

INSIGHTS INTO CENTRALIZED PROCUREMENT FOR CONSTRUCTION MATERIAL SUPPLY CHAIN: A STUDY IN SRI LANKA

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Abstract: The rise of centralized procurement has strengthened the modernization process of materials procurement management in the construction industry. Despite its global implementation, centralized procurement has not yet been widely adopted in the Sri Lankan construction industry. Hence, the study aims to investigate the application of centralized procurement of construction supply chains in Sri Lanka. A qualitative survey was conducted using an interview strategy, with data collected through ten semi-structured interviews with experts in the field. The collected data was analyzed using manual content analysis. The findings of the study elucidate the positive and negative impacts of practicing centralized procurement in this context. Key positive impacts include possible cost reduction opportunities, precise procurement operations monitoring, and assistance in making intelligent procurement choices. The vital negative impacts were restricted competition, loss of client satisfaction, less innovation, and diminished stakeholder confidence. Key factors that hinder strategy adoption include the lack of uniformity in procurement practices, resistance to changes in the construction business, and obstacles from legal and regulatory bodies. The recommended solutions include creating transparent and uniform procurement procedures through standards, developing explicit norms for supplier selection, bidding procedures, and contract administration, and fostering collaborations with legal professionals and government entities. The study provides valuable insights into adopting centralized procurement in the Sri Lankan construction industry. It highlights its positive impacts and strategies to overcome obstacles and offers a foundation for further research on using digital technologies to enhance procurement efficiency and potentially benefit similar developing countries' construction industries.

Keywords: *Centralized Procurement; Construction Material; Impacts; Sri Lankan Construction industry; Supply Chain.*

1. Introduction

The global construction sector faces fluctuating material prices and a lack of competent labourers (Al-Ali et al., 2010). Since materials comprise more than 60% of all construction expenditures, lowering procurement costs is essential for improving efficiency gains (Yunna & Ping, 2012). Moreover, the construction supply chain is long, non-transparent, and complex, causing difficulties in monitoring compliance and leading to project delays and increased costs (Behera et al., 2015; Nanayakkara et al., 2021). Most stakeholders, including clients and contractors, are severely impacted by the construction supply chain's inherent dynamic and complexity (Danuri et al., 2006). Construction enterprises overlook material management and lack unified management, resulting in project companies making independent purchases, which leads to a large backlog of inventory and unnecessary capital waste and occupation (Yunna & Ping, 2012). Thus, centralized procurement can be utilized to enhance Supply Chain Management (SCM) in construction amidst traditional procurement practices (Liu et al., 2016).

A centralized procurement strategy is one in which an organization's department or central authority is in charge of all procurement decisions and procedures (Contreras, 2016). This method manages procurement tasks centrally from a single point of contact instead of being distributed among several divisions or business units (Contreras, 2016). Centralized Procurement (CP) for construction works refers to the procurement of construction projects conducted centrally in one place, although several projects happen simultaneously. CP for construction materials lowers material procurement costs while improving procurement quality, ensuring project quality, and encouraging company profitability (Li et al., 2012). Additionally, Weingarten et al. (2010) further stated that centralized procurement platforms can help firms decrease costs and boost value in the supply chain, culminating in advantages for the firm and its clients. However, it is evident from empirical sources that there has been a tremendous success in practicing a centralized procurement strategy to reduce purchasing expenses from a global perspective (Prior & Mudiyansele, 2021; Stritch et al., 2020).

1.1 RESEARCH GAP

Although centralized procurement has been implemented globally, the Sri Lankan construction industry has yet to adopt it on a large scale. However, De Silva and Panagodage (2022) manifested that traditional supply chain management practices in the Sri Lankan construction industry experience significant issues such as material deliveries not according to plan, non-compliance with materials, and payment delays. Thus, centralized procurement can be implemented in the Sri Lankan construction industry to address these issues effectively. Further, Gunawardhane and Karunasena (2016) highlighted the need to adapt contemporary and cost-effective alternative

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FARU Journal: Volume 11 Issue 01 DOI: <https://doi.org/10.4038/faruj.v11i1.313>

procurement practices in the Sri Lankan construction industry. There is a notable absence of studies focused on applying CP in the Sri Lankan construction industry (Mei et al., 2019; Yuna & Ping, 2012).

To bridge the existing research gap, applying a centralized procurement strategy in supply chain management in the Sri Lankan construction industry needs to be studied extensively. Such novel research would be valuable to relevant stakeholders in understanding the application of CP under existing circumstances of the Sri Lankan construction industry, bracing itself for new changes while enhancing industry practice. Therefore, this study aimed to investigate the application of centralized procurement of construction supply chains in Sri Lanka. In achieving the research aim, the following objectives were formulated;

1. To analyze centralized procurement's positive and negative impacts on the construction material supply chain
2. To identify the strategies to overcome the possible negative impacts of CP in Sri Lankan construction industry
3. To recommend factors that hinder adoption and solutions against hindrances for adopting CP for the construction material supply chain in Sri Lanka

2. Literature Review

2.1 SIGNIFICANCE OF CENTRALIZED PROCUREMENT STRATEGY IN SUPPLY CHAIN MANAGEMENT

Supply Chain Management (SCM) entails coordinating the flow of information, resources, and services, in addition to the elements and raw materials, during the manufacturing process and delivery of commodities to end users (Habib, 2011). Within the more extensive supply chain architecture, procurement acts as the entry point of the supply chain. It is a specialist area concentrating on acquiring the products and services required for the company's operations. Further, it determines the quality, cost, and timeliness of the inputs that power the company's core business functions. In essence, the stability and effectiveness of the entire supply chain are based on procurement. Most importantly, procurement decisions and the supply chain interact in a way that is a typical example of cause and effect with broad implications (Procurify, 2024).

Centralized procurement consolidates multiple projects' procurement needs into large purchase orders, conducts thorough supplier assessments and comparisons to ensure quality and service integrity, and unifies inventory and settlement processes to enhance efficiency (Yunna & Ping, 2012). This method manages procurement tasks centrally from a single point of contact instead of being distributed among several divisions or business units (Contreras, 2016). Businesses with a broad geographic reach, often comprised of numerous departments, frequently employ this methodical approach to prevent order duplication, boost productivity, and reduce expenses (Harrison & Hoak, 2011). A single headquarters location is the point of contact for one or more sites involved in centralized Procurement (Contreras, 2016). When considering the centralized procurement delivery, Andersen and Kreye (2023) proposed three steps to centralize the supplier bases, reduce and rationalize the supplier base, prioritize suppliers, and manage supplier relations. A centralized procurement strategy allows stakeholders to merge their business processes to reach a shared goal. Ageshin (2001), as cited in Chang et al. (2013), states that centralized procurement's influence on supply chain performance depends on the extent of partner connections, information exchange, and supply chain integration.

2.2 SUBSTANTIAL BENEFITS THROUGH THE ADOPTION OF CENTRALIZED PROCUREMENT IN SUPPLY CHAIN MANAGEMENT

The table below presents the substantial benefits of adopting Centralized Procurement (CP) in an organization, as collected from the literature sources from a global perspective. The table headers provide serial numbers, benefits, and corresponding citations of the literature sources. The identified benefits can be categorized into four main categories: cost-related, time-related, quality-related, and process-related.

As per Table 1, Most studies have highlighted the assurance of quicker payment to suppliers and more accuracy as benefits of CP adoption. Adopting CP would significantly reduce the typical cost of the procurement process by minimizing administrative expenses, processing expenses, and wasteful expenses, ultimately leading to an increase in revenue and total profitability. Further, CP provides bulk discounts through bulk orders. In addition, it ensures quick payments to suppliers and enhances cash flow management. Moreover, this speeds up procurement through quicker processing, quicker delivery, quicker transactional procedure, quicker payments, and reduction of buffer time. The practice of centralized procurement systems can be considered an effective protocol since it results in process simplification and expense reduction; procurement systems can be outsourced to minimize expenses (Parry et al., 2006; Puschmann & Alt, 2005). The CP reduces mistakes through the transparent procedure, thus accelerating innovation and enhancing the overall functionality of the process. Thus, a thorough literature research was conducted to review the substantial benefits of adopting centralized procurement in the supply chain.

Table 1, Benefits of Centralized Procurement Strategy

No	Benefits due to the adoption of Centralized procurement	Sources
Cost related Benefits		
1)	Significantly reduce the typical cost of the whole procurement process	
	Cut administrative expenses	[1],[2], [9]
	An increase in revenue benefits	[1], [2], [6]
	Improvement in total profitability	[2], [8], [9]
	The expense of selecting suppliers decreases in the pursuit of better offers	[3], [10]
	Decline in order processing expenses	[2],[7]
	Decline in transaction processing expenses	[2], [7]
	Decline in non-productive operating expenses	[2], [7]
	Minimize wasteful expenditures	[10]
	Price reduction through culminating in bulk orders and bulk discounts	[4], [10]
2)	More accurate spending data	[4], [5], [10]
3)	Enhanced cash flow management	[4], [5]
4)	Assurance of quick payment to the suppliers	[4], [5], [7], [10]
Time-related Benefits		
5)	Quick processing and delivery	[8]
6)	Quicker Payments	[1], [4]
7)	Reduce buffer time	[5], [7], [10]
8)	Speeds up procurement cycles	[4], [7]
9)	Accelerates transactional procedures	[4], [7]
Quality related Benefits		
10)	Accelerate Innovation	[3],
11)	More accuracy	[1], [4], [7], [8], [10]
12)	Fewer ordering mistakes	[4], [7]
Process related Benefits		
13)	Transparent Procedures	[1], [10]
14)	Decrease in the number of procurement activities	[2], [8]
15)	Reduction in complexity of procurement activities	[2], [9]
16)	Reduced inventory management services	[6]
17)	Enhance the overall functionality and effectiveness of procurement	[5]
18)	Permits the utilization of a wide variety of goods and services	[3]
19)	Make it easier to audit every transaction in the project	[3]
20)	Helps firms to streamline their strategic sourcing process	[4], [10]
21)	Enhance access to information	[4], [10]
22)	Minimize the number of bulk purchases	[5], [7], [10]
[1]- Atkinson (2001), [2]- Boer et al. (2001), [3]- Croom (2000), [4]- Eakin (2003), [5]- Hua et al.(2022), [6]- Johnson and Whang (2002), [7]- Prior and Mudiyansele (2021), [8]- Rajkumar (2001), [9]- Soares-Aguiar and Palma-dos-Reis (2008), [10]- Stritch et al. (2020).		

3. Methodology

The study intends to investigate the application of centralized procurement of construction materials on supply chain management in Sri Lankan construction. To interpret the existing practices in the construction industry and to get a deeper and more comprehensive understanding of the application of CP in the Sri Lankan context, capturing the richness of human perspectives and experiences is vital. According to Hastie and Hay (2011), in-depth discussion based on the professionals' experiences in the field is necessary for a more comprehensive understanding of the subject matter, where a qualitative approach is required. Moreover, qualitative research is suited for studies with a short sample of the population and for understanding new and developing concepts thoroughly (Yin, 2011). Thus, a qualitative approach was used for the study. The simple representation of the research design of this study is demonstrated in Figure 1 below.

The secondary data was collected using an interview strategy to gather in-depth insights. Semi-structured interviews allow the researcher to uncover deeper insights and understandings of the responses and greater flexibility to accommodate participant's responses (MacDonald & Headlam, 2014). According to the authors, it further facilitates a methodical approach permitting situational questioning based on the views of specialists. Thus, this study used semi-structured interviews as the data collection technique. The literature review findings on the benefits of CP were instrumental in preparing interview guidelines. Thus, the interview guideline was carefully designed to capture detailed insights from interviewees, and an expert in the construction procurement field verified it to ensure the guideline was comprehensive and relevant. It comprised open-ended questions under several sections, including general information, positive and negative impacts, and hindering factors for adaptation and relevant solutions relating to the given context.

Due to the limited population and the selection of experts with the most relevant background, purposive sampling was used for the study. The interviews were conducted with experts with first-hand knowledge, a university degree, and years of experience in procuring materials in the construction industry. Also, the experts include top managers from reputed construction organizations involved in strategic procurement decisions. Ten semi-structured interviews were conducted to collect the views, ideas, and perspectives on the research area. A level of data saturation was reached at the ten number of interviews, where additional interviews were unlikely to provide new insights. The selection criteria of interviewees and profiles of interview experts are further shown in Table 2.

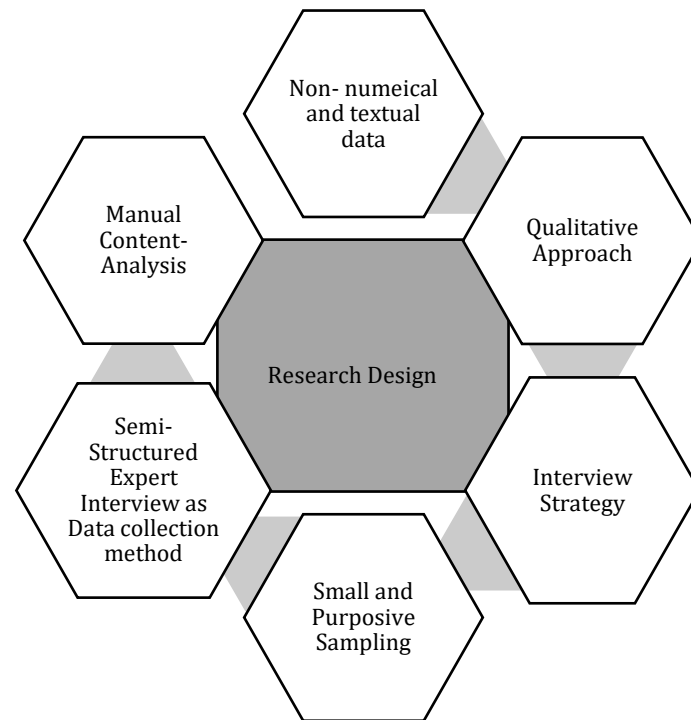


Figure 1, Research Methodology

Table 2, Selection criteria and profiles of interview experts

Experts	Designation	Having Years of Experience more than ten years	Working at reputed organization	Construction-related reputed professional	Graduated with a construction-related degree
E1	Procurement Officer	√	√	√	√
E2	Project Planning and Procurement Manager	√	√	√	√
E3	Director	√	√	√	√
E4	Chief Executive Officer (CEO)	√	√	√	√
E5	Deputy General Manager (DGM)	√	√	√	√
E6	Engineering Manager	√	√	√	√
E7	Supply Chain Manager	√	√	√	√
E8	Contract Manager	√	√	√	√
E9	Senior Deputy General Manager	√	√	√	√
E10	Assistant Director	√	√	√	√

In-person interviews were conducted, which lasted around thirty to forty-five minutes. Meanwhile, interviews were recorded with consent and transcribed for analysis while maintaining confidentiality by anonymizing the details of interviewees.

Content analysis is a prominent method for assessing qualitative data in a structured and systematic way to facilitate Contextual Understanding (Wahyuni, 2012). This technique transcribes unique interpretations in the text data by recognizing patterns and employs coding schemes to arrange concepts (Bradley et al., 2007). Therefore, qualitative data was analyzed using the content analysis method and done manually. In Microsoft Excel, data were

manually coded using a coding framework. To verify reliability, consistency tests were carried out by re-coding a sample of data and comparing the outcomes.

4. Results

The collected data was analyzed under three main sections to achieve objectives separately. According to expert opinion, centralized procurement is not yet widely implemented in the Sri Lankan construction industry. Therefore, experts have shared their insights on the potential implementation and its impact based on existing practices. In the first section, experts were asked to share their opinions on the positive and negative impacts of centralized procurement on the construction material supply chain in Sri Lanka. Consequently, the list of positive and negative impacts is indicated in Figure 2 and Figure 3. Next, experts were asked to identify strategies to overcome the possible negative impacts of CP in the Sri Lankan construction industry. The findings are illustrated in Figure 3. Finally, the experts were questioned to recommend factors that hinder adoption and solutions against hindrances to adopting CP for the construction material supply chain in Sri Lanka. The findings are indicated in Figure 4.

4.1 POSITIVE IMPACTS DUE TO PRACTICING OF CENTRALIZED PROCUREMENT STRATEGY ON THE CONSTRUCTION SUPPLY CHAIN IN SRI LANKA

Figure 2 denoted the positive impacts of centralized procurement on the construction material supply chain in Sri Lanka. The purpose of evaluating the impact of centralized procurement on the supply chain is to determine its benefits and value.

The positive impacts were further categorized based on the codes and grouped. Thus, nine categories were identified: value creation, improved cost management, delay minimization, enhanced risk management, enhanced supplier management, simplified procurement process, legal compliance, value engineering gains, and accuracy in the overall procurement and project timeline. Among all the impacts listed, the positive impacts highlighted by most of the respondents were (a) discovering possible cost reduction opportunities, (b) minimizing delay, (c) precise monitoring of procurement operations across many projects, (d) advanced risk management, (e) enhanced supplier performance, (f) intelligent and well-informed procurement choices, and (g) boost efficacy and efficiency of procurement.

4.2 NEGATIVE IMPACTS AND STRATEGIES TO MITIGATE THE NEGATIVE IMPACTS DUE TO PRACTICING OF CENTRALIZED PROCUREMENT STRATEGY ON THE CONSTRUCTION SUPPLY CHAIN IN SRI LANKA

Figure 3 shows the negative impacts of centralized procurement on the construction material supply chain in Sri Lanka. The collected data was presented in Figure 2 by categorizing under five (5) categories based on codes grouped.

The five categories were (a) difficulties in meeting specific demands and requirements of the project, (b) a limited number of suppliers to fulfill the central authority's standard, (c) decisions made by the top management causing complications in procedures and criteria, (d) lack of requisites skills and resources to manage the risk, and (e) diverse procurement preference of different stakeholders. Among them, the negative impacts highlighted by most of the respondents were (a) restricted competition, (b) loss of client satisfaction due to lack of meeting the demands of the project, (c) Less innovation, (d) diminished stakeholder confidence, (e) delays due to norms and procedures, and (f) diverse procurement preferences among stakeholders.

4.3 STRATEGIES TO MITIGATE THE NEGATIVE IMPACTS DUE TO PRACTICING THE CENTRALIZED PROCUREMENT STRATEGY ON THE CONSTRUCTION SUPPLY CHAIN IN SRI LANKA

Figure 3 demonstrates strategies proposed by the experts to overcome the possible negative impacts of CP in the Sri Lankan construction industry, as illustrated in Figure 3.

Key strategies mentioned by experts include (a) collaborating with clients to discover opportunities for procurement improvement, (b) locating international suppliers and re-assess their quality before every procurement, (c) guaranteeing compliance with procurement standards, (d) Sharing risk-related information, and assure worker, material, and equipment safety, (e) developing a resilient supply chain, and (f) increasing the supply chain visibility, transparency and comprehension.

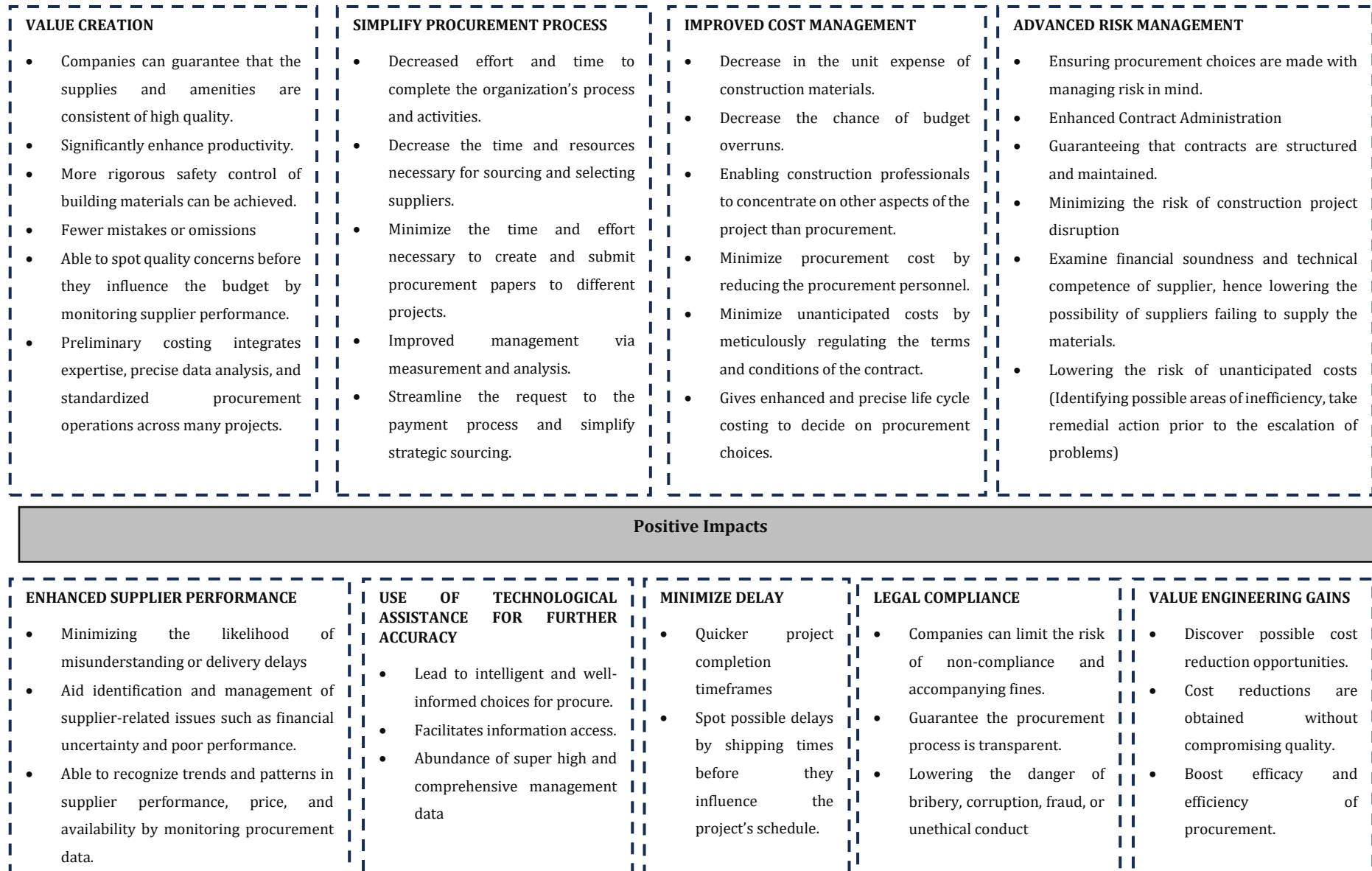


Figure 2, Positive impacts due to practicing centralized procurement for construction material supply chain in Sri Lanka.

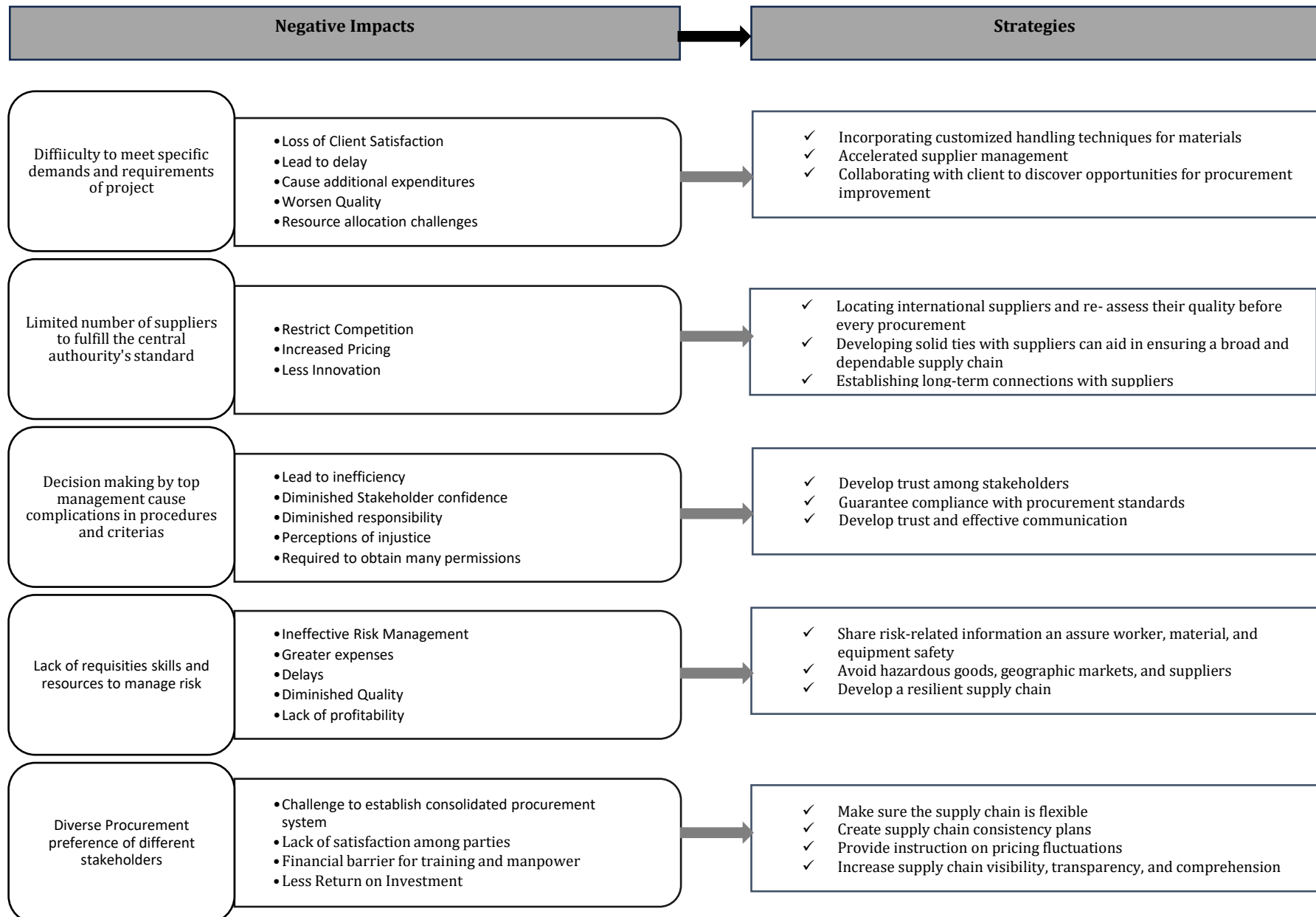


Figure 3, Negative Impacts due to practicing centralized procurement on construction material supply chain and respective strategies to mitigate the negative impacts

4.4 FACTORS THAT HINDER ADOPTION AND SOLUTIONS AGAINST HINDRANCES FOR ADOPTING CP FOR CONSTRUCTION MATERIAL SUPPLY CHAIN IN SRI LANKA

The section discusses recommended factors that hinder adoption and solutions against hindrances for adopting CP for the construction material supply chain in Sri Lanka, as indicated in Figure 4. Key factors listed are (a) Lack of uniformity of procurement practices in the construction industry, (b) Opposition to make adjustments in the construction business, (c) Hesitation to embrace new strategy, and (d) obstacles due to legal and regulatory bodies. Interviewees highlighted, *"Construction business is extremely fragmented and decentralized, with several parties participating in each project."* Most interview respondents insisted that decentralization practices have been the standard in the sector for a long time. Thus, several stakeholders are unwilling to switch to a centralized procurement strategy. However, it is crucial to note that the time necessary for change can fluctuate based on various variables, including the project's complexity, the extent to which suppliers are involved, and the degree of coordination required among various stakeholders, according to expert opinions.

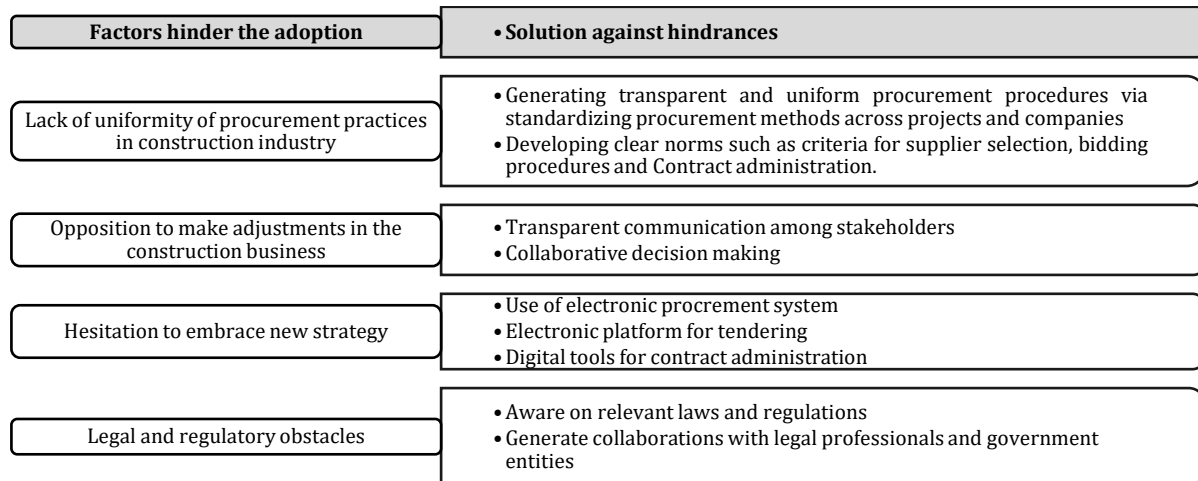


Figure 4: Factors hindering centralized procurement adoption in the Sri Lankan construction industry and solutions against hindrances.

Thus, crucial solutions recommended to overcome the hindrances include (a) generating transparent and uniform procurement procedures via standards, (b) developing explicit norms such as criteria for supplier selection, bidding procedures, and contract administration, and (c) generating collaborations with legal professionals and government entities. The recommended solutions address the immediate actions to ensure the implementation of CP in the construction material supply chain in Sri Lanka.

5. Conclusion

This study investigated the application of centralized procurement in Sri Lanka's construction supply chain. Key positive impacts identified include Identifying cost reduction opportunities, minimizing delays, precisely monitoring procurement operations across projects, improving risk management, enhancing supplier performance, making informed procurement decisions, and increasing procurement efficiency and effectiveness. In addition, key negative impacts included restricted competition, diminished client satisfaction from unmet project demands, reduced innovation, decreased stakeholder confidence, delays due to procedural norms, and varied procurement preferences.

Key factors that hinder the adoption of centralized procurement for the construction material supply chain in Sri Lanka include the lack of uniformity in procurement practices, resistance to changes in the construction business, reluctance to embrace new strategies, and obstacles from legal and regulatory bodies. The recommended solutions include creating transparent and uniform procurement procedures through standards, developing explicit norms for supplier selection, bidding procedures, and contract administration, and fostering collaborations with legal professionals and government entities. The findings may assist industry practitioners in identifying the criticality, monitoring possible obstacles in advance, and making strategic decisions to ensure the proper application of CP in the supply chain management of construction projects in Sri Lanka. The findings bridge the gap of deficiency in knowledge regarding current practices by offering insightful information about the revolutionary possibilities through a new approach to adopting and practicing centralized procurement in the Sri Lankan construction industry. The study contributes to the body of knowledge by providing initial guidance for applying CP in the context of a developing country. Moreover, future studies can be carried out to investigate the potentiality of using digital technologies to increase the efficiency of Centralized procurement for the construction material supply chain in the Sri Lankan construction industry.

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