Mason (2010), the size of the sample in qualitative studies is irrelevant because the value of the study is based on the quality of data. The primary reason for recruiting these seven participants was their experience, expertise, and willingness to participate in the study. Implementing such a strategy, according to Simms and Rogers (2006), increases the richness of data due to the commitment of the interviewees.

4. Results & Discussion

Based on the responses of the interview participants in this research, the success factor's themes identified are organized into the following categories, namely,

1. Communication
2. Scheduling/Planning
3. Self-perform supervision
4. Hands on experience of GC super
5. Relationship between GC team and self-perform team

4.1 Communication

Communication is one of the most important factors affecting the construction project success. This study identified that efficient, transparent and open communication related to estimates, budget and work planning between general contractor team and self-perform team are crucial for a self-perform project success. Participant 3, the general contractor's project manager said,

At the start of the self-perform scope, we had a very good communication with drywall estimator to understand the project costs from their side and co-relate budgets from our side working through a lot of the details and things and the expectations of how things were going to go. And then, we had a great communication with self-perform project engineer and superintendent regarding on time procurement and building. Both teams always had honest and transparent communication regarding project issues. This helped both teams understand budgets and schedules clearly, and work accordingly to meet the project goals,

indicating that clear communication about project goals, issues, and planning helped self-perform team achieve success. Echoing the same, participant 5, self-perform project manager said,

The GC side and the self-perform side discussed earlier, got on the same page early, learned what's in our estimate so that both sides can be bought in on the scope of work. I think that was very valuable, and I think that that's something that we should do going forward.

Adding to this, participant 7, self-perform foreman mentioned,

We communicated so much with GC superintendent and knew exactly where we were going the next day. Also, we have a board. We have maps on the wall that told the crew where they're going through the next five days. So, we plan ahead for the time for five days,

indicating that planning properly and effectively communicating that to the team is critical in the success of a self-perform project scope.

4.2 Scheduling/Planning

This case study identified that creation of a clear schedule that breaks down every tiny task of the project by the GC team and communicating the same to self-perform team so that they can breakdown their budgets appropriately and updating the schedule regularly as the project goes is extremely important for self-perform project success. This is evidenced by participant 5, self-perform project manager as he said,

Once we were awarded the scope of work, I was breaking down the quantities and the budgets. I had the budget broken out by the GC Superintendent's schedule. Because his schedule was so detailed, I was able to extract quantities in each area and know what the budget amount was for each area, which was further helping the project control process, and that helped us stay on budget and time,

indicating the importance of a detailed schedule for self-perform project success. Furthermore, participant 2, self-perform assistant superintendent said, "The detailed schedule helped us identify key activities and their durations clearly, making the self-perform team's job easier to discuss how many crew members are needed", confirming that detailed schedule is important. He further added that,

Our [self-perform] foreman was able to read the schedule, dissect that schedule for his activities only or activities that precede him or activities that come after him in order to build a three to six-week look- ahead schedule for himself to ensure other trades are not affected,

indicating the need to train foremen on reading and understanding schedules to ensure self-perform project success. The participant 7, drywall self-perform foreman supported this saying, "Detailed schedule helped us a lot. every morning we'd get together, and we'd talk about the job and make sure we attacked the critical part, make sure we're not holding anybody up, like electricians and MEP", confirming the importance of detailed schedule. Adding to this, participant 4, general contractor assistant project manager said,

Our [general contractor's] super always updated schedules as the project goes and issues come up, reworked on the schedule to accommodate what was going on. He was constantly learning schedule related updates from self-perform team, and reworking schedules based on their needs and challenges. Having our superintendent knowledgeable and staying on top of what the self-perform team is doing helped us achieve the success,

he further added, "The self-perform assistant superintendent did an amazing managing the day-to-day progress and looking ahead and coordinating issues between the GC team and the self-perform craft so that they can be productive and complete on schedule" indicating that general contractor superintendent's and self-perform superintendents scheduling knowledge and their enthusiasm to address schedule related challenges helps improving the performance of self-perform scope for a general contractor. Overall, this indicates that scheduling knowledge and the ability to update

schedules, communicate that with all team members, and enthusiasm to solve schedule related challenges by superintendents and foreman helps completing self-performing scopes on time.

4.3 Self-Perform Supervision

This study identified that diligent supervision efforts from the self-perform team and respective responsible leadership from general contractor's team make a huge difference in the success of self-perform scope of the construction project. Participant 1, GC superintendent mentioned,

The contribution of self-perform superintendents is enormous in project success. The self-perform superintendent of this project made sure his men were set up the right way, they always had material looking forward weeks and months in advance, extremely attentive to the schedule, worked hard to make sure that things worked, made sure the supply chain kept coming. All of this contributed to the success.

Adding to this, participant 5, self-perform project manager said, "Site supervision was critical to the success of this project. For example, making sure timecards were right so we can track the production well, tracking quantities and hours accurately, etc. helped staying on track of this project". In addition, participant 2, self-perform assistant superintendent mentioned,

My biggest goal was to get to be as good a companion or sidekick or however it needed to be with [the drywall foreman] to support him over the course of the beginning of the project. I was looking at schedule and manpower, talking materials with [the drywall foreman]. I [sat] in on sub meetings and coordinating with the superintendents for the electrician. I was coordinating with the superintendents for HVAC, MEPs, and then I was also running productivity. I was there walking the job 8 to 10 hours every day with [the drywall foreman], asking questions, getting those questions out to the GC team.

This indicates that sincere supervision efforts from self-perform team are crucial in the success of self-perform scope success.

4.4 Hands-On Experience of GC Superintendents

This research identified that having GC superintendents with hands-on experience in self-perform trades is valuable for success of the projects. Participant 3, self-perform project manager opined,

I think because of the GC Superintendent's background in framing and drywall, he was able to understand the scope of work pretty detailed, and the fact that he was able to break out his schedules in a way that we could actually track against.

Adding to this, participant 4, GC assistant project manager said,

I think that [the GC Superintendent] is one of the greatest driving factors in the project overall, and especially his efforts on the self-perform. One big thing is he has a heavy carpentry background himself and so he was able to walk the site and say, 'Hey, you guys are supposed to be 50 percent done, I'd say you're about 25 percent done,' and he would send that to the self-perform team. They would check their productivity and most of the time he was right on the money. So, having that knowledge really helped.

This indicates that hiring superintendents that have hand-on experience in the trades that the general contractors would like to self-perform is valuable for the project success. By doing this, the hand-on experience the GC superintendents have will help them understand the challenges of self-perform teams and support them accordingly.

4.5 Relationship between GC team and self-perform team

This research identified that establishing a trustworthy relationship between both the GC team and self-perform team and having an attitude of one team are important factors that influences both teams towards success. Confirming this, participant 5, self-perform project manager mentioned, “I think it was just the one team mentality from everybody that helped the project. We would not have been as successful as we were without the GC side wanting to make us successful”. Further he added, “There was never anybody taking advantage of anybody. We had trust built. So, it never was contentious. It was always the GC side helping us and us trying to help the GC side by getting ahead” with materials procurement. Participant 7, foreman opined that the GC team always supported them and mentioned, [The GC Project Manager] would come once a week for the meetings, "and he'd always come to me and say, 'Well, is there anything I can do for you?' and those kinds of questions. And, I mean, to me that's support right there.” This indicated different ways, the relationship was strengthened with the teams by establishing trust. This indicates that establishing early on in the project and maintaining the same throughout the project duration helps both teams and thereby the success of the project. Table 4 shows a summary of all responses from the participants.

Table 4. Summary of Participant Responses

Success Factors	Participant	Response
Communication	Participant 3	At the start of the self-perform scope, we had a very good communication with drywall estimator to understand the project costs from their side and co-relate budgets from our side working through a lot of the details and things and the expectations of how things were going to go. And then, we had a great communication with self-perform project engineer and superintendent regarding on time procurement and building. Both teams always had honest and transparent communication regarding project issues. This helped both teams understand budgets and schedules clearly, and work accordingly to meet the project goals
	Participant 5	The GC side and the self-perform side discussed earlier, got on the same page early, learned what's in our estimate so that both sides can be bought in on the scope of work. I think that was very valuable, and I think that that's something that we should do going forward
	Participant 7	We communicated so much with GC superintendent and knew exactly where we were going the next day. Also, we have a board. We have maps on the wall that told the crew where they're going through the next five days. So, we plan ahead for the time for five days
Scheduling/Planning	Participant 5	Once we were awarded the scope of work, I was breaking down the quantities and the budgets. I had the budget broken out by the GC Superintendent's schedule. Because his schedule was so detailed, I was able to extract quantities in each area and know what the budget amount was for each area, which was further helping the project control process, and that helped us stay on budget and time

	Participant 2	Our [self-perform] foreman was able to read the schedule, dissect that schedule for his activities only or activities that precede him or activities that come after him in order to build a three to six-week look ahead schedule for himself to ensure other trades are not affected
	Participant 7	Our [general contractor's] super always updated schedules as the project goes and issues come up, reworked on the schedule to accommodate what was going on. He was constantly learning schedule related updates from self-perform team, and reworking schedules based on their needs and challenges. Having our superintendent knowledgeable and staying on top of what the self-perform team is doing helped us achieve the success
Self-perform supervision	Participant 1	The contribution of self-perform superintendents is enormous in project success. The self-perform superintendent of this project made sure his men were set up the right way, they always had material looking forward weeks and months in advance, extremely attentive to the schedule, worked hard to make sure that things worked, made sure the supply chain kept coming. All of this contributed to the success
	Participant 5	My biggest goal was to get to be as good a companion or sidekick or however it needed to be with [the drywall foreman] to support him over the course of the beginning of the project. I was looking at schedule and manpower, talking materials with [the drywall foreman]. I [sat] in on sub meetings and coordinating with the superintendents for the electrician. I was coordinating with the superintendents for HVAC, MEPs, and then I was also running productivity. I was there walking the job 8 to 10 hours every day with [the drywall foreman], asking questions, getting those questions out to the GC team
Hands on experience of GC super	Participant 3	I think because of the GC Superintendent's background in framing and drywall, he was able to understand the scope of work pretty detailed, and the fact that he was able to break out his schedules in a way that we could actually track against
	Participant 4	I think that [the GC Superintendent] is one of the greatest driving factors in the project overall, and especially his efforts on the self-perform. One big thing is he has a heavy carpentry background himself and so he was able to walk the site and say, 'Hey, you guys are supposed to be 50 percent done, I'd say you're about 25 percent done,' and he would send that to the self-perform team. They would check their productivity and most of the time he was right on the money. So, having that knowledge really helped

Relationship between GC team and self-perform team	Participant 5	I think it was just the one team mentality from everybody that helped the project. We would not have been as successful as we were without the GC side wanting to make us successful
	Participant 7	[The GC Project Manager] would come once a week for the meetings, "and he'd always come to me and say, 'Well, is there anything I can do for you?' and those kinds of questions. And, I mean, to me that's support right there

5. Conclusion

The objective of this study was to identify project success factors and best practices for success of a self-perform scope of work for a general contractor through a case study of technology company renovation project in the Midwest region. The study provided a list of factors that influence the success of self-perform scope of work that includes effective communication, efficient planning and project scheduling, self-perform supervision, hands-on experience of general contractor superintendents in self-perform trades, and establishing trustworthy relationship between both general contractor and self-perform teams. The factors identified in this study are similar to those factors for overall project success identified in other studies, however there is a difference in how these factors play out between the general contractor and self-performing teams as both teams belong to the same company with one goal of project and company success. The limitations of this study include a small sample size and that all participants were from the same company and same project. Future research is recommended to explore conducting more interviews with project teams that handle self-perform scopes, and also extend a mixed-methods study to collect data from a large set of project teams from across the U.S. regarding the self-perform project success factors and how those factors influence each other. This study contributes to the body of knowledge by identifying attributes of general contractor teams and self-perform teams and factors that contribute to the success of self-perform scope of construction projects. This information can be used by construction firms doing self-perform scopes to effectively complete their projects within time and budget.

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