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The Need for Standardized Decision-Making in K-12 Construction Projects

Denish Sonani [1*], Mark D. Fulford [2]

[1, 2] School of Business, Economics, & Technology, Campbellsville University, Campbellsville, USA
[*] Corresponding Author Email: dsona636@students.campbellsville.edu

Abstract

Historically, owners and project managers in the construction industry have relied on their own experience and intuition when deriving estimates for project cost and duration. This has resulted in less-than-optimal outcomes: the vast majority of projects come in over budget and past deadlines. In the K-12 construction sphere, there is less tolerance for these outcomes as budget is oftentimes subject to public referendum and time is frequently locked in by the school district calendar. However, additional challenges are posed in the process of decision-making. Public school projects involve many stakeholder groups (e.g., district administrators, school board members, parents, and community representatives). Bond construction or steering committees may be comprised of members from each of these groups. While well-meaning, the creation of such groups frequently results in delayed decision-making as more meetings are needed, additional approvals are required, and perhaps even necessitate school board votes. Instead of just focusing on the outcomes (which are not measurable until "after the fact"), a more comprehensive approach involving the examination of the decision-making process as well is proposed. A standardized risk-management approach removes individual biases, captures more data inputs than most project managers initiate on their own, and ensures a more comprehensive view to address and ameliorate potential causes of overruns. Adopting this proactive approach provides efficiencies and expedited stakeholder co-ordination, mandated proactive planning, and reduces the expensive "learning curve" experience that exists for every new school project.

Keywords

Budget, Construction, K-12 Construction, Schedule, Standardized decision-making.

INTRODUCTION

Traditional risk management in construction has been largely reactive, relying on the experience and intuition of project teams instead of systematic analysis. Results associated with this method have been disappointing: more than half of projects exceeded their budgets by far, nearly 9 out of 10 projects experienced cost overruns [1] [2] [3]. Cost overruns may commonly occur due to inaccurate initial estimates, unknown site conditions, and scope changes, reiterating the opportunity to provide improved decision-making approaches for project managers. The challenges previously mentioned become increasingly more difficult for projects with K-12 constructions at the forefront.

Educational construction projects have restrictions that must be considered beyond the typical project management scope; projects involving school building usually involve deadlines that must be met (e.g. opening day at the beginning of the academic year) and budget constraints based on public funds or bonds. The costs or delays incurred in school projects can significantly affect students and the community, resulting in delays to school openings or additional funding from taxpayers. This further demonstrates the importance of improving predictive capabilities to manage schedule and cost in K-12 construction projects.

Owners and program managers for K-12 construction projects can benefit greatly by adopting more structured, data-informed approaches to anticipate and address issues before they escalate. Data-driven decision-making allows project managers to look at trends, forecast outcomes, and make well-informed decisions as opposed to making decisions based on instinct [4] [5]. [6] noted that "although we have good estimates of how well or bad projects perform, we know less about why many do not achieve certain performance measures". This latter emphasis on project management performance, as opposed to project performance, allows for the investigation of the various processes and procedures enacted throughout the project that contributed to its success.

CURRENT STATE OF DECISION-MAKING IN K-12 CONSTRUCTION PROJECTS

Decision-making in K-12 school construction projects today is typically fragmented and largely non-standardized. The construction industry is notorious for chronic inefficiencies and cost overruns – certainly, research has shown that more than half of projects exceed budget [1] while almost 90% of large projects have costs that far exceed targets [2]. Schedule slippages have demonstrated equally distressing trends: for example, one research project showed that approximately 88% of total projects had both delay and budget overrun [3]. The disappointing nature of these outcomes can, in part, be attributed to the way decision-making is organized and acted upon. Most construction projects invariably involve various fragmented stakeholders (owners, architects, contractors, consultants, government regulators, etc.) and decision-making challenges around coordination of those fragmentations [7]. Nowhere is this more complex or pronounced than in K-12 school construction, where heavier layers of public oversight and

educational scheduling add a layer of complexity and a unique set of constraints.

Fragmentation-Driven Inefficiencies

As has been stated above, K-12 projects carry forward the industry's endemic cost and schedule overruns, but what is different about K-12 projects is the systematic, persistent overrun due to the fragmentation of authority, diffuse oversight, and inconsistency in decision making.

Unlike private-sector construction, school projects must accommodate multiple layers of public scrutiny and vested interest from district administrators, elected boards, school personnel, and community stakeholders, each requesting transparency and input. In order not to lose credibility, many districts create construction steering or bond oversight committees. These committee structures, while well intended, often involve slow approval timelines, undefined ownership of decision rights, and responsibility dilution. However, these committees can complicate and slow down decision making and committees that require consensus from a number of parties, each with their own dynamic and sometimes conflicting priorities, can often be tedious and laborious. Decisions that a single private owner can make without deliberation may take place in many meetings, approvals or even school board votes in a school project. The committee-based decision-making process, though well-meaning in terms of transparency and buy-in, often both dilutes accountability and slows key decisions from being made in a timely manner. Often in reality, significant design and scope decisions need to be brought back to committees to address stakeholder feedback - with a significant amount of consequences being late project changes to budget and schedule.

Immutable Budgets and Deadlines

K-12 projects are additionally constrained by academic calendars and bond-funded budgets; schools must open in time for the start of an academic year, which is a hard deadline of necessity and political promise. This hard deadline drives prioritization in every decision: a delay in approvals, or even indecision during design, compresses construction schedules as opening day is a deadline that cannot be shifted without disruption to students and the surrounding community. Additionally, project funding is often through bonds or public dollars approved by voters. Budgets are typically fixed, and inflexible - increasing the project budget means going back to taxpayers or cutting back on the scope. These unyielding boundaries mandate that a decision must be made early, deliberately, and resolutely. However, many districts still rely on informal governance structures, and don't have proactive planning values in place. If indecision occurs early in the process, this pushes the construction schedule into a compress. Every do-over elevates risk and interest from contractors diminishes. Price estimates like start-up, mobilization, and overtime premiums rise to expedite work. What should be a moment for decisive action, becomes a rush to meet deadlines and requirements that were never meant to be enacted in the first place.

Absence of Standardized Frameworks and Tools

Preconstruction Phase Issues

Unlike some industries that mostly follow standardized processes and protocols, K-12 construction decision making typically does not leverage standard work processes or templates across projects. There are no standard defining playbooks on how school districts should plan and deliver K-12 capital projects, despite the implications of failure being immense. Each district and each project team tend to construct their own processes, sometimes "on-the-fly" or based on what they did in the last project. Different school districts also "reinvent the wheel" for each school build or renovation rather than following repeatable frameworks. The absence of a standard process means important steps can be missed; lessons learned are not applied systematically. The lack of concrete processes leads to varied processes each time and as such is inefficient (e.g., miscommunication/double work where who had decision authority was unclear). Scholars report that lack of standardized construction processes adds variability and lower productivity [8] [9]. In the K-12 space, the end result is a high incidence of changes and course-corrections to projects. When decisions have not been vetted fully or new stakeholders engage and add input, scope changes are not uncommon. Such late changes are a well-known driver of cost overruns [10] and often trigger schedule delays as teams adjust plans. Ultimately, without a guiding framework or governance tool, decision-making tends to be reactive – problems are addressed only after they become pressing, rather than being anticipated through a standard risk management approach.

Construction Phase Issues

During the construction phase of K–12 projects, non-standardized organizational processes can lead to drastically inefficient work practices, changes in scope, cost overruns, and delays. School districts and project teams generally do not use standardized organization processes, but rather enact their own disparate plans, resulting in a lack of consistency. This lack of consistency prevents effective communication and coordination because team members use different processes and engage in different assumptions. Studies have found that non-standardized processes degrade project communication and effectiveness, creating a hotbed for mistakes and rework [11]. In real terms, this often means project teams spend most of their time planning and reacting, rather than actively preventing problems.

A familiar product of non-standardized workflows is a breakdown in coordination. If there aren't clear communication protocols and specified roles in the team, the critical information can get lost or misinterpreted between stakeholders. For example, it has been empirically demonstrated that poor coordination between owners, contractors, and outside agencies (utilities/local authorities) leads to direct delays in the construction process [12]. If the

participants are "on different pages," the project can suffer from duplicative efforts, omissions, or poor decision-making that leads to last-minute adjustments.

An inconsistent approach to change management is yet another indication of ad hoc processes. The project team manages design errors, omissions and unexpected site conditions without a formalized process, which means that change orders, for the most part are dealt with off-the-cuff. Critical decisions may always go up to approve because of who is leading the team or may slide into oblivion altogether. Notably, the lack of a formal change control process has been identified as one of the key drivers behind scope creep: the imposition of ill-defined and uncontrolled project scope, which leads to overrunning the project budget and its timeline [13]. In a nutshell, if there is no consistent process for managing change, the project will either suffer from disproportional scope escalation, or disruptive delays while the project team scrambles to accommodate the changes.

Just as the absence of standardized cost management and approval process across projects creates confusion and delays in decision making, without some form of district-wide standardization, each project creates its own rules for authorizing additional work or expenditures. In one district, for example, a project representative may be able to make a change order without full board approval up to a dollar limit, whereas in another district, even small change orders require board approval [14]. The nuanced difference in authorization progress and the ad hoc nature of tracking costs across all projects cause confusion and makes it difficult to monitor budgets or react to cost issues in a timely manner. Further, it diffuses responsibility, when everyone has their own process for what and how authorizations to expend funds are made, it makes it difficult to identify accountability when costs go wrong.

Ultimately, these siloed and reactive methods result in rework, disjointed decision making, and diffused accountability. Construction industry studies indicate that poor communication and rushed, unstructured decisions (signs of ad hoc management) only serve to cause pervasive rework and schedule delays [15]. Because the process provides no standard template for action, team members drift into a reactive stance; it is only when a defect or omission is caused that the matter is brought to the attention of the group [16] [17]. Viewed through the lens of chaos when there are no standard processes in place, “no one seems responsible for anything,” and problems slip through the cracks [17]. The net result is a cycle of reactive firefighters and blame-stormers defeating project results. Standardizing communication loops, assigning responsibility, and establishing approval processes must be established for the K–12 construction industry to move out of the reactive cycle and to improve efficiencies and reliability.

In conclusion, the K-12 construction decision-making landscape is highly complex but lacks standardization. Impeded by fragmented stakeholder groups treating school districts as clients, academic calendar dates, and defined public funds, school districts will always find it challenging to make decisions, but rarely do they formalize what decision-making support tools, processes, or approaches are available. This leads to an inefficient status quo, where inefficiencies, scope creep, and delay are the products of an ad hoc approach. Most projects planning typically starts from scratch, and success relies on the experience and instinct of the individuals, not on politically legitimized best practices. This gap highlights the need for more formal repeatable decision-making processes and frameworks in K-12 school construction [18] – processes and frameworks that would provide efficiencies and expedited stakeholder co-ordination, mandate proactive planning, and reduce the expensive "learning curve" experience that exists for every new school project.

The literature identifies clarity or lack of clarity in roles, confusion about decision protocols, and lack of standardization are important contributors to schedule delay and rework [8]. When the roles are unclear, and decision-making practices vary, team members will only be in a reactive posture; that is, responding to problems after they have disrupted work, rather than preventing them through better planning and proactive behavior.

Falling Behind an Evolving Industry

The broader construction industry is moving quickly toward digitized, integrated decision-making [19]. AI-assisted decision-support tools, visualization with real-time dashboards, predictive modelling for risk, and collaborative work and contract platforms are in use for large commercial projects and infrastructure projects. Collectively, these technologies depend on structured data, established governance, and specified workflows, none of which are typically evident in public school construction.

The analog methods of governance in K–12 construction are at risk of divergence from the technologies that could enhance project delivery. If we don't get to the point where we can operate processes, we will not be able to use digital platforms in any standard deliverable and be locked out of the potential for public owners to use innovation to improve project delivery in aspects like transparency, velocity, and cost containment.

THE ROLE AND BENEFITS OF STANDARDIZED DECISION-MAKING

As illustrated in Figure 1, standardization offers a contrasting pathway where structured data inputs and proactive governance enable controlled scope and on-time, on-budget delivery. Standardized decision-making has been shown to be beneficial in the fields of facility design [20], civil engineering [21], and linear construction [22]. Similar outcomes should result when applied to the K-12 Construction Industry as well. Primary reasons behind the improvements seen from standardized decision-making include the following:

Removal of Individual Bias

Human decision-making is fraught with personal biases. In K-12 construction projects, this bias comes into play when decision-makers rely on their own experiences to guide them. The problem here is when are more critically examined solutions derived: when do we have a single experience upon which to rely or when the experiences of multiple others are also used as yardsticks against which to measure our potential responses? The obvious answer is in the latter case. In the former case, it is these biases that lead to sub-optimal outcomes.

Captures more Data Input than Most Project Managers Initiate on their Own

Similar to the situation described above, when project managers are left on their own to make decisions, they only "know what they know" and are therefore subject to their own limitations. This results in fewer pieces of critical data being taken into consideration. In comparison, standardized decision-making tools are comprised of prompts for many more data inputs.

Ensures a More Comprehensive Analysis to Address and Ameliorate Potential Causes of Project Overruns

In statistical analysis, when more variables are added to a model (within reason), the predictive validity of the model typically increases. The same phenomenon holds when more data is taken into consideration in a decision-making model. It allows for a more rigorous examination of potential causes of delays and cost-overruns. When more of these causes of negative outcomes can be controlled (and oftentimes, minimized), the more estimations will be accurate and realized upon project completion.

RESULTS

Fragmentation and Inefficiencies in K-12 Construction

The analysis identified decision making in K-12 construction as mostly fragmented, informal, and abstract, mixing authority and responsibilities while reacting to problems with little foresight. Without defined roles and thresholds or standardized processes, the same repeated delays, scope creep, and overruns took hold again and again. Stakeholders were not in position to use data derived tools, confused over approval processes, and relied on project teams to react to circumstances rather than managing, and being proactive to, the same hurdles.

Impacts on Cost and Schedule Performance

The results suggested that immovable academic deadlines and bond funded budgets continued to fuel these inefficiencies. Districts cannot delay opening a school without community outrage so every point of indecision early in the design or construction, compressed the schedule and increased cost premiums for overtime, additional mobilization, and accelerated work. Change from an established scope of work was not typically defined by thresholds or even a clear change management process, so the smallest scope changes were multiplied by multiple high upstream dependencies to disrupt outcomes for both schedule and cost.

Comparative Outcomes of Reactive vs. Standardized Approaches

The analysis found a significant gap between reactive, ad hoc processes, and standardized, structured processes. Reactive, ad hoc processes found districts trapped in loops of rework, delayed approvals, and inconsistent accountability, while standardized processes supported decision making improved predictable outcomes through defined roles, structured inputs, decision making and proactive governance. Figure 1 summarizes the differences between ad hoc, recurring inefficiencies, and structured, controlled outcomes. The next report will provide a more detailed analysis of current decision-making practices in K-12 construction.

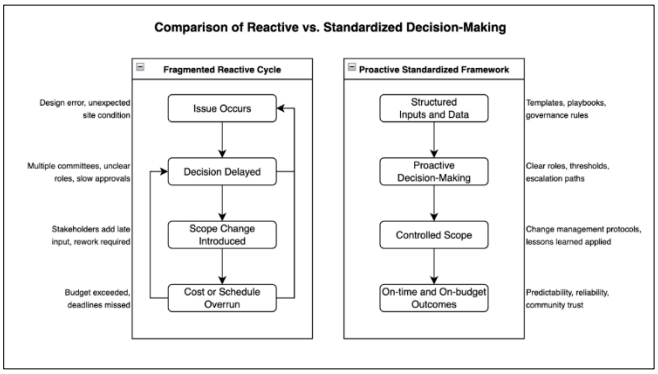

Figure 1. Comparison of reactive, ad hoc decision-making with standardized, structured decision-making in K-12 construction projects. The reactive cycle (left) illustrates recurring inefficiencies and overruns, while the standardized framework (right) demonstrates how structured inputs, clear roles, and change management protocols lead to predictable outcomes.

Derived Governance Framework

These evidence, further demonstrates that effective remedies require both governance structures and operational tools. Specifically, two tiers emerged as necessary:

Governance Charter – to formalize decision rights, escalation thresholds, and quality expectations for data.

ERP-Grade Standardization Workbook – to encode workflows, approval gates, and required data inputs from project inception through close-out.

Combined, these mechanisms target the sources of reactive practice, reduce variability, shorten approval cycles, and capture institution knowledge throughout projects, and leverage the structured datasets for the newest applications, e.g., AI-based forecasting, predictive analytics, and digital-twin simulations.

CONCLUSION

Decision-making in K-12 construction projects is largely fragmented and reactive, leading to delays, scope creep, and

cost overruns against the pressure of fixed budgets and immovable deadlines driven by our education agenda. This research illustrates the challenge of developing effective governance structures and standardized processes so that school districts can communicate clearly, and have accountability between them and the construction, IT, and administration processes and functions. Absent either formal governance structures or standardized processes, school districts are essentially left to their own ad-hoc practices, which unfortunately reinforces inefficiency and weakens accountability.

Standardized governance structures can bring positive changes, in the form of governance charters and similar, ERP-grade decision-making workbooks, to support a framework for improved predictability, transparency, and efficiency. Not only do they enable the reduction of bias and the collection of wider data elements, but they can also streamline approvals of various processes and support subsequent tools for AI analytics or digital twins. Transparent and direct decision-making structures in K-12 construction are important not only in the interest of efficiency but importantly for educational continuity and accountability to bureaucracies and communities as trusted public and professional servants.

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