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Updated Analysis of QBS in the Procurement of Consulting Services

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Executive Summary

The issue of whether Qualifications-Based Selection should be the law of the land in Canada is one that has been visited several times. However, the use of QBS in Canada remains a provincial issue as the Federal government has not provided a definitive answer as to whether QBS will be the required approach to design service procurement. As documented by QBS Canada “It is only in February 2018, that the government of Canada has announced they will launch a pilot program for Qualifications-Based Selection (QBS), a procurement process that has been mandated in the USA by the Brooks Act since 1972” (Shelton 2018). However, even with pilot programs and individual provincial policies, misperceptions due to confusing marketing campaigns by alternative procurement groups exist as to the advantages of QBS. In this study, the authors address these questions through a national analysis of the state of QBS procurement.

The overall conclusion of the study is that QBS continues to provide an advantage in the traditional project metrics of cost and schedule. Data from a companion study in the United States, finds that QBS-based projects outperform the national performance in cost growth (3% growth versus 6% growth), and in schedule growth (7% growth versus 10% growth). Based on the analysis of the projects in the study, the authors conclude that there is a strong association between the use of QBS, the quality of construction documents developed by the design team, and the final cost and schedule performance.

In addition to providing traditional cost and schedule savings, the Canadian QBS study finds that QBS provides specific benefits to complex projects. While there are specific value-added benefits from the application of QBS procurement methods to **all** projects, it is particularly evident for **complex projects.** Complexity can emerge from numerous points in a project including community engagement, political or social sensitivities, technical challenges in design or in constructions, or management and collaboration of project participants.

Finally, QBS leads to increased innovation on projects. Innovation is a cornerstone of advancing project solutions as well as developing better solutions for clients. Innovation can occur on projects of any size or in any sector. This study found that projects incorporating QBS have a greater likelihood of producing innovative solutions.

In summary, the current study found that QBS provides direct benefits in all phases of projects. From direct cost and schedule benefits to indirect benefits of reduced management issues and increased innovation, QBS demonstrates a clear benefit when applied across a series of project types and geographic regions.

Table of Contents

Introduction

The issue of whether Qualifications-Based Selection should be the law of the land in Canada is one that has been visited several times. However, the use of QBS in Canada remains a provincial issue as the Federal government has not provided a definitive answer as to whether QBS will be the required approach to design service procurement. As documented by QBS Canada, “It is only in February 2018, that the government of Canada has announced they will launch a pilot program for Qualifications-Based Selection (QBS), a procurement process that has been mandated in the USA by the Brooks Act since 1972” (Shelton 2018). However, individual provinces including Ontario and Quebec have moved forward independently on requiring QBS raising further questions as to whether this should be a broadly enforced requirement. It is this lack of clarity that has resulted in professional organizations such as the Association of Consulting Engineers of Quebec to increase the pressure on local and national governing agencies to develop consistent procurement rules.

However, even with increasing adoption of QBS regulations at the city and provincial levels, questions persist as to the appropriateness of such a requirement. Similar questions have persisted in the United States even though QBS is the Federal procurement law. Chinowsky and Kingsley published an initial report on Qualifications-Based Selection (QBS) in the United States in 2007. Today, although QBS remains the general law of the United States in terms of procuring design services, questions regarding the appropriateness of QBS persist. In response to these questions in both Canada and the United States, the authors analyzed the value of QBS across distinct datasets in Canada and the United States. This report focuses on the Canadian stud but brings in data from the US study as appropriate to validate results.

The results of the studies in each location illustrate that QBS continues to provide clear advantages in terms of the quality of product produced, the reductions in cost and schedule delays due to poor documents, and the benefits of increased innovation and general satisfaction with the final project. However, due to factors including the reduction in trained staff in smaller jurisdictions, the lack of education on appropriate procurement policy, and misperceptions due to confusing marketing campaigns by alternative procurement groups, questions arise as to the applicability of QBS, the appropriateness of QBS, and the policy enforcement of QBS. It is not the question of whether QBS is required, that is answered by local and national laws. Rather, the current study finds that the benefits of QBS remain consistent, but a segment of officials, primarily in smaller jurisdictions, may not be fully educated on the life-cycle benefits of QBS.

In this study, we visit questions of project performance and project metrics under QBS. However, we also delve into the governance issues surrounding QBS procurement. The authors address the challenges facing owner organizations as they select and implement procurement processes for increasingly complex projects. From this perspective, the study addresses the questions of why and when QBS is advantageous with an emphasis on the complexities that projects face from political and social issues.

To answer the central research question of whether QBS provides benefits to owners, a set of key objectives were put in place to emphasize the need for a data-focused study to establish the state of QBS procurement. Specifically, the **key objectives** for this study were established as follows:

- Provide a current review of the research and professional literature on QBS – Over the past 10 years there have been developments in the research literature focused on QBS policies and procurement practices. A current literature review provides a focus on procurement research developments over the last decade.
- Provide a quantitative or descriptive analysis of QBS – Except for limited studies, QBS procurement has been analyzed from a qualitative perspective. This perspective is not sufficient to defend a procurement practice. Therefore, this study provides a quantitative perspective on QBS practices.

These objectives provide the context required to answer **key research questions** including the following:

- What is the impact of QBS on short-term and long-term project costs?
- Does QBS continue to provide owners with enhanced value over alternative contracting methods such as design-build or value-based procurement?
- Does a connection exist between the quality of the design output and the use of QBS?
- Does project type have an impact on the success of QBS?
- What role does owner policy and processes have in QBS success? Are there interaction effects between federal, state and local policies that are influencing QBS processes and procedures?
- What is the relationship between risk and design costs and QBS?
- What is the relationship between project complexity and QBS?

These objectives extend the previous studies into QBS that have been undertaken to date. Specifically, older studies such as by Christodolou (2003) were limited in terms of geographic scope and project type. Although the data obtained from these studies validated the use of QBS in the limited sample frames and context of the studies, these investigations were limited in terms of the perspectives listed above. In response, the intent of the current study is to provide an analysis of QBS from multiple perspectives and success measures.

Methodology

The research methodology for this study follows that established for the 2007 study. Specifically, a multi-dimensional study was undertaken based on three perspectives that extend the analysis of QBS beyond simply a procurement process. In this expanded perspective, a policy-process-procedure (PPP) set of perspectives were adopted as follows.

- Policy – QBS is a policy that is followed by public agencies. The first perspective to analyze the effectiveness of QBS is whether QBS is meeting the policy goals of agencies, as well as meeting the requirements of the Brooks Act, including life-cycle costs, meeting quality expectations, and meeting societal needs.
- Process – QBS is a process that is followed by procurement officers and business development managers. From this perspective, QBS must be analyzed to determine the impact of problem definition, administrative oversight, and consistency on design costs, project risk factors, and life-cycle effectiveness.
- Procedure – QBS is a procedure that is followed by individual firms to submit proposals and qualifications to public agencies and procurement officers. From this perspective, QBS must be analyzed in terms of pragmatic benefits including design fee leverage, fee vs. total project costs, fee vs. life-cycle costs, and fee vs. project risk factors.

This triad of perspectives provides a broader picture of the QBS procurement process and the interrelationships between the contracting agency and the design firms.

QBS Perspectives

The first component of implementation for the multi-perspective approach required input from each of the provinces to obtain insights into the way QBS procurement was being implemented. A survey tool was deployed to knowledgeable leaders in each province to obtain these perspectives. The survey, as detailed, in the following chapters, emphasized policy and governance in response to the first leg of the triad, policy. The responses from each province were compiled to provide a foundation for the answers to the questions around how, where, and when QBS is being used on a national basis.

Project Procurement Perspectives

The second component within the overall study was the obtainment of perspectives of QBS at a project level. For this focus, a survey tool was deployed to a cross-section of project

participants based on project nominations. Projects crossing sectoral boundaries, geographic boundaries, as well as differences in size and scope were included in the final population from the overall set pf project nominations. As detailed later in the study, each project was queried for success metrics, scope characteristics, and participant perspectives. The compilation of this data provided input to the questions of QBS process and procedure.

Project Participant Perspectives

The final component of the effort focused on obtaining deeper perspectives into a cross-section of projects through case studies. The case studies entailed interviews with project participants encompassing questions around all three elements of the study triad. The intent being to extract the underlying reasons why answers were provided in the project nomination form. Each participant was provided. The opportunity to go into depth on any of the topics and thus provide a greater understanding of why and how the project was approached and completed.

The combination of these methodological steps and devices provided the comprehensive perspective required to generate the list of conclusions provided at the end of this report. The following chapters introduce each of these steps as well as the data collected and interpreted in each stage.

Literature Review

Education around QBS is promoted by numerous organizations across the United States and Canada including the American Council of Engineering Companies, the Association of Consulting Engineers in multiple provinces, and the National Society of Professional Engineers in the United States. However, advocates for alternative procurement methods, primarily Best Value (BV) procurement, are increasing advocacy efforts in an attempt to both reintroduce price to the procurement process as well as open the door further to greater influence by construction organizations over project delivery. One of the primary factors leading this trend towards cost-including procurement methods is the perception that greater consultant qualifications are inherently associated with higher design and construction costs.

However, the perception that QBS procurement's focus on qualifications results in higher design and project costs has been shown to be incorrect. In fact greater qualifications do not in fact correspond with higher project fees. In one analysis of 42 projects, no significant correlation was found between more qualified firms and higher cost proposals (Shalwani 2017). A separate study by the same researcher supports this same conclusion as 122 publicly procured A/E projects analyzed across North America revealed that greater consultation qualifications had no correlation with higher design costs (Lines and Shalwani 2019). Contrary to an oft-quoted Molenaar study (1999), a more recent study found that QBS performed better in terms of cost when compared to best value procurement in 160 DB projects built between 2008-2019 (Adamtey 2020). **These studies all showcase the inaccuracy of the assumption that qualifications and past performance-based procurement necessitate higher costs.**

Much of the cost efficiency created by QBS is due to the strength of design documents obtained through this procurement method. Past performance and proficiency have been found to lead to higher quality design documents and lower construction costs (Gransberg et al 2020). In contrast, poor design documents lead to increased construction costs incurred through construction contract modifications and errors. Though design fees themselves can range from 4% to 15% of the total project cost, their impact on the rest of the project is significant. Studies have determined that 56% of construction contract modifications were due to design deficiencies, and design errors and omissions discovered during construction accounted for 79% of all contract modification costs, which in turn averaged 9.5% of total project cost (Burati *et al.* 1992). An Australian study in 2011 reinforces this connection between cost growth and poor design documents, as it found that poor design documentation was the major source of rework, leading to construction cost increases (Love 2002).

Continuing with the focus on cost and project results, in a review of 76 design-build projects, QBS was found to have the lowest cost growth and the fastest construction speed when compared to sole source, BV, and LB (Wardani et al 2006). A study focusing on US airport public works contracts found that QBS awards increase the quality of the tender's design documents, which in turn, increases construction certainty (Gransberg et al 2019). Additionally, investing more design effort was shown to reduce the project's final cost from early estimates by solving construction problems during the design phase when the costs are lower than after construction has commenced. Another metric from which to judge design documents is the amount of Requests for Information generated by the documents. Well over three times as many owners (50%) cited better performance from their QBS teams related to RFI's than those saying they preferred fee-based approaches (DODG 2020).

This focus in the literature on the relative benefits of QBS versus design-build and other procurement options highlights the need for a revisiting of the benefits of QBS. In this study, the authors focus on the question of value of QBS in the overall project context. In contrast to the move towards including price in all project decisions, the current research takes a critical look at the overall benefits of QBS to the project and the owner.

The Current State of QBS

To better understand the current use of QBS across the provinces we surveyed knowledgeable professionals who work with provincial procurement rules. This overview was obtained through a 17-question survey sent to each individual addressing current QBS use in several areas including: 1) current regulatory guidelines, 2) QBS enforcement, 3) QBS Support, 4) QBS usage, and 5) alternative procurement usage. The research team received replies from six of the ten provinces. The following sections summarize these responses in terms of the major areas covered.

QBS Mandates

Overall, the commitment of provinces to QBS contracting varies, but is strongest in the most populous provinces where QBS contracting processes are embedded in provincial laws. In the provinces where QBS is mandated, QBS requirements cover provincial agencies in the same way as state laws cover procurement requirements in the United States in that projects coming under the ownership of provincial agencies must utilize QBS procurement. However, as becomes clear from the data, the underlying challenge for Canadian professionals is the difference in laws that accompany projects in each province.

Additionally, it is also clear that compliance with QBS requirements is minimal or local at best. The respondents all agreed that enforcement of QBS laws is an area needing additional regulatory attention so that consistent enforcement can be applied to governments and agencies that fail to adhere to QBS practices. This pattern of well-established QBS laws and mandates and the need for greater oversight and enforcement follows many previously undertaken QBS studies.

Current Use

The focus on how QBS is being used today, led to a focused set of questions around current QBS procurement patters. As stated previously, QBS is not mandated equally across the provinces and this impacts perceptions on the potential expansion of its use going forward. Given this backdrop, we looked further then into the questions of whether there were any roadblocks in place that were preventing any jurisdictions from fully implementing QBS.

To get at this issue, the respondents were queried as to the current use of QBS at various levels in the provincial government structure. Specifically, the use of QBS at the province, county, municipal, and school board level was analyzed.

Table 1: Use of QBS and Provincial and Local Levels	All Provincial Agencies	Agency Most Committed to QBS	Civic Governments	Municipal	School Boards	Other
Group Average	1.7	2.6	1.2	1.3	1.6	1.2
Survey Options: 1:0-20%, 2:21-40%, 3:41-60%, 4:61-80%, 5: 81-100%						

As illustrated in Table 1, QBS is the primary procurement tool at the provincial level in less than 40% of the projects. The highest rate is in the provincial agency that is most committed to QBS with an average in the 50% range of projects.

However, there is concern that the use of QBS drops off when the focus of procurement moves to the local levels. As illustrated, civic governments, Municipalities, School Boards, and Other agencies are found to be using QBS closer in the 0-20% range. While there are variations, most notably in Quebec, the overall use of QBS is lagging in most areas. This illustrates the level of challenge facing professionals in terms of fully adopting QBS. This finding led to the question of whether this is a performance issue, which goes against the quantitative analysis of this and other reports or is it an education issue among procurement officials.

The answer to this question was found in further analysis of the case studies as well as outside procurement literature. Specifically, the lack of adoption of QBS in some local jurisdictions can be placed in two areas: education and capacity.

In terms of education, similar to many countries, turnover in procurement departments has been increasing over the last decade with long-term civil servants retiring and procurement turning over to less experienced individuals in a number of areas. Concurrently with this turnover has been a significant increase in the level of advocacy from alternative procurement groups. In this combination, the level of knowledge concerning the core reasons for utilizing QBS has dropped amongst some local jurisdictions. Hence, this is not a performance issue, but in many cases a perception issue that QBS is costlier which is being put forth by alternative advocacy groups.

In terms of capacity, there are many smaller jurisdictions where procurement responsibilities do not fall to a dedicated staff. Rather, procurement is part of a larger set of responsibilities that a single individual may have. In these cases, individuals have reported that they believe QBS may take longer up front and this it is a capacity issue. These individuals are

less concerned about the downstream risks involved with alternative procurement methods as their responsibility is limited to procuring design services and getting a project moving so they can return to other responsibilities.

Focus of Current Use

In response to the type of projects that are most often using QBS in their jurisdiction, the primary driver for QBS appears to be Provincially funded projects and in particular transportation and utility projects. In terms of the value of the project, the value of the project is far less significant in terms of using QBS than the type of project. Only one of the respondents indicated that there was a threshold level, at least a $1 million project, above which QBS is required to be used as the procurement method. This provides a strong indicator that the cost of the project is not the driver for using QBS as is often mistakenly put forward.

What is Being Used?

The last question for the respondents was to indicate what other procurement methods are currently being used and how are professional services being procured in these systems. The responses provide an indication of the range of procurement that is being tested, primarily in local jurisdictions. Predominantly, Best-Value-based procurement methods are being increasingly tested. Within the provinces utilizing these methods, the selection of professionals is including a greater number of weighting and scoring systems, many of which include price. Many respondents indicated a strong use of a “two-envelope” system where price is separate from the main proposal, but it is a primary determinant in the final selection.

The implication of these responses is that the qualifications of firms for professional services are often being combined in a broader point or weighting system. Thus, these alternative procurement systems are providing a controversial stepping off point for including price in professional service firm procurement which goes against many of the recommended or required regulatory practices evident in these same locations.

Summary

QBS is unequally applied in the majority of provincial level projects. In some smaller jurisdictions, the QBS landscape becomes even less clear with the entry of alternative procurement options due to challenges including education and capacity. These findings echo the general trends reported in the literature review and in the QBS study in the United States where QBS is being challenged by procurement agents at the local level (in favor of price-based methods) and under increasing competition from price-based procurement methods. The combination of this drive to include price, lack of equal enforcement, and the need for education at local levels creates a current use environment that can be summarized as QBS is the mandated method in some provinces, but additional education is needed in others to expand QBS procurement.

QBS Project Analysis

The second part of the QBS Canada Study moved from analyzing the overall state of QBS procurement to a focus on the outcomes of utilizing QBS. In this phase, projects from multiple sectors, procurement types, levels of success, and geographic locations were solicited to provide a population from which the impact of QBS on project delivery could be analyzed. The focus of this effort was to create a foundation of data on which overall messages could be developed around the impact of QBS on project delivery. In this section, the projects are analyzed in four areas: procurement, outcomes, management, and innovation.

The project population from which the results are presented was derived from a call for project nominations from professionals across Canada. Like the initial phase, a Qualtrics survey was employed to obtain input from participants on specific projects. The participants self-nominated projects to be included in the final population. The call for nominations resulted in 14 projects being included in the final population. A segment of project nominations was eliminated to get to this number due to issues including incomplete nominations, requests for confidentiality of data, and inability to contact project participants.

Case nominations reflect the variety of types of projects pursued by professional service firms including both private and public sector owners (Figure 1). The projects covered a range of

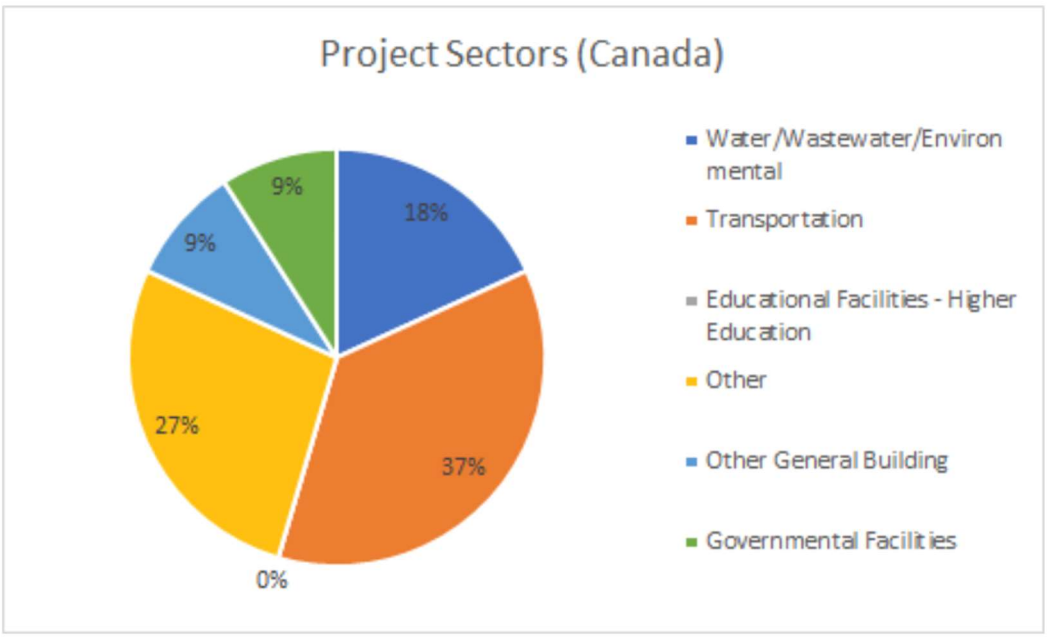

Figure 1: The selection of a procurement method correlates with an understanding that QBS benefits projects, both short-term and long-term.

industries including both design services as well as the marketing sector. The projects covered both new projects as well as renovation projects in the building sector. This diversity provided an opportunity to examine similarities and differences among the projects as well as project metrics.

Procurement Method

Among the cases nominated, the procurement method employed varied to include QBS, Best-Value, Sole Source, and low bid. As a foundational question to the study, an initial query to nominators was to determine whether price was a driving factor in the procurement process. As such, we asked those nominating cases to indicate the role of price in the final selection of the design firm. For the overall population responding to this question, the results were evenly split between Not Important and some degree of importance (Figure 2). Respondents rated the role of price on a 5-point scale (5 indicating price as an extremely important factor and 1 indicating price as not a factor). The average response across all case nominations is 3.4. However, in the population of projects that did not utilize QBS, the respondents were varied across the spectrum from Not Important to Very Important indicating that the importance of price is specific to each project and differs among jurisdictions. This response reinforced the conclusion that there is a misperception in some jurisdictions that utilizing QBS results in higher project costs.

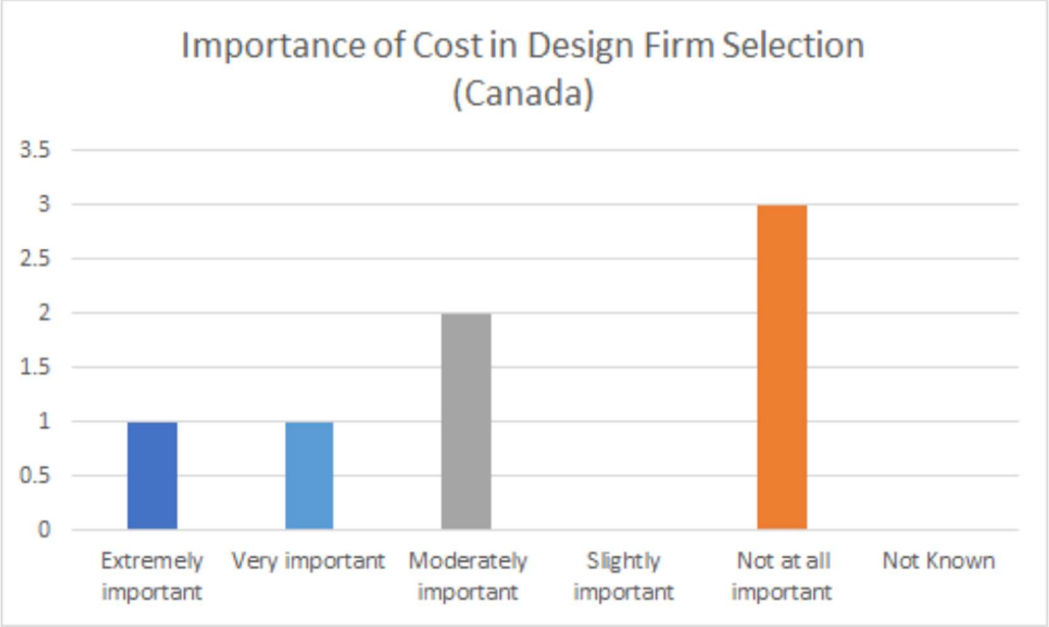

Figure 2: The selection of a procurement method correlates with an understanding that QBS benefits projects, both short-term and long-term.

The difference in responses to the role of price in design firm selection indicates a strong link between the procurement method selected and the misperception that incorporating QBS results in higher costs.

Project Outcomes

A primary determinant of the success of any procurement methodology is the outcomes that are generated when utilizing the selected methodology. In the current effort, project outcomes were analyzed from several perspectives including opinions on project success, the degree to which projects met project schedules and budgets, and the level of innovation which was brought to the project. The following sections introduce these multiple perspectives on project outcomes to build a relationship between project procurement methods and project outcomes.

Project Success Perspectives

The first perspective analyzed from the survey data was the level of project success from the designer's perspective. When looking at all projects in the population, the projects received a rating of "High" or "Very High" from the respondents in all instances. This indicates that a large majority of design firms believed their projects were an overall success in terms of meeting project objectives independent of the procurement method used. However, when looking at the non-QBS projects, a difference between the two populations emerges in the comments associated with the projects. Specifically, comments in the QBS-based projects emphasize the value of previous experience as well as the relationships between the project constituents. Examples include:

- "Project is highly visible in the landscape and received some prizes"
- "their experience really helped find coherent solution to all the bridge problems"
- "[complemented the client for a smooth, intelligent and respectful process"

These quotes reflect the importance of experience and established professional networks in developing successful project solutions. The design firms commented frequently on the teams they collaborated closely with, and had developed over time, in addressing unique issues on complex projects.

The second perspective on project success emerged from the owner's point of view. The results from this question mirrored the overall results from the designers, with all projects receiving "High" or "Very High" satisfaction.

In contrast to the designer comments, the owner comments emphasized the ability for the owner to further their objectives in terms of long-term relationships. These comments emphasized the positive opportunity on QBS projects to collaborate with an experienced design team as well as to build on the design team's experience to better position their projects for future success.

Cost and Schedule Performance

The core metrics of project success are schedule and budget. While these metrics may not encompass the complete impact of a given project, they traditionally are held as key indicators of how well a project was managed during development and how well it met the short-term goals of the owners. QBS studies have traditionally compared project outcomes against industry norms in terms of cost and schedule growth. In the current study, the team went beyond surface cost and schedule metrics to focus on the impact that design can have on the ultimate success of a project including the overall cost and schedule. Thus, the study looked at the traditional overall project cost and schedule, but also specifically the growth in the construction project where it was appropriate as it reflected the quality of the construction documents.

The population of projects in the current study was insufficient to provide quantitative results that were significant in scope. However, the initial trends in the data reinforce the findings in other studies that QBS projects consistently exceed expectations against industry norms for both cost and schedule. As this study was completed in parallel with a similar study in the Unites States, the findings from that study are presented here.

Utilizing updated literature reviews of cost and schedule growth, the project established a national norm of 10% growth for schedule and 6% growth for budget (Tran et al 2018). Utilizing this metric as a comparison, the current effort found that QBS projects outperform the national average in both cost and schedule growth. In terms of cost growth, the QBS projects analyzed in this study had an overall project cost growth of 3%. This is half of the national average of 6%. When isolating this to just construction cost growth, this increase remains low at only 4%. Based on the in-depth case studies, this is a reflection of the quality of the construction documents developed by the design firms which is a primary reason that many design firms advocate for this process to potential owners. In terms of schedule growth, QBS projects

outperformed the national average by having a schedule growth of 7% versus the national metric of 10%. This is a 30% reduction in the typical schedule growth of a project.

In addressing the underlying reasons why QBS outperforms the national average, the survey first focused on the issue of design and construction schedule milestones. While there was minimal difference in meeting design milestones, the difference between QBS and non-QBS projects in meeting construction milestones is evident. In this question, the analysis focused on whether the experience brought forward in QBS may be a factor in the construction process. From this perspective, a significant difference exists in the projects. Specifically, 48%, or about half of the QBS projects met all construction milestones with no adjustment in schedule required. Conversely, only 32% of non-QBS projects had the same performance. This is a 50% increase in the number of projects that met all schedules.

The significant different between these populations is highly correlated based on interviews with project participants and analysis of the projects with the quality of the construction documents put forward by the design team. And, following on that point, the teams with the greater experience working together, and in that sector, consistently produced documents resulting in fewer delays during the construction process due to incomplete documents or documents requiring clarifications.

Innovation

The final outcome-based metric explored in the study focused on the level of innovation employed on each project. The innovation metric is included for two reasons. First, innovation is an indirect measure of project complexity as more complex projects often require innovative solutions to address specific project challenges. Second, innovation is a measure of how design firms approach a project in terms of the flexibility of solutions they may bring to the project. This is an important factor as the greater the number of tools and solutions that a team can bring to a project, the greater the likelihood that they can provide a solution that meets or exceeds client expectations.

From this perspective, there is a notable difference in the rate of innovation noted by the participants. On the upper end of innovation, QBS projects were more likely to have moderate or significant innovation included in the solutions. However, of greater significance is the fact that non-QBS projects were more likely to have little or no innovation included in the project. This is a significant finding as it notably reduces the opportunity for an owner to have a project delivered that considers new or emerging solutions to issues that arise on the project. Additionally, it significantly reduces the likelihood that cost or schedule saving opportunities might be explored by the design team.

As a second element to innovation, the team analyzed the comments for the projects in terms of complexity of the project and the introduction of innovative solutions. From this perspective, the team found similar comments to those obtained in the United States study that projects that mentioned complexity either in terms of physical challenges or in terms of social or political challenges, were consistently higher in terms of innovations when QBS was the procurement method put in place. As discussed in the case studies, this relationship was consistently reinforced through interviews. Specifically, it was found that while QBS continues to be a benefit on all types of projects, this benefit increases with the complexity of the project.

Summary

In summary, the analysis of the projects in the study population provided a foundation for establishing key messages as well as the lines of inquiry for the in-depth case studies. The overall distribution of the projects provided a national perspective on the use of QBS in project procurement and the resulting project outcomes. The key messages from the analysis include the following:

- QBS has a strong positive impact on every project.
- There is a strong link between the level of complexity, the project outcomes, and the use of QBS as the procurement method. As the complexity of the project grows, the positive impact of using QBS grows along with it.
- Project success metrics are influenced by QBS through the experience and teams that are brought to the project and the likelihood of generating documents and solutions that reduce costs and schedules during construction.
- Project success from an owner's perspective is influenced by the experience of the design team and their ability to meet project milestones.

Case Study Perspectives

The case study process provided the research team an opportunity to go in-depth on a group of projects to better understand the reasons behind the answers provided. Case studies were conducted both in Canada and the United States to gather a broad range of perspectives on current QBS practices. What became clear from these interviews was the desire by knowledgeable owners to adopt QBS procedures. The advantages of experience are acknowledged by owners, but conflicting messages from multiple constituencies makes the adoption and application uneven across geographic regions. In summary, the interviews produced the following perspectives:

- Outside Challenges Require Experience – Projects that have external challenges such as political, social, or community engagement issues require project participants with experience in these areas.
- Experienced Teams Bring Innovation – Regardless of the overall scope of a project, innovative solutions provide an opportunity for project participants to examine appropriate approaches to the project solution. In almost all cases, projects that had experienced teams also worked to bring innovative solutions to enhance the project.
- Owner Capacity Influenced Procurement Approaches – Similar to the conclusions drawn from the larger project populations, the case studies emphasized the challenge of procurement in scenarios with limited owner knowledge of QBS benefits. Specifically, the experience of the owner organization in engaging a QBS procurement process directly impacted the use of QBS. While QBS may be the legal requirement of a jurisdiction, the actual enforcement of the process was specific to each jurisdiction.
- Participant Satisfaction Correlates with Procurement System – While the case studies are a limited population, the combination of the Canadian and American case studies indicate a correlation between the procurement method and the level of satisfaction of the project participants.

Overall Conclusions

To complete the study, the research team took a vertical analysis through the complete set of data collected for the study. Specifically, the research team compared results from: 1) previous studies, 2) the impressions provided by the provincial respondents, 3) detail project information obtained in the project surveys, and 4) the case study perspectives. This broad set of data provided an opportunity to validate assumptions developed from one set of data against the data obtained from the other data collection efforts. Thus, the research team took these multiple perspectives and developed the following overall conclusions from the study.

- QBS Benefits Complex Projects - In this study we observe significant value-added from the application of QBS procurement methods to **all** projects. This is particularly true for **complex projects** that can benefit from experienced and stable design teams comprised of high-quality providers. Complexity can emerge from numerous points in a project including: community engagement, political or social sensitivities, technical challenges in design or in constructions, or management and collaboration of project participants. In short, complexity of a project can emerge from multiple known or unknown project elements, each of which benefits from experience identified through QBS procurement.
- QBS Leads to Innovation - Innovation is a cornerstone of advancing project solutions as well as developing better solutions for clients. Innovation can occur on projects of any size or in any sector. This study found that projects incorporating QBS have a greater likelihood of producing innovative solutions. This is often based on firms having greater opportunity to explore innovations and collaborations when price is not the driving factor.
- QBS Enhances Construction Process – While QBS focuses on design, the selection of design firms with greater experience in key project components including developing construction documents, assisting in setting requirements for the selection of construction firms, and defining clear project roles and responsibilities, will result in fewer project delays and greater likelihood of owner satisfaction with the overall project.

In summary, the current research effort illustrates the benefits in project delivery that QBS provides to owners on all projects. The data indicates QBS continues to enhance project solutions and owner satisfaction. The overall cost and schedule savings that is likely to result from utilizing QBS as the procurement method is a foundational element in recommending the

use of QBS, but the advantages from an innovation, teaming, and satisfaction perspective reinforce the value of QBS. These advantages should motivate jurisdictions at all levels to reexamine the potential adoption of QBS in public projects. Additionally, a coherent set of rules regarding QBS procurement would significantly benefit all provincial and local jurisdictions.

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