Study of factors in specifying the scope of work and communication that affects the control of the scope of work in Electrical Communication and Telecommunications systems projects

Kanpicha Pumvises
Dundusid Porananond
Graduate School of Management and Innovation, King Mongkut's University of Technology Thonburi

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Abstract

This study examined how clearly defining project scope and fostering effective communication can help control scope creep in electrical, communication, and telecommunication (ECT) projects. The research combined quantitative and qualitative methods. Quantitative analysis explored the links among various factors such as complexity, specification, risk, communication, client requirements, and a project's susceptibility to scope creep which can indicated by scope clarity, new scope addition and scope modification. Qualitative data, gathered through open questionnaire surveys, provided insights into methods for mitigating scope creep. A strong correlation emerged between scope creep and factors like communication effectiveness, managing client requirements, and proactive risk management. Ineffective communication was identified as the most significant factor, leading to misunderstandings and unplanned additions to the project scope. Based on these findings, the research recommends prioritizing clear scope definition, establishing formal communication plans, and implementing proactive risk management strategies. Additionally, utilizing project management tools and fostering open communication throughout the project lifecycle can significantly reduce scope creep. The benefits extend beyond individual project success. Implementing these recommendations can lead to improved communication efficiency, stronger client relationships, and enhanced project management practices within organizations. Furthermore, the research contributes to a more informed industry landscape by sharing knowledge and improving the understanding of scope control in ECT projects.

Keywords: scope creep; project management; Electrical Communication and Telecommunication (ECT) projects; project scope definition

1. Introduction

Scope creep, the uncontrolled expansion of project scope, is a prevalent issue in project management, particularly in the electrical, communication, and telecommunication (ECT) industry. This industry's unique complexities, driven by technological advancements, stringent regulations, infrastructure integration, and stakeholder diversity, create a fertile ground for scope creep. The characteristics of ECT project are supported by following researches. All researches are grounded in existing literature and draws from the insights of industry experts. Studies by McKinsey Global Institute (2017), the International Telecommunication Union (ITU) (2023), and Gartner (2023) have highlighted the unique challenges faced by ECT projects, including technological advancements, regulatory complexities, infrastructure integration, and stakeholder diversity. These factors have been identified as key contributors to scope creep. Firstly, the findings of McKinsey Global Institute's (2017) report, "The Future of Work: Automation, Employment, and Productivity" support the assertion that the rapid pace of technological change in the ECT industry introduces new requirements and modifications, making it challenging to maintain a defined project scope. Secondly, the International Telecommunication Union (ITU)'s 2023 report, "Regulatory Framework for the ICT Industry," discovered that ECT projects are subject to a complex regulatory environment, including safety standards, licensing requirements, and industry best practices. Compliance with these regulations can introduce additional scope items and complexities. Thirdly, Gartner (2022) report, "Top Trends in Infrastructure and Operations," concluded that ECT projects often involve the integration of various technologies and infrastructure components, increasing project complexity and the potential for unforeseen challenges.

ECT projects typically involve a wide range of stakeholders, each with their own needs and expectations. Coordinating these diverse perspectives and ensuring alignment can be challenging. These factors can contribute to scope creep, leading to budget overruns, delays, and compromised quality. To effectively manage scope creep in ECT projects, organizations must identify its root causes and implement targeted mitigation strategies.

2. Objectives

1) To study the factors in specifying the scope of work and communication that affect the control of the scope of work in the electrical, communication and telecommunications system projects.
2) To suggest the methods to improve communication efficiency in projects in the field of electrical communication and telecommunications.
3) To suggest suitable tools for specifying the scope of work appropriate for the implementation of projects in the field of electrical communications and telecommunications.

3. Literature Review

Scope creep, an uncontrolled expansion of project scope, poses a significant challenge in project management, particularly in complex domains like ECT projects. This topic delves into the existing literature to understand the factors contributing to scope creep, its impact on project success, and potential mitigation strategies.

Factors contributing to scope creep are stakeholder perspectives, project complexity, and communication effectiveness. Research supports these factors as critical contributors, as evidenced by the following:

- Studies have shown that diverse stakeholder views on project scope can contribute to scope creep. This finding is supported by the research titled "The Impact of Stakeholder Communication on Project Scope Creep" (Project Management Institute, 2021). By studying the relationship between communication effectiveness and scope creep, researchers from PMI have concluded that effective communication and collaboration among stakeholders are crucial to aligning expectations and preventing misunderstandings.
- This research aims to investigate the most influential factors impacting scope creep in the construction field. The study, titled "Scope Creep in Construction Projects: Causes and Mitigation Strategies" (Baccarini, 2016), identifies projects with high degrees of customization, technical intricacies, and regulatory requirements as more susceptible to scope creep. Furthermore, the research highlights clear project definition and risk management as essential factors to mitigate these challenges.
- Collecting data from various projects to analyze the relationship between communication breakdowns and scope creep, the study "The Role of Communication in Preventing Scope Creep" (Cleland, 2017) identifies ineffective communication among project stakeholders as a major contributor to scope creep. Delays, misunderstandings, and lack of information sharing can lead to unplanned changes in project scope.

All research mentioned that scope creep has detrimental effects on project success, leading to increased costs, delayed schedules, and compromised quality. Research has demonstrated a strong correlation between scope creep and project failure.

Various knowledge areas within the Project Management Body of Knowledge (PMBOK) Guide, providing a theoretical framework for understanding, addressing scope creep in these projects and potential mitigation strategies as following:

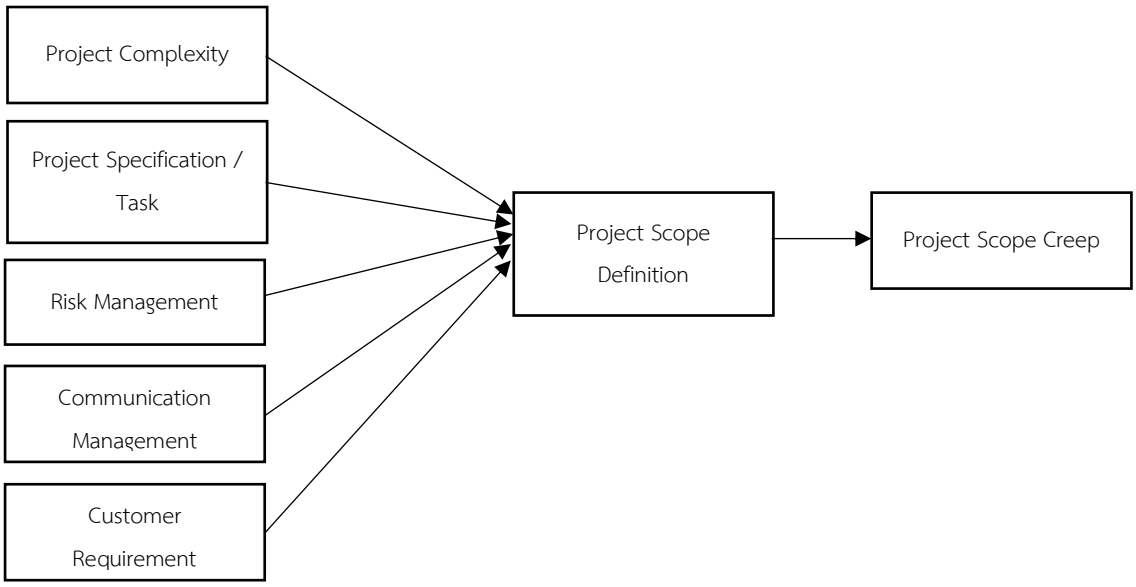
- Scope Management: This knowledge area focuses on defining, creating, managing, controlling, and verifying project scope.
- Stakeholder Management: This knowledge area deals with identifying, analyzing, and managing stakeholder expectations throughout the project lifecycle.
- Communication Management: This knowledge area focuses on ensuring effective information exchange among project stakeholders.

- Risk Management: This knowledge area deals with identifying, assessing, and responding to project risks.

Effective project management, as highlighted in previous studies and theories, requires a proactive approach that addresses the root causes of scope creep. Examples of effective strategies include Clear Scope Definition, Robust Communication, Proactive Risk Management, and Change Management. (International Institute of Business Analysis, 2016).

The literature review indicates that these factors, which include complexity, specification, risk, communication, and customer perspectives, all influence the project scope definition. If the project scope is not clearly defined or is subject to changes, it can lead to project scope creep, which is the uncontrolled expansion of the project scope as illustrated by the conceptual framework in the next chapter. By understanding the factors contributing to scope creep and implementing appropriate mitigation strategies, project managers can significantly improve project success and deliver projects within the defined scope, time, and budget. (Ismail et al., 2020)

Picture 1 illustrates the conceptual framework that explores the relationships between various factors and project scope, ultimately leading to scope creep. Picture 2 outlines the research process and procedures followed in this study.



Picture 1 Conceptual Framework

These factors all influence the project scope definition. If the project scope is not clearly defined or is subject to changes, it can lead to project scope creep, which is the uncontrolled expansion of the project scope.

Table 1 presents a list of factors that can contribute to scope creep in ECT projects. These factors are categorized into five main areas: Scope Management, Tasks/Specifications, Risk, Communication, and Customers. It identifies five main categories of factors:

1. Complexity/Uncertainty
2. Tasks/Specifications
3. Risk
4. Communication
5. Customers

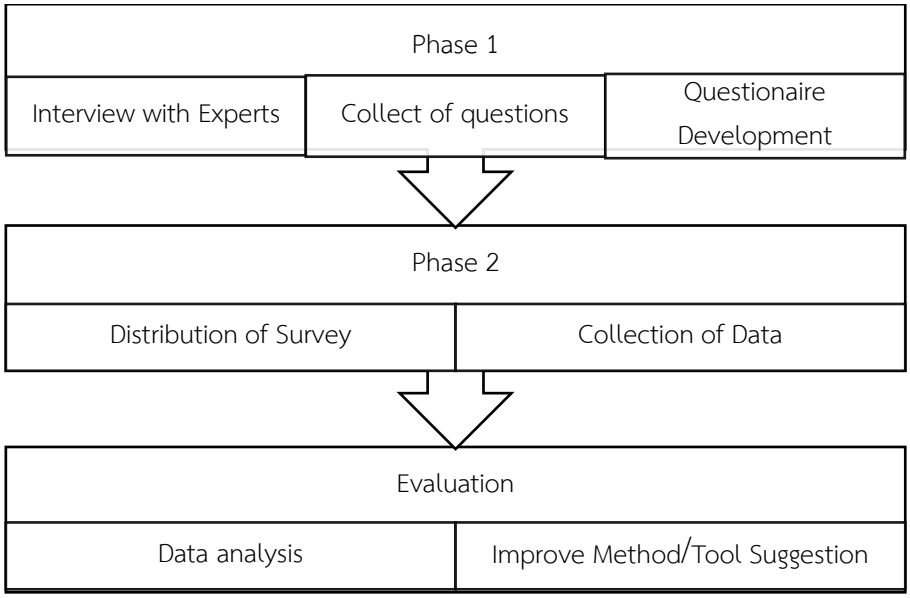
The factors listed in the table can all contribute to scope creep, which is the uncontrolled expansion of project scope. By addressing these factors, project managers can help to prevent scope creep and ensure successful project delivery. These indicators will be incorporated into the questionnaire to ask respondents to share their experiences about the current project outcome and situation in order to calculate correlation. (Ajmal et al., 2019; Ajmal et al., 2021; Ibdayanti et al., 2024).

Table 1 Research variables

Variable	Factors	Indicators	
Scope Management (X)	Complexity/ uncertainty (X_1)	($X_{1.1}$)	A high number of external contractors and vendors
		($X_{1.2}$)	A high number of internal functions
		($X_{1.3}$)	A complex work breakdown structure (WBS)
		($X_{1.4}$)	A high degree of customization
		($X_{1.5}$)	Variety of distinct knowledge bases
		($X_{1.6}$)	High level of technological novelty
		($X_{1.7}$)	Frequent changes in client/user requirements
		($X_{1.8}$)	Degree of inputs in suppliers' equipment
		($X_{1.9}$)	Degree of user/ customer involvement in the design
		($X_{1.10}$)	Clarity of project goals and objectives
		($X_{1.11}$)	Impact of the embedded software in the product/system
		($X_{1.12}$)	Degree of compliance with regulatory requirements
	Tasks/ specifications (X_2)	($X_{2.1}$)	An overlap among tasks
		($X_{2.2}$)	A requirement for several instructions and approvals
		($X_{2.3}$)	Chronological order of task in execution
		($X_{2.4}$)	Variation in task requirements
		($X_{2.5}$)	The precision of language in the project specification
	Risk (X_3)	($X_{3.1}$)	Lack of defining the sources, categories and events of risk
		($X_{3.2}$)	Lack of defining the probabilities and consequences of risks
		($X_{3.3}$)	Lack of defining responsibility and authority for performing the risk management
		($X_{3.4}$)	Involvement of external consultants for identifying risks
		($X_{3.5}$)	Lack of a plan for responding to the most critical risks
		($X_{3.6}$)	Lack of mitigation strategies and contingency plans for risks
	Communication (X_4)	($X_{4.1}$)	Delay in a project due to lack of formal communication plan
		($X_{4.2}$)	Lack of formal resources for the exchange of information
		($X_{4.3}$)	Lack of an open forum for communication among stakeholders
		($X_{4.4}$)	Failure in addressing the concerns of the affected stakeholders
	Customers (X_5)	($X_{5.1}$)	Change in the requirements from the customer
		($X_{5.2}$)	Ambiguity in customer's requirements
		($X_{5.3}$)	An error in defining the scope of the project in the contract
Scope creep in Electrical Communication and Telecommunication Project (Y)	Scope Ambiguity (Y_1)		
	New Added Scope (Y_2)		
	Scope Change (Y_3)		

4. Research Methodology

Literature review indicates that there are five main factors affecting scope creep. This study adopts a mixed-methods research design, combining quantitative and qualitative approaches to comprehensively investigate the factors influencing scope creep in electrical, communication, and telecommunication (ECT) projects. Picture 2 outlines the research process and procedures followed in this study.



Picture 2 Research Process

4.1 Phase 1

To gain an in-depth understanding of scope creep challenges, semi-structured interviews were conducted with three experienced project managers in the ECT industry. Participants were selected based on their extensive experience and expertise. Interview data were analyzed using thematic analysis to identify key factors contributing to scope creep in order to develop the questionnaire in phase 2. Thematic analysis was employed to analyze the interview data, identifying recurring themes and patterns related to scope creep.

In phase 1, the interview guide focused on eliciting expert insights into the factors contributing to scope creep in ECT projects. Participants were asked about their experiences, challenges encountered, and strategies for mitigating scope creep. The interviews covered five key areas of scope creeps.

4.2 Phase 2

Based on the findings from the exploratory phase and existing literature, a structured questionnaire was developed to collect quantitative data from a larger sample of ECT project professionals. The questionnaire employed a Likert scale to measure the impact of various factors on scope creep and open-question in the last sector. A total of 30 employees from different ECT companies participated in the survey.

In phase 2, the questionnaire was selected as the primary tool to collect data. It consisted of three sections

- **Section 1:** Demographic information about the respondents.
- **Section 2:** Likert-scale items measuring the impact of various factors on scope creep.

- **Section 3:** The open-ended responses about scope creep and communication suggestion.

4.3 Evaluation

4.3.1 Data Analysis

These findings were triangulated with the quantitative results, which were obtained through descriptive statistics to summarize the demographic characteristics of the respondents and the frequency distribution of responses, as well as Pearson correlation analysis to examine the relationships between project characteristics, communication, risk management, and scope creep. This combined approach provided a comprehensive understanding of the research problem. By using mixed methods, this study can provide a more nuanced and in-depth understanding of scope creep in electrical, communication, and telecommunication projects, leading to more effective strategies for its prevention and mitigation. (Creswell et al., 2018)

4.3.2 Data Analysis Techniques

- **Descriptive Statistics:** Used to summarize demographic data and frequency distributions in the first section of questionnaire. (International Institute of Business Analysis (IIBA), 2016).
- **Pearson Correlation Analysis:** Used to examine the relationships between variables. Pearson correlation analysis is able to identify significant associations between specific factors and scope creep, providing valuable insights for project managers and organizations seeking to mitigate scope creep in ECT projects in the second section of questionnaire. (Field, 2016; Mukherjee, 2017).

$$R = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{\left[n\sum x^2 - (\sum x)^2\right]\left[n\sum y^2 - (\sum y)^2\right]}}$$

- **Frequency Analysis:** Used to analyze qualitative data from opened question in section 3. (Walpole, 2016; Agresti et al., 2009; Neuendorf , 2017).

By combining quantitative and qualitative research methods, this study provides a comprehensive understanding of the factors influencing scope creep in ECT projects and offers valuable insights for practitioners and researchers.

5. Research Finding

This topic presents the findings from both the qualitative and quantitative phases of the study. The qualitative data, derived from interviews with experienced project managers, provided insights into the key factors influencing scope creep in ECT projects. The quantitative data, collected through a survey, allowed for a broader exploration of these factors and their impact on scope creep.

5.1 Phase 1: Questionnaire Development

Expert interviews conducted in the first phase of questionnaire development identified several key factors contributing to scope creep in ECT projects:

- **Complexity and Uncertainty:** Projects in this sector often involve intricate technical specifications, diverse stakeholder involvement, and dynamic technological landscapes, leading to increased complexity and uncertainty.
- **Task and Specification Challenges:** Defining clear and sequential tasks, along with precise specifications, is crucial for preventing scope creep. Overlapping tasks, vague requirements, and changes in specifications can contribute to project scope expansion.
- **Risk Management:** Inadequate risk identification, assessment, and mitigation strategies can lead to unforeseen challenges and scope creep.
- **Communication Breakdown:** Ineffective communication among stakeholders can result in misunderstandings, delays, and the introduction of new scope elements.
- **Customer Involvement:** Ambiguous customer requirements and changes in customer needs can directly impact project scope.

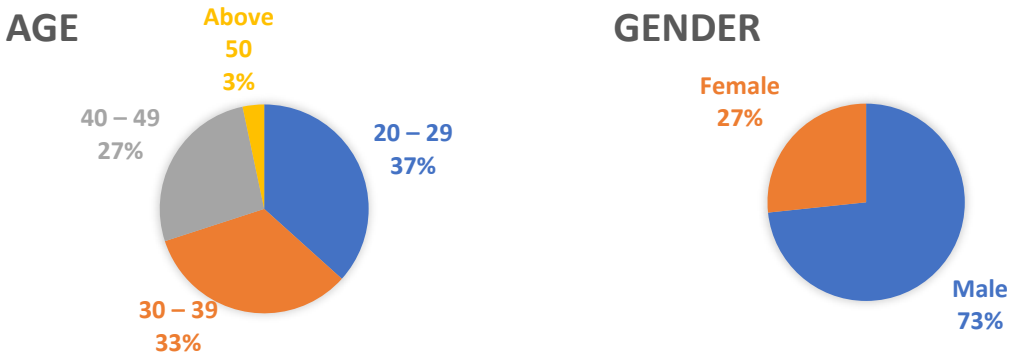
These findings provided a foundation for the development of the survey instrument that was used in phase 2 of the research process. All indicators mentioned in Table 1 can be addressed in the questionnaire as common situations in the ECT field.

5.2 Phase 2 Survey

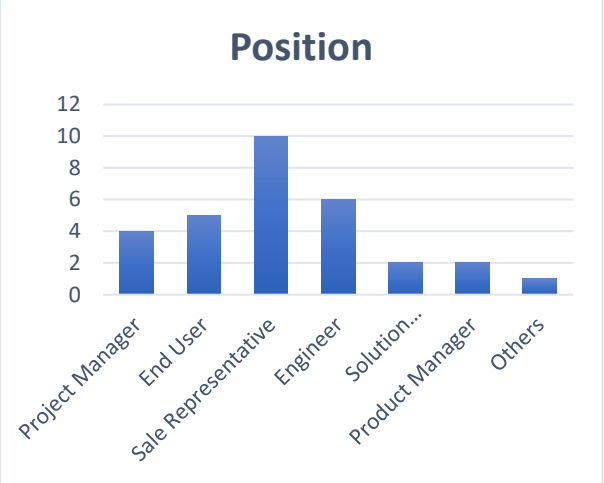
The survey instrument was divided into three sections to gather information on respondent personal information, the relationship between scope creep and factors, and open-ended questions, in order to achieve the research objectives.

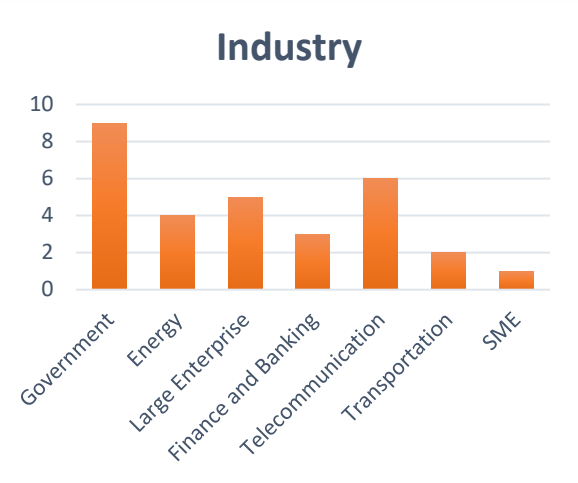
5.2.1 Section 1: Descriptive Statistics

Descriptive statistics were employed to characterize the sample population of 30 respondents and understand the distribution of responses as following



- **Demographics:** The majority of respondents are male (73.3%) aged between 20-39 years old (70%) with a Bachelor's degree (76.7%).





- **Role:** Sales representatives make up the largest group (33.3%), followed by engineers (20%). Sales representatives play a pivotal role in driving business growth, building client relationships, and ensuring successful communication in ECT projects.
- **Experience:** Most respondents have 2-5 years of experience in the electrical, communication, and telecommunication industry (50%).
- **Industry:** The government sector represents the largest end-user industry (30%), followed by the energy industry (13.3%).

5.2.2 Section 2: Correlation Analysis

To achieve the first objective, a Pearson correlation analysis was conducted to examine the relationships between the identified factors and scope creep. The results are summarized in Table 3.

Table 2 Value of correlation

Scale of Correlation Coefficient	Value
$0 < r \leq 0.19$	Very Low Correlation
$0.2 \leq r \leq 0.39$	Low Correlation
$0.4 \leq r \leq 0.59$	Moderate Correlation
$0.6 \leq r \leq 0.79$	High Correlation
$0.8 \leq r \leq 1$	Very High Correlation

Table 3 Correlation Result

Indicators	Scope Ambiguity (Y_1) of the project.	New Added Scope (Y_2) to the project.	Scope Change (Y_3) in the project.
Complexity and Uncertainty			
A high number of external contractors and vendors ($X_{1.1}$)	0.582	0.641	0.554
A high number of internal functions ($X_{1.2}$)	0.481	0.665	0.489
A complex work breakdown structure (WBS) ($X_{1.3}$)	0.457	0.596	0.511
A high degree of customization ($X_{1.4}$)	0.777	0.704	0.767
Variety of distinct knowledge bases ($X_{1.5}$)	0.519	0.629	0.682

Indicators	Scope Ambiguity (Y_1) of the project.	New Added Scope (Y_2) to the project.	Scope Change (Y_3) in the project.
High level of technological novelty ($X_{1.6}$)	0.595	0.740	0.629
Frequent changes in client/user requirements ($X_{1.7}$)	0.7160	0.757	0.887
Degree of inputs in suppliers' equipment ($X_{1.8}$)	0.423	0.364	0.362
Degree of user/ customer involvement in the design ($X_{1.9}$)	0.453	0.566	0.385
Clarity of project goals and objectives ($X_{1.10}$)	0.590	0.893	0.628
Impact of the embedded software in the product/system ($X_{1.11}$)	0.554	0.657	0.647
Degree of compliance with regulatory requirements ($X_{1.12}$)	0.469	0.472	0.450
Task and Specification			
An overlap among tasks ($X_{2.1}$)	0.588	0.552	0.563
A requirement for several instructions and approvals ($X_{2.2}$)	0.444	0.498	0.393
Wrong Chronological order of task in execution ($X_{2.3}$)	0.792	0.699	0.797
Variation in task requirements ($X_{2.4}$)	0.598	0.641	0.672
The precision of language in the project specification ($X_{2.5}$)	0.440	0.569	0.368
Risk			
Lack of defining the sources, categories and events of risk ($X_{3.1}$)	0.477	0.394	0.605
Lack of defining the probabilities and consequences of risks ($X_{3.2}$)	0.628	0.544	0.570
Lack of defining responsibility and authority for performing the risk management ($X_{3.3}$)	0.587	0.644	0.506
Involvement of external consultants for identifying risks ($X_{3.4}$)	0.437	0.514	0.416
Lack of a plan for responding to the most critical risks ($X_{3.5}$)	0.759	0.742	0.768
Lack of mitigation strategies and contingency plans for risks ($X_{3.6}$)	0.843	0.749	0.890
Communication			
Delay in a project due to lack of formal communication plan ($X_{4.1}$)	0.797	0.790	0.809
Lack of formal resources for the exchange of information ($X_{4.2}$)	0.665	0.731	0.830
Lack of an open forum for communication among stakeholders ($X_{4.3}$)	0.901	0.524	0.657
Failure in addressing the concerns of the affected stakeholders ($X_{4.4}$)	0.692	0.475	0.621
End-Customer			
Change in the requirements from the customer ($X_{5.1}$)	0.576	0.745	0.690
Ambiguity in customer's requirements ($X_{5.2}$)	0.852	0.554	0.688
An error in defining the scope of the project in the contract ($X_{5.3}$)	0.707	0.636	0.717

= Very Low Correlation = Low Correlation = Moderate Correlation = High Correlation = Very High Correlation

- **Complexity and Uncertainty:** Several indicators within this factor demonstrated a strong positive correlation with scope creep in various dimensions, particularly those related to customization, frequent changes in requirements, and technological novelty. These correlations were considered significant, as the values exceeded 0.6.
- **Task and Specification:** A wrong chronological order of task execution was found to be strongly positively correlated with scope ambiguity, new added scope, and scope change. These relationships are further explored in Table 3. These correlations were considered significant, as the values exceeded 0.6.

- **Risk:** The lack of risk mitigation strategies and contingency plans was positively correlated with all indicators of scope creep. These correlations were considered significant, as the values exceeded 0.7 as shown in Table 3.
- **Communication:** Ineffective communication practices, including lack of open forums and unclear communication channels, were positively correlated with scope ambiguity, new added scope, and scope change, emphasizing the importance of communication in managing project scope as shown in Table 3.
- **End-Customer:** Ambiguity in customer requirements and frequent changes in customer needs were strongly associated with scope creep.

The analysis unequivocally demonstrates that communication emerges as the most influential factor contributing to scope creep in electrical, communication, and telecommunication projects. This assertion is substantiated by the observation that communication exhibits the highest number of very high correlations as shown in Table 3.

5.2.3. Section 3: Mapping Communication Channels and Scope Definition Tools

This section explores communication channels and scope definition tools used in ECT projects by the response in the open-questionnaire analyzed by frequency analysis. There are 3 main questions to suggest the communication channel, scope definition tools and mitigating scope creeps.

1) Communication Channels

Survey participants identified email as the primary written communication tool, emphasizing its efficiency and documentation capabilities. Meetings emerged as the preferred verbal communication method, highlighting the importance of face-to-face interactions for decision-making and collaboration. These findings help us achieve the second objective.

2) Scope Definition Tools

Project management software, particularly Microsoft Project, was favored for its ability to manage complex project scopes electronically. However, hard copy Scope of Work (SOW) documents remained essential for sharing project scope information with all stakeholders. These findings help us achieve the third objective.

3) Mitigating Scope Creep

Participants emphasized clear scope definition, effective communication, and robust documentation as key strategies for managing scope creep. Regular meetings, risk management, and understanding international regulations were also highlighted as important factors. Overall, effective communication, clear documentation, and proactive risk management are crucial for controlling scope creep in ECT projects.

6 Conclusion/Discussion

6.1 Factor Influence

This part presents the results of the correlation analysis between project factors and scope creep in ECT projects. Based on these findings address the root causes of scope creep as following. These findings align with previous research, which indicates that factors such as complexity, specification, risk, communication, and customer perspectives all influence project scope definition. (Project Management Institute, 2017).

6.1.1 Complexity and Uncertainty

The analysis found a strong negative correlation between high degrees of customization and scope clarity. To mitigate this, project managers should minimize customization and clearly outline the base project scope. Additionally, clear project goals are crucial for preventing scope creep. Project managers should establish clear goals from the start and ensure everyone involved is aligned. (Chapman, 2016)

6.1.2 Task and Specification Clarity

The analysis found a strong correlation between the Chronological Order of Task Execution and scope creep. Project managers should prioritize clear task sequencing and involve stakeholders in planning to prevent scope creep. Additionally, utilizing project management software can streamline task management and improve adherence to the planned task order. (Project Management Institute, 2013).

6.1.3 Risk Management

The analysis found a strong negative correlation between effective risk management practices and scope creep. The most significant indicator was the lack of mitigation strategies and contingency plans. Project managers should prioritize proactive risk identification, thorough assessment, and the development of mitigation plans to reduce the likelihood of scope creep. (Project Management Institute, 2017).

6.1.4 Communication

The analysis found a strong negative correlation between open communication and scope creep. Project managers should establish a culture of open communication, promote stakeholder engagement, and ensure everyone is aligned on project goals and expectations. Additionally, a clear communication plan is crucial for preventing unplanned scope changes. Project managers should establish a well-defined communication plan early on to reduce the likelihood of scope additions and changes. These findings align with the study "The Role of Communication in Preventing Scope Creep" (Cleland, 2017), which identifies ineffective communication among project stakeholders as a major contributor to scope creep. (International Project Management Association, 2016; International Institute of Business Analysis, 2016).

6.1.5 Customer

The analysis found that customer-related factors impact different dimensions of scope creep. To mitigate these issues, project managers should focus on addressing ambiguity in customer requirements, managing changes effectively, and ensuring clear communication and stakeholder involvement throughout the project lifecycle. (Contract Management Institute, 2016; Project Management Institute, 2017).

The analysis reveals that communication is the most significant factor influencing scope creep in ECT projects. By prioritizing communication and implementing effective strategies, project managers can significantly reduce the likelihood of unplanned scope changes and improve overall project efficiency. Following the knowledge areas within the Project Management Body of Knowledge (PMBOK) Guide, project managers can implement strategies to enhance communication and mitigate scope creep. (Project Management Institute, 2016).

6.2 Participant Suggestions for Tools

This section explores participant-suggested tools for managing scope creep in ECT projects. Participants predominantly used email for asynchronous communication and meetings for real-time collaboration. Project management software like Microsoft Project was favored for scope definition, while hard copy SOWs facilitated broader stakeholder understanding. (Moretti, 2005; Chen et al., 2019).

In conclusion, this research successfully achieved its objectives. It identified key factors influencing scope creep in ECT projects, including complexity, uncertainty, task specifications, communication, and customer relationships. To mitigate scope creep, effective communication, collaboration, and project management tools were recommended. By addressing these factors, project managers can significantly reduce scope creep and improve project outcomes in the ECT industry.

7 Research Suggestions

This research highlights several areas for future exploration to address the limitations and gaps in understanding scope creep in ECT projects. (Walker, 2013).

- **Longitudinal Studies:** Tracking scope creep over time and analyzing its impact on project outcomes can provide valuable insights into its evolution and consequences.
- **Comparative Analysis:** Examining scope creep across different ECT sub-sectors and regions can identify industry-specific challenges and effective mitigation strategies.
- **Stakeholder Perspectives:** Gathering diverse perspectives from various stakeholders can provide a more comprehensive understanding of the challenges and effective strategies.
- **Global Context:** Analyzing scope creep across different regions can identify global trends and best practices for managing this issue.

By addressing these research gaps, future studies can contribute to a more comprehensive understanding of scope creep in ECT projects and develop effective strategies for its prevention and mitigation.

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Contact Information

1. Ms. Kanpicha Pumvises
   E-mail: bellseobsu@gmail.com, kanpicha.pumv@kmutt.ac.th
   Graduate School of Management and Innovation, King Mongkut's University of Technology Thonburi
   E-mail: bellseobsu@gmail.com, kanpicha.pumv@kmutt.ac.th
2. Dundusid Porananond
   Graduate School of Management and Innovation, King Mongkut's University of Technology Thonburi
   E-mail: dundusid.por@kmutt.ac.th