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# Mitigating Scope Creep in Egyptian Construction Projects: A Comprehensive Review of Causes, Impacts, and Prevention Strategies

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Abstract

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Scope creep has a significant impact on construction projects, often leading to delays, budget overruns, and reduced project quality. The main objective of this paper aims is to review, explore and integrate the key factors contributing to scope creep and its impacts on project outcomes. Hence, the most proactive and effective strategies which can be introduced to mitigate that impact. Some of these key factors such as inadequate project scope definition, unmanaged stakeholder communication, and changes in project requirements are identified as primary contributors to scope creep. These factors are illustrating that how poor planning, ineffective communication, and a lack of coordinated management efforts have significant adverse effects on project timelines, costs, and performance. Various strategies of scope creep, such as clear and detailed scope definition at the outset, early and ongoing involvement of stakeholders, and the implementation of rigorous change management processes throughout the project lifecycle have signific proactive strategies. By addressing the root causes of scope creep and improving communication and planning practices, these strategies aim to minimize its negative impacts on construction projects. This study is adding value to the project managers and construction professionals, by introducing practical recommendations to mitigate scope creep and improve project outcomes in the construction, particularly in Egypt.

Keywords: Scope creep, Construction projects, Change management, Mitigation strategies.

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# 1. Introduction

One of the elements that affects project success is scope creep, which is difficult to quantify or anticipate with current project management techniques (Mokashi, et al., 2018). Because of its potential to result in financial waste, a decline in customer satisfaction, and a sharp decline in the likelihood of achieving the project's anticipated value, it is also taken into account in risk management (Nabet, 2017). Scope creep is still an issue in building projects, even with the best efforts of

project management. Scope creep happens when a project's scope grows beyond its initial parameters, frequently as a result of unanticipated events, shifting project specifications, or stakeholder demands. For building projects, scope creep can have serious repercussions, such as quality compromise, cost overruns, and delays. According to (Project Management Institute, Inc., 2021), "scope creep" often refers to the uncontrolled growth of the scope of work to include a product or project without corresponding changes to time, cost, or resources. Every firm wants its projects to be successful, and it has been shown that the two key metrics that determine project success are client happiness and project quality (Mokashi, et al., 2018). Yet, projects have the tendency to fail, which is stated in multiple research reports studying projects' outcome. Scope creep refers to the changes that made to the project with one side is not aware of it or there is no agreement between the project parties upon it or the is no formal acceptance and review for its impacts (Amoatey, et al., 2017).

Scope creep is a change in scope that frequently begins with minor, seemingly unimportant modification requests that the project team accepts to appease the project sponsor. Eventually, these requests grow to be numerous and large. The phenomenon known as "scope creep," which is the gradual expansion of project work without formal acceptance or acknowledgement of their associated costs, schedule impacts, or other effects, is particularly common in construction projects and is always an unknown project risk. Managing scope creep is a very difficult task (Nabet, 2017). Despite this, it is reported that, even with alternative approaches to deal with such issues, cost and schedule overruns occurred in over half of building projects (Shehu, et al., 2014).

Conflicts don't just happen; they don't just happen overnight, and of course, no one is to blame. Projects are highstakes, time-bound endeavors that are unpredictable, and they can occasionally result in modifications, expenses, and conflicts. Scope creep was defined as the unchecked growth of a project's or product's scope without corresponding changes to time, cost, or resources (Project Management Institute, Inc., 2017). As a result, there was a need to create dispute risk management strategies, modify existing processes, and figure out how to prevent disagreements from becoming into contested issues. The elements that contribute to project scope creep have been identified in the literature; however, to the best of the researchers' knowledge, no prior study has examined how these factors affect construction projects and how to predict the magnitude of scope creep occurrence during the project. Furthermore, not much research has been done on failed projects to determine the reasons behind their failure, which necessitates further study in this field, particularly on the reasons behind project scope creep and how those reasons interact (Project Management Institute, 2017).

The effects of scope creep can be especially noticeable in Egypt, where building projects are essential to the nation's infrastructure advancement and economic growth (El-Sayegh, 2008). It might be difficult to establish precise project goals and efficiently manage project stakeholders because of the complexity of many building projects in Egypt. Furthermore, the issue may be made worse by the prevalence of informal interactions among stakeholders and the absence of established project management procedures (El-Gohary, 2014). Around 7.5% of Egypt's GDP in 2019 came from the country's construction sector, according to the World Bank (Bank, 2021). This is a noteworthy contribution that highlights how crucial the building industry is to Egypt's economy. Nonetheless, scope creep must be addressed, and good project management techniques must be used.

This review paper's objective is to methodically identify and examine the main causes of scope creep in construction projects, including ambiguous project requirements, poorly managed stakeholder communication, and modifications to project specifications. Additionally, the review aims to examine the impacts of scope creep on project timelines, costs, and overall success, exploring how these factors lead to delays and cost overruns. Furthermore, the paper seeks to review and evaluate various prevention strategies, including improved scope definition, stakeholder involvement, and effective change management. Ultimately, the goal is to provide a comprehensive overview of scope creep, offering insights that can help project managers and construction professionals mitigate its occurrence and minimize its effects on project outcomes.

# 2. Methodology

The methodology as illustrated in **Fig.1** begins with the identification of relevant literature, focusing on academic papers, reports, and other scholarly sources that discuss scope creep in construction and project management. Once the relevant literature is identified, key factors, impacts, and prevention strategies related to scope creep are extracted. This involves identifying the main causes of scope creep, its effects on projects—such as delays, cost overruns, and quality issues—and the proposed methods to prevent or mitigate it. The extracted data is then analyzed and categorized into themes, grouping common causes, impacts, and strategies for easier interpretation. Finally, the findings from the literature are synthesized into a cohesive analysis that highlights the major contributors to scope creep, its consequences, and effective prevention techniques. This structured methodology provides a comprehensive understanding of the phenomenon based solely on existing literature.

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Fig.1. Flow Chart of the Methodology

# 3. Literature review

### 3.1. Project and Project Management Overview

A project is described as a brief endeavor with a definite beginning and finish that is carried out to provide a special good, service, or outcome (Project Management Institute, Inc., 2021). The project's outcome includes deliverables, outputs, and artifacts but focuses more broadly on the benefits and value it aims to provide. A project is considered complete when its objectives have been achieved, or when it is terminated due to unachievable goals or the project's irrelevance (Project Management Institute, Inc., 2017). The APM BOK further describes a project as a unique and transient endeavor aimed at achieving a specific outcome (© Association for Project Management, 2012). Projects consist of coordinated activities, driven by clear objectives, that require a combination of time, human, and financial resources to succeed (Tonchia, 2018). To determine project success, project management must be taken seriously (Mokashi, et al., 2018). Effective project management involves several key components that, when properly managed, lead to the project's successful completion (Ajmal, et al., 2021). One of the critical aspects of this is managing the project scope, which ensures that the project's goals are met. PMBOK emphasizes the importance of balancing competing demands such as scope, time, cost, quality, resources, and risk (Project Management Institute, Inc., 2017). The APM BOK notes that project management drives change within an organization, addressing non-routine tasks. Both standards agree that following a structured, sequential process through the project life cycle—from initiation to closure—is essential for successful project outcomes.

### 3.2. Processes of project management

A process is defined as a continuous and specific series of actions aimed at achieving a particular result (Tonchia, 2018). Achieving project goals depends on the effective application of project management procedures. The Project Management Institute (PMI) states that project management involves systematic activities designed to produce specific outputs through various inputs (Project Management Institute, Inc., 2017). Construction megaprojects, due to their scale and stakeholder expectations, add complexity to these processes (Ershadi, et al., 2021). The APM body of knowledge divides project management into four sections: context, people, delivery, and interfaces. Context focuses on governance and organizational factors that affect success. People highlight the importance of interpersonal skills for project managers. Delivery covers essential areas such as scope, schedule, finance, risk, quality, and resource management. Finally, interfaces explore how project management interacts with other fields like accounting, human resources, law, and sustainability (© Association for Project Management, 2012). According to PMI, a project is managed through 49 processes divided into five "Process Groups": initiating, planning, executing, monitoring and controlling, and closing. The initiating group secures authorization to start the project, while the planning group sets the project scope, objectives, and the course of action. The executing group completes the planned work, and the monitoring and controlling group tracks progress, makes necessary adjustments, and implements changes. The closing group finalizes and formally closes the project or contract (Project Management Institute, Inc., 2017). Integration, scope, schedule, money, quality, resources, communications, risk, procurement, and stakeholder management are the ten domains into which the PMBOK divides project management expertise. Different 49 procedures are dispersed over different domains. Planning scope management, obtaining requirements, defining scope, creating a work breakdown structure (WBS), verifying scope, and controlling scope are the six main steps in scope management. Following approval of the project charter, scope

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management starts with an examination of the project's goals, presumptions, limitations, and specifications. This analysis is used to construct the requirements management and scope management plans (Project Management Institute, Inc., 2017). The "collect requirements" process identifies and documents stakeholder needs, forming the foundation for defining the project scope and ensuring requirements traceability. The "define scope" process creates a detailed description of the project, including boundaries, deliverables, and acceptance criteria. The project scope statement also includes exclusions to manage stakeholder expectations. The "create WBS" process breaks down project deliverables into smaller, manageable components using hierarchical decomposition. The approved scope statement, WBS, and WBS dictionary together form the "scope baseline," which can only be modified within official change control procedures. During project execution, scope changes may occur and are managed through the "validate scope" and "control scope" processes. "Validate scope" approves deliverables that meet acceptance criteria, while non-accepted items may require change requests. "Control scope" monitors the scope status and manages changes to the baseline. PMBOK and APM BOK offer different approaches to project management. PMI provides a structured process flow, while APM focuses on value creation and goal visualization. Both approaches can be combined to optimize project management practices.

### 3.3. Project scope and scope creep

The effort necessary to deliver a product, service, or outcome with particular features and functionalities is referred to as the project scope (Project Management Institute, Inc., 2021). Accurately defining the project scope during the planning phase is critical to prevent unexpected changes during execution, which can lead to cost overruns (Flyvbjerg, et al., 2018). Project managers collaborate with sponsors to align the project's objectives with broader organizational goals and ensure that scope-related tasks add value (Burek, 2006). Early in the project lifecycle, a project scope statement is created to define boundaries and communicate the scope to the team and stakeholders (Millhollan, 2008). Managing scope changes is a key responsibility of project managers. While scope changes are natural, they must be effectively controlled to avoid negatively impacting the project. A straightforward and understandable method for scope management is essential to ensure stakeholders are aligned. Scope definition and risk identification should occur early in the pre-project planning phase to mitigate potential risks (Gibson, et al., 2006). Scope changes can result from both internal factors, such as inadequate scope definition or stakeholder misalignment, and external factors like economic fluctuations, price changes, or market competition (Sharma, et al., 2006). Proper scope management helps to minimize these risks and ensures project success.

The project management triangle, or Triple Constraint, illustrates the balance between time, cost, and scope, showing how changes to one element affect the others. When the project scope is altered, it typically impacts either time or cost. In construction projects, scope changes are a primary driver of time and cost overruns, especially if they occur late in the process. Early design changes tend to have less impact on the overall project (Parasad, et al., 2018). The primary duty assigned to the project manager by the project board or sponsor is the scope, which reflects the desired outcomes of the project. The project board or sponsor plays a crucial role in outlining the project's goals and monitoring its advancement. They are in charge of making important choices about any modifications and making sure the project stays in line with the corporate goals (Dinsmore, et al., 2006). The sponsor regularly reviews the project with the project manager to ensure the scope is met, even when changes occur. This is typically done through stage gates or heartbeat reviews, which help confirm that the project continues to align with the organization's strategy. Stage gates, as defined by the project management body of knowledge, are review points at the end of a project phase where decisions are made to proceed, modify, or terminate the project (Project Management Institute, Inc., 2021).

Projects significantly influence decision-making, with the project manager primarily responsible for managing the defined scope (Millhollan, 2008). However, planners and managers often underestimate scope changes and complexity, leading to cost overruns (Flyvbjerg, et al., 2018). These overruns are frequently caused by poorly managed scope changes and a lack of proper change control, which can harm customer satisfaction and the perceived effectiveness of project managers (Millhollan, 2008). Proper planning, coordination, milestone setting, and change control are essential to managing uncertainty and preventing excessive changes (Atkinson, et al., 2006). The uncontrolled expansion of a project's scope without accompanying adjustments to the budget, timeline, or resources is referred to as "scope creep" (Project Management Institute, Inc., 2021). It happens when more work than was initially planned is added, which raises expenses and lengthens deadlines (Mokashi, et al., 2018). Scope creep happens when changes are made without proper awareness, agreement between parties, or formal review (Amoatey, et al., 2017). It often arises from unexpected shifts in customer expectations and requirements, typically occurring slowly and unofficially, causing projects to extend beyond their original boundaries without corresponding adjustments to schedules or budgets (Hussain, 2012). The term "scope creep" describes how a project's scope gradually changes or expands, frequently as a result of pressure to deliver more than was initially anticipated. It is occasionally regarded as the natural process by which customers hone their perception of their desires (Helms, 2002). Frequently, this expansion of scope starts with minor, ostensibly unimportant change requests that add up over time and finally become important (Nabet, 2017). In construction projects, scope creep is common and poses a risk as it leads to unapproved changes in work, costs, or timelines without formal acceptance. Managing scope creep

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can be complex, as it often goes initially unnoticed (Larson, et al., 2009). It typically results from adding unauthorized features or requirements, which increases the project's size and complexity (Elton, 2018). The rise in scope creep has become a global trend, impacting many organizations (Carkenord, 2014). It generally represents any uncontrolled changes in project requirements that extend the original boundaries without adjusting the schedule, budget, or completion date (Amoatey, et al., 2017). This thesis seeks to delve into the causes of scope creep and explore its effects on project management.

### 3.4. Construction projects and project scope creep

The construction industry is crucial to Egypt's economic growth, being one of the largest sectors in terms of employment and GDP contribution. It includes activities such as infrastructure development, commercial and residential construction, and the restoration of historical sites (El-Mikawy, 2014). Egypt's strategic location and rich cultural heritage make it attractive for foreign investment, with the government encouraging this through policies like the establishment of special economic zones and investment regulation liberalization. Construction projects may have delays and cost overruns as a result of the industry's difficulties, which include bureaucratic processes, regulatory barriers, and restricted access to funding (Youssef, et al., 2019). Most construction projects in Egypt follow the traditional waterfall lifecycle, where controlling changes to the defined scope is crucial for success. Effective change control processes are essential for maintaining project quality, timeliness, budget compliance, and customer satisfaction. Project success is measured not only by scope, schedule, and budget but also by alignment with the overall business goals and objectives (Project Management Institute, Inc., 2017). A project may meet its technical goals but still be unsuccessful if it fails to contribute to broader organizational success. Defining project scope in a collaborative workshop environment offers significant benefits to the project team (Burek, 2006). The project scope includes the deliverables, and the work required to produce them. In construction projects, where the goals are clear and tangible, it is crucial to define the scope accurately from the outset to minimize changes and avoid increased costs (Chakraborty, et al., 2020). Clearly identifying what is within and outside the scope reduces misunderstandings and helps manage stakeholder expectations, minimizing risks (© Association for Project Management, 2012). However, construction projects are prone to scope creep, where project goals gradually expand beyond the original scope. This often occurs due to changes in project specifications, client requests, or unforeseen circumstances, leading to delays, cost overruns, and other challenges.

Scope creep typically results from adding features or functionality without considering the impacts on time, costs, or resources, or without proper customer approval. Managing scope effectively is key to avoiding these negative outcomes (Ajmal, et al., 2021). Scope creep can significantly impact project success, leading to requirement changes, quality issues, delays, plan modifications, unmet customer expectations, poor communication, and decreased team motivation (Kumari, et al., 2014). Managing scope creep is a critical challenge for construction project managers, as failure to control it often results in projects exceeding budget, falling behind schedule, and potentially compromising the safety and quality of the final product. All further modifications raise project costs after scope creep, which results in overruns and prolongs the project's completion date (Nabet, 2017). Project managers must use appropriate project management tools and procedures, keep lines of communication open with all stakeholders, and establish project goals and requirements explicitly from the beginning in order to avoid these unfavorable consequences (Burek, 2006). Without additional resources, scope creep can result in "schedule lengthening," delaying completion. This delay can negatively affect the project owner, as the product might reach the market too late, reducing potential profits.

# 4. Extract Key Factors, Impacts, and Preventions

The next step is to methodically extract the most important information from the pertinent literature after it has been located. This includes identifying key factors that contribute to scope creep, the impacts scope creep has on project outcomes (such as time delays, cost overruns, and quality issues), and the recommended prevention strategies provided by different sources.

# 4.1. Distinctive features of scope creep

To understand scope creep, it's essential to first define the "scope baseline," which includes the approved scope statement, work breakdown structure (WBS), and WBS dictionary. This baseline serves as a reference point to track any changes to the project. Scope creep occurs when additional features or requirements are added to the project without adjusting the time, cost, or resources. This often leads to budget overruns, delays, and potential compromises in safety and quality. Construction projects are particularly vulnerable to scope creep due to ineffective management (Yap, et al., 2019). Therefore, managing scope creep is a significant challenge for construction project managers. Successful scope management requires clearly defined goals, effective communication with stakeholders, and the use of proper project management tools and techniques to prevent uncontrolled changes.

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Many projects suffer from scope creep, causing frustration for both project teams and stakeholders (Ajmal, et al., 2021). This happens when project teams work on unauthorized features or unapproved requirements, dedicating time to these changes without adjusting the project's timeline or budget. As a result, there is often less time available to complete the approved parts of the project, leading to incomplete deliverables and deviation from the original project charter. This also increases the likelihood of time and cost overruns to finish the authorized scope (Larson, et al., 2009). Common causes of scope creep identified in the literature (Nabet, 2017), (Amoatey, et al., 2017), [9], (Ajmal, et al., 2021), (Hussain, 2012), (Larson, et al., 2009) include the followings:

- 1. The original specification document was vague and shallow.
- 2. Permitting team members and clients to have direct [unmanaged] communication.
- 3. Clients attempting to obtain additional work "on the cheap."
- 4. Starting a project's design and development before doing a comprehensive requirements analysis and costbenefit analysis
- 5. Scope creep, which occurs when someone does it to themselves due to a lack of preparation and foresight
- 6. Poor initial collection of requirements
- 7. "Management promises developers the moon and the sun and breaks their backs to deliver on those promises in impossible time frames."
- 8. A vague or imprecise description of scope
- 9. Inadequate requirements management or formal scope
- 10. Inconsistent process for collecting product requirements
- 11. Insufficient sponsorship and involvement of stakeholders
- 12. The duration of the project
- 13. Inadequate comprehension of client needs before defining the project's scope
- 14. The incorrect people are defining scope.
- 15. Delaying the identification of important stakeholders until the project has started
- 16. Variations and late confirmation of variations
- 17. Unrealistic and non-executable Statement of Scope
- 18. Focusing on major scope changes while ignoring small changes that could lead to bigger scope creep problems.
- 19. Lack of a defined and disciplined procedure for change management
- 20. Bad management of project changes and absence of scope management and control systems
- 21. Projects being executed after years of completion of study and scope definition
- 22. Lack of formal risk analysis and planning process
- 23. Lack of a formal communication plan
- 24. Owner requirement changes
- 25. Business environment changes

Scope creep does not happen simply because requirements change; the critical factor is whether these changes are authorized or not (Larson, et al., 2009). When changes are poorly managed, scope creep can occur. Although change requests and scope creep are sometimes seen as the same, they are different. A change request, which is monitored and controlled by the organization's change control board, is anticipated and managed, whereas scope creep is often unanticipated and uncontrolled (Mokashi, et al., 2018). Scope creep—whether technological, organizational, or human—has a significantly negative impact on the success of a project (Ahmed, et al., 2022).

# 4.2. Scope Creep Impact on Projects

Scope creep occurs when a project extends beyond its original boundaries due to the addition of features or changes in scope without addressing their impact on time, cost, and resources, or obtaining customer approval (Ajmal, et al., 2021). It can lead to various issues, including requirement changes, quality problems, delays, and unmet customer expectations (Kumari, et al., 2014). Once scope creep sets in, it results in cost overruns and impacts the project's timeline (Nabet, 2017). Without proper management, scope creep can negatively affect project performance, causing delays, extra costs, and potentially delaying the product's entry to the market, reducing profits for the owner (Suvvari, 2022).

Globally, more than 70% of project management professionals in the construction industry report experiencing scope creep, which leads to delays and budget overruns (Nabet, 2017). In the past year, 53% of projects faced scope creep, a rise from 43% five years earlier (Project Management Institute, 2024). To understand factors influencing project success, PMI conducted a global survey of nearly 3,500 professionals (Project Management Institute, 2023), revealing that a low level of scope creep is one of the key drivers of successful project outcomes as shown in **Fig. 2**.

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Fig. 2. Key Drivers of Project Success

# 4.3. Probable Ways to Prevent Scope Creep

Preventing scope creep in construction projects is crucial for maintaining project success within the constraints of time and budget. This section outlines strategies to mitigate scope creep based on a study that links project failure to poor scope management and control, identifying scope creep as a leading cause of failure globally (Hussain, 2012). Despite defined processes and success factors, scope changes may still arise. Internal factors often contribute to scope creep, making it harder to control (Abramovici, 2000). Engineers, for example, may unintentionally contribute to scope creep by constantly striving to improve and exceed project requirements, rather than simply meeting the original project goals. This tendency can make scope creep more difficult to detect and manage. The analogy of a driver needing a defined speed limit to control speed illustrates the importance of having a clear project scope. A well-structured methodology for scope change control relies on clearly defining the project scope upfront (Millhollan, 2008). Effective change control processes also involve risk assessments to evaluate the consequences of approving or rejecting change requests. Early identification of all project needs is one of the greatest methods to avoid scope creep (Amoatey, et al., 2017). Clear definition of the project's goals, deliverables, and scope during the planning stage, together with early stakeholder participation, reduce miscommunications and unforeseen changes (Nabet, 2017). Tools like a Work Breakdown Structure (WBS) ensure every aspect of the project is captured, promoting better communication and alignment among stakeholders (Ajmal, et al., 2021). By monitoring the progress of deliverables, project managers can make sure the project stays within its initial scope, timeline, and budget. Regular project status updates that actively involve sponsors are critical in preventing scope creep. By tracking how deliverables are progressing, project managers can ensure the project remains aligned with its original scope, timeline, and budget (Larson, et al., 2009). Tools like Gantt charts provide clear and concise updates, keeping sponsors informed and addressing potential issues before they lead to uncontrolled changes. Additionally, a lessons learned register serves as a valuable resource by documenting past experiences with project scope, stakeholder management, and change control (Project Management Institute, Inc., 2021). This register can identify common causes of scope creep, such as unclear requirements or inadequate stakeholder involvement. (Mamata Rajgor, et al., 2016)

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Reviewing these lessons at the start of a new project helps teams anticipate potential challenges and implement proactive measures to prevent scope creep from occurring again (Nabet, 2017).

# 5. Analyze and Categorize Data

After extracting the key elements, the data is analyzed and categorized. This step involves organizing the data into themes or categories, such as common causes of scope creep, its effects on project success, and different approaches to mitigate or prevent scope creep.

# 5.1. Characteristics and Features of Scope Creep

The steady and uncontrolled growth of a project's scope beyond its original objectives is known as scope creep, and it is a typical problem in project management that frequently leads to cost overruns, delays, and decreased quality (Alkass, et al., 2019). This is particularly prevalent in construction projects, where evolving requirements and stakeholder demands frequently lead to scope changes. The key traits of scope creep include its gradual onset, unpredictable nature, and the cumulative effect of small, seemingly insignificant changes that occur without proper review or approval (Muller, et al., 2007). Usually, scope creep starts with little, seemingly innocuous change requests that add up over time to cause major departures from the initial project plan (Olawale, et al., 2010), (McCord, et al., 2015). It can stem from poor project planning, inadequate requirements gathering, or unclear stakeholder expectations (Zwikael, et al., 2019). Scope creep can also be caused by outside variables like market fluctuations, technology breakthroughs, and regulatory changes, which force teams to modify their goals and deliverables (Flyvbjerg, et al., 2004). Furthermore, scope creep thrives in environments with weak communication and a lack of formal processes for reviewing and approving changes (Kappelman, et al., 2006).

# 5.2. Variety of Factors Influencing Scope Creep

Scope creep in construction projects is influenced by a wide range of factors that emerge at different stages of the project lifecycle. These factors are driven by the complexity of construction projects, which involve multiple stakeholders, intricate designs, and evolving external conditions. The various influences on scope creep can be categorized based on the nature of the project, stakeholder involvement, and the specific project phases, each of which applies unique pressures on the project's scope. Understanding how these factors interact throughout the different stages of a project is essential for managing and mitigating the risks associated with scope creep (Alkass, et al., 2019), (Kappelman, et al., 2006), (Flyvbjerg, et al., 2004).

# 5.2.1. Factors Related to Project Nature and Stakeholders Category

The nature of a project and its stakeholders play a key role in determining its vulnerability to scope creep. Factors such as the project's type, direction, and size directly influence its complexity, making it more difficult to control scope (Alkass, et al., 2019), (Kappelman, et al., 2006). Large-scale projects with numerous stakeholders often encounter communication challenges, leading to unclear requirements or delayed decisions, which can expand the project's scope (Olawale, et al., 2010), (Zwikael, et al., 2019). Moreover, the party responsible for managing the scope is crucial in maintaining project boundaries (Dvir, et al., 2004). When scope management is not clearly assigned or stakeholders' interests conflict, it becomes more difficult to keep the project aligned with its original scope (Flyvbjerg, et al., 2004). Furthermore, the type of contract and the ranking of contractors—such as those under the Egyptian Federation for Construction and Building Contractors—affect how changes are managed. Higher-ranked contractors are generally better equipped to handle changes without causing significant scope expansion (Olawale, et al., 2010), (Zwikael, et al., 2019).

# 5.2.2. Factors Related to Initiation and Planning Phases

The initiation and planning phases are crucial for preventing scope creep, as poor scope definition and planning failures at these stages can lead to significant issues later. Key factors contributing to scope creep, as shown in **Table 1**, include not appointing an experienced project manager and failing to involve users or customers during the design process (Nabet, 2017), (Ajmal, et al., 2021), (Olawale, et al., 2010), (Flyvbjerg, et al., 2004). Incomplete drawings and unclear specifications, as well as ambiguous bills of quantities, frequently cause scope changes as the project progresses (Ajmal, et al., 2021), (El-sokhn, et al., 2014), (Zwikael, et al., 2019). Inadequate risk allocation in the planning stage is another serious problem (Nabet, 2017), (Ajmal, et al., 2021). Without a solid risk response plan, projects become vulnerable to unexpected changes that increase the scope (Kappelman, et al., 2006). Overdesign or underestimating project costs can also set unrealistic expectations, making it harder to control scope (Flyvbjerg, et al., 2004), (Dvir, et al., 2004).

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Additionally, contractors' failure to plan effectively or stick to schedules can exacerbate the problem, allowing scope creep to take hold more easily (Alkass, et al., 2019).

Table 1. Relative Weight of factors influencing scope creep in Initiation and Planning phases

Scope Creep Factors	Rel. W.
Site conditions which differ from those described in the contract documents	16.52%
Inexperienced owner/owner representative	15.55%
Poor Risk allocation/ Lack of a plan for responding to the most critical risks	13.89%
Degree of user/ customer involvement in the design	12.41%
Contractors fail to plan sufficiently and to follow planned schedules	10.39%
Incompleteness of drawing and specifications	10.25%
Unclear and incomplete description of items in the bills of quantities	5.23%
Unsafe designs lead to delay during the construction	4.76%
Ambiguous specifications	2.99%
Failure to appoint a project manager	2.42%
Design and specification oversights and errors or omissions resulting from uncoordinated trades	1.54%
Overdesign and underestimating the costs involved.	1.42%
Poor scope definition	1.40%
Specifying what is included in the project and what is not included	1.22%

# 5.2.3. Factors Related to Execution and Implementation Phase

During the execution phase, scope creep is often worsened by factors such as delays in approving drawings and submittals, work acceleration requests from the owner, and poor communication among stakeholders (Ajmal, et al., 2021), (Hussain, 2012), (Olawale, et al., 2010), (Kappelman, et al., 2006). Delays in workshop drawings and permissions, along with discrepancies between site conditions and contract descriptions, frequently lead to scope adjustments to accommodate unforeseen challenges (Nabet, 2017), (Flyvbjerg, et al., 2004). Other contributors to scope expansion include poor workmanship, inexperienced contractors, and consultants, which result in rework or adjustments in scope to resolve quality or design issues (Amoatey, et al., 2017), (Zwikael, et al., 2019), (El-sokhn, et al., 2014). Additionally, inadequate management and supervision, along with a lack of cohesion among contractors, allow scope changes to occur without proper evaluation or control, further exacerbating scope creep (Flyvbjerg, et al., 2004), (Dvir, et al., 2004). The Relative Weight for these factors is outlined in **Table 2**.

Table 2. Relative	Weight of factor	s influencing scope	e creep in Execution phase
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Scope Creep Factors	Rel. W.
Delay/ suspension of works	39.07%
Delay of drawings and submittals approval	16.25%
Lack of fund	7.57%
Poor workmanship	6.41%
Acceleration of works requested by owner that leading to change in schedule	5.03%
Delays in the supply of workshop drawings	4.86%
Lack of Communication	4.71%
Delay of permissions	4.59%
Inexperienced contractors	3.85%
Inexperienced Consultant	3.15%

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Inexperience of subcontractors	2.37%
Lack of Team Spirit	2.15%
Delay/ suspension of works	39.07%
Delay of drawings and submittals approval	16.25%

# 5.2.4. Factors Related to Monitoring, Controlling and Closing Phases

In the monitoring and controlling phases, as presented in **Table 3**, scope creep often occurs due to ineffective processes for managing and approving project changes (Hussain, 2012). Significant scope extension can result from inadequate change management, a lack of a strong conflict resolution system, and a delay in responding to variations (Parasad, et al., 2018), (Alkass, et al., 2019), (Flyvbjerg, et al., 2004). When variations are not promptly confirmed, delays and additional costs are likely, further extending the project scope (Elhegazy, et al., 2023), (Olawale, et al., 2010). Additional factors contributing to scope creep include late confirmation of changes, unstable economic or political conditions, and overdue payments to contractors or subcontractors (Amoatey, et al., 2017), (Ajmal, et al., 2021). Furthermore, inadequate documentation and record-keeping by owners, contractors, and consultants create ambiguities, leading to mismanagement of the scope (Kappelman, et al., 2006). Even in the closing phase, unresolved disputes and delayed payments can unexpectedly extend the project's scope, preventing the proper finalization of deliverables.

Table 3. Relative Weight of factors influencing scope creep in Monitoring & controlling and Closing phases

Scope Creep Factors	Rel. W.
Variations and late confirmation of variations	27.63%
Failure to respond in timely manner	21.96%
Over measurement or under measurement of works by consultants for work in progress	10.38%
Unstable economic and political conditions	9.28%
New Law/regulations	6.74%
Owner changes during construction	5.44%
Lack of process for comprehensive dispute resolution	5.40%
Change of the contractor during the construction phase (within contractual terms)	3.03%
Late payment of subcontractors/suppliers	2.40%
Unconfirmed oral instructions	2.13%
Deficient management of project changes, and absence of scope management and control systems	2.04%
Delay of contractor payment	2.00%
Insufficient contractor's management, supervision, and coordination	1.57%
Variations and late confirmation of variations	27.63%

# 5.3. Effective Mitigation Strategies to Prevent Scope Creep

Preventing scope creep in construction projects requires a proactive strategy that focuses on maintaining project boundaries and ensuring alignment with stakeholders. A key approach is to establish a clear and comprehensive project scope statement at the outset, explicitly defining objectives, deliverables, and boundaries to serve as a reference throughout the project lifecycle (Olawale, et al., 2010), (Munns, et al., 1996). Involving stakeholders early in the planning process ensures their expectations and requirements are accurately captured, reducing the chance of future modifications that could lead to scope creep (Nabet, 2017). Another critical strategy is to implement strong change control processes (Söderlund, 2004). These processes should define how changes are proposed, evaluated, and approved, ensuring any adjustments are assessed for their impact on time, cost, and quality (Chua, et al., 1999), (Kerzner, 2017). Regular project status meetings can facilitate communication among stakeholders, providing an opportunity to address emerging issues and changes collaboratively, thereby preventing misunderstandings and misalignments that may result in scope expansions (Pinto, 2016). Lastly, reviewing lessons learned from past projects can offer valuable insights into managing scope effectively (Xiang, et al., 2022). By examining previous experiences, project teams can identify common challenges and develop tailored approaches to avoid scope creep in future projects (Umuhoza, et al., 2021). These strategies promote

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continuous improvement and shared understanding, ultimately enhancing project success and minimizing the negative effects of scope creep.

# 6. Synthesis of Findings

The analyzed data is synthesized to provide meaningful conclusions, summarizing findings from various studies into a cohesive overview of the factors contributing to scope creep, its impact on project management, and the most effective control strategies. Scope creep in construction projects is driven by multiple factors at different stages of the project lifecycle, as outlined in **Table 4**. These factors include project complexity, involvement of numerous stakeholders, poor initial planning, inadequate risk management, and ineffective communication. During the execution phase, incomplete drawings, unclear requirements, and delays in approvals further contribute to scope expansion. Additionally, poor workmanship, unstable external conditions, and a lack of change management processes during the monitoring and closing phases worsen the problem. Preventing scope creep requires thorough planning, clear assignment of responsibilities, and strong stakeholder communication.

No.	Scope Creep Factors	Project Phase	Impact	Prevention	References
1	Project type, direction, and size	Initiation	Schedule and Budget	Proper planning and consideration of project complexity	(Ajmal, et al., 2021)
2	Contract type and contractor ranking	Initiation	Schedule and Budget	Appropriate contract management and ranking criteria	(Ajmal, et al., 2021)
3	Failure to appoint an experienced project manager	Initiation	Schedule and Budget	Appoint experienced project managers	(Ajmal, et al., 2021)
4	Lack of clarity and depth to the original specification document	Planning	Schedule and Budget	Clear and detailed specification documentation	(Ajmal, et al., 2021)
5	Beginning design and development without thorough requirements analysis	Planning	Schedule and Budget	Thorough requirements analysis and Budget-benefit analysis	(Amoatey, et al., 2017)
6	Poor initial collection of requirements	Planning	Schedule and Budget	Improved requirement gathering methods	(Ajmal, et al., 2021)
7	Ambiguous or unrefined scope definition	Planning	Schedule and Budget	Well-defined and refined scope	(Ajmal, et al., 2021)
8	Lack of formal scope or requirements management	Planning	Schedule and Budget	Formal scope and requirements management processes	(Ajmal, et al., 2021)
9	Poor scope definition	Planning	Schedule and Budget	Comprehensive and clear scope definition	(Ajmal, et al., 2021)
10	Lack of risk allocation	Planning	Schedule and Budget	Effective risk management	(Project Management Institute, 2024)
11	Overdesign or underestimating project Budgets	Planning	Schedule and Budget	Accurate project Budget estimation	(Project Management Institute, 2023)
12	Contractors failing to plan effectively or adhere to schedules	Planning	Schedule and Budget	Effective planning and adherence to schedules	(Abramovici, 2000)
13	Lack of user or customer involvement in the design	Design	Schedule and Budget	Involve users or customers early in the design process	(Yap, et al., 2019)
14	Incompleteness of drawings and specifications	Design	Schedule and Budget	Ensure completeness of drawings and specifications	(Ahmed, et al., 2022)
15	Ambiguous or unclear bill of quantities	Design	Schedule and Budget	Clarify bill of quantities early	(Suvvari, 2022)

 Table 4. factors influencing scope creep

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16	Allowing direct [unmanaged] contact between client and team participants	Execution	Schedule and Budget	Managed communication channels between client and team	(Ajmal, et al., 2021)
17	Customers trying to get extra work 'on the cheap'	Execution	Budget	Clearly define project boundaries and scope	(Mokashi, et al., 2018)
18	Variations and late confirmation of variations	Execution	Schedule and Budget	Timely confirmation of variations	(Ajmal, et al., 2021)
19	Owner requirement changes	Execution	Schedule and Budget	Clear communication and alignment with stakeholders	(Nabet, 2017)
20	Business environment changes	Execution	Schedule and Budget	Risk analysis and adaptation to external conditions	(Amoatey, et al., 2017)
21	Delays in approval of drawings and submittals	Execution	Schedule and Budget	Timely approval of drawings and submittals	(Mamata Rajgor, et al., 2016)
22	Acceleration of work requests by the owner	Execution	Schedule and Budget	Manage acceleration requests carefully	(Alkass, et al., 2019)
23	Poor communication among stakeholders	Execution	Schedule and Budget	Ensure clear communication between all parties	(Muller, et al., 2007)
24	Differences in site conditions from the contract	Execution	Schedule and Budget	Thorough site condition assessments	(Olawale, et al., 2010)
25	Poor workmanship and inexperienced contractors or consultants	Execution	Schedule and Budget	Improve contractor and consultant selection	(McCord, et al., 2015)
26	Lack of sufficient management and supervision	Execution	Schedule and Budget	Provide strong management and supervision	(Zwikael, et al., 2019)
27	Inadequate processes for managing project changes	Monitoring	Schedule and Budget	Implement robust change management processes	(Flyvbjerg, et al., 2004)
28	Failure to respond to variations in a timely manner	Monitoring	Schedule and Budget	Respond promptly to variations	(Kappelman, et al., 2006)
29	Absence of a comprehensive dispute resolution process	Monitoring	Schedule and Budget	Establish a clear dispute resolution process	(Flyvbjerg, et al., 2004)
30	Late confirmation of variations	Monitoring	Schedule and Budget	Timely confirmation of variations	(El-sokhn, et al., 2014)
31	Overdue payments to contractors or subcontractors	Closing	Schedule and Budget	Ensure timely payments	(Elhegazy, et al., 2023)
32	Lack of proper documentation and record-keeping	Closing	Schedule and Budget	Maintain accurate documentation	(Munns, et al., 1996)
33	Project length	All Phases	Schedule and Budget	Effective timeline and scope management throughout	(Ajmal, et al., 2021)
34	Multiple stakeholders	All Phases	Schedule and Budget	Effective stakeholder communication and management	(Ajmal, et al., 2021)
35	Lack of clear responsibility for scope management	All Phases	Schedule and Budget	Clearly assign scope management responsibility	(Ajmal, et al., 2021)
36	Conflicting stakeholder interests	All Phases	Schedule and Budget	Stakeholder alignment and conflict resolution	(Ajmal, et al., 2021)
37	Unstable economic and political conditions	All Phases	Schedule and Budget	Monitor and adapt to external conditions	(Dvir, et al., 2004)

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# 7. Conclusion

In conclusion, scope creep is a widespread challenge in the construction sector, particularly in Egypt, where it significantly affects project outcomes. The root causes of scope creep, such as inadequate planning, ineffective communication, and conflicting stakeholder interests, frequently lead to project delays, cost overruns, and a reduction in quality. This review highlights the key contributors to scope creep across the project lifecycle, emphasizing the importance of proper initial planning, clear communication, and thorough risk management to prevent uncontrolled scope expansion.

In Egypt, where scope creep poses a considerable risk to construction project success, adopting proactive strategies is crucial. These strategies include fostering collaboration among stakeholders, establishing clear project objectives from the outset, and implementing robust change management processes to handle scope changes effectively. By addressing these challenges, project managers can better control scope creep, improve project timelines and budgets, and maintain the desired level of quality.

The insights from this review provide valuable guidance for project managers and stakeholders looking to enhance construction management practices in Egypt. By focusing on the root causes of scope creep and applying effective management strategies, future construction projects can achieve greater efficiency, improved cost control, and higher overall quality. Continuous research and the implementation of these approaches will be critical for advancing the construction sector and promoting economic growth in the region.

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