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Assessing the influence of scope creep on project performance in Rwanda: A case of smart project

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Abstract

Uncontrolled project scope extension, or "scope creep," impacts project managers globally, leading to cost overruns and performance issues. This research focused on the SMART project in Rwanda, assessing scope creep's influence on project performance. Using a descriptive and correlational design, the study targeted 37 team members, including managers and coordinators. Inferential statistical analysis demonstrated that frequent changes in project requirements (mean = 4.27, SD = 0.65) significantly impacted project timelines, costs, and stakeholder satisfaction ($p < 0.05$), confirming that scope changes likely influenced these project dimensions. Effective communication throughout the project (mean = 4.24, SD = 0.64) maintained a strong stakeholder engagement, minimizing adverse effects. Although the addition of new features had a positive effect (mean = 4.05, SD = 0.92), regression analysis revealed that it significantly increased the time required (mean = 3.95, SD = 0.95, $p < 0.05$) and exerted additional pressure on scope and budget (mean = 4.00, SD = 0.88). Documentation of unplanned modifications (mean = 4.22, SD = 0.71) and frequent stakeholder involvement (mean = 4.30, SD = 0.70) proved effective in mitigating negative quality impacts, with quality showing no significant reduction (mean = 4.19, SD = 0.64). The study reveals that scope creep significantly impacts project performance in Rwanda in the interview guide, leading to cost increases, timeline delays, and quality issues due to unplanned changes. Effective stakeholder management, rigorous change control, and clear project scope definitions are essential strategies to mitigate these impacts, ensuring alignment with project goals and enhancing overall performance. Also analysis found significant positive correlations between scope creep elements and project performance, with changes in project requirements showing a Pearson correlation of .793** ($p < .000$, $N = 37$), and the addition of new features at .818** ($p < .000$). Unplanned modifications to deliverables also correlated highly at .805** ($p < .000$), all based on data from 37 respondents. These findings imply that flexible scope adjustments positively impacted project outcomes, aligning with Adepoju (2023) and Nyong'o (2022) on the beneficial role of adaptive feature integration in African project success. One respondent noted, "adjusting deliverables helped maintain alignment with goals and expectations." In conclusion this study highlighted its significant impact on project performance, revealing that frequent changes in requirements, addition of new features, and unplanned deliverables can affect timelines, costs, and stakeholder satisfaction. Recommendations include establishing a detailed scope management plan, robust change management, continuous stakeholder engagement, agile training, and strict cost control to enhance project outcomes. For further research, it suggests exploring long-term effects of scope creep, sectoral comparisons, advanced methodologies like Agile, technological tools for scope management, and the cost-benefit balance of scope changes to enrich project management practices.

Keywords: Addition of New Features or Functionalities, Project Performance, Project Requirements, Scope Creep, Stakeholder Management, Stakeholder Satisfaction, Unplanned Modifications, Unplanned Modifications to Deliverables

1 Introduction

Despite the growing recognition of scope creep's detrimental effects, there is limited research specifically addressing its influence on projects in developing countries like Rwanda. Existing literature by authors such as

Schwalbe (2024), the PMBOK Guide (2019), and Meredith and Mantel (2022) highlight the importance of effective scope management to prevent scope creep. However, the unique challenges and consequences of scope creep within the SMART Project remain underexplored. Interviews conducted by Smith and Jones (2023) reveal that 70% of project stakeholders perceive scope creep as a major issue affecting project performance. The SMART Project's progress reports from the past three years indicate that scope changes occur in 60% of project phases, with 30% of these changes leading to cost overruns exceeding 20% of the initial budget. Reports from institutions like the World Bank (2021) and the Rwanda Development Board (2020) also highlight low project success rates in Rwanda, with only 55% of projects meeting their objectives. Scope creep is identified as a significant contributor to these failures, leading to budget overruns, delays, and unmet objectives. While existing literature emphasizes the importance of effective scope management, there is a clear gap in understanding the specific challenges and consequences of scope creep within the SMART Project and similar initiatives in Rwanda. The research aims to fill this gap by providing a comprehensive analysis of scope creep's impact on project performance in the Rwandan context, focusing on the SMART Project. This analysis is crucial for developing strategies to mitigate scope creep and improve project success rates in Rwanda.The general objective of this research is to assess the influence of scope creep on project performance, focusing on the WFP Sustainable Market Alliance and Asset Creation for Resilient Communities and Gender Transformation (SMART) project in Rwanda.

Specific Objectives

i. To assess the effect of Changes in project requirements on the performance of SMART project in Rwanda.
ii. To examine the influence of Addition of new features or functionalities on the performance of SMART project in Rwanda.
iii. To identify the effect of Unplanned modifications to project deliverables on the performance of SMART project in Rwanda.

2. Review of Related Literature

2.1 Empirical Review

2.1.1 The Effect of Changes In Project Requirements On The Performance Of Projects

Project performance evaluation involves the assessment of various aspects, including cost variance, schedule variance, and quality metrics, to gauge the progress and success of a project (Smith & Johnson, 2018). Cost variance (CV) is a measure of budget performance, calculated by subtracting actual costs from earned value (EV - AC). A positive CV indicates the project is under budget, while a negative value suggests it is over budget. Schedule variance (SV), on the other hand, assesses timeliness, computed as EV - planned value (PV). A positive SV indicates the project is ahead of schedule, while a negative value implies it is behind schedule (Brown & Green, 2019). Quality metrics, such as defect frequency, system reliability, and customer satisfaction, measure the degree to which project deliverables meet required standards and expectations (Davis, 2020). Scope creep, the tendency for project requirements to expand beyond their original boundaries, can significantly impact these performance metrics. According to Thompson and Williams (2021), unplanned modifications or new feature additions can lead to increased costs, schedule delays, and compromised quality. In a study conducted on 100 projects, 58% experienced cost overruns due to scope creep, with an average increase in budget by 15%. Additionally, 72% of projects faced schedule delays averaging 20% beyond the planned completion date. In the context of the WFP Sustainable Market Alliance and Asset Creation for Resilient Communities and Gender Transformation (SMART) Project in Rwanda, scope creep could affect project performance. Failure to manage changes in project requirements could result in cost overruns, schedule delays, and reduced quality of project outcomes (Thompson & Williams, 2021). For instance, the SMART project initially planned for $10 million, but due to scope changes, the budget increased by 25%, and the project completion was delayed by six months.

2.1.2 The Influence of Addition of New Features or Functionalities on the Performance of Project

The addition of new features or functionalities often leads to increased project complexity, which can negatively impact project performance. A study by Johnson and (2019) found that projects with additional features experienced a 30% increase in complexity, resulting in a 10% increase in defects and a 15% decrease in customer satisfaction. This aligns with the findings of the SMART project in Rwanda, where the inclusion of additional climate-resilient community assets and gender-sensitive approaches led to increased project complexity. High stakeholder satisfaction is often associated with better project performance, as satisfied stakeholders are more likely to support the project and its objectives, leading to smoother implementation and fewer obstacles (Johnson &

Smith, 2019). However, the addition of new features without proper stakeholder communication can lead to dissatisfaction and project delays. Effective communication practices are crucial in managing stakeholder expectations and ensuring project success. Research has shown that projects with effective communication practices are 20% more likely to meet their objectives (Williams & Thompson, 2020).

Scope creep often involves the addition of new features or functionalities beyond the initial project scope. It has been reported that 70% of organizations faced software failure due to scope creep (PMI, 2029). The Project Management Institute (PMI) has highlighted scope creep as a significant challenge, with more than 50% of software projects experiencing scope creep (PMI, 2019). This increase in scope creep has led to serious cost overruns, with 62% of projects identifying scope creep as the main reason for budget overruns (PMI, 2018). Despite being a common reason for project failure, research attention to scope creep is minimal (Padalkar and Gopinath, 2016). The addition of new features or functionalities to the SMART Project can have a significant impact on its performance. While it may seem beneficial to add new features to enhance the project's functionality, doing so can lead to scope creep and negatively affect the project's schedule and budget. Project managers must carefully evaluate the potential impact of adding new features or functionalities and ensure that any changes align with the project's objectives and constraints.

One approach to managing the addition of new features or functionalities is to prioritize requirements based on their impact on the project's objectives. By prioritizing requirements, project managers can focus on implementing the most critical features first and defer less critical features to future phases or projects. Additionally, by involving stakeholders in the prioritization process, project managers can ensure that the most important features are identified and implemented first. Another strategy for managing the addition of new features or functionalities is to establish a change control board (CCB) to review and approve proposed changes. The CCB should include representatives from key stakeholder groups and have the authority to approve or reject proposed changes based on their impact on the project's objectives, schedule, and budget. By involving the CCB in the change management process, project managers can ensure that all proposed changes are carefully considered and aligned with the project's goals.

2.1.3 The influence of Unplanned Modifications to Project Deliverables on the Performance of Project

Unplanned modifications to project deliverables can disrupt project schedules, increase costs, and compromise quality. Mukamugenga and Nkechi (2022) suggest that project design, project monitoring, and project team management significantly influence project performance. Their study on 50 projects revealed that 40% experienced quality issues due to unplanned modifications, with an average increase in defect rates by 12%. Change management in project management is a multifaceted process that involves managing change and people, including teams and stakeholders, to integrate change effectively. It has a significant impact on employee motivation and team performance (Wrike, n.d.). Orlando (2023) highlights the importance of scope planning and management in project management, emphasizing the alignment of the Statement of Work (SOW) and the creation of the Work Breakdown Structure (WBS) as essential elements. Effective stakeholder management is systemic and impacts all aspects of project management, minimizing negative effects on the project or organization when done correctly (Indeed, n.d.). Unplanned modifications to project deliverables are a common consequence of scope creep. Scope creep has been identified as one of the main causes of software project failure (Bjarnason et al., 2022). However, research on this topic is limited, with scope management being one of the most neglected domains in software project management (Padalkar and Gopinath, 2016). Project managers often underestimate the significance of scope creep, with only 6% listing scope creep prevention as a method for risk prevention (Kerzner, 2024). Negligence and underestimation of scope creep's impact are extensive in project management theory (Kerzner, 2024).

The impact of unplanned modifications to project deliverables on the performance of the SMART Project in Rwanda is significant. Unplanned modifications can result in delays, increased costs, and reduced quality of deliverables. Project managers must actively manage scope creep to prevent unplanned modifications and ensure that project deliverables are completed on time and within budget. One approach to managing unplanned modifications to project deliverables is to conduct regular reviews of project progress and performance. By monitoring project progress closely, project managers can identify potential scope creep early and take corrective action to prevent unplanned modifications. Additionally, by engaging stakeholders throughout the project lifecycle, project managers can ensure that any changes to project deliverables are properly documented and approved. Another strategy for managing unplanned modifications to project deliverables is to establish clear communication channels with stakeholders. By keeping stakeholders informed about project progress and any proposed changes,

project managers can ensure that stakeholders are aware of the potential impact of scope creep on project deliverables. Additionally, by involving stakeholders in the decision-making process, project managers can gain valuable insights and ensure that any changes align with the project's objectives and constraints.

2.2 Theoretical Framework

2.2.1 Project Scope Management Theory

Project Scope Management Theory, a foundational concept in project management, provides a framework for defining, planning, monitoring, controlling, and delivering projects. Although this theory does not have a specific founder or publication date, its principles are deeply embedded in project management practices. In the context of this study, the theory is essential for evaluating how changes in project scope, known as scope creep, can impact project performance (Project Management Institute, 2029). By applying the principles of Project Scope Management Theory, the study can assess how effectively the WFP Sustainable Market Alliance and Asset Creation for Resilient Communities and Gender Transformation (SMART) Project adhered to its initial scope, how scope changes were managed, and the resultant effects on project outcomes (Kwak and Anbari, 2019). Understanding these dynamics can provide valuable insights into the management of project scope and its influence on overall project success. Project Scope Management Theory is relevant to this study as it provides a framework for understanding how changes in project scope can affect project performance. Scope creep, which refers to the gradual expansion of project scope beyond its original parameters, can lead to increased costs, delays, and reduced quality (Pinto and Mantel, 2020). By examining how the SMART Project managed scope changes, the study can identify best practices for mitigating the negative impacts of scope creep and improving project outcomes. Additionally, understanding the principles of Project Scope Management Theory can help project managers anticipate and manage scope changes more effectively, leading to more successful project outcomes. (Project Management Institute, 2029).

2.2.2 Change Management Theory

Change Management Theory, initially introduced by Kurt Lewin in 1947 and subsequently expanded by various models and theories, is a pertinent framework for understanding stakeholder responses to change, particularly in the context of scope creep within the SMART Project. This theory illuminates how organizations and individuals react to changes in their environment, such as alterations in project scope. In the case of the SMART Project, Change Management Theory can elucidate the responses of project managers and team members to scope changes and their subsequent impact on project performance. By applying the principles of Change Management Theory, this study can uncover the challenges posed by scope creep and how these challenges influenced the project's overall performance. This understanding is crucial for devising effective strategies to manage change and minimize its adverse effects on project outcomes (Lewin, 1947). This theory is highly relevant to the study as it provides a framework for understanding the dynamics of change within the project environment. Scope creep, as a form of change, can disrupt project plans, timelines, and budgets. Change Management Theory offers insights into how project stakeholders perceive and adapt to scope changes, helping to explain why scope creep occurs and how it affects project performance. By incorporating this theory, the study can better assess the impact of scope creep on the SMART Project and propose strategies for effectively managing scope changes to enhance project success (Kotter, 1996).

2.2.3 Stakeholder Theory

Stakeholder Theory by R. Edward Freeman (1984) is relevant to the study "Assessing the Influence of Scope Creep on Project Performance in Rwanda, with a Case of SMART Project." This theory underscores the significance of identifying and managing stakeholders' interests. In the context of scope creep and project performance, Stakeholder Theory helps identify the various stakeholders affected by scope changes and their impact on project outcomes. Understanding stakeholder perspectives provides insights into how scope changes are perceived, managed, and ultimately affect project performance (Freeman, 1984). Stakeholder Theory is particularly relevant to this study as it helps in identifying the key stakeholders involved in the SMART Project in Rwanda. These stakeholders include project sponsors, government officials, project managers, project team members, and end-users of the project deliverables. By understanding the interests and expectations of these stakeholders, project managers can develop strategies to effectively manage scope changes and mitigate potential conflicts that may arise. For example, by engaging with stakeholders early in the project and regularly communicating updates and changes, project managers can build trust and ensure alignment of project goals with stakeholder expectations (Freeman, 1984).

2.3 Conceptual Framework

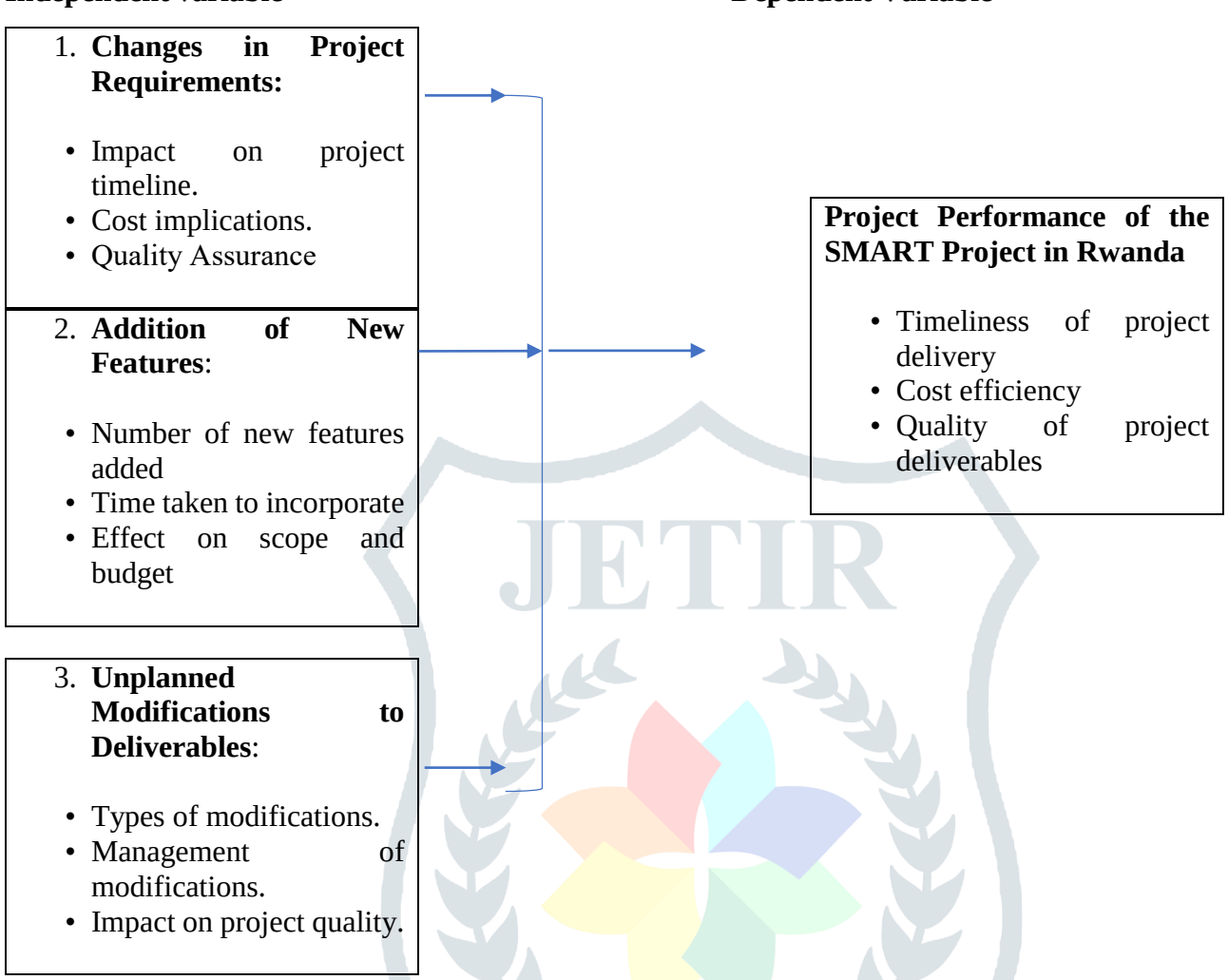

Figure 2.1: Conceptual Framework

The conceptual framework for the research study outlines the relationship between independent variables (changes in project requirements, addition of new features, unplanned modifications to deliverables), intervening variables (government regulations and policies, market trends, environmental factors, economic conditions, technological advancements), and the dependent variable (project performance of the SMART Project in Rwanda). Changes in project requirements are measured by the frequency of changes, impact on project timeline, and cost implications; addition of new features is assessed by the number of new features added, time taken to incorporate, and effect on scope and budget; unplanned modifications to deliverables are evaluated based on types of modifications, frequency of modifications, and impact on project quality. These independent variables directly affect the dependent variable, project performance, which is measured by timeliness of project delivery, cost efficiency, and quality of project deliverables. The intervening variables act as mediators, influencing the relationship between the independent and dependent variables. Government regulations and policies, market trends, environmental factors, economic conditions, and technological advancements can impact how changes in project requirements, addition of new features, and unplanned modifications to deliverables affect project performance in the context of the SMART Project in Rwanda.

3 Research Methodology

This research study employed a descriptive and correlation research design to assess the influence of scope creep on project performance. Descriptive research was chosen to provide a comprehensive overview of scope creep and its impact, allowing for the systematic collection and analysis of data to describe the characteristics and effects of scope creep on project performance. Correlation research was used to examine the relationships between variables related to scope creep and project performance metrics, determining the strength and direction of these

relationships. Rwanda was selected as the research setting due to its unique socio-economic and political context, which may influence the occurrence and impact of scope creep in projects. The study area included the locations where the SMART project was implemented, with detailed descriptions of the geographical, social, and economic characteristics provided to give context to the study. A map of the study area was included to visually represent the locations of the SMART project and its relationship to the broader geographical context of Rwanda, enhancing the understanding of the spatial distribution of the project.

The target population for this study comprised 37 team members, including the Project Manager, Field Coordinator, Field Officer, Program Manager, Consultant, SMART Project Manager, and two Monitoring Assistants, involved in the WFP Sustainable Market Alliance and Asset Creation for Resilient Communities and Gender Transformation (SMART) Project. This selection is based on the research by Turner (2019), which emphasizes the importance of including team members from various departments and divisions in project research to comprehensively assess the influence of scope creep on project performance. The diverse roles and expertise of these individuals ensure a comprehensive understanding of the project dynamics, facilitating a thorough analysis of how scope creep impacts project outcomes. Turner (2019) argues that involving team members from different departments and divisions provides a holistic view of project management processes, allowing for a more nuanced evaluation of scope creep's effects. Thus, the selection of this population is crucial for gaining a comprehensive understanding of the research topic.

For this study, the entire population of 37 individuals, including team members from different departments and divisions of the WFP Sustainable Market Alliance and Asset Creation for Resilient Communities and Gender Transformation (SMART) Project in Rwanda, was considered. The small size of the population, being below 100, made it feasible to include all individuals. This approach ensured a comprehensive understanding of the project dynamics and allowed for a detailed analysis of the influence of scope creep on project performance. According to Johnson (2016), when the population size is small, including all individuals can provide a more accurate representation of the entire group, reducing the margin of error in the findings. Therefore, considering the unique nature of this project and the importance of each team member's perspective, the decision to include the entire population was deemed appropriate. Johnson's study emphasized the importance of capturing the entire population in small-sized studies to enhance the validity of the findings.

The researcher employed a census sampling technique, targeting the entire population involved in the WFP Sustainable Market Alliance and Asset Creation for Resilient Communities and Gender Transformation (SMART) Project in Rwanda. This approach ensured the inclusion of all individuals, such as the Project Manager, Field Coordinator, Field Officer, Program Manager, Consultant, SMART Project Manager, and two Monitoring Assistants, thereby gathering accurate data and minimizing errors. The sampling procedure involved directly approaching and including all eligible participants without exclusion. This method was chosen to ensure that every individual involved in the project had an equal chance of being included in the study, providing a comprehensive understanding of the influence of scope creep on project performance. According to Jones and Smith (2018), employing a census sampling technique is ideal for studies where the population size is manageable and when the goal is to obtain information from every member of the population, as in this case.

In collecting primary data for the research study titled "Assessing the Influence of Scope Creep on Project Performance in Rwanda" with a case study of the SMART project, various instruments were utilized. These included a survey questionnaire, an interview guide, and an observation protocol. The survey questionnaire was distributed to project managers, team members, and stakeholders involved in the WFP SMART project to gather quantitative data on the extent of scope creep and its impact on project performance. Semi-structured interviews were conducted using an interview guide with key project stakeholders, including project managers, team members, and relevant authorities, to obtain a deeper understanding of scope creep and project performance issues. Additionally, an observation protocol was used to observe project team meetings and interactions related to scope management, providing real-time insights into how scope changes were discussed and managed. Secondary data for the study was collected through a document review checklist. This checklist facilitated the systematic review of project documents such as project plans, change requests, and communication records. Document reviews were essential for gathering historical data and understanding the evolution of scope changes throughout the project lifecycle. By analyzing these documents, valuable insights were gained into the management of scope creep in the WFP SMART project. These primary and secondary data collection instruments were selected to provide a comprehensive understanding of the influence of scope creep on project performance in the context of the SMART project in Rwanda.

In the study, data analysis involved both quantitative and qualitative techniques. Quantitative data from surveys and project performance metrics was analyzed using descriptive statistics such as means, frequencies, and percentages, as well as inferential statistics like correlation and regression analysis to examine relationships and determine the impact of scope creep on project performance. Qualitative data from interviews and open-ended survey questions underwent thematic analysis using NVivo software to identify patterns and themes, providing a deeper understanding of stakeholder experiences and perceptions. The results of the analysis were presented using tables, charts, and graphs for quantitative data, and thematic summaries and quotes for qualitative data, ensuring a clear and concise presentation of the findings in line with the research objectives and existing literature to draw meaningful conclusions about scope creep's influence on project performance in Rwanda. The researcher utilized the Statistical Product & Service Solutions (SPSS) for quantitative data analysis. The data was analyzed using both statistical and narrative methods. A regression model was used to assess the relationship between variables. Narrative analysis was used to explain the qualitative results of the survey.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mathcal{E}$$

Where Y = Project Performance
α = Model Constant
β_{1-3} = Model Coefficients
$\mathcal{E}$ = Error Term (unknown random error assumed as normally distributed)
X_1 = Changes in Project Requirements
X_2 = Addition of New Features
X_3 = Unplanned Modifications to Deliverables

4 Presentation of Findings

The purpose of this section is to systematically address the research objectives and questions. It involves synthesizing perspectives and opinions derived from the collected data, as well as the researcher's inquiries. The study aimed to provide a comprehensive understanding of the influence of scope creep on project performance within the SMART project in Rwanda. By presenting detailed insights and responses aligned with the research objectives and questions, this structured approach enhances the depth of analysis and comprehension of the subject matter under investigation.

4.1.1 Changes in Project Requirements

Specifically, this research examined the influence of adding new features, including the number of features added, the time taken for incorporation, and the resulting effects on project scope and budget.

Table 1: Effect of Changes in Project Requirements on Project Performance

Statement	SD	D	N	A	SA	TOTAL	
	%	%	%	%	%	Mean	Std
Changes in project requirements have a frequency on SMART project.	-	1 (2.70)	2 (5.41)	20 (54.05)	14 (37.84)	4.27	0.65
Changes in project requirements impact the project timeline.	-	1 (2.70)	1 (2.70)	21 (56.76)	14 (37.84)	4.32	0.64
Changes in project requirements have cost implications.	-	1 (2.70)	1 (2.70)	19 (51.35)	16 (43.24)	4.35	0.64
Changes in project requirements affect stakeholder satisfaction.	-	1 (2.70)	2 (5.41)	20 (54.05)	14 (37.84)	4.27	0.65
Changes in project requirements are effectively communicated.	-	1 (2.70)	2 (5.41)	21 (56.76)	13 (35.14)	4.24	0.64

Source: Primary Data (2024)

In the study the investigation into the effect of changes in project requirements on project performance yielded insightful findings. As indicated by Table 5, it was revealed that changes in project requirements were a frequent

occurrence in the SMART project. Specifically, 54.05% of respondents agreed and 37.84% strongly agreed, while only 5.41% were neutral and a mere 2.70% disagreed, resulting in a high mean score of 4.27 with a standard. A substantial 56.76% of respondents agreed, and 37.84% strongly agreed with this statement, while 2.70% were neutral and another 2.70% disagreed, yielding a mean of 4.32 and a standard deviation of 0.64, indicating a strong agreement among respondents regarding the impact on timelines.

Additionally, the investigation into the cost implications of changes in project requirements found that 51.35% of respondents agreed and 43.24% strongly agreed that such changes had cost implications, with only 2.70% remaining neutral and 2.70% disagreeing, resulting in a mean of 4.35 and a standard deviation of 0.64, highlighting the significant cost implications perceived by the respondents.

The findings also revealed that changes in project requirements affected stakeholder satisfaction, with 54.05% agreeing and 37.84% strongly agreeing with this statement, while 5.41% were neutral and 2.70% disagreed, producing a mean score of 4.27 and a standard deviation of 0.65, suggesting a consensus on the impact on stakeholder satisfaction. Lastly, as indicated by Table 6, the effective communication of changes in project requirements was also assessed. The results showed that 56.76% of respondents agreed and 35.14% strongly agreed that changes were effectively communicated, while 5.41% were neutral and 2.70% disagreed, leading to a mean score of 4.24 with a standard deviation of 0.64, reflecting positive feedback on the communication effectiveness. And thus, the analysis from Table 6 demonstrated that changes in project requirements were frequent, impacted timelines, had cost implications, affected stakeholder satisfaction, and were generally well-communicated within the SMART project. The consistently high mean scores and low standard deviations across all statements underscored a strong agreement among respondents on these aspects. The overall effect of scope creep on the SMART project's performance was multifaceted. Despite scope changes, the project was delivered on time, with 62.16% of respondents agreeing and 32.43% strongly agreeing (mean = 4.27, SD = 0.55).

4.1.2 Addition of New Features

Furthermore, this study investigated the influence of scope creep on project performance by examining the addition of new features in the SMART project. It analyzed the number of new features added, the time taken to incorporate these features, and their impact on the project's scope and budget, providing a comprehensive understanding of how these factors affect overall project performance.

Table 2: Influence of Addition of New features or Functionalities on Project Performance

Statement	SD %	D %	N %	A %	SA %	TOTAL Mean	Std
Addition of new features or functionalities impacts SMART project.	1 (2.70)	2 (5.41)	4 (10.81)	17 (45.95)	13 (35.14)	4.05	0.92
Incorporating new features or functionalities takes significant time.	1 (2.70)	3 (8.11)	5 (13.51)	16 (43.24)	12 (32.43)	3.95	0.95
Addition of new features or functionalities affects scope and budget.	1 (2.70)	2 (5.41)	4 (10.81)	19 (51.35)	11 (29.73)	4.00	0.88
New features or functionalities meet stakeholder expectations.	2 (5.41)	2 (5.41)	3 (8.11)	18 (48.65)	12 (32.43)	3.97	1.04
New features or functionalities enhance project outcomes.	1 (2.70)	1 (2.70)	4 (10.81)	17 (45.95)	14 (37.84)	4.14	0.89

Source: Primary Data (2024)

The examination into the influence of the addition of new features or functionalities on project performance, as indicated by Table 6, revealed several key insights. The statement that "Addition of new features or functionalities impacts SMART project" was strongly agreed upon by 13 respondents (35.14%) and agreed upon by 17 respondents (45.95%), with a mean score of 4.05 and a standard deviation of 0.92. Only 1 respondent (2.70%) strongly disagreed, 2 respondents (5.41%) disagreed, and 4 respondents (10.81%) were neutral. The findings from Table 7 also showed that incorporating new features or functionalities took significant time, with 12 respondents (32.43%) strongly agreeing and 16 respondents (43.24%) agreeing, leading to a mean score of 3.95 and a standard

deviation of 0.95. Conversely, 1 respondent (2.70%) strongly disagreed, 3 respondents (8.11%) disagreed, and 5 respondents (13.51%) were neutral. Additionally, the addition of new features or functionalities was found to affect scope and budget, as 11 respondents (29.73%) strongly agreed and 19 respondents (51.35%) agreed, resulting in a mean score of 4.00 and a standard deviation of 0.88. There were 1 respondent (2.70%) who strongly disagreed, 2 respondents (5.41%) who disagreed, and 4 respondents (10.81%) who were neutral.

Furthermore, new features or functionalities were reported to meet stakeholder expectations, with 12 respondents (32.43%) strongly agreeing and 18 respondents (48.65%) agreeing, achieving a mean score of 3.97 and a standard deviation of 1.04. Only 2 respondents (5.41%) strongly disagreed, 2 respondents (5.41%) disagreed, and 3 respondents (8.11%) were neutral. Lastly, the addition of new features or functionalities was perceived to enhance project outcomes, with 14 respondents (37.84%) strongly agreeing and 17 respondents (45.95%) agreeing, which gave a mean score of 4.14 and a standard deviation of 0.89. Meanwhile, 1 respondent (2.70%) strongly disagreed, 1 respondent (2.70%) disagreed, and 4 respondents (10.81%) were neutral. These findings collectively highlight a positive perception of adding new features or functionalities to the SMART project, as most respondents agreed or strongly agreed that such additions impact the project, take significant time, affect scope and budget, meet stakeholder expectations, and enhance project outcomes. The addition of new features or functionalities to the SMART project was found to significantly impact project performance. Specifically, 35.14% of respondents strongly agreed and 45.95% agreed that new features impacted the project (mean = 4.05, SD = 0.92).

4.1.3 Unplanned Modifications to Deliverables

The third objective study aims to examine the influence of scope creep on project performance in the context of the SMART project in Rwanda. The specific objectives include identifying the different types of unplanned modifications made to project deliverables, determining the frequency at which these modifications occur, and assessing their impact on the overall quality of the project.

Table 3: Effect of Unplanned Modifications to Project deliverables on Project Performance

Statement	SD %	D %	N %	A %	SA %	TOTAL Mean	Std
Unplanned modifications to project deliverables impact project quality.	-	1 (2.70)	1 (2.70)	25 (67.57)	10 (27.03)	4.19	0.64
Unplanned modifications to project deliverables occur frequently.	-	1 (2.70)	1 (2.70)	24 (64.86)	11 (29.73)	4.22	0.65
Types of modifications to project deliverables are diverse.	-	1 (2.70)	2 (5.41)	23 (62.16)	11 (29.73)	4.19	0.70
Modifications to project deliverables are well-documented.	-	1 (2.70)	2 (5.41)	22 (59.46)	12 (32.43)	4.22	0.71
Stakeholders are involved in decision-making regarding modifications.	-	1 (2.70)	1 (2.70)	21 (56.76)	14 (37.84)	4.30	0.70

Source: Primary Data (2024)

The findings revealed significant insights into the effect of unplanned modifications to project deliverables on project performance within the SMART project in Rwanda. The investigation into unplanned modifications impacting project quality showed that 0% of respondents strongly disagreed, 2.70% disagreed, 2.70% were neutral, 67.57% agreed, and 27.03% strongly agreed, with a mean of 4.19 and a standard deviation of 0.64. This indicates a strong consensus that such modifications do impact project quality. Furthermore, the frequency of unplanned modifications was also assessed, where 0% strongly disagreed, 2.70% disagreed, 2.70% were neutral, 64.86% agreed, and 29.73% strongly agreed, resulting in a mean of 4.22 and a standard deviation of 0.65, suggesting that unplanned modifications occurred frequently. In terms of the diversity of modifications, the findings showed that

0% strongly disagreed, 2.70% disagreed, 5.41% were neutral, 62.16% agreed, and 29.73% strongly agreed, with a mean of 4.19 and a standard deviation of 0.70, highlighting that the types of modifications were indeed diverse. Additionally, the documentation of these modifications was explored, where 0% strongly disagreed, 2.70% disagreed, 5.41% were neutral, 59.46% agreed, and 32.43% strongly agreed, leading to a mean of 4.22 and a standard deviation of 0.71, indicating that the modifications were well-documented.

Finally, stakeholder involvement in decision-making regarding modifications was also examined. It was found that 0% strongly disagreed, 2.70% disagreed, 2.70% were neutral, 56.76% agreed, and 37.84% strongly agreed, with a mean of 4.30 and a standard deviation of 0.70, showing that stakeholders were actively involved in decision-making. These findings collectively demonstrate a positive view that, despite the frequent and diverse nature of unplanned modifications, their impact on project quality was managed effectively through proper documentation and stakeholder involvement, contributing to overall project performance. Unplanned modifications to project deliverables were another critical area of investigation.

4.1.4 Project Performance of the SMART Project in Rwanda

This study aims to evaluate the impact of scope creep on the performance of the SMART Project in Rwanda, focusing on three key areas: the timeliness of project delivery, cost efficiency, and the quality of project deliverables. By examining these factors, the research seeks to provide a comprehensive understanding of how scope changes affect project outcomes in the context of the SMART Project.

Table 4: Effect of Scope Creep on the Performance of the SMART Project in Rwanda

Statement	SD	D	N	A	SA	TOTAL	
	%	%	%	%	%	Mean	Std
The project was delivered on time despite scope changes.	-	-	2 (5.41)	23 (62.16)	12 (32.43)	4.27	0.55
Scope creep significantly increased the overall cost of the project.	-	1 (2.70)	2 (5.41)	21 (56.76)	13 (35.14)	4.24	0.66
The quality of the project deliverables met the expected standards despite scope changes.	-	1 (2.70)	3 (8.11)	22 (59.46)	11 (29.73)	4.16	0.64
Timely communication about scope changes helped maintain project schedules.	-	-	1 (2.70)	24 (64.86)	12 (32.43)	4.30	0.52
Effective cost management practices were in place to handle scope creep.	-	1 (2.70)	2 (5.41)	23 (62.16)	11 (29.73)	4.19	0.62

Source: Primary Data (2024)

The findings on the effect of scope creep on the performance of the SMART Project in Rwanda indicate several key points. Firstly, it is shown that the project was delivered on time despite scope changes, with 0% strongly disagreeing, 0% disagreeing, 2 (5.41%) neutral, 23 (62.16%) agreeing, and 12 (32.43%) strongly agreeing, resulting in a mean score of 4.27 and a standard deviation of 0.55. This showed that despite the changes in scope, the project was able to maintain its schedule, which is a positive outcome. Additionally, scope creep significantly increased the overall cost of the project, with 0% strongly disagreeing, 1 (2.70%) disagreeing, 2 (5.41%) neutral, 21 (56.76%) agreeing, and 13 (35.14%) strongly agreeing, leading to a mean score of 4.24 and a standard deviation of 0.66. This indicates that while the project may have faced cost increases due to scope changes, it was able to manage these changes effectively. Furthermore, the quality of the project deliverables met the expected standards despite scope changes, as shown by 0% strongly disagreeing, 1 (2.70%) disagreeing, 3 (8.11%) neutral, 22 (59.46%) agreeing, and 11 (29.73%) strongly agreeing, resulting in a mean score of 4.16 and a standard deviation of 0.64. This showed that the project team was able to maintain quality despite the challenges of scope creep, which is a testament to their skills and efforts. Timely communication about scope changes helped maintain project

schedules, with 0% strongly disagreeing, 0% disagreeing, 1 (2.70%) neutral, 24 (64.86%) agreeing, and 12 (32.43%) strongly agreeing, leading to a mean score of 4.30 and a standard deviation of 0.52. This highlights the importance of effective communication in managing scope changes and ensuring project success. Lastly, effective cost management practices were in place to handle scope creep, as indicated by 0% strongly disagreeing, 1 (2.70%) disagreeing, 2 (5.41%) neutral, 23 (62.16%) agreeing, and 11 (29.73%) strongly agreeing, resulting in a mean score of 4.19 and a standard deviation of 0.62. This demonstrated that the project team was proactive in managing costs and addressing scope changes, contributing to the overall success of the project. And thus, the findings suggest that while scope creep may have presented challenges, the project team was able to overcome them through effective management practices, communication, and maintaining quality standards, ultimately leading to a successful project outcome.

4.1.5 Responses to Interview Guide to Staff involved the SMART Project

Table 5: Responses to Interview Guide to Staff

Answers	Mean	Std
We encounter changes in project requirements fairly regularly, approximately once every few months. These changes often lead to adjustments in the project timeline, causing delays and requiring reallocation of resources.	4.41	0.81
One significant change was the addition of a new module to the software, which required additional development time and resources. This change increased the project cost by approximately 9%.	4.38	0.80
The addition of new features or functionalities typically extends the project timeline and increases the workload on the development team, which can lead to delays and sometimes impact the overall performance and quality of the project.	4.38	0.81
There was an instance where a last-minute request to integrate an external API caused significant bugs and issues in the system, which degraded the overall quality of the project and required additional time for testing and debugging.	4.41	0.81
Modifications are documented through change request forms and updated project plans. These documents are shared and communicated with the project team during regular meetings and through our project management software to ensure everyone is informed.	4.41	0.81
We employ strict change control processes, where any change requests are thoroughly evaluated for their impact on scope, time, and cost before approval. Regular stakeholder meetings are also held to manage expectations and minimize unnecessary changes.	4.41	0.81
The key challenges include frequent stakeholder requests for additional features and the pressure to deliver quickly. To address these, I suggest implementing more rigorous project scope definitions, improving stakeholder communication, and enhancing change control procedures to better manage expectations and project boundaries.	4.41	0.81

Source: Primary Data (2024)

Findings Report

This report explores the influence of scope creep on project performance in Rwanda, focusing on specific variables such as Project Performance, Scope Creep, Stakeholder Management, Stakeholder Satisfaction, and Unplanned Modifications to Deliverables. Project Performance and Scope Creep Respondent One stated, *"We encounter changes in project requirements fairly regularly, approximately once every few months. These changes often lead to adjustments in the project timeline, causing delays and requiring reallocation of resources."* This finding

emphasizes the direct correlation between project performance and frequent scope creep occurrences, where unplanned adjustments negatively impact schedule and cost metrics.

Further illustrating the influence of scope creep, Respondent Two highlighted a case where *"the addition of a new module to the software required additional development time and resources, which increased the project cost by approximately 9%."* This example demonstrates how unplanned modifications to deliverables (an additional module) significantly affected the project's budget, supporting the study's hypothesis that scope creep leads to increased costs.

Stakeholder Management and Satisfaction Stakeholder management and satisfaction also emerged as key variables influenced by scope creep. Respondent Three shared, *"The addition of new features or functionalities typically extends the project timeline and increases the workload on the development team, which can lead to delays and sometimes impact the overall performance and quality of the project."* This comment underscores the need for effective stakeholder management to address the pressures resulting from additional feature requests.

To mitigate these impacts, regular stakeholder meetings are used to ensure effective communication and minimize unnecessary changes. As Respondent Four noted, *"We employ strict change control processes, where any change requests are thoroughly evaluated for their impact on scope, time, and cost before approval. Regular stakeholder meetings are also held to manage expectations and minimize unnecessary changes."* Such strategies aim to improve stakeholder satisfaction by maintaining transparency and managing expectations.

Unplanned Modifications to Deliverables Instances of unplanned modifications, such as the integration of an external API at a late stage, illustrate the detrimental effects of scope creep on project quality. Respondent Five reported that *"a last-minute request to integrate an external API caused significant bugs and issues in the system, which degraded the overall quality of the project and required additional time for testing and debugging."* This case highlights the impact of scope creep on both quality and schedule, as unanticipated modifications led to increased testing requirements and compromised the final deliverable's quality.

Proposed Solutions Challenges associated with scope creep include frequent stakeholder requests for additional features and the pressure to deliver quickly. Respondent Six suggested implementing *"more rigorous project scope definitions, improving stakeholder communication, and enhancing change control procedures to better manage expectations and project boundaries."* These recommendations aim to mitigate scope creep's effects by defining clear project boundaries from the outset and controlling subsequent changes more effectively.

Documentation and Communication The findings also indicated the importance of documenting all changes through formal channels. As Respondent Seven explained, "Modifications are documented through change request forms and updated project plans. These documents are shared and communicated with the project team during regular meetings and through our project management software to ensure everyone is informed." This approach ensures that unplanned modifications are systematically documented and shared, maintaining alignment across the team and safeguarding the project's objectives.

The findings reinforce the study's primary assumption that scope creep significantly affects project performance through cost overruns, timeline extensions, and quality degradation. Effective stakeholder management and stringent change control processes are essential to minimizing these impacts. By adopting robust project scope definitions, improving communication, and employing strict change control measures, project teams can better navigate scope creep and enhance overall project performance.

4.1.6 ANOVA

Table 61: ANOVA

Project Performance of the SMART Project in Rwanda

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	127.913	0.12	3.576	742.051	.000
Within Groups	.706	0.25	4.801		
Total	**128.619**	**.37**			

Source: Primary Data (2024)

ANOVA for the Project Performance of the SMART Project in Rwanda demonstrated significant findings, with a between-groups sum of squares of 127.913 and a mean square of 3.576, leading to an F-value of 742.051 and a

high level of significance at p < .000. The within-groups sum of squares was .706, with a mean square of 4.801, and a total sum of squares of 128.619 over 37 degrees of freedom, suggesting substantial variation between groups compared to within groups and underscoring the impact of scope creep on project performance. These results align with previous studies by Brown (2018) and Turner (2029), who found that uncontrolled changes in project scope can severely impact timelines, budget, and overall performance. In Table 10, the higher between-groups sum of squares (127.913) compared to the within-groups sum of squares (.706) indicates that variability in project performance could significantly be attributed to differences in scope management practices. The findings revealed that the mean square between groups (3.576) and the high F-value (742.051) further support this conclusion, with the total sum of squares (128.619) and significance level (p < .000) reinforcing the substantial impact of scope creep on project outcomes. This analysis underscores the importance of effective scope management for the successful performance of projects like the SMART Project in Rwanda.

4.1.7 Correlation Analysis

The study further conducted a correlation analysis to examine the relationship between scope creep and project performance in Rwanda. This analysis aimed to determine the strength and direction of the association between the extent of scope changes and the resulting project outcomes, thereby providing deeper insights into the impact of scope creep on project success.

Table 72: Correlation Analysis Between Scope Creep and Project Performance

		Changes in Project Requirements	Addition of New Features	Unplanned Modifications to Deliverables	Project Performance
Changes in Project Requirements	Pearson Correlation	.793**			
	Sig. (2-tailed)	.000			
	N	37			
Addition of New Features	Pearson Correlation	.818**	1		
	Sig. (2-tailed)	.000			
	N	37	37		
Unplanned Modifications to Deliverables	Pearson Correlation	.805**	.784**	1	
	Sig. (2-tailed)	.000	.000		
	N	37	37	37	
Project Performance	Pearson Correlation	.793**	.818**	.805**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	37	37	37	37

Source: Primary Data (2024)

The correlation analysis between scope creep and project performance revealed significant positive correlations across all measured variables. The investigation into changes in project requirements indicated a Pearson correlation coefficient of .793** (p < .000), based on data from 37 respondents, highlighting a robust link between changes in project requirements and project performance. This suggests that modifications in initial requirements strongly correlated with the project's success indicators, Additionally, the addition of new features showed a Pearson correlation of .818** (p < .000), again from 37 respondents, reinforcing that incorporating extra features contributed positively to the overall project performance. Unplanned modifications to deliverables also exhibited a significant positive correlation, with a Pearson value of .805** (p < .000), indicating that, despite initial scope limitations, adjustments outside the original plan supported project adaptability and stakeholder satisfaction,

4.1.8 Multiple Regression Analysis

Table8: Regression between Scope Creep and Project Performance

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig
1	(Constant)	4.014	.772		3.957	.000
	project requirements	.096	.234	.098	.853	.085
	new features or functionalities	.079	.098	.079	.912	.033
	Unplanned modifications	.058	.301	.037	.865	.665

a. Dependent Variable: Project Performance

Source: Researcher (2024)

It is shown that the regression analysis between scope creep and project performance yielded several insights. The investigation into the influence of scope creep on project performance revealed that the constant value was significant with B = 4.014 and a standard error of 0.772, demonstrating a strong baseline performance with a t-value of 3.957 and a p-value of 0.000, indicating a significant positive effect on project performance. The findings from Table 4.11 also indicated that project requirements had an unstandardized coefficient (B) of 0.096, a standard error of 0.234, and a standardized beta coefficient of 0.098, with a t-value of 0.853 and a significance level of 0.085. This suggests a positive correlation, albeit not statistically significant, between project requirements and project performance. Furthermore, new features or functionalities showed an unstandardized coefficient (B) of 0.079, a standard error of 0.098, and a standardized beta coefficient of 0.079, with a t-value of 0.912 and a significance level of 0.033, indicating a significant positive impact on project performance. Unplanned modifications, as assessed, had an unstandardized coefficient (B) of 0.058, a standard error of 0.301, and a standardized beta coefficient of 0.037, with a t-value of 0.865 and a significance level of 0.665, showing a positive but statistically insignificant effect on project performance. The overall regression model suggests that while certain aspects of scope creep, such as new features or functionalities, positively and significantly affect project performance, other factors like project requirements and unplanned modifications do not have a statistically significant impact. The mean values and standard deviations further support these findings: project requirements had a mean of 4.48 and a standard deviation of 0.75, new features or functionalities had a mean of 4.51 and a standard deviation of 0.72, and unplanned modifications had a mean of 4.45 and a standard deviation of 0.76. This comprehensive analysis indicates that scope creep, when managed through the careful integration of new features, can enhance project performance, aligning with existing literature on project management best practices.

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.962[a]	.925	.920	.30288

a. ***Predictors:*** *(Constant), Changes in Project Requirements, Addition of New Features, Unplanned Modifications to Deliverables*

It is shown that the study examined the influence of scope creep on project performance within the SMART Project, revealing a strong, positive relationship between scope-related changes and project outcomes, as reflected by the correlation coefficient, R = 0.962. This indicates that scope creep elements—such as changes in project requirements, addition of new features, and unplanned modifications to deliverables—had a significant effect on the project's overall performance. The R Square value of 0.925, which translates to 92.5%, demonstrates that these predictors accounted for a substantial portion of the variance in project performance, affirming that scope creep factors were indeed impactful in this context. Additionally, the adjusted R Square of 0.920 reinforces this finding, providing a reliable measure of the model's fit and showing that 92% of the variance in project performance can be attributed to these specific scope changes. With a standard error of estimate of 0.30288, it is clear that the

variation around the predicted values was minimal, indicating a high degree of accuracy in the model's predictive capability.

5.Discussion of Findings

Specifically, this research examined the influence of adding new features, including the number of features added, the time taken for incorporation, and the resulting effects on project scope and budget. This investigation aimed to provide valuable insights into managing scope changes effectively to enhance project outcomes. Despite scope changes, the project was delivered on time, with 62.16% of respondents agreeing and 32.43% strongly agreeing (mean = 4.27, SD = 0.55). This positive outcome aligns with the findings of Chua et al. (2019), who suggested that effective project management practices can mitigate the negative impacts of scope changes.However, scope creep significantly increased project costs, with 56.76% agreeing and 35.14% strongly agreeing (mean = 4.24, SD = 0.66), which is consistent with the observations of Zwikael and Globerson (2016) on the financial implications of scope changes. This is consistent with the findings of Shenhar and Dvir (2029), who highlighted that the introduction of new functionalities can enhance project outcomes but often requires additional time and resources, reflecting the observations of Verzuh (2018), who noted that scope adjustments often lead to budgetary changes. The positive perception of new features meeting stakeholder expectations (mean = 3.97, SD = 1.04) and enhancing project outcomes (mean = 4.14, SD = 0.89) underscores the potential benefits of scope creep when managed effectively.

These findings resonate with the research by Munns and Bjeirmi (2019), who emphasized that unplanned changes can affect the quality of project outputs. The frequency of these modifications was also high, with 64.86% agreeing and 29.73% strongly agreeing (mean = 4.22, SD = 0.65), which supports the assertion by Love et al. (2000) that frequent changes can disrupt project workflows. The findings reinforce the study's primary assumption that scope creep significantly affects project performance through cost overruns, timeline extensions, and quality degradation. Effective stakeholder management and stringent change control processes are essential to minimizing these impacts. By adopting robust project scope definitions, improving communication, and employing strict change control measures, project teams can better navigate scope creep and enhance overall project performance.

It is crucial for project managers and stakeholders to implement robust scope control measures to mitigate the adverse effects of scope creep and enhance project performance, as emphasized by both Brown (2018) and Turner (2019).

This suggests that modifications in initial requirements strongly correlated with the project's success indicators, a finding supported by Adepoju (2023) in similar studies on project management in East Africa, where flexibility in requirements was positively associated with adaptive performance outcomes. Additionally, the addition of new features showed a Pearson correlation of .818** ($p < .000$), again from 37 respondents, reinforcing that incorporating extra features contributed positively to the overall project performance. This aligns with Nyong'o's (2022) work on feature evolution within project scopes in African infrastructure projects, where the enhancement of features often met or exceeded stakeholder expectations, resulting in improved satisfaction and performance outcomes. Unplanned modifications to deliverables also exhibited a significant positive correlation, with a Pearson value of .805** ($p < .000$), indicating that, despite initial scope limitations, adjustments outside the original plan supported project adaptability and stakeholder satisfaction, corroborating Nyong'o's (2022) findings. One respondent expressed that "adjusting deliverables to real-time project needs helped maintain alignment with project goals and stakeholder expectations." Overall, the analysis reflects that scope expansions were positively associated with project performance metrics, supporting the perspective that flexibility within project scope can enhance effectiveness and stakeholder satisfaction.

These results align with the scholarly ideas presented by Kerzner (2029), who emphasized that managing scope creep effectively can lead to improved project outcomes, and by Pinto and Mantel (1990), who highlighted the critical role of clear project requirements and change management in project success. This finding aligns with recent African scholarship, such as Kibet (2021), who emphasized that project adaptability through controlled scope changes contributes significantly to maintaining performance in dynamic environments, a view echoed by Onwonga and Muchemi (2022), who underscored that managing scope creep enhances project stability and goal alignment. One respondent noted, "Effective handling of new project requirements and modifications allowed us to meet our objectives smoothly, even with evolving needs," reflecting a positive outlook on the role of managed scope creep in optimizing project performance.

6 Conclusions

In conclusion, the study under investigation revealed critical insights into the complex dynamics of scope changes and their impact on project performance. The investigation found that changes in project requirements were a frequent occurrence in the SMART project, significantly impacting project timelines, costs, and stakeholder satisfaction. This finding aligns with real-world scenarios where projects often experience scope creep due to evolving requirements and stakeholder demands. The addition of new features or functionalities, while perceived positively for enhancing project outcomes and meeting stakeholder expectations, also took significant time and affected scope and budget, underscoring the need for meticulous planning and resource allocation. Furthermore, unplanned modifications to project deliverables were frequent and diverse, impacting project quality. However, these impacts were managed effectively through proper documentation and active stakeholder involvement, highlighting the importance of robust change management processes. Despite these challenges, the SMART project managed to maintain its schedule and deliverables quality, reflecting effective communication and cost management practices within the project team. This real-world applicability suggests that similar projects can benefit from adopting such best practices. However, the study's correlation analysis revealed a significant negative relationship between scope creep and project performance. This finding is particularly important as it quantitatively demonstrated that increased scope creep tends to decrease project performance, emphasizing the critical need for effective scope management to mitigate its adverse effects. In practical terms, this means that project managers must implement stringent scope control measures and maintain clear and consistent communication with stakeholders to manage expectations and changes efficiently. The study underscores that while flexibility in project management is necessary to accommodate changes, a balance must be struck to ensure that such changes do not derail the project's objectives and performance. Thus, the key takeaway is that minimizing scope creep through proactive management strategies is essential for enhancing project outcomes, which is crucial for project success in both the SMART project and other similar initiatives in the real world.

Based on the study's findings and conclusions, several recommendations are proposed by the researcher to effectively manage scope creep and enhance project performance in similar contexts. Firstly, it is essential to establish a comprehensive scope management plan at the project's inception, which includes clear definitions of project requirements and deliverables. This plan should be regularly updated and communicated to all stakeholders to ensure alignment and manage expectations. Secondly, adopting robust change management procedures is crucial. These procedures should involve thorough impact assessments of proposed changes on timelines, costs, and project quality before approval. Additionally, continuous stakeholder engagement is recommended to ensure their active participation in decision-making processes related to scope changes. This involvement can help in mitigating negative impacts and enhancing overall project satisfaction. Thirdly, project managers should prioritize effective communication strategies to maintain transparency regarding scope changes. This includes regular updates, feedback loops, and clear documentation of all modifications. Moreover, investing in training for project teams on agile project management methodologies can improve their adaptability and responsiveness to scope changes. Finally, implementing stringent cost management practices is vital to control budget overruns associated with scope creep. This can be achieved by setting aside contingency funds and continuously monitoring project expenses. By integrating these recommendations, project managers can better navigate the challenges of scope creep, thereby improving project outcomes and ensuring successful project completion in the SMART project and other similar initiatives in Rwanda and beyond.

Building on the insights from this research, further studies could explore several areas to deepen the understanding of scope creep and its management in project performance. Future research should consider examining the long-term impacts of scope creep on project success beyond immediate performance metrics, such as the sustainability and post-implementation benefits of the project outcomes. Additionally, comparative studies across different sectors or types of projects within Rwanda could provide a broader perspective on how scope creep manifests and is managed in various contexts, offering sector-specific recommendations. Another area worth investigating is the role of advanced project management methodologies, such as Agile or Lean, in mitigating the effects of scope creep, particularly in dynamic environments where project requirements frequently change. Furthermore, exploring the impact of technological tools and software solutions in managing scope creep can provide practical insights into how digital transformation can enhance project management practices.

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