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An Empirical Study on the Effects of Disputes on Successful Completion of Construction Projects

Amila N. K. K. Gamage[1*], Dr. Suresh Kumar[2]

[1]PhD Candidate, Project Management, LIGS University
[2]Lecturer, Project Management, LIGS University

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***Corresponding author:** Amila N. K. K. Gamage
PhD Candidate, Project Management, LIGS University

Abstract **Original Research Article**

Disputes are common in construction projects, demanding significant attention in terms of financial resources, time, and manpower to seek resolutions. Conversely, unresolved disputes can create unfavorable effects on project performance. When project leaders recognize the major consequences of disputes, they can formulate strategies to proactively prevent or alleviate such conflicts. This heightened awareness empowers project teams to swiftly identify and resolve disputes, preventing their adverse consequences on successful project completion. The primary objective of this research is to enhance project management practices by providing insights into the effects of disputes, thereby enabling stakeholders to implement proactive strategies for prevention, mitigation, and effective resolution. Utilizing existing literature published between 2019 and 2023, this study critically analyzes 18 selected journal papers sourced from the ProQuest Central database, all of which have undergone rigorous review. This research identified nine major effects that appear due to disputes in construction projects. Further, cost overrun is identified as the major effect of disputes that can impact negatively in project performance and successful completion. This study further identified research gaps that need future studies.

Keywords: Causes of Construction Disputes, Construction Disputes, Construction contracts, Disputes in Construction, Effects of disputes.

The construction industry is a keystone of economic development that contributes significantly to infrastructure improvement, urbanization, and job creation. On the other hand, construction projects, ranging from residential buildings to large-scale infrastructure initiatives, are complex in nature involving many stakeholders. Architects, engineers, contractors, subcontractors, suppliers, and project owners collaborate to transform architectural blueprints into tangible structures. This collaborative effort also brings together different interests, perspectives, and expectations, making situation for potential conflicts and disputes. Therefore, it is essential to pay attention on potential disputes during the different stages of a construction project.

While disputes are inevitable in construction projects, by understanding the causes and effects of disputes, project leaders can find dispute management solutions to minimize its impact on project progress. Construction disputes have emerged as a daunting challenge for project leaders. These disputes, arising from various causes such as contractual disagreements, design flaws, cost overruns, and project delays, can disrupt the on-going project management and finally its successful completion.

According to the studies done by Lee *et al.*, (2021), most of the construction disputes occur due to contractual matters. On the other hand, studies done by El-Sayegh *et al.*, (2020) revealed that disagreement between contractual parties creates grounds for potential disputes. Therefore contract matters are with great impact on project progress by creating grounds for potential disputes. If disputes occur, then the parties to a contract need to spend more resources, time and money to find resolutions.

Other than contractual matters, there are other causes of construction disputes. Such disputes can arise from a multitude of factors, including design and planning deficiencies, delays in project completion, cost overruns, substandard workmanship or materials, regulatory compliance issues, safety concerns, and

environmental considerations. Each of these factors presents challenges to the project team that can disrupt the project progress. Such disputes can also strain relationships among stakeholders. According to Surahyo (2018), the main categories of dispute causes are technical-related, duration related, financial-related, and quality-related. Further, Durand (2019) revealed that construction disputes can impact the relationship of the contractual parties negatively.

According to Duchaussoy (2019), disputes are one of the major factors that impact negatively on successful project completion. Further, studies done by Alaloul *et al.,* (2019) too revealed disputes as one of the major factors that can lead projects to be unsuccessful. Construction disputes can cause significant time delays, increased project costs, quality compromises and damaged stakeholder relationships.

The triple constraints of a project that are time, cost and quality decides the success of a project completion (Hassan *et al.,* 2019). On the other hand, a construction project is successful when it is completed within the originally set time span and within the allocated budget to the initially expected quality (Alaloul *et al.,* 2019). Many studies have revealed that disputes can impact negatively on a project's triple constraints leading it to be unsuccessful.

Further, if there are disputes, then project team needs to spend their resources, time and money to resolve such disputes. Disputes are known as expensive considering higher costs involved such as legal fees. When project managers and project leaders understand the disputant causes and its effects on project success, they can work on mitigating and preventing such potential disputant causes to complete projects within initial time, cost and quality scopes. Therefore, this study aims at finding the effects of disputes on successful completion of construction projects.

Purpose

This study seeks a comprehensive exploration into the impact of disputes on the overall success of construction projects. By delving into the effects that disputes can have, the research aims to provide project leaders with a nuanced understanding of the challenges they pose and their potential to adversely impact project performance. Through this exploration, project leaders can craft tailored strategies for preventing, mitigating, and effectively managing disputes, thereby fostering a more resilient and adaptive project environment.

With the anticipation of making a substantial contribution to the field, the authors position this research as a valuable resource for project leaders, offering actionable insights to enhance their project management practices. Specifically focusing on the effects of construction disputes on successful project completion, the study aims to surpass surface-level analysis, providing a comprehensive understanding of the multifaceted nature of dispute impacts.

The outlined objectives of this study include identifying the major effects of disputes, pinpointing the project parties most significantly affected, and determining the specific project phases where these effects exert the greatest influence. By addressing these objectives, this research seeks to empower project leaders with targeted knowledge, promoting collaboration and conflict resolution within project teams. Ultimately, the study aspires to contribute valuable perspectives that enhance the resilience and success of construction projects through improved dispute management.

Problem Statement

In construction project management, disputes have emerged as formidable challenges, exerting a substantial and multifaceted impact on project success. The absence of a comprehensive understanding of the effects of disputes hinders the ability of project leaders to navigate and mitigate these challenges effectively. As disputes can occur across various project phases, their consequences ripple through project parties, adversely affecting performance and potentially jeopardizing successful project completion.

The lack of targeted knowledge regarding the major effects of disputes, the parties most significantly impacted, and the specific project phases where these effects wield the greatest influence creates a critical gap in current project management practices. This gap poses a substantial risk to the resilience and success of construction projects, as project leaders are left without the necessary insights to formulate tailored strategies for dispute prevention, mitigation, and effective management.

This research addresses the pressing problem of insufficient understanding and strategic response to the impact of disputes on construction projects. By identifying and exploring the intricacies of these challenges, this study aims to bridge the existing gap in knowledge, offering project leaders actionable insights to enhance their ability to navigate and successfully manage disputes throughout the project lifecycle.

Research Hypothesis

Below are the hypotheses that are to be tested in this study.

- Disputes impact significantly on successful project completion
- All the parties to a contract are equally affected due to effects of disputes.
- There is a connection between the effects of disputes and project stages.

This study does not focus on a particular geographical area or a specific sector within the

construction industry. It is presumed that significant construction disputes are prevalent across countries, irrespective of factors such as geographic location, cultural differences, or economic conditions.

Theoretical Background

Successful Completion of Construction Projects

The successful completion of construction projects depend on the delicate balance and effective management of the project's triple constraints: time, quality, and cost (Hassan *et al.,* 2019). Each constraint contributes to the project success, and any imbalance between the three can impact negatively throughout the entire project performance. Figure 1 illustrates the triple constraints of project management.

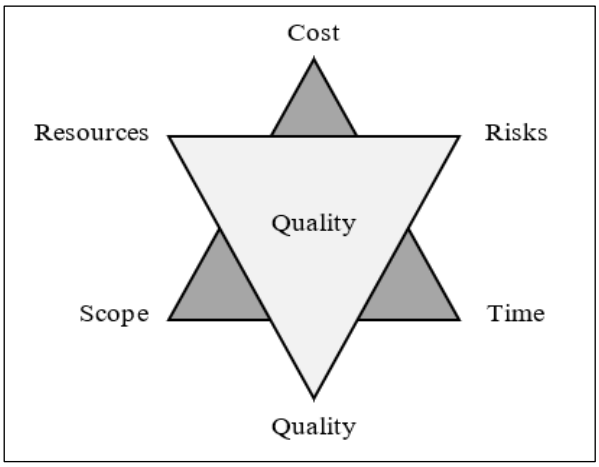

Figure 1: Triple constraints of project management

Time, as a critical constraint, is one of the most visibly impactful elements. Meeting deadlines and adhering to project schedules is not just a matter of punctuality; it is a cornerstone of project success. Delays can cascade through various phases of a construction project, affecting subsequent tasks and milestones. According to Adham (2023), the postponement in the implementation of the construction project was characterized as a deviation from the initially agreed-upon delivery schedule, attributable to various factors. Efficient time management ensures that projects is not only completed on schedule but also contributes to cost control by minimizing the impact of unforeseen delays.

Quality stands as another major constraint that decides the success of a project completion. The successful completion of a construction project is not solely measured by its timely conclusion but also by the adherence to established standards and specifications. According to Tang *et al.,* (2005), Quality is the fulfillment of legal, aesthetic, and functional expectations in a product or project, guided by customer requirements. Quality management involves systematically identifying and overseeing activities to achieve an organization's quality objectives, ensuring alignment with customer expectations and legal standards. The durability, functionality, and safety of the constructed asset are paramount. Balancing quality considerations with time constraints requires meticulous planning and oversight to ensure that construction processes align with industry standards and project requirements.

Cost, the third cornerstone decides financial viability through the project lifecycle. Effective cost management involves budget adherence, resource optimization, and risk mitigation. Any deviation from the budget can have cascading effects on the project, potentially compromising both time and quality. A well-executed cost management strategy ensures that resources are allocated carefully, preventing cost overruns that could jeopardize the project's overall success (Rahman *et al.,* 2013). Further, according to Rahman *et al.,* (2013), financial difficulties result in project delay and as a result, cost overrun of the project too.

Therefore, the balance between these constraints is the key to successful project completion. Project leaders must navigate the intricate interplay of time, quality, and cost, making informed decisions and adjustments to maintain equilibrium. Embracing innovative project management techniques, leveraging technology, and fostering a collaborative project environment are essential components to maintain the balancing between the triple constraints.

Ultimately, the successful completion of construction projects is a demonstration of managing these triple constraints. When time is managed with precision, quality is upheld with diligence, and costs are controlled effectively, the result is not merely a finished structure but an accomplishment of project management.

Effects of Disputes on Project Performance

The effects of disputes on construction project success are profound and multifaceted, affecting every facet of the project lifecycle. Mainly, disputes introduce uncertainty and contention that can compromise the overall success of a construction project. One primary effect of disputes is project delays. Disputes, whether arising from contractual disagreements, design discrepancies, or unforeseen issues, have the potential to disrupt the initially established timeline of a construction project. Delays, in turn, contribute to increased costs, as extended project durations often lead to additional expenditures on labor, materials, and overhead. Further, delay claims have become a significant cause of conflict within the construction industry, posing considerable challenges in terms of resolution. (Braimah, 2013).

Financial implications extend beyond mere delays, encompassing the direct costs associated with resolving disputes. Legal fees, mediation expenses, and the costs incurred in settling disagreements between project parties represent a significant financial burden that can erode project budgets and profitability.

Moreover, disputes can strain relationships between project stakeholders, including owners, contractors, subcontractors, and suppliers. The breakdown of collaboration and communication can escalate disputes, worsening their impact on project success.

Quality is the other element that deeply affected by disputes. The conflict-ridden atmosphere can divert attention from adherence to project specifications and standards, leading to compromised workmanship and construction quality. This not only jeopardizes the project's compliance with industry regulations but also poses long-term risks in terms of building durability and functionality.

Furthermore, disputes can tarnish the project's reputation. Disputes can negatively impact on public perception, client satisfaction, and the overall image of the project. This may impact the ability of project stakeholders to secure future contracts and partnerships.

In addressing the effects of disputes on construction project success, it becomes evident that their consequences extend far beyond immediate financial considerations. A holistic understanding of these effects is crucial for project leaders to implement proactive strategies, fostering a collaborative environment that mitigates disputes and enhances the overall resilience and success of construction projects. Figure 2 is an illustration of effects of disputes on project's triple constraints.

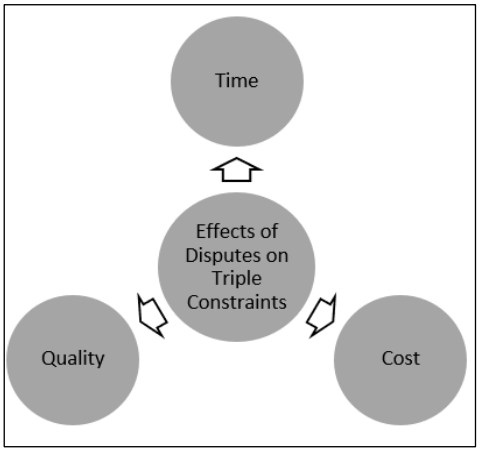

Figure 2: Effects of Disputes on Triple Constraints

Moreover, as outlined in the research conducted by Cheung and Yiu (2006), conflicts in construction projects are predominantly shaped by three key elements: Contract Provisions, Triggering Events, and the Conflict itself (Cheung & Yiu, 2006). These components are commonly denoted as the dispute triangle within construction projects, illustrated in Figure 3.

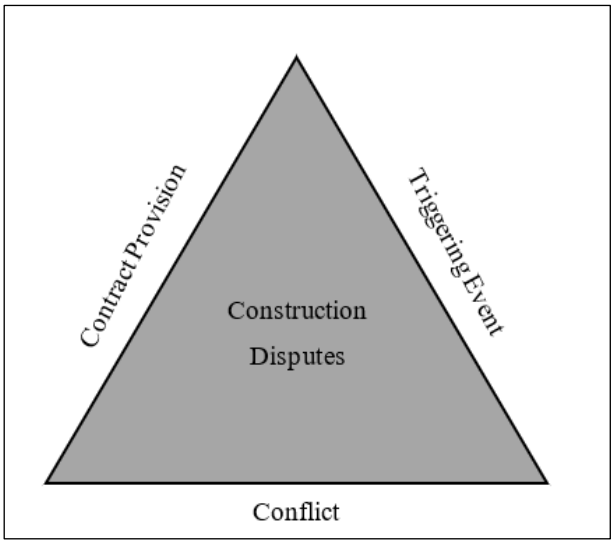

Figure 3: The Dispute Triangle for Construction Projects

Dispute Management in Construction Projects

Effective dispute management is crucial for the successful completion of construction projects, given the inherent complexities and challenges that often arise during the project lifecycle. With multiple stakeholders, intricate contractual agreements, and diverse project phases, construction projects are susceptible to potential disputes. As a result, the implementation of strategies and methodologies becomes imperative for proactively identifying, preventing, and efficiently resolving disputes, ensuring a smooth progression of the project.

Dispute management in construction projects encompasses three key options that are dispute prevention, dispute mitigation, and dispute resolution. Each of these strategies plays a crucial role in facilitating the seamless progression and ultimate success of construction projects. These dispute management strategies are shown in Figure 4.

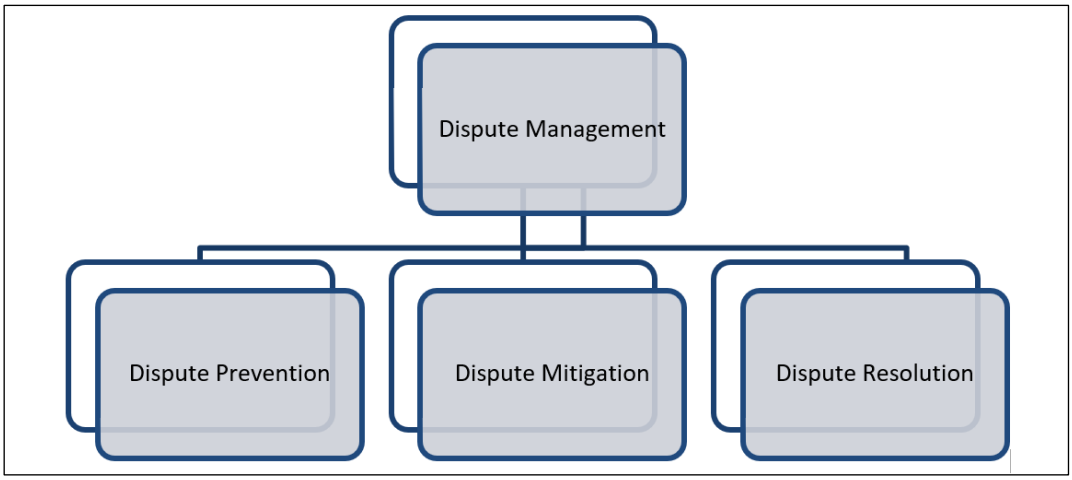

Figure 4: The Dispute Management Strategies

Dispute prevention

Dispute prevention in construction projects involves proactive measures to prevent conflicts before they arise. Through meticulous contract drafting, clear communication, and comprehensive risk assessment, potential triggers for disputes are identified and mitigated early in the project lifecycle. Establishing robust project management protocols and fostering collaborative relationships among stakeholders are integral components of effective dispute prevention. By prioritizing clarity and transparency in contractual agreements and communication channels, construction projects can significantly reduce the likelihood of disputes, fostering a harmonious and efficient project environment (Koc & Pelin, 2021).

Dispute Mitigation

Dispute mitigation in construction projects is essential for preemptively addressing potential conflicts. Strategies include regular project meetings to foster communication, identify issues early, and ensure alignment among stakeholders. A proactive approach involves checking work procedures before commencement, ensuring adherence to specifications and minimizing the likelihood of disputes.

Moreover, Sinha and Wayal (2007) advocate for contractors to bolster their management teams through either recruiting qualified personnel or offering training. Owners are advised to minimize interference in contractors' work and streamline processes for responding to inquiries, approvals, and progress payments. This proactive approach contributes to the mitigation of potential disputes (Sinha & Wayal, 2007). These practices create a collaborative environment, promoting transparency and understanding among project participants, ultimately reducing the risk of conflicts and contributing to the successful execution of construction projects.

Dispute Resolution

Dispute resolution in construction projects involves mechanisms to address conflicts efficiently. Litigation, a traditional approach, entails legal proceedings to settle disputes in a court of law. Alternatively, Alternative Dispute Resolution (ADR) methods, such as mediation, arbitration or adjudication, provide collaborative forums for parties to negotiate and reach agreements outside the courtroom. These strategies aim to expedite conflict resolution, minimize costs, and maintain project momentum (Safinia, 2014).

The selection of dispute resolution approaches depends on the nature and severity of the dispute, offering flexibility for construction projects to navigate conflicts and achieve successful outcomes. According to the previous studies of the author, there are several factors that affect in deciding the most suitable alternative dispute resolution strategy for a construction project dispute. Those factors are categorized as financial factors, organizational factors, and legal factors (Gamage, 2023).

While there are different dispute resolution methods available, it is also successful to identify causes of disputes and addressing those effectively before it becomes a complex dispute that requires more resources to resolve. The Conflict Management Model by Thomas Kilman serves as a valuable tool for discerning various conflict management styles (Thomas & Kilmann, 1974). Once acquainted with these styles, parties can readily identify the other party in their dispute, enabling the formulation of a strategic approach tailored to both the conflicting issue and the individuals involved. Figure 5 illustrates the Thomas Kilman Conflict Management Model.

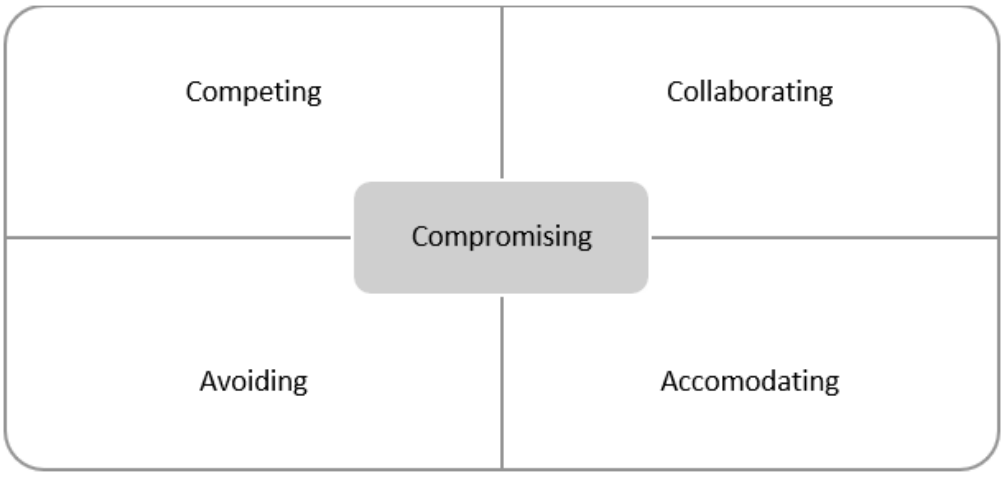

Figure 5: Thomas Kilman Conflict Management Model

By familiarizing themselves with these dispute management techniques, project leaders gain the capability to proactively prevent, mitigate, or find resolutions for project disputes. Ultimately, efficient dispute management plays a pivotal role in achieving successful project completion. An insightful understanding of the effects and potential negative consequences of disputes further underscores the significance of adeptly managing conflicts. This not only ensures smoother project progression but also highlights the strategic importance of effective dispute resolution in fostering positive project outcomes.

METHODOLOGY

This study was done as an empirical study by using available secondary data. Author referred existing literature that is published in peer reviewed journals to obtain the data for this research. An empirical study is a research approach that relies on tangible, observable evidence to investigate a specific phenomenon or answer research questions. Researchers collect and analyze data through experiments, observations, surveys, or other systematic methods (Fisher *et al.,* 2020). The goal of an empirical study is to derive objective conclusions based on factual, real-world observations rather than theory or speculation.

Further, empirical studies are fundamental in various fields, including science, social sciences, and psychology, as they provide empirical evidence that allow for the validation or rejection of hypotheses. Other than that, an empirical study contributes to the growth of knowledge, and evidence-based decision-making and policy formulation (Fisher *et al.*, 2020).

Considering the practical aspects of disputes and its impact on project performance, this study was conducted based on existing data from recent studies. According to Graulich *et al.,* (2021), the process of conducting a literature review contributes to a deeper understanding of the existing knowledge within a particular subject area. Literature review also helps in identifying additional research requirements (Graulich *et al.,* 2021). Figure 6 illustrates the process for data collection and evaluation for this study.

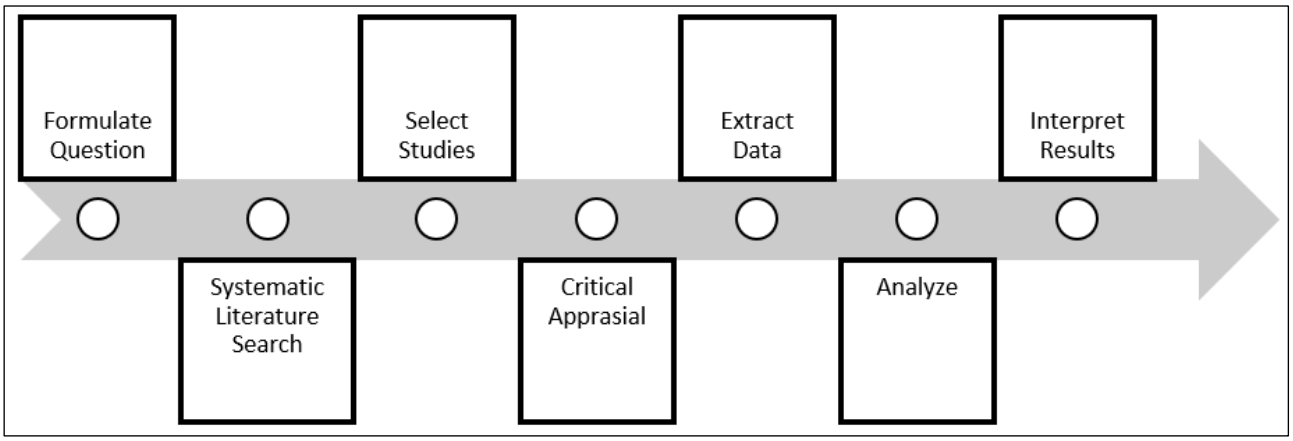

Figure 6: **Main Steps of Systematic Literature Review Process**

Article Selection and Data Sampling

Existing literature published between 2019-2023 were used for data extraction. ProQuest Central database was used to find the published papers. Further, this study only used papers published in peer reviewed journals. Only the open access papers or papers that don't

need any fee to access were considered for the study. Keywords such as 'Construction Disputes', 'Causes of construction disputes' and 'effects of construction disputes' were used to shortlist existing literature. Figure 7 shows the article selection and screening process that was used to obtain the secondary data.

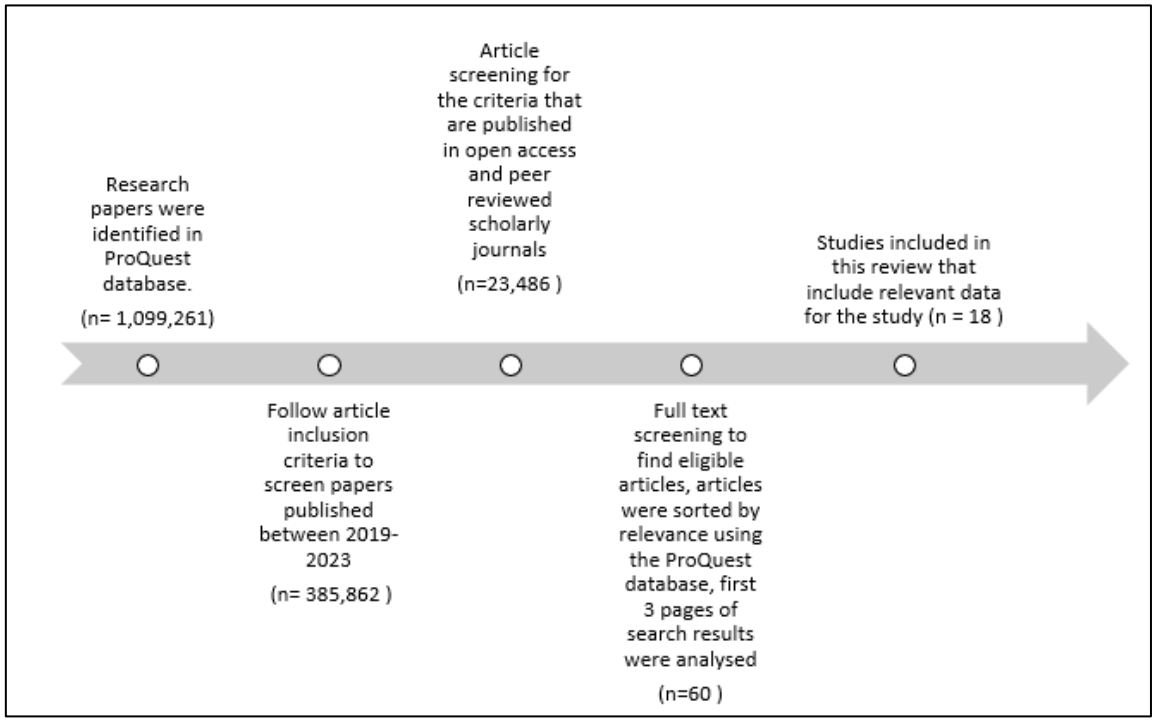

Figure 7: The Article Selection Process for retrieval of Data

Data Sampling

Convenience sampling technique was used to select the data for this study which is a non-probability sampling method (Stratton, 2021). Data sample was selected using the criteria mentioned above under article selection. However, initial screening for article selection criteria resulted in 23,486 articles which the author found it as not practical to read all papers in full. Therefore, using the ProQuest Central database's shortlisting criteria 'relevance' was used to further shortlist the articles. Among those shortlisted papers, the first three pages of search results showed 60 articles that are related to construction disputes. These 60 papers were read in full to identify the most appropriate data for this study. This step shortlisted 18 papers and those were used as the sample for obtaining secondary data.

Although convenience sampling was used for this study as a practical approach, it has limitations. It may introduce bias, as the selected sources might not be representative of the entire body of literature on a given topic (Stratton, 2021).

Various existing literature highlights different effects of construction disputes. While most researchers identified cost overruns and time overruns are as major effects of disputes, there are other effects too such as damaged business relationships. The data collected for this study is tabulated in Table 1.

Table 1: Major Effects of Disputes in Construction Projects

S/N	Effect	Literature Sources/Reference
1	Cost overruns	Atanasov *et al.*, (2022), Anumudu & Uchendu (2023), Anysz *et al.*, (2021), Bagherian-Marandi *et al.*, (2021), El-Sayegh *et al.*, (2020), Jagannathan & Venkata Santosh (2022), Koc & Gurgun (2022), Lee *et al.*, (2021), Li & Cheung (2022), Muhammad & Abdur (2022), Rahnamayiezekavat *et al.*, (2022), Vilkonis *et al.*, (2023), Tanriverdi *et al.*, (2021), Tang & Li (2022).
2	Time overruns	Atanasov *et al.*, (2022), Anumudu & Uchendu (2023), Anysz *et al.*, (2021), El-Sayegh et al. (2020), Koc & Gurgun (2022), Lee *et al.*, (2021), Li & Cheung (2022), Muhammad & Abdur (2022), Rahnamayiezekavat *et al.*, (2022), Vilkonis *et al.*, (2023), Tanriverdi *et al.*, (2021), Tang & Li (2022).

S/N	Effect	Literature Sources/Reference
3	Lead to time-related disputes	Atanasov *et al.*, (2022), Anysz *et al.*, (2021), Jagannathan & Venkata Santosh (2022).
4	Destroys existing cordial relationships between project participants	Anumudu & Uchendu (2023), El-Sayegh *et al.*, (2020), Li & Cheung (2022), Rahnamayiezekavat *et al.*, (2022), Sabri & Torp (2022).
5	Lead to poor construction quality	Sabri & Torp (2022), Koc & Gurgun (2022).
6	Poor project performance	Aritonang & Manlian Ronald (2020), Muhammad & Abdur (2022), El-Sayegh *et al.*, (2020), Vilkonis *et al.*, (2023).
7	Consume more resources	Li & Cheung (2022), Tang & Li (2022).
8	Unresolved disputes can create another dispute making it a combination of disputes	Hemanth Sai Kalyan *et al.*, (2022)
9	significant loss to both the project owners and the contractors	Khisa & Mutuku (2023), Tanriverdi *et al.*, (2021).

Data Analysis

The collected data was analysed in few different ways to find the effects of construction disputes. During the data collection, papers published from 2019 to 2023 were reviewed. However, the research papers selected for this study that include relevant information include papers from 2020 to 2023. The figure 8 shows the distribution of papers from each year.

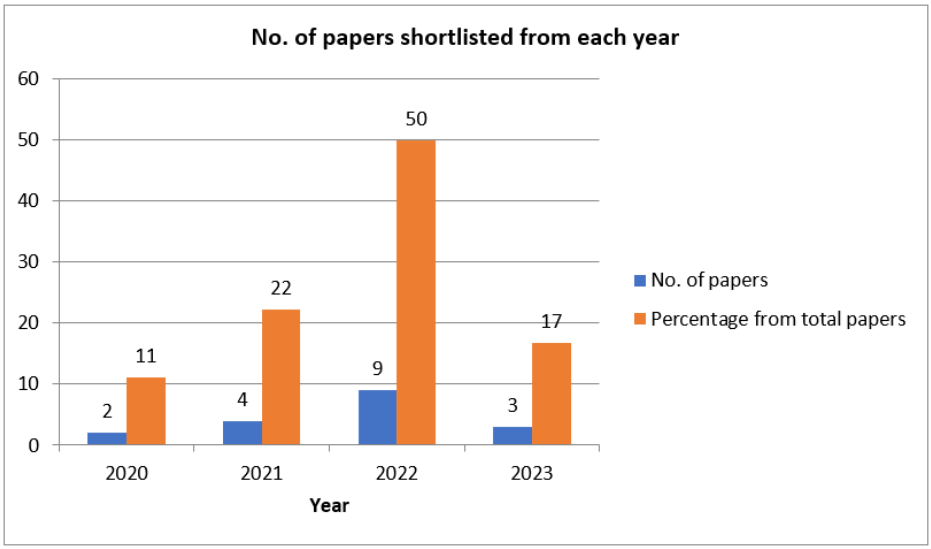

Figure 8: No. of papers shortlisted from each year

According to the graph, 50% of total research papers considered for this study is published in year 2022 while the lowest number of papers is shortlisted from 2020.

After collecting data from the selected 18 papers the frequency of each effect of construction disputes were calculated. The frequency and the percentage of frequency from the total number of major effects are calculated and tabulated in table 2.

The formula for percentage (%) = (f / N) × 100
Where:
N: is total amount of items in data sample, (N=45).
F is frequency of each effect.

Table 2: Frequency of Each Effect of Construction Disputes

SN	Effect	Frequency	Percentage
1	Cost overruns	14	31.11
2	Time overruns	12	26.67
3	Lead to time-related disputes	3	6.67
4	Destroys existing cordial Relationships between project participants	5	11.11
5	Lead to poor construction quality	2	4.44
6	Poor project performance	4	8.89
7	Consume more resources	2	4.44
8	Unresolved disputes can create another dispute making it a combination of disputes	1	2.22
9	Significant loss to both the project owners and the contractors	2	4.44

RESULTS & DISCUSSION

Figure 9 illustrates the major effects of disputes according to their percentage of occurrence in projects. This study identified nine major effects that occur in most construction projects due to disputes.

According to Figure 9, the results show that the cost overruns of a project as the major impact of disputes. The occurrence of cost overrun is mentioned in 31.11% of research papers that were selected as data samples. The next major impact is time overrun which is again a critical factor for successful project completion. It is mentioned in 26.67% of research papers in the data sample. The third most appearing effect is mentioned as the impact on the existing relationship between the parties to a contract. It is mentioned in 11.11% of selected papers. The fourth major effect of construction disputes is poor project performance which is 8.89% appearance in the selected sample.

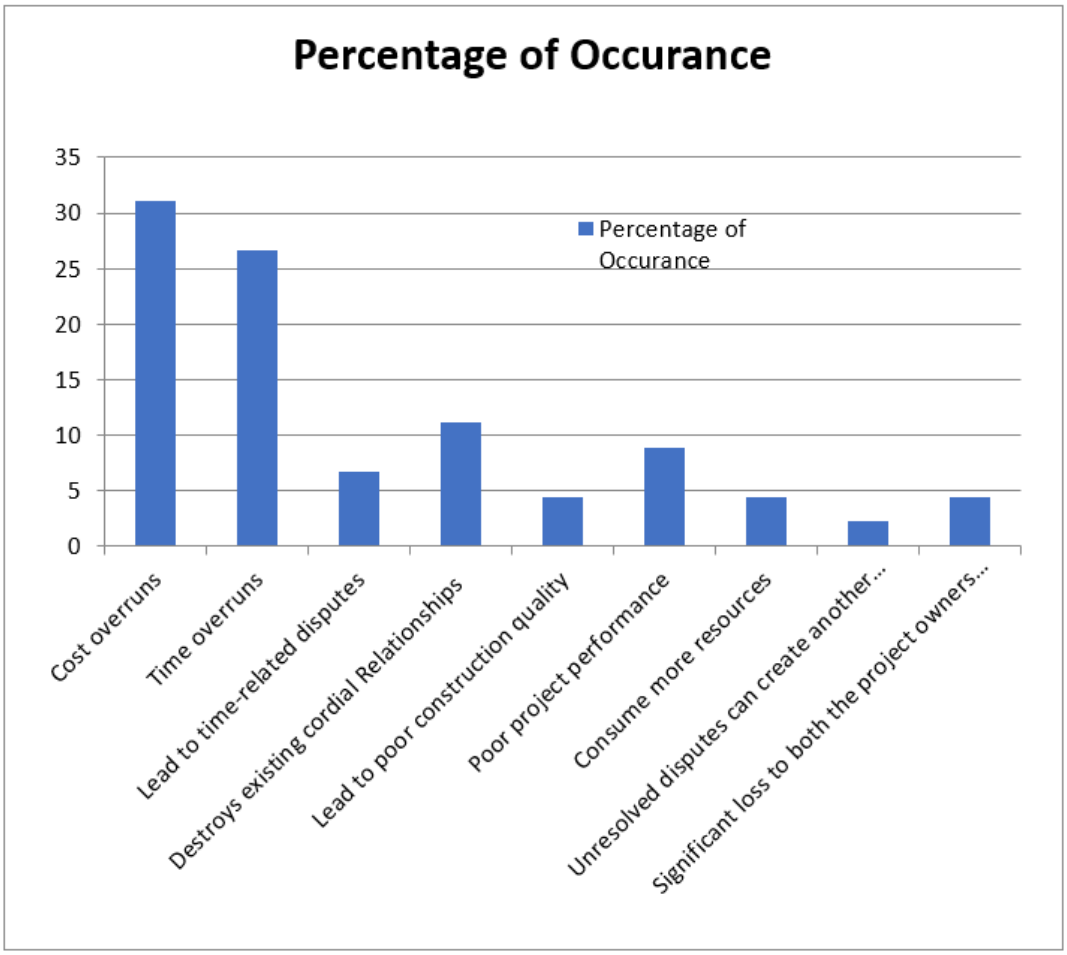

Figure 9: Percentage of Occurrence of Major Effects due to Construction Disputes

However, the selected data sample didn't provide a clear idea of the phases these effects appear mostly or the parties who will get affected mostly due to these impacts of disputes. But in general, both the employer and contractor are affected due to the major effects that are cost overruns, time overruns, and damaged business relationships. Although, there is no obvious mention of the project phases, when it comes to cost overruns, time overruns, and quality issues we can see that the effects of disputes can impact the project implementation stage mostly. Further, disputes affect the triple constraints of a project which are cost, time, and quality which impact negatively on successful project completion.

The hypothesis testing resulted as below after analyzing the data sample.

- Disputes impact significantly on successful project completion
- All the parties to a contract are affected due to effects of disputes. However, we don't have data to analyse that get affected mostly.
- According to available data, the most effects impact project implementation stage.

According to these results, it is recommended to both employer and contractor together with other parties to a construction project to find ways to prevent mitigate, and find quick resolutions to manage disputes. In that way, project leaders can complete their projects

successfully without cost overruns, time overruns, and quality issues. They can also maintain their business relationships for future projects.

Further, Based on the findings of this research, it is vital for both employers and contractors, alongside other stakeholders in construction projects, to proactively seek ways to prevent, mitigate, and swiftly resolve disputes. This approach empowers project leaders to complete their projects successfully, avoiding cost overruns, time delays, and issues related to project quality. Moreover, fostering such a proactive approach enables the preservation of positive business relationships, laying the groundwork for future collaborations.

Project leaders should prioritize the implementation of proactive measures aimed at minimizing cost overruns, developing efficient strategies for time management, and adopting approaches that foster positive relationships among all project participants. By addressing these critical aspects, project teams can enhance their ability to deliver projects within the stipulated timelines, budgets, and quality standards.

A collaborative approach, supported by effective communication and conflict resolution mechanisms, emerges as a pivotal strategy for dispute prevention and overall project success. The insights gained from understanding the impact of disputes on project performance can guide project teams in crafting tailored solutions that contribute to successful project completion. This collaborative attitude is instrumental in creating a project environment that values transparency, teamwork, and mutual understanding.

Moreover, the integration of emerging technologies, such as advanced project management software and dispute resolution platforms, into construction projects can help in minimizing disputes while minimizing the effects of disputes as well. Consistently seeking out creative solutions and incorporating industry-leading practices can lay the foundation for a robust and flourishing construction sector.

Limitations and Research Gap

This research was conducted using existing secondary data from papers published in the past five years. Among the selected papers, those published in 2021 and 2022 primarily discussed the effects of disputes, in contrast to 2023. Furthermore, it employed the convenience sampling technique to narrow down the selection to 18 papers instead of screening all papers published in the past five years. This has resulted in a research gap in identifying the current effects of disputes and the most relevant disputes published in the past five years. Considering these factors, further studies on the effects of construction disputes using primary data are recommended.

Furthermore, the selected data is not specific to any particular country or region. Therefore, conducting further studies that focus on a specific location is vital for uncovering the major effects of construction disputes that are specific to a geographical area.

CONCLUSION

The objective of this study was to identify the impact of disputes on the successful completion of a construction project. The results indicate that disputes primarily affect cost overruns, time delays, and quality issues. Additionally, disputes can harm business relationships, which are crucial for project success. Another significant effect of disputes is poor project performance, ranking fourth in the selected data sample. Considering all these major effects, it is evident that disputes can have a negative impact on the successful completion of a construction project.

Therefore, project leaders should prioritize their attention to disputes and their root causes to develop strategies for preventing, mitigating, and managing disputes throughout project implementation. Moreover, it is advisable to proactively prevent disputes through effective contract management from the project's inception, given the substantial impact they can have once they arise. Beyond identifying the causes of disputes, it is equally important to educate the project team about disputes and their effects on project performance. This way, project leaders can achieve successful project completion by minimizing the adverse effects of disputes, which otherwise consume significant costs, time, and resources in search of resolutions.

In conclusion, this study emphasizes the critical need for proactive and strategic approaches in addressing construction disputes to ensure successful project completion. Beyond merely identifying the causes of disputes, project leaders should actively implement measures to prevent conflicts through effective contract management, right from the project's initiation. Education and training programs for the project team about the potential effects of disputes are equally essential to foster a collaborative and informed environment. Moving forward, embracing emerging technologies in project management and dispute resolution, as well as continuous monitoring and adaptation of industry best practices, can further contribute to minimizing the negative impact of disputes on construction projects. By promoting a culture of open communication, collaboration, and early intervention, project leaders can minimize the challenges posed by disputes, thereby enhancing the overall resilience and success of construction projects. This study lays the groundwork for future research endeavors to explore deeper into innovative strategies and technological interventions that can shape the future landscape of construction dispute management.

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