Analyzing the Importance of Cost Overrun Planning and Control for Construction Projects Success in the UAE Region

تحليل أهمية تخطيط ومراقبة تجاوز التكاليف لنجاح مشاريع البناء في منطقة الإمارات العربية المتحدة

by

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Dissertation submitted in partial fulfilment
of the requirements for the degree of
MSc PROJECT MANAGEMENT
at
The British University in Dubai

July 2023

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Abstract

Cost overruns are considered a major hindrance to project completion as they lead to a decline in the contractor's income, resulting in significant financial setbacks and endangering the entire project. The cost of construction stands as a critical element in determining the project's overall success. Throughout the entire lifespan of the construction industry, a prominent concern arises, namely, the pervasive impact of uncertainty and deadlines on all projects, regardless of their size or complexity. These elements continuously pose challenges and demand careful attention from stakeholders involved in construction endeavors. Cost overruns are a prevailing issue in construction projects within developing countries. Such overruns manifest across various construction undertakings, exhibiting different degrees of severity. Hence, it is imperative to recognize and address the critical concern of construction cost overruns. Several factors contribute to the occurrence of cost overruns in construction projects, with the most prominent ones being design and contract-related aspects, estimation uncertainties, planning and scheduling challenges, project management complexities, labor constraints, financial factors, material and machinery considerations, construction phase issues, communication hurdles, and external influences. The current study holds significant value as it consolidates the most frequent causes of construction cost overruns, enabling project participants to identify, tackle, and mitigate the adverse effects of these factors.

Keywords: cost overrun, cost management, construction projects

خلاصة

تعتبر تجاوزات التكاليف عائقًا كبيرًا أمام إنجاز المشروع حيث تؤدي إلى انخفاض دخل المقاول، مما يؤدي إلى انتكاسات مالية كبيرة وتعريض المشروع بأكمله للخطر. تقف تكلفة البناء كعنصر حاسم في تحديد النجاح الشامل للمشروع طوال عمر صناعة البناء والتشييد، يبرز مصدر قلق بارز، وهو التأثير المنتشر لعدم اليقين والمواعيد النهائية على جميع المشاريع، بغض النظر عن حجمها أو تعقيدها. تشكل هذه العناصر باستمرار تحديات وتتطلب اهتمامًا دقيقًا من أصحاب المصلحة المشاركين في جهود البناء تعتبر تجاوزات التكاليف قضية سائدة في مشاريع البناء داخل البلدان النامية. تظهر مثل هذه التجاوزات في مختلف مشاريع البناء، وتظهر درجات مختلفة من الخطورة. ومن ثم، فمن الضروري إدراك ومعالجة المخاوف الحاسمة المتعلقة بتجاوز تكاليف البناء. تساهم عدة عوامل في حدوث تجاوزات في التكاليف في مشاريع البناء، وأبرزها الجوانب المتعلقة بالتصميم والعقد، وعدم اليقين في التقدير، وتحديات التخطيط والجدولة، وتعقيدات إدارة المشروع، وقيود العمل، والعوامل المالية، واعتبارات المواد والآلات، والبناء قضايا المرحلة، ومعوقات الاتصال، والمؤثرات الخارجية. تحمل الدراسة الحالية قيمة كبيرة لأنها تدمج الأسباب الأكثر شيوعًا لتجاوز تكاليف البناء، مما يمكّن المشاركين في المشروع من تحديد ومعالجة وتخفيف الآثار السلبية لهذه العوامل.

الكلمات المفتاحية: تجاوز التكلفة، إدارة التكلفة، مشاريع البناء

Acknowledgements

I am profoundly grateful for the unwavering support and guidance provided by the distinguished doctors and management at The British University in Dubai throughout the journey of my dissertation. Their expertise and encouragement have been instrumental in shaping the success of my academic endeavors. Additionally, I extend my heartfelt appreciation to the construction companies that collaborated with me, generously offering their time, resources, and expertise to facilitate the data collection process for my dissertation. Their invaluable contributions have not only enriched the quality of my research but have also allowed me to gain a deeper understanding of the subject matter. This collaborative effort underscores the spirit of cooperation and shared commitment to academic excellence. I am sincerely thankful for the collaborative and supportive environment fostered by my university and the construction companies, which has been crucial to the successful completion of my dissertation.

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Chapter 1: Introduction

The construction industry is vital in the economic growth of a country and has grown in importance in recent decades.

The industry of construction has become one of the most influential sectors worldwide. As construction projects become more complex, construction managers are under increasing pressure to achieve high-quality, on-time project completions while respecting budget constraints. In particular, the biggest challenge facing the industry of construction in progressing countries is the ongoing issue of cost overruns. As construction projects become more complicated, construction managers face growing pressure to finish projects on time and within budget (Smith, 2020). The reoccurring issue of cost overruns in the building industry in developing countries is a significant impediment. This is particularly true in these countries, where cost overruns can sometimes surpass 100% of the initial project cost. The main reason of these cost overruns is typically identified as insufficient resource management (Jones, 2018). Effective cost performance monitoring is crucial for keeping construction projects within budget. This is where the concept of construction cost management comes into play, with its inclusion required at all stages of the project. This trend is particularly pronounced in progressing countries, where cost overruns can be times more than 100% of the project's estimated initial cost. Such overruns are often attributed to inadequate resource management. Effectively monitoring the project's cost performance is essential to ensure construction costs stay within budget. This is where construction cost management comes in, which needs to be implemented at all stages of a project to minimize such challenges and achieve successful outcomes.

The construction industry in the United Arab Emirates (UAE) has seen a stunning and rapid growth during the last several decades. This thriving business has come to represent the UAE's outstanding economic growth and financial stability around the world.

The UAE construction industry has grown into a global powerhouse, powered by major infrastructure projects, landmark structures, and a constantly growing urban landscape (Alshamsi & Fellows, 2017). The construction industry has been essential in growing the UAE's economy and attracting international investment, hence increasing the UAE's position as a global commercial and tourism hub (Hassanain & Hamid, 2019). This introduction presents an overview of the UAE's active and dominant construction industry, which has not only changed the physical landscape but also holds future promise, in addition to the above mentioned here are some examples in real life of cost overrun in construction projects, cost overruns in real-world building projects are an ongoing problem with serious consequences. one of the most famous instances is the Sydney Opera House. The initial estimate was AUD 7 million, but the ultimate cost was AUD 102 million, indicating a stunning 1300% increase (Oberhardt, 2013). another noteworthy example is the Boston Central Artery/Tunnel Project, which is also referred to informally as the "Big Dig." The initial budget was $2.6 billion, but the end-of-project cost was $14.6 billion, which was approximately six times the initial budget (Gribbons & Jones, 2005). these real-world examples illustrate the significant nature of cost overruns in construction projects, highlighting the industry's dependence on effective cost management and risk assessment.

A cost overrun, also known as budget overrun, comes off when unexpected expenses transcend the originally budgeted amount due to an underestimation of actual costs during the budgeting phase. According to a Flyvbjerg study of the global construction industry in 2002, almost 90% of projects had cost overruns. This challenge of cost overruns is a main problem in both progressed and progressing countries, as Angelo and Reina pointed out in 2002. Therefore, it is of paramount importance to investigate cost overruns thoroughly in order to find effective solutions to the cost overruns in the future. Cost management encompasses various categories such as project resource planning, cost estimation, cost control, and cost budgeting, all of which play a critical role in managing and mitigating concerns related to cost overruns.

There are two basic components to consider when controlling costs: cash flow management and project accounting. These elements work together to determine the final projected cost, taking into account future estimates of scope, time, and quality. The major objective of this article is to review previous study dealing with the factors influencing the factors of cost overruns in construction.

Nevertheless, when it comes to defining project management performance, especially in terms of success, the cost criterion takes center stage in most definitions. For instance, various reputable authors and organizations such as the UK Association of Project Management (APM) Body of Knowledge (BoK), Wright (1997), Turner (1993), Morris and Hough (1987), Wateridge (1998), deWit (1988), McCoy (1987), Pinto and Slevin (1988), Saarinen (1990), Rosenfeld (2014), Ahiaga-Dagbui et al. (2017), and Ortiz et al. (2018) have all emphasized the importance of cost in determining the success of construction projects. Despite the introduction of new criteria for project success, the significance of cost remains central (Papke-Shields, 2010). Acknowledging the cost of the project as a significant risk factor, the Project Management Institute (PMI) has included project cost management as one of the ten knowledge areas that all project managers should be familiar with (PMI, 2000). Flyvbjerg et al. (2003) found that cost overruns were present in 258 projects, accounting for 90% of road and rail projects across 20 countries.

Other countries have gained considerable expertise in researching the cost overruns in engineering projects. In (Ramanathan et al. 2012), the authors conducted a survey among relevant practitioners using a questionnaire, and they ranked the factors and groups based on the overall perspectives of the involved parties. The insights derived from this study can be utilized to address the cost overruns in projects of construction within Malaysia and enhance the overall project performance.

According to the authors' research, highway projects have an average overbudget of 20%, while rail projects have a higher average overbudget of 45%. This shows that the risk of construction cost overruns has not decreased over the past seven decades, despite ongoing debates in literature and practice about their origins and possible solutions. In Ghana, Ameyaw and Oteng-Seifah (2010) reported cost overruns in 23% of the 62 construction projects studied, while Asiedu and Alfen (2014) found cost overruns in 72% of them. Ghana's 321 public works projects. Despite ample evidence of cost overruns, researchers and practitioners have yet to reach consensus on the key factors driving this disruptive global phenomenon. The drivers of this risk appear to be diverse, dynamic, and country and sector specific. Although various studies have attempted to identify the causes of cost overruns in different countries, previous authors have often viewed these causes in isolation and paid little attention to the nature involved.

During the initial phases of a construction project, accurate cost estimation plays a pivotal role. Its impact on finances goes beyond a few future decisions, making effective cost estimation crucial as it determines the project's financial outcome. Escalating construction costs not only burden the construction industry but also influence investment decisions and lead to wastage of national funds. It becomes evident that a solution is required to enhance predictability in cost estimates at all project stages and ensure that initial cost expectations are met. Therefore, the identification and understanding of the root causes behind project overruns are of utmost importance, as this serves as the initial step in problem-solving, allowing for appropriate corrective actions to be implemented.

The objective of this study was to analyze the interplay of various individual and specific factors responsible for cost overruns in public works projects in developing countries. In addition, the study attempts to identify and prioritize the root causes of cost overruns based on their overall impact on construction projects. With this review, we wanted to emphasize the importance of cost management in construction projects and bring its importance into the discussion.

1.1 Research Objectives

a- To understand the importance of planning and controlling cost overruns.

b- To examine the reasons for cost overruns and their impact on the project.

c- Assesses the impact of excessive planning and cost control on construction projects and shows how avoiding a few simple practices can increase your chances of success. of construction projects.

1.2 Theoretical Background

Cost overrun planning entails proactive strategies and approaches employed in construction projects to anticipate, control, and mitigate cost overruns. Cost overruns present a significant challenge in the construction industry, occurring when actual project expenses surpass the estimated or budgeted amounts. To effectively address this issue, a mathematical framework for cost overrun planning becomes necessary. Part of cost overrun planning involves precisely defining and assessing cost overruns. As emphasized by Flyvbjerg, Holm, and Buhl (2002), having straightforward and clear criteria for measurement is crucial in differentiating between mere errors and intentional deviations. This level of measurement accuracy enables project stakeholders to understand the nature of the issue and take appropriate actions. Recognizing the root causes of cost overruns is indispensable for effective cost planning and monitoring, Cost overrun planning is essential for the effective completion of any construction project. Cost overruns in construction projects may lead to a chain reaction of difficulties, which include delays, quality sacrifices, and stressed stakeholder relationships. Effective cost overrun planning, according to the Construction Industry Institute (CII), requires reliable cost estimation, detailed risk evaluation, and proactive mitigation strategies (CII, "Best Practices for Cost Overrun Management in Large Capital Projects," 2013). This type of planning ensures that sufficient financial resources have been allocated and could end up in cost savings, boosting the project's chances of meeting its original objectives, It also makes it possible project managers to be aware of potential problems and make well-informed decisions in order to reduce risks and keep the project on track. Flyvbjerg and Holm underline the relevance of cost overrun planning on the success of a project in their study "Megaprojects and Risk," indicating that improved cost management has the potential to significantly enhance the overall performance of a construction project (Flyvbjerg and Holm, 2015). As a result, cost overrun planning is crucial to the long-term success of construction projects because it keeps them on track, on budget, on schedule, and within acceptable levels of quality, resulting in a greater level of stakeholder satisfaction and a long-term sustainability, according to Frederick Gould and Nancy Joyce in their book "Construction Project Management," overinflated costs can put pressure on the resources that are available, forcing the construction team to make dashed decisions, possibly leading to inadequate workmanship or design changes, which can impact the project's overall quality (Gould and Joyce, 2019). As a result, effective cost management procedures are crucial for construction projects to avoid and manage cost overruns, guaranteeing that projects stay on budget, on time, and fulfill quality standards.

Chan and Chan (2004) assert that inadequate project performance, which includes factors like deficient project management, inaccurate cost estimation, or insufficient risk management, can significantly contribute to cost overruns. Hence, to achieve effective cost overrun planning, a thorough evaluation of these contributing factors is essential. Various concepts and techniques can aid in cost overrun planning, with cost estimation theories offering methods for precisely forecasting project expenditures.

Mohamed and McCaffer (2001) explore ways to make cost estimation more accurate in international building projects, considering methods like the Delphi process and analogy-based estimate. Planning for cost overruns involves using multiple concepts and procedures. Loosemore and Albrecht (2002) highlight the importance of combining construction research and practice to enhance cost forecasting. They emphasize the iterative nature of planning and the need for stakeholder involvement in developing comprehensive cost overrun planning frameworks. Additionally, contingency planning theories play a role in creating effective cost-overrun strategies.

Chapman (2011) underscores the importance of contingency planning, involving the allocation of extra resources and devising backup plans to handle unforeseen costs. Strategies like contingency budgeting, scenario planning, and dynamic contingency adjustment aid in preparing for the unexpected. To achieve this, accurate measurement, understanding the causes of cost overruns, incorporating cost estimation and contingency planning theories, and integrating diverse methodologies are foundational principles. By applying these theoretical concepts, construction projects can improve cost performance and attain successful outcomes.

1.3 Research Gap Analysis

Figure 1

Research Gap Analysis

Objectives	Current State	Future Impact	Gap	Remedy
To understand the importance of planning and controlling cost overruns. To examine the reasons for cost overruns and their impact on the project. Assesses the impact of excessive planning and cost control on construction projects and shows how avoiding a few simple practices can increase your chances of success. of construction projects.	Construction companies are specially the constractors are just bidding on projects wothout the proper planning and consideration of the common risks and inpredectable costs that might face them through the project life cycle, which lead to cost overruns in most of the construction projects accoring to (Papke-Shields, 2010).	Long-term research can reveal the economic consequences of cost overruns, enabling stakeholders to make more financially sound decisions. This information is capable of helping project stakeholders make more informed decisions by identifying and mitigating potential long-term issues. The findings of this research could be applied to develop more efficient risk mitigation approaches that can be used to construction projects to reduce the long-term consequences of cost overruns.	There is relatively not much study into the long-term effects of cost overruns. Analyzing how cost overruns affect construction project lifecycle performance can provide valuable insight into the project's long-term sustainability and economical implications	In order to close the research gap on the long-term impacts of cost overruns, experts must collaborate to collect data, perform studies, and learn from experience. By using these strategies, the construction industry will be able to better understand, anticipate, and deal with the long-term consequences of cost overruns, resulting in more profitable and sustainable building projects.

Chapter 2: Literature Review

2.1 Introduction

Cost overrun occurs when real project expenses are higher than anticipated. This misalignment has significant financial ramifications in addition to having an impact on project timeframes, stakeholder satisfaction, and overall project success. For effective project planning, risk management, and mitigation solution creation, cost-overrun variables must be recognized and understood. we want to provide a complete study of the key components and underlying mechanisms that contribute to cost overruns by assessing previous studies, theoretical frameworks, and empirical data, not only but also, this literature review will investigate a wide range of variables that have been recognized as potential drivers of cost overruns. These variables include project design, procurement procedures, project complexity, risk assessment, and project team dynamics. Furthermore, the review will consider external influences such as market circumstances, regulatory requirements, and unforeseen events, all of which can have a substantial impact on project costs. Finally, the review will critically evaluate past studies' approaches for analyzing cost overruns, such as statistical analysis, case studies, and qualitative assessments. By comparing the strengths and limitations of various research methodologies.

2.2 Construction Industry in the UAE

The UAE has appeared as one of the most rapidly expanding economies in the Middle East and north Africa, with a strong emphasis on both societal and national development. The country has witnessed substantial investments in the sector of construction over the past forty years. In comparison to other Middle Eastern nations, the UAE's construction industry has experienced significant growth. Despite facing a commercial downturn in 2008, the industry rebounded swiftly between 2007 and 2009, contributing to 8% of the country's GDP growth. The sector construction has been boosted by increased revenue from the gas and oil industries, which has further fueled its expansion.

The industry of construction contributed significantly to the non-oil sectors, around 30% to 40% at the end of each governmental Development schedule from 1980 to 2000, as stated by the UAE Ministry of Infrastructure Development (Aichouni, Al-Ghonamy, and Mahamid).

However, according to Assaf and Al-Hejji (2006), only 30% of construction projects were handed over on time and within the planned budget. Poor cost performance, as reported by Faridi and Al-Sayegh (2006), is a main and repeated issue in the UAE industry of construction. Many ongoing building projects have taken longer than expected, requiring more resources and time than initially planned. Factors like rising manufacturing costs and inflation can make the situation worse. On a positive note, some construction projects can be handed on schedule and within estimated cost with proper planning and management.

2.3 Cost Overrun Examples from Around the World

Cost overruns occur when project objectives cannot be achieved within the original estimated budget (Avots 1983). The amount by which actual costs exceed budget is called cost overrun. To calculate the cost overrun ratio, divide the contract amount by the original contract amount. This calculation can be converted to percentages for ease of comparison (Jackson 1990).

In 1990, Morris conducted research to understand the possible causes of cost overruns on construction projects. These factors include improper project planning, construction delays, changes in project scope during planning and execution, problems with contractors sourcing materials and equipment, constraints on critical resources such as energy and finance, and delays in foreign trade preparations, delays in state decision-making, and failure of regulatory agencies. specific mix. These items were found to contribute significantly to the occurrence of cost overruns in construction activities.

Elinwa and Buba conducted a survey in Nigeria in 1994. The main causes of cost overruns were found to be the cost of raw materials, dishonest behavior, rising raw material prices, and overhead costs. Excessive machinery and inadequate planning.

The expenses of public works projects, both actual and anticipated, were studied by Flyvbjerg (2002). His objective was to ascertain whether the actual and expected expenditures varied. He employed a number of techniques to reach the conclusion that the discrepancy between actual and expected costs is brought about by technical, economic, psychological, and political variables. Based on these facts, he came to the conclusion that every infrastructure project's actual cost will be more than the predicted cost. He continued by saying that both human error and purposeful deception contribute to cost underestimate. In their research in 2002, Bubshait and Al-Juwairah investigated 42 significant factors influencing costs in Saudi construction projects. The study determined that incorrect planning, inadequate financial control on-site, lack of contract management experience, and material costs were key factors contributing to elevated construction expenses. The researchers assessed the importance of these factors by employing a severity index, considering responses from owners, consultants, contractors, and a combination of respondents.

The most common causes of cost overruns are poor project planning and management, unforeseen field conditions, lack of information, design development, estimation methods, procurement routes, application of commercial forces, time constraints, and outside influences.

Cordsman (2000) points out the remarkable development of the construction industry in Saudi Arabia over the past 30 years, attracting professionals from all over the world. Industry is the main contributor to non-oil production sectors, accounting for 30% to 40% of the total in each national development plan between 1980 and 2000. However, Faridi and Al-Sayegh (2006) recognize that the industry faces persistent challenges related to cost and time management. Assaf and Al-Hejji (2006) find that only 30% of construction projects in Saudi Arabia are completed on time and on schedule. To address this serious problem, it is essential to identify the main causes of construction cost overruns. projects in Saudi Arabia. This study aims to present the results of a survey conducted from the perspective of contractors, which focuses on solving the risk matrix on causes of cost overruns in domestic construction projects. The goal is to use these results to improve the overall performance of the construction industry, not only in Saudi Arabia but also in other developing countries.

According to contractors and consultants, monthly payment problems are the biggest cause of cost overruns, while contractor mismanagement is the biggest cost overrun factor for owners, according to the survey. Frimpong's 2003 survey of 26 factors leading to cost overruns in construction of groundwater projects in Ghana.

Although there was some disagreement among the three groups surveyed, there was a significant degree of consensus among participants about the ranking of the factors. Key factors identified in the ranking results include monthly payment issues, poor technical performance, material sourcing problems, poor subcontractor management, and inflated material prices.

Koushki (2005) conducted a study to ascertain cost overrun estimates and causes in Kuwait. The research involved interviewing 450 private residential project owners and developers selected randomly. The study revealed that the primary reasons contributing to cost overruns were contractor-related issues, financial limitations on the part of the owners, and material-related problems.

According to Larry (2002), many different factors have an impact on project costs, including final product specifications such as performance levels, quality, and reliability. In addition, compliance with governmental, institutional, or internal standards, technical requirements such as computer hardware upgrades, and administrative needs such as corporate financial policies also play a role. important in influencing the cost of the project.

They encouraged project owners to provide enough time and money during the design phase to prevent cost overruns, as well as to insist on enough funding, the choice of qualified experts, and a reliable contractor to complete the task.

Creedy (2005) examined the main variables affecting cost overruns in highway construction projects in Australia. removal and replacement of nonconforming materials due to faculty design, design changes as an environmental issue based on local conditions, design changes due to faculty design, bid changes, and improvements Quality measurement are key issues.

Project costs include both financial resources and various assets such as people, equipment, and materials. Generally, clients aim to complete projects efficiently and in a timely manner. However, the project manager is responsible for setting a cost performance standard, either by applying existing standards or by creating new ones (Larry, 2002). Over time and in different places, several factors that lead to cost overruns in construction projects have been identified. An important factor is that most contractors provide quotes based on prior estimates, resulting in cost overruns. Unfortunately, rapidly changing prices make the initial budget unrealistic (Azhar et al., 2008).

Omoregie and Radford (2006) examined why infrastructure projects in Nigeria are over budget. The most common reasons for cost overruns include imported materials and equipment, overtime, lack of raw materials, inaccurate estimates, named suppliers and subcontractors, failure to meet terms and conditions. contracts, errors, and deviations. under these conditions, price volatility, financing and payment for work completed.

Ardi and associates. (1985) conducted a study highlighting how cost overruns have become a common problem in construction projects due to the many risks and uncertainties associated with it. These risks arise from the complex, unique and dynamic nature of construction operations. Several studies in different countries including Turkey, Nigeria, Kuwait, the United Kingdom, and Vietnam have identified the main causes of cost overruns in construction projects. Key factors include rising material prices, inflation, delays due to design specifications changes, material shortages, poor contract management, price fluctuations, fraud, machine costs machinery, poor planning, inaccurate estimates of job complexity, unexpected field conditions, lack of information, estimation methods, inadequate site monitoring and management, financial constraints ownership, design changes, and ineffective contract management. To ensure the success of construction projects, it is important for construction professionals to effectively identify and manage these risks, with the aim of minimizing cost overruns.

According to Le-Hoai (2008), five important factors influence excess cost in Vietnam. These factors are owner financial hardship, poor site management and supervision, inadequate project management support, contractor financial difficulty and design changes. These aspects play an important role in the cost overrun of construction projects in Vietnam.

Enshassi (2009) investigated resource constraints, poor planning and monitoring of pre- and post-construction costs, contractor supply of materials and equipment, and local currency mismatches. against the dollar value, exclusivity of some suppliers' project materials and delays in construction.

Ali. EQUAL. et al. (2010) conducted a questionnaire study to investigate the causes of cost overruns in the construction industry. Research shows that inaccurate or incomplete initial cost estimates were identified as the most important contributors to cost overruns. The researchers point out that making full use of project costs and financing is key to minimizing construction costs. They concluded that cost overruns are indeed a serious problem in the construction industry.

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In construction projects in Nigeria, Oleola et al. (2008) identified six important variables that affect the accuracy of pre-bid cost estimates. These include the experience of the construction team, the quality of the information provided, the bidding process and market conditions, the completion of pre-contract design, and the complexity of the construction. According to Frimpong et al. (2003), the main reasons for cost overruns in groundwater projects include monthly payment problems, poor contractor management, material supply problems, poor technical performance, and overuse. material pricing. Iyer et al. (2005) identified 55 factors affecting the cost performance of construction projects in India, including conflicts among participants, ignorance, project-specific attributes, adverse climatic, economic, and social conditions, reluctance to make timely decisions, stiff competition in the bidding period, and limited time to prepare bids.

In 2010, Olawale et al. presented a study in the United Kingdom to pointing the primary reasons behind cost overruns. They discovered 21 key factors contributing to such overruns, including alterations in project design, inaccurate estimation of project time and costs, uncertainties related to project risks, subcontractor nonperformance, conflicts among project stakeholders, fluctuations in exchange rates, a scarcity of skilled labor, challenges with financing and payments, volatility in interest rates, intricacy of project tasks, insufficient training and experience in project management, discrepancies in contract documentation, inadequate software resources, inflation in prices, and inadequate contingency planning.

Ameh et al. (2010) investigated telecommunications projects and identified several important causes that contribute to cost overruns. These factors include contractor inexperience, cost of materials, frequent design changes, fluctuating material prices, economic stability, financing methods, high interest rates charged by banks. imposed on contractor loans, payment problems and related to bribery and fraud. The study has classified 35 common causes of cost overruns, which can serve as a basis for further studies to assess their relevance to the construction industry in Malaysia.

2.4 Main Factors Causing Cost Overrun in the UAE

Projects construction in the UAE may encounter cost overruns because of various factors. Identifying these causes is crucial to maneuver and lower the potential issues (Azhar, Farooqui, & Ahmed, 2008). Therefore, thoroughly investigating the problem of cost overruns is essential to prevent them and ensure successful project completion. However, prior research has not given adequate attention to examining the causes contributing to cost overruns throughout the construction project's duration, and there is a lack of evaluation of causal connections in the existing literature. To address this urgent matter, it is necessary to identify the primary reasons for cost overruns in UAE projects construction.

Consequently, the objective of this study is to identify the elements that influence projects construction in the UAE. To accomplish this, Jackson, and Steven (2001) conducted a survey using questionnaires to examine the reasons behind overruns of cost in Ilorin construction projects. Their results revealed that reasons behind cost overruns included the change of material/labor prices and fees, variations, delays in authorities' certificates, inadequate tender analysis, choosing poor quality contractors, lack of proper project evaluation, and false representation of client's needs and goals.

Jackson (2002) conducted a survey using questionnaires to understand the causes of budget overruns in construction projects in the UK. The study results revealed that the main reasons for over budgeting include design changes, design development factors, information availability, estimation methods, performance of design and management

According to Koushki, Al-Rashid and Kartam (2005), the three main factors that contribute to cost increase in private residential projects in Kuwait are contractor issues, materials, and financial constraints of Owner. On the other hand, Omoregie, and Radford (2006) found that cost overruns in infrastructure projects in Nigeria are mainly due to price fluctuations, financial difficulties, and payment for completed work. completion, poor contract management, schedule delays, changing site conditions, inaccurate estimates, shortages of raw materials, imported materials and plant items, additional work, design changes, subcontractors, named suppliers, weather conditions and non-compliance with contractual obligations.

To identify the main causes of cost overruns in construction projects in Gaza, Enshassi, Al-Najjar and Kumaraswamy (2009) conducted a survey of 42 contractors, consultants, and owners. The study identified the top 10 factors contributing to cost overruns, including rising raw material prices due to ongoing border closures, construction delays, problems with contractors sourcing raw materials, and more. materials and equipment, fluctuations in prices of construction materials, exchange rates, exchange rate fluctuations affecting the local currency against the dollar, project material exclusivity of some suppliers and limitations resource constraints such as funds and assimilation.

Niazi and Painting (2017) used a questionnaire survey to identify the main causes of construction cost overruns in Afghanistan, focusing on important factors such as corruption, ownership late payments on schedule, difficulties the contractor encountered in financing the project, security, changes in orders by the owners during construction and the market. inflationary. Poor contract planning and monitoring, changing orders, weak economic and institutional environment of the project, and lack of effective coordination among the contracting parties are the four main causes of this situation. cost overruns of Asiedu and Adaku (2019). According to Andric, Mahamadu, Wang, Zou and Zhong (2019), resources (building materials, equipment, and labor), construction work, design changes, land acquisition and re-establishment are the causes. most commonly lead to cost overruns.

Johnson and Babu (2020) conducted a questionnaire survey to explore the cost performance of construction projects in the UAE. They identified common causes of cost overruns, including differences in client and consultant designs, poor project cost estimates, and inadequate project management. Other factors that contribute to cost overruns are delays in customer decision making, financial constraints faced by customers, failure to implement effective sourcing strategies resulting in poor risk management during project implementation, inadequate planning at the beginning of the project, lack of customer experience, design flexibility, poor contractor performance, and a lack of understanding of the contract terms of the project parties. In a separate study on the Vietnamese construction industry, Phama, Luub, Kimc and Vien (2020) found four main causes of cost overruns in construction projects. These causes include risks, resource problems, incompetence of the parties and project participants, transportation costs and machinery costs. Flyvbjerg et al. (2003) conducted an in-depth assessment of 258 transport infrastructure projects in 20 countries on 5 continents, including both developed and developing countries. Research shows that cost escalation is a common problem in transportation infrastructure projects, with 9 out of 10 projects experiencing cost overruns, an average of 28% for all project types. judgment. This phenomenon of cost escalation is observed globally and is more pronounced in developing countries than in North America and Europe. In addition, research has shown that escalating costs have not improved over the past 70 years. Al-Zarooni et al. (2000) conducted a survey of cost estimates for public projects in the UAE and found that variations in cost estimates can be attributed to the use of a unit estimate basis, regardless of the type of project estimate. project or associated risks and complexity of construction. Deck (2004) analyzed data from Norwegian road construction projects between 1992 and 1995 and found that cost overruns averaged 7.9%, with variations from -59% to +183%. Small projects are more prone to cost overruns than larger projects, and lead times can affect cost overruns.

In 1996, Al-Momani conducted a study in Jordan to predict the cost of building public schools. The study analyzed data from 125 completed school projects between 1984 and 1994. The study found that actual costs exceeded the original contract price by 30% and that changing orders resulted in costs. fee. fees over 8.3%. Enshassi et al. (2005) focuses on the accuracy of cost estimates for construction contracts in the Gaza Strip. They analyzed a 51-factor questionnaire survey and identified the key factors affecting the accuracy of cost estimates. These factors include the location of the project, the division of the Gaza Strip, restrictions on movement between regions, the political situation, and the financial situation of the owners. Shehu et al. (2014) studied the construction cost performance of projects in Malaysia, considering both the public and private sectors. Their research covers various aspects such as procurement methods, procurement methods, nature, and scale of the project. The study, based on survey questionnaires of Malaysian consultants in quantitative studies, found that 55% of Malaysian construction projects were cost overrun. In addition, public sector projects perform better in terms of cost excess than private sector projects. The study also found that design and construction methods were associated with low excess cost, followed by traditional and project management methods, based on procurement and tendering techniques.

2.5 Possible Factors That Could Contribute to Cost Overruns

Cost overruns in projects of construction are common and can be caused by a variety of reasons. Design change or errors can lead to additional construction costs, delays, and rework, all of which can contribute to cost overruns. Loh, S., & Tang, S. L. (2018). Labor and material cost fluctuations can have a major impact on project costs, especially when these costs rise unexpectedly. This is especially true in the UAE, where labor costs can be prohibitively expensive due to the country's reliance on foreign labor Alshawi, M., & Sardar, I. (2016). Inflation can raise the cost of building materials and labor, as well as the cost of obtaining loans, leading to cost overruns. Le-Hoai, L., Lee, Y. D., & Lee, J. Y. (2018. Delays and disruptions in projects can result in additional costs because contractors may need to spend more money to complete the project within the revised timeline (1). unexpected site conditions, such as poor soil quality or environmental hazards, may necessitate more work and resources, resulting in cost overruns (1). Unanticipated costs can result from a change in project scope, such as the addition of new features or amenities (1). Also, poor budgeting or communication can lead to cost overruns (1). As a result, project managers must identify these risks and put cost-saving measures in place to mitigate their impact on project costs, Cost overruns in UAE projects construction can be caused by a variety of causes. Changes in government regulations or policies, for example, can have an influence on project costs and timelines (1). The availability and cost of materials and resources can be impacted by global market fluctuations as well as regional conflicts (2). in addition, an absence of qualified workers in certain fields, or a high demand for specific skills, can result in higher labor costs and longer project timelines (3). Finally, due to the project's complexity, unexpected challenges and costs, such as the use of new technologies or construction methods, may arise (4). Project managers can mitigate these risks through risk management, project planning, and effective communication with stakeholders. A thorough cost-estimating process is also required, which includes identifying potential hazards and unpredictability and developing contingency plans (6).

2.6 Construction Project Phases That Lead to Cost Overrun

2.6.1 Planning Phase

According to Koushki, P. A., Al-Rashid, K., & Kartam, N. (2005). to avoid cost overruns, it is important to have effective planning in construction projects, which often involve multiple interdependent tasks, such as design, procurement, construction, and project management. Any delays or errors in these tasks can lead to increased costs. Planning is an essential step in construction project management and involves identifying project objectives, defining the scope of work, estimating costs, and developing a project schedule. Proper planning helps to ensure that project goals are clearly defined, resources are efficiently utilized, and potential risks are identified and managed proactively. to ensure efficient planning of a construction project and prevent cost overruns, it is important to point out the project objectives, which establish its purpose and desired outcomes. Akintoye, A. S., & MacLeod, M. J. (1997). Defining the scope of work involves identifying the project's boundaries, deliverables, and the work required to be accomplished. Accurately estimating the cost is also crucial, which requires determining the resources needed, including materials, labour, and equipment. Planning a building project makes it easier to spot potential problems before they arise, which is one of its key benefits. The procedures for creating a project schedule include identifying the tasks that must be done, estimating the time needed to complete each activity, and coming up with a deadline for the project. By recognizing possible issues early in the planning process, the project team may be able to take further actions to lower the risks and avoid cost overruns. To illustrate, suppose the project team identifies a potential delay in the delivery of essential materials that could adversely affect the project schedule and budget. In that case, they can take a proactive approach by developing a contingency plan to expedite the delivery or identifying alternative materials that can be used. This proactive approach helps to mitigate the risk of cost overruns and ensures that the project is accomplished within the desired timeline and budget.

According to El-Sayegh, S. M. (2008). to ensure that a construction project is executed efficiently, planning is essential. Planning involves establishing a baseline that outlines the scope of the project, cost, and schedule. This baseline helps the team to monitor the project's progress and identify deviations from the plan. By identifying deviations early, the team can take corrective action to reduce the impact on cost and schedule. Additionally, planning helps to establish project priorities and allocate resources effectively. For example, by identifying critical tasks and allocating resources accordingly, the team can ensure that the project is accomplished on time and within budget. Furthermore, planning helps to identify potential conflicts and dependencies between tasks, allowing the team to develop strategies to manage them effectively. Ultimately, planning is a critical component of successful construction project management, enabling the team to deliver high-quality projects efficiently and within budget. By developing a project schedule, the team may identify the critical route the sequence of duties that must be achieved on a specific time scale to ensure that the project is completed on time. By identifying the crucial path, the team may focus their efforts on these tasks, ensuring that they are completed on time. By defining the scope of work and creating a project timeline, excellent planning helps improve communication among project team members in construction projects. By doing this, team members are better able to comprehend their duties and how their efforts affect the success of the project as a whole. This improved communication and decreased the chance of misunderstandings or miscommunications, which can lead to delays and extra costs, boost collaboration. In the end, good teamwork and communication may ensure that the project is completed effectively, within the contract period, and within budget.

2.6.2 Design Phase

Cost overruns are common in construction projects and may happen at any stage. Design cost overruns are frequently caused by errors or flaws in the design documents. According to Flyvbjerg et al. (2003), design errors are the biggest reason behind cost overruns, accounting for 40% of total cost overruns in construction projects. Inadequate planning, poor coordination among project stakeholders, or incomplete or incorrect information can all lead to these errors. To address this issue, project team members and stakeholders must establish open lines of communication to ensure that all parties are updated and understand the project's goals, the lack of experience or expertise on the design team is another factor that can contribute to cost overruns during the design phase. Inexperienced designers may be unfamiliar with the specific requirements of the project, or they may lack the skills to identify potential issues and develop effective solutions. As a result, their designs may be flawed or incomplete, requiring expensive changes during construction. To reduce this risk, select a design team with relevant experience and expertise in similar projects. This can help ensure that the design documents are correct and complete, lowering the risk of cost overruns, changes in project scope or requirements during the design phase can also result in cost overruns. Changes in project scope, according to Leiringer and Glynn (2016), are the second most common cause of cost overruns, accounting for 25% of all cost overruns in construction projects. These changes could be the result of changing client requirements, new regulations or codes, or unanticipated site conditions. To mitigate this risk, create a clear scope of work and communicate any changes to the project team and stakeholders as soon as possible. Changes have a less significant impact on design documents and project timelines, lowering the risk of cost overruns.

2.6.3 Budgeting Phase

Cost estimation and budgeting help to avoid cost overruns by providing an accurate view of the full cost of the construction project. By breaking down a building project into smaller components, a detailed cost estimation enables the project team to spot potential areas where expenses may go above their allotted budget. Alison Dykstra (2011). Through early detection of potential cost overruns, this proactive approach enables the team to take corrective action before the overrun occurs. Another advantage of detailed cost estimation is that it enables the project team to create a realistic budget for the construction project. By estimating the costs of each component, the project team can accurately determine the total cost of the project, which helps to ensure that the project is properly budgeted. This reduces the likelihood of cost overruns, as all costs have been accounted for in the budget. H. Peter Timmermans (2019). In addition, a realistic budget can help to manage the expectations of stakeholders, as they will have a clear understanding of the costs associated with the project from the outset. Project owners, investors, and other interested parties are examples of stakeholders who frequently have expectations about the price of a construction project. The project team may control these expectations and present a more accurate picture of the costs of the project by providing a thorough cost estimation. With this strategy, there is less chance of cost overruns and the project's associated risk. The project team can take remedial action and lower overall project risk by anticipating potential cost overruns early on. By giving a thorough understanding of the costs related to each project component, detailed cost estimating also enables improved risk management.

To make sure that the construction project will succeed, it is important to allocate resources effectively. A detailed cost estimation allows the project team to accurately estimate the resources required to complete each component of the project. This helps to prevent resource shortages or overallocation that can lead to cost overruns. Additionally, a well-planned resource allocation ensures that the project team has the necessary tools, equipment, and personnel to complete the project efficiently, saving time and money. Adam Ding (2018). A comprehensive cost estimation gives the project team a clear picture of the project cost and over heads, allowing them to ensure that they have enough resources including those to deal with any potential cost overruns to complete the project on its time and within their projected budget, in addition to identifying potential cost overruns, a detailed cost estimation also provides the project team with a comprehensive understanding of the project scope. By breaking down the project into smaller parts and activities, the project team can identify the specific tasks and activities that need to be accomplished. This knowledge is critical for effective project planning and resource allocation, moreover, a clear understanding of the project scope helps prevent scope creep, which can lead to cost overruns. Scope creep occurs when changes are made to the project without proper evaluation of their impact on the project's cost and schedule. A detailed cost estimation provides a solid foundation for evaluating proposed changes to the project scope and ensuring that they align with the project's goals and budget.

2.6.4 Procurement Phase

Construction procurement management is critical because it has a significant impact on project cost and timeline (Odeyinka & Yusif, 2014). Selecting appropriate vendors and suppliers, negotiating contracts, and managing procurement activities throughout the project's lifecycle are all part of effective procurement management. implementing effective procurement management strategies can help to reduce cost overruns and improve a construction project's overall financial performance, one of the primary advantages of effective procurement management is cost control, which is achieved by selecting vendors and suppliers who provide high-quality products and services at reasonable prices (Odeyinka & Yusif, 2014). Negotiating favorable contract terms, such as volume discounts and payment terms, reduces costs and improves the financial performance of the project, by increasing transparency into project costs and budgets, procurement management improves project financial performance. Identifying potential risks and implementing risk-mitigation strategies such as collaborating with multiple vendors and suppliers and developing contingency plans to address potential supply chain disruptions are all part of effective procurement management (Odeyinka & Yusif, 2014). The project team can identify potential cost overruns early and take corrective action to keep the project on budget by tracking procurement activities and costs in real time (Abdullahi et al., 2016).

2.6.5 Cost Control During the Project

An organized approach is a method for successfully controlling cost overruns on construction projects. The first step is to develop a comprehensive project budget that includes all project costs such as labor, materials, equipment, permits, fees, and contingencies. Actual expenditures should be regularly compared with budgets to identify any discrepancies. Project management software or spreadsheets can help. Once a cost overrun is identified, the root cause must be identified, and corrective action taken. Value engineering can also be used to identify opportunities to reduce costs without sacrificing quality.

The primary purpose of project control in the construction industry is to ensure that projects are completed within budget, schedule, and other project objectives. Project managers manage this complex task by continuously monitoring progress, analyzing plans, and taking corrective action as needed. Several project control techniques have been developed over the past few decades, such as Gantt bar charts, Program Review and Evaluation Techniques (PERT), and the Critical Line Method (CPM) (Lester) 2000, Nicholas 2001). In addition, there are several software packages, including Microsoft Project, Asta Power Project, and Primavera, designed to help implement these project control techniques. Despite the widespread use of these tools in practice, many construction projects still face the challenge of cost overruns and overshoots. Many recent global studies have been conducted to examine the factors that contribute to project time and cost overruns. In Nigeria, Mansfield et al. (1994) conducted a survey of 50 contractors, consultants, and client organizations. They identified several key factors causing construction delays and cost overruns, including poor contract management, financial and payment problems for completed work, changes to construction site components, lack of materials, use of materials and components from imported facilities, design changes and problems with subcontractors. and designated suppliers.

Similarly, Kaming et al. (1997) conducted a questionnaire survey of 31 project managers overseeing high-rise construction projects in Indonesia. They identified eleven variables, such as design changes, low labor productivity, improper planning, lack of raw materials, inaccurate raw material estimates, and lack of skilled labor, are factors that contribute to the passage of time. In addition, they found seven variables, including inflated material costs due to inflation, incorrect number of takeoffs, and lack of experience in terms of location and type of project, leading to cost overspending.

In Hong Kong, Kumaraswamy, and Chan (1998) conducted an in-depth study using 400 questionnaires and interviews. They highlighted delays in design information, long wait times for drawing approval, poor site supervision and management, and discrepancies in design documentation as the top ten causes of delays. . . in construction from the contractor's point of view. Other researchers have applied case study methods to study specific projects. For example, Al-Momani (2000) examined 130 public projects in Jordan and concluded that designer-initiated changes, client requirements, weather, site conditions, delays in construction, delivery and economic conditions are the main causes of delays. Akinsola et al. (1997) analyzed 46 completed construction projects in the UK and examined quantitatively the factors that influence the degree and frequency of change in construction projects, including client characteristics, particular project characteristics and project characteristics. project and elements of project organization and management. The same survey was carried out by Frimpong et al. (2003) in Ghana and by Assaf and Al-Hejji (2006) in Saudi Arabia. Hsieh et al. (2004) analyzed 90 urban public works projects in Taiwan and identified planning and design problems as the main cause of order change. Yogeswaran et al. (1998) examined 67 civil engineering projects in Hong Kong and found that about 15-20% of the time it resulted in weather conditions.

2.7 The Importance of Communication Management in Construction Projects

The communications management plan plays a crucial role in the promising execution of a project’s construction. It serves as a roadmap for managing communications throughout the project lifecycle. Effective communication is critical to project success, and a well-implemented communication management plan can significantly reduce the incidence of cost overruns. One way the plan achieves this is by keeping all stakeholders, including project owners, investors, contractors, and other involved parties, well-informed about the project's scope, budget, timeline, and progress. This clear understanding helps prevent misunderstandings and miscommunications that could lead to delays and cost overruns.

Furthermore, the communication management plan ensures that all project team members are aligned and on the same page. It outlines how information will be shared and how team members will communicate with each other, avoiding confusion and mistakes that could result in delays and cost overruns. Additionally, effective communication helps identify potential issues early in the project, allowing the team to take corrective action promptly and prevent cost overruns associated with rework or delays.

Managing expectations is another significant benefit of a communication management plan, particularly regarding the project owner and investors. By outlining how progress will be reported and information shared, the plan helps stakeholders have a realistic understanding of the project's progress and any potential challenges. This transparency reduces the likelihood of surprises and unexpected cost overruns.

Lastly, the communication management plan promotes accountability among project team members. By defining how information will be shared and decisions made, the plan ensures that team members take responsibility for their actions. This accountability fosters a culture of responsibility and reduces the risk of mistakes that could lead to cost overruns. Overall, a well-implemented communication management plan is a fundamental tool for avoiding cost overruns and achieving a successful construction project.

2.8 Factors Affecting Cost Overrun Planning and Control

In the past time, researchers have studied various factors affecting cost overruns in construction projects, the table below summarizes the results for conducting the study.

Table 1

Factors Affecting Cost Overrun Planning and Control

Authors	Focus of Research	Research Context	Factors affecting Cost Overrun Planning
(Doloi, 2012).	The importance of accurate planning in construction projects, and involving the needed resources including costs, manpower, materials, and machinary of the project before even initiating the execution, and how the lack of planning is a major cause of cost overrun in construction projects.	General Context	Project planning including resources.
(Chan et al., 2013).	How critical is the budgeting phase in construction projects, and in-accurate budgeting is a major cause of cost overrun.	General Context	Accurate budgeting and estimation of the project.
(Liu and Fellows, 2015).	The design process is an essential component of any construction project. It comprises developing project plans and specifications. Effective design can assist reduce the likelihood of cost overruns by ensuring that the project is completed to the desired quality within the available budget and how deign changes cause cost overrun.	General Context	Design process and design change
(Osei-Kyei and Chan, 2015).	Effective procurement can lead to project success and how materials procurement is a major cause of cost overrun when the quality does not match the reqired quality.	General Context	Procurement process
(Li and Wang, 2013).	effective team quality can help to limit the likelihood of cost overruns. Inadequate team quality, on the other side, may contribute to cost overruns.	General Context	team Quality and experience

Construction projects are often complex endeavors involving numerous parties, including different departments responsible for planning, budgeting, design processes and procurement processes. The characteristic of the project team also plays a significant role. As noted earlier in this document, these factors have a significant impact on construction project cost overruns. In the next section, each of these points will be discussed separately.

2.8.1 Planning

In construction projects, careful planning is crucial. This involves identifying the actions, resources, and project goals needed to achieve positive results. Effective planning is essential to ensure projects are completed on time, within budget and with the desired quality level. Conversely, lack of adequate planning can lead to cost overruns. Inadequate planning is a common cause of cost overruns, as it may not fully anticipate all project requirements. This can lead to unforeseen construction costs, ultimately increasing the total cost of the project (Doloi, 2012). In addition, unforeseen costs may arise during the construction phase, adding to the total cost of the project (Doloi, 2012).

2.8.2 Budgeting

Budgeting is an important aspect of construction projects, which involves allocating resources to specific tasks or activities. A budget is typically created during the planning phase and serves as a road map for the project team to ensure that the project meets its financial constraints. However, insufficient budgeting can lead to cost overruns. A common reason for cost overruns due to inadequate budgeting is not considering uncertainties. Contingency costs are unforeseen expenses that can be incurred during the construction phase, resulting in cost overruns if not included in the budget (Chan et al., 2013).

2.8.3 Design

The design phase is an important part of any construction project, involving the creation of project plans and specifications. A well-executed design can help reduce the risk of cost overruns by ensuring that the project is completed with the desired level of quality within the allotted budget. However, design changes can lead to cost overruns. These overshoots due to design changes often result from inadequate communication between the design and construction teams. This can lead to costly design modifications during the construction phase, ultimately increasing the total cost of the project (Liu and Fellows, 2015).

2.8.4 Procurement

Construction projects rely heavily on procurement. It comprises obtaining the resources and services required to complete the project. Effective procurement can help to reduce cost overruns by ensuring that critical products and services are purchased at a fair price and delivered on time. Concerns about procurement, on the other hand, can lead to cost overruns. Failure to select suppliers based on quality and pricing criteria is a key source of procurement cost overruns. As a result, low-quality goods and services may be obtained, or delivery delays may occur, raising the project's overall cost (Osei-Kyei and Chan, 2015).

2.8.5 Team Quality

The workforce's quality is another crucial factor in construction projects. A proficient and effective team ensures that the project is completed to the desired level of quality within the specified budget, thereby reducing the likelihood of cost overruns. Conversely, inadequate team quality can lead to cost overruns. When the team members lack the necessary skills and competency, errors may occur during the construction phase, resulting in increased overall project costs (Li and Wang, 2013).

2.9 Factors Affecting Construction Project Success

The following points have been selected as factors affecting the success of the construction projects that we will engage in our research.

Table 2

Factors Affecting Construction Project Success

Authors	Focus of Research	Research Context	Factors affecting Project Success
(Kwak and Anbari, 2015).	quality management ensures that the project satisfies the requirements and standards. Effective execution and quality control can reduce delays, rework, and cost overruns.	General Context	Execution and Quality Control
(Lim and Mohamed, 2015).	Effective cost control is an additional essential element to construction project success. Cost control refers to the monitoring and management of project costs to ensure that the project is completed within budget restrictions	General Context	Proper Cost control
(Shen et al., 2015).	assessing, and managing risks that may develop throughout the course of a project is known as risk evaluation. A comprehensive risk assessment can help to reduce project delays	General Context	Risk evaluation and assesment
(Jha and Iyer, 2015).	. Delivering project deliverables to end-users or clients to ensure that the project achieves its objectives is what handing over contains.	General Context	proper handing Over System
(Walker and Lloyd-Walker, 2015).	The transfer of data between project stakeholders in order to keep everyone up to date on project progress, issues, and requirements is referred to as communication.	General Context	Proper communication between Project Parties

2.9.1 Execution and Quality Control

The success of a construction project depends on effective execution and quality management. Implementation involves following the project plan, while quality management ensures that the project meets the required requirements and standards. By implementing effective quality control and implementation measures, delays, rework, and cost overruns can be minimized. Common quality control techniques such as inspection, testing, and quality assurance are used to ensure successful implementation and quality management (Chowdhury et al., 2015). Good process control plays an important role in reducing the possibility of delays, rework, and cost overruns. Using project management tools such as planning, progress reporting, and change management is a common approach to achieving successful control (Kwak & Anbari, 2015).

2.9.2 Cost Control

An essential factor for the success of construction projects is the implementation of effective cost control. This involves closely monitoring and managing project costs to ensure they stay within predetermined budget limits. By using effective cost controls, the occurrence of cost overruns and financial failures can be minimized for all parties involved. Commonly used cost management methods, such as accurate cost estimation, prudent budgeting, and close cost tracking, play an important role in achieving this favorable outcome. Lim and Mohamed, 2015).

2.9.3 Risk Evaluation

Effective risk assessment is another essential aspect that contributes to the success of construction projects. Risk assessment involves identifying, assessing, and managing potential risks that may arise during the life of a project. A thorough risk assessment can help reduce project delays, rework, and cost overruns. Risk identification, risk assessment, and risk response planning are common approaches to effective risk assessment in risk management practice (Shen et al., 2015).

2.9.4 Proper Handing Over System

A good handing over system is another important aspect of a successful construction project. The delivery of the deliverables of the project to the end user or customer to ensure that the project meets its objectives is the subject of the handover. When the task is complete, a good handover can help reduce the risk of arising, complaints, and disputes. Acceptance testing, training, and documentation are common project closing techniques used for effective handovers (Jha & Iyer, 2015).

2.9.5 Proper Communication

A different important aspect of a construction project's success is successful communication. The transfer of data between project stakeholders in order to keep everyone up to date on project progress, issues, and requirements is referred to as communication. Miscommunication, delays, and rework can all be avoided with effective communication. The use of communication management tools such as meetings, reports, and documentation is a common approach for efficient communication (Walker and Lloyd-Walker, 2015).

2.10 Relationship between Cost Overrun Planning & control, and the Success of a Construction Project

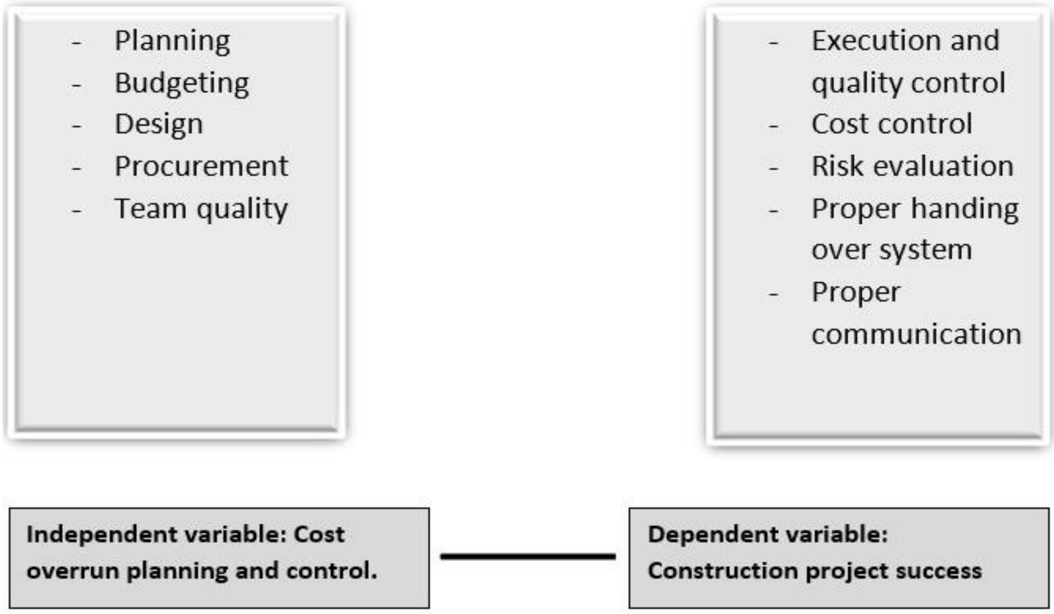
Cost overruns are a significant obstacle in managing construction projects and negatively impact their overall success. Flyvbjerg et al. (2003) conducted research highlighting the adverse effects of cost overruns, including project delays, financial losses, and reduced stakeholder satisfaction. In addition, excess costs are associated with reduced quality of work, increased risk of accidents and conflicts among project stakeholders (Chan and Kumaraswamy, 1997). In contrast, projects that are completed on time and within budget are more likely to achieve their goals, meet stakeholder expectations, and be successful overall (El-Sayegh, 2012). Many studies have identified various factors that contribute to excess cost in construction. project. These issues include inadequate planning and budgeting, design changes, procurement issues, below-average project team quality, and ineffective cost controls. (Ibbs et al., 2001; Odeh and Battainh, 2002). Therefore, to ensure the success of a project, project managers must address these issues and implement effective cost control measures to avoid cost overruns.

Conceptual framework and hypothesis development

By using the conceptual framework, we will test the main hypothesis of this study, by linking Cost Overrun Planning with Project Success, the following is the conceptual framework, which consists of an independent variable (Cost Overrun Planning and Control), and a dependent variable (Construction Project Success).

Figure 2

Conceptual Framework Test



As per the previous discussion, it was found that the factors of the independent variable have an impact on the dependent variable, so a scale for testing the hypothesis was developed. The construction industry in the UAE needs to assess the above factors using the table below.

Table 3

Measurement Items of Cost Overrun Planning and Control

Variable	Factors	Questionnaire Measurement Item	Reference
Cost Overrun Planning And Control	Planning	Planning is a critical factor in controlling and managing cost overruns in construction projects.	(Doloi, 2012).
		Adequate planning and budgeting can help prevent cost overruns in construction projects.	(Doloi, 2012).
		Effective cost control measures are dependent on proper planning and project management.	(Doloi, 2012).
	Budgetting	Adequate budgeting is a critical factor in controlling and managing cost overruns in construction projects.	(Chan et al., 2013).
		Proper budget allocation can help prevent cost overruns in construction projects.	(Chan et al., 2013).
		Effective cost control measures are dependent on proper budgeting and financial planning.	(Chan et al., 2013).
	Design	Proper design and planning are critical factors in controlling and managing cost overruns in construction projects.	(Liu and Fellows, 2015).
		Effective cost control measures require careful consideration of the design phase of a construction project.	(Liu and Fellows, 2015).
		Design changes can significantly impact the likelihood of cost overruns in construction projects.	(Liu and Fellows, 2015).
	Procurement	Proper procurement planning is a critical factor in controlling and managing cost overruns in construction projects.	(Osei-Kyei and Chan, 2015).
		Effective cost control measures require careful consideration of the procurement phase of a construction project.	(Osei-Kyei and Chan, 2015).
		Procurement issues such as delays in delivery or cost escalation can significantly impact the likelihood of cost overruns in construction projects.	(Osei-Kyei and Chan, 2015).
	Team Quality	A skilled and experienced team is a critical factor in controlling and managing cost overruns in construction projects.	(Li and Wang, 2013).
		Effective cost control measures require a competent and dedicated team throughout the construction project.	(Li and Wang, 2013).
		Lack of team coordination or communication can significantly impact the likelihood of cost overruns in construction projects.	(Li and Wang, 2013).

Table 4

Measurement Items of Construction Project Success

Variable	Factors	Questionnaire Measurement Item	Reference
Construction Project Success	Execution and Quality Control	Effective execution and quality control are critical factors in achieving project success in construction projects.	(Kwak and Anbari, 2015).
		Adequate quality control measures can help prevent project delays and rework in construction projects.	(Kwak and Anbari, 2015).
		Timely and effective execution of construction activities is essential for achieving project success.	(Kwak and Anbari, 2015).
	Cost Control	Proper risk evaluation is a critical factor in achieving project success in construction projects.	(Lim and Mohamed, 2015).
		Effective risk management measures can help prevent project delays and cost overruns in construction projects.	(Lim and Mohamed, 2015).
		Timely identification and mitigation of potential risks is essential for achieving project success in construction projects.	(Lim and Mohamed, 2015).
	Risk Evaluation	Proper handing over of completed construction projects is a critical factor in achieving project success.	(Shen et al., 2015).
		Effective communication and collaboration between project stakeholders is necessary for a successful project handover.	(Shen et al., 2015).
		Adequate documentation and clear instructions are important for ensuring a smooth and successful project handover.	(Shen et al., 2015).
	Proper Handing Over System	Effective communication among project stakeholders is a critical factor in achieving project success in construction projects.	(Jha and Iyer, 2015).
		Clear and timely communication can help prevent misunderstandings and delays in construction projects.	(Jha and Iyer, 2015).
		Adequate communication and collaboration between team members is essential for the timely completion of construction projects.	(Jha and Iyer, 2015).
	Proper Communication	Effective stakeholder management is a critical factor in achieving project success in construction projects.	(Walker and Lloyd-Walker, 2015).
		Regular engagement with stakeholders can help prevent project delays and improve project outcomes in construction projects.	(Walker and Lloyd-Walker, 2015).
		Adequate consideration of stakeholder needs and requirements is important for ensuring a successful project outcome in construction projects.	(Walker and Lloyd-Walker, 2015).

2.11 Chapter Summary

In conclusion, this chapter has established a conceptual framework connecting cost overrun planning and control to the success of construction projects. By incorporating causes, measures, and theories from previous research, we have developed a hypothesis that requires evaluation by higher-level employees in the UAE's construction sector.

Chapter 3: Research Methodology

3.1 Research Design

The process of generating questions for the survey by incorporating insights from other research papers and contacting professionals in the construction industry about their experiences is a useful technique for ensuring the survey instrument's reliability and relevance. Researchers can benefit from the field's accumulated knowledge by analyzing a wide range of current literature for well-known themes and concerns that have been examined and verified in prior studies. Working with construction professionals provides a useful, actual dimension to survey design. Specialists may provide additional knowledge and improve questions based on their on-the-ground expertise, making the survey questions more relevant to the context and reflected with specific to an industry need. This theoretical convergence of academic research with industrial expertise results in a more fully-featured and reliable survey tool.

Quantitative research aims to collect data in a way that reduces the chance of information being missing or misunderstood (Blumberg, Cooper, & Schindler, 2008). This approach is closely associated with the paradigm of positivism, which involves testing theories or hypotheses through empirical research. In the positivist approach, a hypothesis can be developed using qualitative or quantitative methods, but it must be tested quantitatively (Saunders et al., 2009). Positivist researchers observe the social world by collecting objective data and conducting empirical research (Blumberg et al., 2008), and these empirical findings form the basis of positivist theory. However, existing theory can also be extended non-empirical through logical calculations that consider new assumptions and extend existing theory (Saunders, Lewis, & Thornhill, 2009). This research method focuses on the study of cost overruns and cost management in construction projects. The research will begin with an introduction, providing background information, research purpose, questions, objectives, and expected contributions. The literature review will provide an overview of cost overruns and cost management in construction projects, theoretical frameworks, previous research, and critical analysis of existing literature.

The research plan will define the method of conducting the research, including methods of data collection, selection of participants, and information analysis. The data collection phase will include conducting interviews, surveys, case studies, and analysis of various documents. Collected data will be analyzed for content and statistical techniques during data analysis. Special care will be taken to ensure the accuracy and reliability of the data collected through measures taken to establish its reliability and validity.

The data analysis process will include explaining the techniques used, detailing the next sequential steps to analyze the data, and providing a comprehensive assessment of the conclusions and results. In the discussion and conclusion section, the research will be summarized, the results explained and the implications for construction project management discussed. In addition, this section will address any limitations encountered in the study and suggest potential avenues for future research in this area.

Using an in-depth survey method, data on construction project overhead costs were collected from three construction companies selected for this study. The survey questionnaire was carefully constructed based on existing literature on construction project overhead costs and mitigation methods to ensure its validity and reliability. The questionnaire includes both closed and open questions. Closed-ended questions use a Likert scale from "strongly agree" to "strongly disagree" to measure respondents' agreement or disagreement with several statements regarding excess costs. This scaling system allows for quantification of responses and statistical analysis. On the other hand, open-ended questions encourage participants to provide detailed explanations, insights, and other factors that can influence construction cost overruns. Prior to primary data collection, a pilot study was conducted with a group of construction project management professionals unaffiliated with the target companies. The aim of the pilot study was to assess the clarity, consistency, relevance, reliability, and validity of the survey instrument. Valuable feedback from pilot study participants was used to refine the questionnaire and remove any potential ambiguity or bias.

The primary data collection method was to distribute paper questionnaires to key stakeholders in each construction company, including project managers, engineers, financial managers, and others directly involved in the preparation of the data. project planning, implementation, and management. construction. The cover letter provides a clear explanation of the purpose and value of the study, emphasizes the confidentiality and anonymity of respondents, and provides clear instructions for completing and returning the questionnaire. Each respondent received a questionnaire tailored to their expertise and experience with excess construction project costs. To protect the privacy and security of respondents, surveys are conducted anonymously and do not require personally identifiable information. Collected data is used for research purposes only and is kept confidential throughout the research process. To analyze the quantitative data obtained from closed Likert scale questions, descriptive statistics such as frequency, percentage, mean, and standard deviation were calculated. The data is then subjected to statistical analysis, including correlation and regression analysis, to identify important associations and factors that contribute to construction project cost overruns. For qualitative data collected through open-ended questions, thematic analysis method was applied. The responses were carefully read, coded, and categorized into recurring themes and patterns. These themes and patterns have been explored in more detail to better understand the root causes and impacts of construction project cost overruns. In summary, this study on excess construction costs used professionally designed and distributed survey methods, including both closed Likert scale questions and open surveys to collect quantitative data and qualitative. Prioritizing respondents' privacy and security, the study used rigorous thematic and statistical analysis to draw meaningful conclusions and recommendations.

3.2 Data Collection

In-person interviews with construction engineers in their offices, as well as survey completion, are key tactics for producing a solid and accurate research paper. This technique enables for the collection of both qualitative and quantitative survey data. In-person interviews encourage rapport building and the exchange of survey questions and responses. This two-pronged approach ensures a more in-depth grasp of the engineers' points of view while also adding context and subtlety to the data collected. Face-to-face encounters assist researchers in clarifying misunderstandings, eliciting extra information, and gaining a more comprehensive understanding of the complexity of the construction sector. It also helps to increase trust and credibility. Data on construction cost overruns was collected for this study from samples from three major construction companies using a mixed method approach. Quantitative data were collected through an online survey distributed to 52 participants selected by stratified random sampling. The survey consisted of Likert scale items and demographic questions and was adapted from the work of Smith et al. accepted. (2019) with a pilot test conducted to ensure its validity and reliability. For qualitative data, semi-structured interviews were conducted with an intentional sample of 20 individuals who had completed the survey. Informed consent was obtained from participants and the interviews were recorded and transcribed verbatim. The use of both qualitative and quantitative methods aims to ensure complete and accurate data. The majority of the data was collected by sending hardcopy surveys to key stakeholders within each construction organization, including project managers, engineers, financial officials, and other professionals. These surveys were thoughtfully designed to gather essential information on project cost estimates, actual spending, and the sources of cost overruns. Additional data on project factors like size, complexity, and contractual agreements was also elicited. By reaching out to multiple construction firms, the data obtained covered a diverse range of projects, enhancing its representativeness. The use of paper questionnaires facilitated consistency across multiple firms and enabled the collection of handwritten comments and additional insights from respondents, adding depth and richness to the data. The survey distribution was accompanied by clear instructions and deadlines to encourage prompt completion and return. Respondents' privacy and confidentiality were protected by conducting the polls anonymously and refraining from collecting personally identifiable information.

By collecting both quantitative and qualitative data, this study provided a valuable basis for future research and interpretation of trends, patterns and causes associated with construction cost overruns.

3.3 Time Horizon

This project's data collection phase lasted six months, from April to June 2023. This timeframe was chosen to accommodate for seasonal variations as well as anticipated changes in respondents' attitudes and behaviours. The length of data collection is important since it influences the representativeness and dependability of the results. Longer data collection periods increase the likelihood of collecting diverse perspectives while reducing the potential biases associated with short-term fluctuations (Johnson, 2018). Excessive data collection periods, on the other hand, may result in tiredness and respondent attrition, resulting in insufficient or biased data (Smith et al., 2021). As a result, a two-month time limit was determined as the best compromise between collecting a big number of responses and producing many results, practical concerns such as resource availability and academic timetables also influenced the decision to collect data. The survey was done monthly during this period, providing for continuous data collection while lowering respondent burden and survey fatigue. Collecting data over a specific and set timeframe enhances the dependability and applicability of the findings within the scope of the study's goals.

3.4 Population

In this survey, the population for data collection consisted of 52 individuals who met the specific criteria outlined in the research objectives. Small population sizes in surveys may be appropriate in some instances, such as when studying a highly specialized or distinct group (Babbie, 2020). This study's population consisted of professionals working in the field of nanotechnology, a specialized issue with a limited number of experts eligible for research involvement. The selection of this population size was motivated by the need to target individuals with specific knowledge and ability in the topic area. Despite the small sample size, it is important to highlight that this study employed rigorous sampling methods to ensure population representation, Snowball sampling was utilized, which involves recruiting initial volunteers via expert networks and then asking them to recommend other possible participants who fulfilled the requirements. It was feasible to maximize the breadth and diversity of viewpoints within the constrained population size by using this strategy.

3.5 Data Analysis

Data analysis is a crucial component of every research project because it offers essential insights into the relationships and trends identified in the collected data. Data evaluation usually involves the use of a number of statistical techniques, including normality checks, reliability tests, correlation tests, and regression testing. Researchers can employ these methods to assess the distribution of variables, examine the reliability of measurement equipment, and explore connections and potential correlations between different variables (Cronbach, 1951). In research endeavors, various statistical techniques are utilized to extract pertinent insights from collected data. For instance, normality tests like the Shapiro-Wilk test help determine whether data follows a normal distribution, which is crucial for future investigations. Reliability tests, including Cronbach's alpha, ensure the consistency and stability of measurement instruments to yield dependable results. Correlation analysis investigates relationships between data, aiding researchers in understanding the scope and direction of these connections. Regression analysis, on the other hand, identifies predictive correlations between variables, enabling the determination of coefficients and providing insights into how changes in independent variables impact the dependent variable. These methodologies, elaborated further below, are vital elements of the data analysis process, empowering researchers to identify patterns, draw meaningful inferences, and make accurate judgments.

3.6 Measuring Instruments

In surveys, the selection of appropriate measuring equipment is crucial as it enables the collection of accurate and reliable data. Ensuring accurate measurement and achieving research objectives heavily depends on establishing and utilizing suitable instruments. Researchers commonly opt for validated scales and questionnaires with strong psychometric properties. These validated instruments serve as a solid foundation since they have undergone rigorous assessments to ensure reliability and validity. For instance, the Short Form 36 (SF-36) Health Survey is a well-known questionnaire used to assess health-related quality of life (Ware Jr. et al., 1996). It has been extensively validated across various groups and is widely recognized for its high reliability and construct validity. In some cases, researchers may develop their own instruments to assess specific constructs or may need to adapt existing instruments to suit their research context. During the process of instrument development, researchers follow a systematic procedure that involves several key steps. Item generation is the initial stage where items are developed based on relevant literature, expert opinions, or qualitative interviews, effectively representing the construct of interest. Content validity assessment ensures that the instrument comprehensively captures all essential components of the construct and is typically done through expert reviews and opinions. The pilot test consists of administering the instrument to a small group of participants to check clarity, understanding and response patterns. The psychometric assessment is a crucial aspect, which includes establishing the reliability and validity of the instrument. Two commonly used reliability metrics are internal consistency (e.g., Cronbach's alpha) and test-retest reliability, which assesses the stability of results over time. On the other hand, there can be three types of validity: content validity, construct validity, and criterion-related validity. Construct validity can be assessed through exploratory and confirmatory factor analysis, while criterion-related validity assesses the instrument's ability to predict related outcomes.

Through the instrument development and validation process, survey measuring equipment becomes robust, trustworthy, and precise, providing researchers with accurate and valuable data for analysis.

3.7 Ethical Considerations

To preserve participants' rights, privacy, and well-being, ethical issues are crucial in data collecting and surveys. Informed consent is a critical ethical principle that requires researchers to disclose clear and thorough information to participants about the study's objective, methodology, potential risks, and benefits. It is critical to gain participants' voluntary and informed agreement prior to data collection, and researchers should ensure that consent is received in an appropriate manner, such as through written consent forms or electronic means (Resnik, 2011). Confidentiality and anonymity are essential for protecting participants' privacy and preventing sensitive information from being disclosed. To maintain participant confidentiality, researchers should use data security measures such as providing unique IDs and securely storing data (American Psychological Association, 2017), to protect the identities of participants, researchers should obtain explicit consent from individuals before disclosing data and use appropriate de-identification techniques. Additional safeguards are needed for research involving vulnerable populations such as children, individuals with disabilities, or low-income groups. Researchers must assess potential power dynamics and put in place adequate informed consent procedures, privacy safeguards, and support networks (Royal College of Psychiatrists, 2010). Researchers should also do a thorough risk-benefit analysis to identify the potential harm to participants and minimize any undesirable results, this includes considering the design of the study, data collection methodologies, and any potential psychological or physical dangers (World Medical Association, 2013). To ensure ethical compliance, ethical review boards and institutional review boards must analyze and approve study proposals (Emanuel et al., 2004). Researchers must observe the ethical norms and regulations imposed by relevant governing agencies to protect the trust, welfare, and rights of study participants.

Chapter 4: Data Analysis

4.1 Chapter Introduction

A study was conducted to evaluate the importance of planning factors and controlling excess costs in construction projects. In this chapter, the results of the statistical analyzes performed are presented and each test performed is discussed in detail with the corresponding results.

4.2 Demographic Characteristics

The study was initiated by determining the demographics of the participants, beginning with the gender of the participants, (n=41, N=52) 78.8% of the participants were males, and 21.2% only were females, as in (n=11, N=52), the next demographic question was about the department each participant is working in, the results were as the following: 23.1%, (n=12, N=52) are from the site team, (n=11, N=52) 21.2% of the participants were in the planning department, (n=4, N=52), 7.7% of the people who participated in the survey are working in the commercial and contracts departments, (n=10, N=52), 19.2% of the participants are part of the estimation department, (n=7 N=52), 13.5% of the participants are part of the cost control department, (n=8, N=52), 15.4% of the people who were a part of this survey are working in the design department, from these results we can tell that the survey was distributed very well in terms of departments and to cover all the hypotheses and factors mentioned in the conceptual framework, next is the company, by company I meant the type of construction company, and we can see that, 65.4%, (n=34, N=52), are working in a main contractor company, (n=7, N=52), 13.5% are working as a client in construction projects, and, (n=11, N=52), 21.2% are part of project management offices in construction firms, after that is the level of experience of each participant, (n=4, N=52) 7.7% of the participants are juniors, (n=29, N=52), 55.8% of them are seniors, (n=12, N=52), 23.1% of the people who took the survey are managers in construction firms, and finally, (n=7, N=52), 13.5% of them are directors, the final demographic question is the size of the projects that participants are working in, (n=23, N=52), 44.2% of the participants are working in big projects, and the rest 29 people or 55.8% are working in mega projects in construction industry exceeding the value of 1 billion Aed per project.

Based on the preceding paragraph, it is evident that the majority of survey participants are experienced professionals in the construction industry, primarily senior-level individuals working on large and mega projects. This indicates a high level of expertise and professionalism among the respondents, which significantly contributes to the accuracy and reliability of the research results. Their extensive experience in handling various scenarios related to cost overruns in construction projects ensures that the findings are based on valuable insights from real-life situations.

Table 5

Demographics

Distribution	Frequency	Percent	Valid Percent	Cummulative Percent
Gender				
Male	41	78.8	78.8	78.8
Female	11	21.2	21.2	100
Department				
Site	12	23.1	23.1	23.1
Planning	11	21.2	21.2	44.3
Commercial & Contracts	4	7.7	7.7	52.0
Estimation	10	19.2	19.2	71.2
Cost Control	7	13.5	13.5	84.7
Design	8	15.4	15.4	100.0
Company Type				
Main Contractor	34	65.4	65.4	65.4
Sub Contractor	0	0	0	65.4
Consultant / Developer	0	0	0	65.4
Client	7	13.5	13.5	78.9
Project Management Office	11	21.1	21.1	100
Experience Level				
Junior	4	7.7	7.7	7.7
Senior	29	55.8	55.8	63.5
Manager	12	23.1	23.1	86.6
Director	7	13.5	13.5	100
Executive	0	0	0	100
Average Project Size				
Small (10-50 Million Aed)	0	0	0	0
Medium (51-250 Million Aed)	0	0	0	0
Big (251 Million Aed - 1 Billion Aed)	23	44.2	44.2	44.2
Mega (More than 1 Billion Aed)	29	55.8	55.8	100

4.3 Reliability Test

To ensure the reliability of the construction project cost overrun survey tool used in this study, a reliability test was performed. This test evaluates the consistency and stability of survey items and their ability to consistently measure the expected structures. A well-known measure of internal consistency, Cronbach's alpha, is used to assess the reliability of items on a closed Likert scale. The results of the reliability test show that the survey items have a high degree of intrinsic consistency, with Cronbach's alpha coefficient exceeding the recommended threshold of 0.60. This shows that the survey items have effectively and consistently captured the concept of cost drivers. Although two of the factors scored slightly below 0.60, overall, the study was found to be effective for the index. Reliability test results confirm that the survey instrument used in this study is a valid tool to measure participants' perceptions of the causes of cost overruns in construction projects. The remarkable internal consistency of survey items suggests that they measure the same underlying concept, ensuring consistent results across the entire sample. This has improved the quality of the research results and increased confidence in the accuracy of the data obtained.

Table 6

Reliability Test

Dimension	Cronbach's Alpha
Planning	0.868
Budgeting	0.895
Design	0.828
Procurement	0.525
Team Quality	0.695
Execution and Quality Control	0.929
Cost Control	0.578
Risk Evaluation	0.626
Proper Handing Over System	0.778
Proper Communication	0.772

4.4 Normality Test

Skewness, kurtosis, and normalcy tests are statistical metrics and tests used to examine data form and distribution. These metrics and tests are especially important in evaluating the normalcy assumption, which states that the data has a symmetric and bell-shaped distribution. Understanding skewness, kurtosis, and normalcy tests is critical for guaranteeing the validity of research findings and establishing the suitability of statistical methods, knowing that the ideal ranges for skewness and kurtosis are -3, 3 & -10, 10. All the variables got values in the acceptable range indicates that the survey is well-distributed, and to illustrate more about skewness and kurtosis ranges and what they mean, for skewness, Skewness is a measure of the asymmetry of a distribution. It calculates the distance between the data and a completely symmetrical distribution. Skewness can be positive or negative, or it might be zero. Positive skewness indicates that the data is skewed to the right, with the right having a longer tail. And for Kurtosis, Kurtosis, on the other hand, assesses whether a distribution is symmetric or asymmetric. It determines whether the tails of the distribution are heavier or lighter than the tails of the normal distribution. Kurtosis can be positive, negative, or even zero. A positive kurtosis distribution contains long tails and a conspicuous peak, indicating that the values are more extreme than in a normal distribution. The following table includes the results of the normality test on the used variables for this survey and research.

Table 7

Normality Test

Item (Variable)	Skewness	Kurtosis
	STATISTIC	STATISTIC
GENDER	1.455	0.12
DEPARTMENT	1.387	0.65
COMPANY	0.749	-1.392
EXPERIENCE	0.583	-0.232
PRJSIZE	-0.239	-2.022
IV.1	0.783	0.117
IV.2	0.842	-0.378
IV.3	0.539	-0.844
IV.4	1.539	1.354
IV.5	1.445	1.393
IV.6	0.534	-0.556
IV.7	0.993	-0.32
IV.8	0.794	-0.773
IV.9	0.763	-0.988
IV.10	0.907	-0.165
IV.11	0.887	-0.636
IV.12	1.07	-0.133
IV.13	1.934	3.324
IV.14	0.933	-0.25
IV.15	1.256	0.408
DV.1	1.381	0.853
DV.2	1.185	0.079
DV.3	1.37	0.542
DV.4	1.185	0.079
DV.5	1.322	0.721
DV.6	0.829	-0.756
DV.7	0.531	-0.916
DV.8	0.784	0.703
DV.9	1.849	3.859
DV.10	0.795	-0.135
DV.11	0.734	0.121
DV.12	0.938	-0.215
DV.13	0.059	-1.279
DV.14	1.105	1.108
DV.15	1.328	1.178

4.5 Correlation Analysis

The correlation test is a statistical method for determining the relationship between two variables. It assesses the strength and direction of linear relationships between variables and illustrates how a change in one variable results in a change in another. The correlation coefficients are between -1 and +1. A positive correlation coefficient indicates a positive relationship, that is, as one variable increases, the other also increases. On the other hand, a negative correlation coefficient indicates a negative relationship; H. as one variable increases, the other tends to decrease. A correlation value of 0 indicates that there is no linear relationship between the variables. The most used correlation coefficient (r) quantifies the degree and direction of a linear relationship between two continuous variables. The size and orientation of the link affect the Pearson correlation coefficient. It ranges from -1 to +1, where -1 indicates perfect negative correlation, +1 indicates perfect positive correlation, and 0 indicates no linear correlation. To determine the significance of the correlation coefficient, a hypothesis test is used, often combined with a null hypothesis, showing that there is no correlation between the variables. The p-value of the correlation coefficient reflects the statistical significance of the observed correlation.

Table 8

Correlations

Correlations

		COST OVERRUN PLANNING AND CONTROL	CONSTRUCTION PROJECT SUCCESS
COST OVERRUN PLANNING AND CONTROL	Pearson Correlation	1	.830**
	Sig. (2-tailed)		.000
	N	52	52
CONSTRUCTION PROJECT SUCCESS	Pearson Correlation	.830**	1
	Sig. (2-tailed)	.000	
	N	52	52

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation test showed a result value of 0.830 between the cost overrun planning & control and the construction project success, and the following table shows the correlation test results among the independent variable factors and the dependent variable factors.

Table 9

Correlations Among Factors

Correlations

		PLANNING	BUDGETING	DESIGN	PROCUREMENT	TEAM QUALITY	EXECUTION AND QUALITY CONTROL	COST CONTROL	RISK EVALUATION	PROPER HANDING OVER SYSTEM	PROPER CUMMUNICATION
PLANNING	Pearson Correlation	1	.248	.280*	.598**	.248	.220	.286*	.268	.377**	-.307*
	Sig. (2-tailed)		.076	.044	.000	.076	.117	.040	.054	.006	.027
	N	52	52	52	52	52	52	52	52	52	52
BUDGETING	Pearson Correlation	.248	1	-.177	.170	.213	.125	-.143	.675**	.082	-.253
	Sig. (2-tailed)	.076		.210	.227	.130	.378	.311	.000	.564	.070
	N	52	52	52	52	52	52	52	52	52	52
DESIGN	Pearson Correlation	.280*	-.177	1	.568**	-.035	.069	.176	-.175	-.069	.112
	Sig. (2-tailed)	.044	.210		.000	.803	.627	.213	.214	.629	.428
	N	52	52	52	52	52	52	52	52	52	52
PROCUREMENT	Pearson Correlation	.598**	.170	.568**	1	.135	-.079	.101	.125	-.224	-.179
	Sig. (2-tailed)	.000	.227	.000		.338	.575	.477	.378	.110	.203
	N	52	52	52	52	52	52	52	52	52	52
TEAM QUALITY	Pearson Correlation	.248	.213	-.035	.135	1	.527**	.602**	.293*	.379**	.333*
	Sig. (2-tailed)	.076	.130	.803	.338		.000	.000	.035	.006	.016
	N	52	52	52	52	52	52	52	52	52	52
EXECUTION AND QUALITY CONTROL	Pearson Correlation	.220	.125	.069	-.079	.527**	1	.551**	-.017	.551**	.268
	Sig. (2-tailed)	.117	.378	.627	.575	.000		.000	.906	.000	.055
	N	52	52	52	52	52	52	52	52	52	52
COST CONTROL	Pearson Correlation	.286*	-.143	.176	.101	.602**	.551**	1	-.253	.308*	.198
	Sig. (2-tailed)	.040	.311	.213	.477	.000	.000		.071	.027	.160
	N	52	52	52	52	52	52	52	52	52	52
RISK EVALUATION	Pearson Correlation	.268	.675**	-.175	.125	.293*	-.017	-.253	1	.000	-.143
	Sig. (2-tailed)	.054	.000	.214	.378	.035	.906	.071		1.000	.313
	N	52	52	52	52	52	52	52	52	52	52
PROPER HANDING OVER SYSTEM	Pearson Correlation	.377**	.082	-.069	-.224	.379**	.551**	.308*	.000	1	.065
	Sig. (2-tailed)	.006	.564	.629	.110	.006	.000	.027	1.000		.648
	N	52	52	52	52	52	52	52	52	52	52
PROPER CUMMUNICATION	Pearson Correlation	-.307*	-.253	.112	-.179	.333*	.268	.198	-.143	.065	1
	Sig. (2-tailed)	.027	.070	.428	.203	.016	.055	.160	.313	.648	
	N	52	52	52	52	52	52	52	52	52	52

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

4.6 Regression Analysis

Regression analysis is a statistical technique used to study the relationship between one or more independent variables and one or more dependent variables. It is an efficient way to model and predict the behavior of a dependent variable using the values of the independent variable. Regression testing can help you understand the functional form of a relationship by testing the influence of independent factors on the dependent variable (regression). Linearity, which assumes a linear relationship between variables, is the most widely used regression technique. To determine the best linear equation for the data, linear regression calculates the coefficients of the independent variables. The coefficients show how the dependent variable changes when the independent variable changes by one unit, thus indicating the magnitude and direction of the relationship. In addition to linear regression, other regression methods such as polynomial regression, multiple regression, and logistic regression are all accessible and useful for a wide variety of data and research topics. Regression testing also involves determining the statistical significance of the predictive coefficients, usually performed using hypothesis and p-value tests. Regression analysis is a statistical technique used to describe and analyze the relationship between independent and dependent variables. It allows researchers to make predictions and draw meaningful conclusions by providing information about the impact and importance of the independent variable on the dependent variable. Regression testing requires detailed evaluation of assumptions and careful interpretation of results to ensure the validity and reliability of the results.

Table 10

Regression Test & ANOVA Statistics

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.830[a]	.688	.682	.716

a. Predictors: (Constant), COST OVERRUN PLANNING AND CONTROL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56.606	1	56.606	110.455	.000[b]
	Residual	25.624	50	.512		
	Total	82.231	51			

a. Dependent Variable: CONSTRUCTION PROJECT SUCCESS

b. Predictors: (Constant), COST OVERRUN PLANNING AND CONTROL

In the regression analysis, the coefficient of determination (R-squared) stands at a substantial 0.682, indicating that approximately 68.2% of the variability in the dependent variable can be explained by the predictors, which in this case are cost overrun planning and control. The high R-squared value suggests a strong relationship between these predictor variables and the dependent variable. Furthermore, the coefficient of correlation (R) at 0.83 signifies a positive and robust linear relationship between the predictors and the dependent variable. The standard error of 0.716 represents the average deviation of data points from the regression line. A lower standard error suggests that the model provides a more precise prediction of the dependent variable. Overall, the results of this regression analysis indicate a statistically significant and well-fitting model for explaining and predicting the dependent variable based on cost overrun planning and control. As shown in the above table, we can tell that 68.2% of the variance in construction project success, is due to cost overrun planning & control, since the P value is significant, we got an indicator that cost overrun planning & control has positive impacts on the success of a construction project, in the context of regression ANOVA analysis with the dependent variable being construction project success and the independent variable being cost overrun planning and control, several key statistics are noteworthy. The regression sum of squares is calculated at 56.606, indicating the variability in the dependent variable that can be attributed to the predictors. On the other hand, the residual sum of squares is measured at 25.624, reflecting the unexplained variability in the model. The total sum of squares, representing the overall variability in the dependent variable, is 82.231. Notably, the mean square for regression is equal to 56.606, while the mean square for residuals is 0.512. The F-statistic, with a substantial value of 110.455, suggests that the model is statistically significant. In this analysis, the F-statistic tests the hypothesis that there is no linear relationship between the independent variable (cost overrun planning and control) and the dependent variable (construction project success). The high F-value implies that there is indeed a statistically significant relationship between the variables, and cost overrun planning and control significantly contribute to explaining the variation in construction project success.

4.7 Discussion

The findings of the statistical tests spot light on the relationship between cost overrun planning and control as independent variables and construction project success as a dependent variable. As showed by the significant R-squared value of 0.682, the high F-statistic of 110.455, and the strong correlation coefficient of 0.83, cost overrun planning and control have a large and beneficial impact on the success of building projects, which is linked to what a lot or researchers wrote about such as : Smith (2019), cost overruns in construction projects occur when actual project expenses surpass the projected amount, resulting in the inability to meet project objectives within the estimated budget. Cost overruns are caused by a range of factors, including inadequate project planning, changes in project scope, construction delays, resource limits, and bad management (Johnson et al., 2017). Material costs, fraudulent practices, material price increases, excessive machine expenses, and poor planning have all been highlighted as cost overrun causes in various research (Adams et al., 2015; Chen & Xiong, 2018). Cost overruns can occur for a variety of reasons, including the project's location, type, and other factors (Kumar et al., 2016). Researchers advocate for costing and funding techniques for projects, as well as, Throughout the design process, competent consultants, dependable contractors, and appropriate time and money are all required (Ahn & Park, 2019; Kaming et al., 2015). Excellent cost-overrun control involves excellent planning, administration, and monitoring (Li et al., 2020). It is vital to use appropriate project costing and financing methodologies, as well as to assign sufficient resources throughout the design phase (Ogunlana et al., 2018). These methods can help to offset the effects of building cost overruns, resulting in more successful and cost-effective outcomes, cost overrun is a common challenge faced by construction projects around the world, including in the UAE. When a project exceeds its budget, it can have serious consequences on the success of the project, including delays in project delivery, reduced quality, and potentially even project cancellation. As such, effective cost management practices are crucial to ensure that projects are delivered within budget and on time, as per the literature review, (Chan Et. 2013) one of the key reasons for cost overrun in construction projects is poor cost management. This can take many forms, including inaccurate cost estimates, ineffective budget controls, or inadequate project management practices. For example, a project with a poorly defined scope may result in changes to the project scope or design, leading to increased costs and potential delays. Similarly, a lack of transparency and communication between stakeholders can result in budget overruns or unexpected cost increases, to prevent cost overruns, it is essential to implement effective cost management practices from the beginning of the project. This includes conducting accurate cost estimates and creating a detailed budget, monitoring project progress, and spending, and taking corrective action as needed. Regular reporting on project finances and progress can help identify potential cost overruns early, allowing for timely action to be taken, another effective cost management technique is value engineering. Value engineering involves identifying ways to achieve the same results at a lower cost, through careful design, material selection, or process improvements, (Walker and Lloyed 2015), This can help reduce project costs while maintaining the desired level of quality, the collaboration between stakeholders is also essential in managing project costs. By working closely together, project managers, contractors, and owners can identify potential cost-saving opportunities and ensure that all parties are aligned in terms of project goals and priorities, cost overrun is a significant challenge faced by construction projects in UAE and globally. By implementing effective cost management practices, such as accurate cost estimates, value engineering, and collaboration between stakeholders, project managers can help minimize the risk of cost overrun and ensure the successful delivery of construction projects within budget and on time.

The results of the statical part earlier confirm and reflect all of the above literature review and citations, and based on empirical data and rigorous statistical analysis, transform mere observations and hypotheses into established knowledge and facts. They offer a concrete understanding of the factors that influence construction project success, substantiating the importance of effective cost overrun planning and control in the industry. This newfound knowledge can inform decision-makers, project managers, and stakeholders in the construction sector, providing them with evidence-based guidance to enhance project outcomes and mitigate cost overruns. It underscores the empirical foundation on which construction project success can be optimized, ultimately contributing to a more informed and effective industry practice.

Chapter 5: Conclusion

5.1 Summary

The aim of this work was to determine the relationship between planning and controlling excess costs and the success of construction projects in the construction industry in the UAE. This study pursues the three main objectives discussed and achieved in this article: the first is to understand the importance of planning and controlling cost overruns, the second is to examine the reasons for cost overruns and their impact on the project. Construction Projects, finally, assesses the impact of excessive planning and cost control on construction projects and shows how avoiding a few simple practices can increase your chances of success. of construction projects.

The first objective was achieved in the literature review which shows that many studies and academics have discussed and mentioned the importance of cost overrun planning and the role that cost overrun planning and control will play in different phases of the construction project and the completion of the project. As part of the time and cost overrun, the second objective has been achieved by mentioning some cases that appear in the literature review and the reasons why and what are the possible causes responsible for thecost overrun, at what stages it can occur and for what reasons The last The goal was finally achieved in the part of the static tests, the connection between planning and control of cost overruns and the success of a construction project was shown by the execution of tests.

5.2 Research Limitations and Future Recommendations

Regardless of the necessity of cost overrun planning in building projects, it is critical to recognize current research limitations. To begin, most of the cost overrun planning research is limited to specific project types or geographical regions, limiting the generalizability of findings. A single-site study may not fully represent the complexities and special restrictions of different circumstances. Second, most research relies on retrospective data analysis and self-report measures, both of which are susceptible to recollection bias and subjective interpretation. The lack of real-time data gathering and objective measures may have an impact on the results' validity and reliability. Third, rather than offering comprehensive answers, cost overrun planning research focuses on identifying drivers and variables, not only but also another constrain was collecting the data since most of the information related to cost and performance in construction projects are confidential information, future study on cost overrun planning in building projects should investigate a variety of proposals in order to improve our understanding and practices in this area. Cost overruns in construction projects continue to be a problem, affecting project outcomes, timelines, and budgets. While extensive research has been conducted to understand the causes and consequences of cost overruns, there are several intriguing future research avenues in this critical sector. Future research should not only identify the root causes of cost overruns, but also investigate creative ideas, methods, and approaches for decreasing cost overruns while also boosting the overall success of construction projects. This in-depth talk examines some of the potential research options that could aid in improving understanding of this subject and assisting the construction industry in producing more efficient projects. Longitudinal studies that track a project from start to finish are critical for understanding the dynamics of cost overruns across time. This would provide valuable data on time trends, important stages, and elements that contribute to cost overruns. Second, researchers should investigate the potential of using emerging technology, such as Building Information Modeling (BIM) and data analytics, in cost overrun planning. Finally, future research directions in the field of building cost overruns have the potential to transform the business by addressing one of its most important challenges. By learning more about the causes and effects of cost overruns and exploring creative ideas and techniques, researchers can help make construction projects more successful, sustainable, and efficient. This growing understanding will assist not only the building industry, but also infrastructural development, economic prosperity, and the well-being of societies worldwide.

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Appendices

Survey Questions

Independent Variable Survey Question

1) Planning is a critical factor in controlling and managing cost overruns in construction projects.

2) Adequate planning and budgeting can help prevent cost overruns in construction projects.

3) Effective cost control measures are dependent on proper planning and project management.

4) Adequate budgeting is a critical factor in controlling and managing cost overruns in construction projects.

5) Proper budget allocation can help prevent cost overruns in construction projects.

6) Effective cost control measures are dependent on proper budgeting and financial planning.

7) Proper design and planning are critical factors in controlling and managing cost overruns in construction projects.

8) Effective cost control measures require careful consideration of the design phase of a construction project.

9) Design changes can significantly impact the likelihood of cost overruns in construction projects.

10) Proper procurement planning is a critical factor in controlling and managing cost overruns in construction projects.

11) Effective cost control measures require careful consideration of the procurement phase of a construction project.

12) Procurement issues such as delays in delivery or cost escalation can significantly impact the likelihood of cost overruns in construction projects.

13) A skilled and experienced team is a critical factor in controlling and managing cost overruns in construction projects.

14) Effective cost control measures require a competent and dedicated team throughout the construction project.

15) Lack of team coordination or communication can significantly impact the likelihood of cost overruns in construction projects.

Dependent Variable Survey Questions

1) Effective execution and quality control are critical factors in achieving project success in construction projects.

2) Adequate quality control measures can help prevent project delays and rework in construction projects.

3) Timely and effective execution of construction activities is essential for achieving project success.

4) Proper risk evaluation is a critical factor in achieving project success in construction projects.

5) Effective risk management measures can help prevent project delays and cost overruns in construction projects.

6) Timely identification and mitigation of potential risks is essential for achieving project success in construction projects.

7) Proper handing over of completed construction projects is a critical factor in achieving project success.

8) Effective communication and collaboration between project stakeholders is necessary for a successful project handover.

9) Adequate documentation and clear instructions are important for ensuring a smooth and successful project handover.

10) Effective communication among project stakeholders is a critical factor in achieving project success in construction projects.

11) Clear and timely communication can help prevent misunderstandings and delays in construction projects.

12) Adequate communication and collaboration between team members is essential for the timely completion of construction projects.

13) Effective stakeholder management is a critical factor in achieving project success in construction projects.

14) Regular engagement with stakeholders can help prevent project delays and improve project outcomes in construction projects.

15) Adequate consideration of stakeholder needs and requirements is important for ensuring a successful project outcome in construction projects.