Barriers to Effective Knowledge Management in IT Projects: Insights from the Sri Lankan Telecommunications Industry

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ABSTRACT
The accelerating pace of digitization within the telecommunications industry has led to a substantial increase in IT project initiatives, placing a greater emphasis on effective knowledge management (KM) as a key driver of project success. KM is instrumental in fostering operational efficiency, innovation, and continuous improvement. Despite its critical importance, many IT projects encounter significant barriers to the adoption and integration of KM practices.

This study explores KM practices in IT project environments, with a particular focus on the Telecom industry in Sri Lanka. Employing a structured questionnaire administered to project managers, the research identifies key impediments to KM implementation. The findings indicate that time constraints are the primary challenge, hindering the systematic capture and transfer of knowledge. This limitation, in turn, restricts access to the tacit expertise of experienced professionals, diminishing opportunities for organizational learning and capability development.

Moreover, the study emphasizes the necessity of articulating a clear role for KM within IT project governance to support informed decision-making, enhance team collaboration, and ensure sustainable project outcomes. The insights presented advocate for the development of context-specific KM frameworks tailored to the telecommunications sector, aimed at safeguarding institutional knowledge and enabling innovation in future project cycles.

Keywords
Challenges, IT projects, Knowledge Management, Telecom Industry, Time Constraints

1. INTRODUCTION

1.1 Background
Globalization has significantly reshaped the dynamics of the knowledge economy, prompting businesses to invest heavily in information technology (IT) as a means of enhancing efficiency and competitiveness. In the telecommunications sector, this digital shift is particularly evident through the increasing number of IT-related projects. These projects, spanning systems such as customer relationship management (CRM), enterprise resource planning (ERP), and billing support serve as the digital backbone of core telecom operations. While the telecom network provides essential business services, these IT systems ensure seamless service delivery and strategic oversight.

Unlike traditional project types, IT projects in telecommunications emphasize automation, which reduces manual intervention and enhances organizational visibility and performance. Their successful implementation leads to better reporting, continuous monitoring, and improved responsiveness to internal and external demands.

In this context, knowledge management (KM) has become an essential enabler of growth and innovation. KM systems help expand the usable knowledge within organizations and support continuous learning and improvement. As [9] argues, knowledge management functions as a catalyst for economic advancement by enabling informed action. According to [24], knowledge has evolved into a strategic asset that must be cultivated and optimized to gain a competitive edge. The relevance of KM lies in its ability to convert information into actionable insights, particularly when applied to future operations. Foundational KM processes include knowledge creation, storage, retrieval, and transfer [1].

Information and communications technology (ICT) projects are often executed through structured project methodologies [5]. These projects are highly knowledge-intensive, involving significant knowledge acquisition, application, and transformation [28]. Effective KM within project environments is therefore critical to improving project outcomes and fostering organizational learning [3]. Focusing on knowledge within IT projects provides opportunities to generate new insights and develop repeatable strategies that enhance overall project success [19].

As [20], classify project knowledge into three categories: knowledge about projects, knowledge within projects, and knowledge from or between projects. Managing these forms of knowledge requires attention to both intra-project and inter-project dynamics [14], [13]. Strategic approaches to KM that consider these perspectives are particularly important in the telecommunications sector, where the fast-paced nature of technology requires agile and evidence-informed project knowledge practices.

1.2 Problem Statement
The telecommunications industry is increasingly reliant on information technology (IT) projects to enhance operational efficiency, customer experience, and service delivery. As the number and complexity of IT initiatives grow, telecom operators must develop a robust understanding of IT project implementation and management. A critical component of successful IT project execution is knowledge management (KM), which supports knowledge creation, sharing, and reuse throughout the project lifecycle.

Despite its importance, research indicates that effective KM practices are often underutilized in project settings. As [3]

argues, the success rate of KM implementation within projects remains limited, as many organizations encounter persistent challenges in capturing, managing, and applying knowledge assets to support both project and organizational outcomes. These challenges are particularly pronounced in dynamic and knowledge-intensive environments such as telecommunications, where rapid technological changes demand continuous learning and adaptation.

In the context of Sri Lanka, there is a notable gap in empirical research exploring the adoption and effectiveness of KM practices in IT-related telecom projects. The extent to which KM is integrated into these projects, as well as the key barriers to its implementation, remains largely unexplored. Consequently, telecom operators in Sri Lanka lack data-driven insights into how knowledge is managed across IT projects and what organizational or contextual factors hinder its effective use.

This study seeks to address this gap by investigating KM practices within IT projects in the Sri Lankan telecommunications sector. It aims to identify the prevalence of KM adoption and the core challenges that project teams face in leveraging knowledge for improved project outcomes.

1.3 Research Objectives

To address the identified research problem, the study was guided by the following two primary objectives. Through the course of this investigation, the researcher aimed to:

1. To assess the extent to which knowledge management (KM) practices are currently applied in IT projects within the telecommunications sector in Sri Lanka.
2. To identify the key challenges and barriers faced by telecom project teams in implementing KM strategies effectively.

These objectives provide a structured basis for evaluating current KM practices and developing insights to enhance the success of IT projects in the telecom industry through improved knowledge utilization.

2. LITERATURE REVIEW

2.1 Knowledge Management

In the evolving landscape of the knowledge economy, organizations must adopt new working paradigms that prioritize learning and the systematic management of knowledge [17]. Knowledge is increasingly recognized as a critical asset, and effective knowledge management (KM) is viewed as a catalyst for economic growth. As [22], highlight, knowledge flourishes when it is allowed to flow freely within and across organizational boundaries.

The strategic management of knowledge plays a pivotal role in enhancing organizational performance, provided it is approached in a structured and integrated manner. As [21] emphasize that well-managed KM systems can significantly contribute to improved decision-making, innovation, and operational efficiency. Supporting this view, [25] argues that KM is not only essential for organizational survival and sustaining competitive advantage but also serves as a fundamental driver of innovation.

Effective KM, according to [22] requires a synergistic combination of people, processes, and technology to ensure that the right knowledge is made available at the right time. This triadic model enables organizations to convert tacit insights into explicit, usable knowledge that can be shared and leveraged. Furthermore, organizational culture emerges as a vital enabler of KM. As [26] contend that a culture conducive to sharing, collaboration, and continuous learning is critical for promoting knowledge creation and dissemination within institutions.

Collectively, these perspectives underscore the necessity of embedding KM practices into the organizational fabric, enabling firms to respond dynamically to internal and external challenges while fostering sustainable growth.

2.2 Project Knowledge Management

Projects are dynamic environments where new knowledge is continuously created through processes of execution, collaboration, and problem-solving. As [12] argues that project knowledge management (PKM) is not solely a managerial function; instead, it is a shared responsibility that involves both project managers and team members. As [24] project participants attain new knowledge upon the completion of a project, which, if not retained, can be lost when individuals transition to new roles. This observation aligns with earlier findings by [15], [20] who emphasize that the failure to preserve knowledge generated during projects results in critical information being lost post-project, weakening organizational learning.

As [2] further observe that although many projects include mechanisms for capturing lessons learned, such mechanisms are rarely used effectively. As [26] echo this concern, highlighting that valuable knowledge gained during IT projects is infrequently documented or leveraged for future use. As [20] stress the importance of capturing and retaining lessons learned to enhance organizational learning and project performance. Complementing this perspective, [3] contends that effectively managing lessons learned can significantly improve the outcomes of subsequent projects by reducing knowledge loss and promoting continuity.

As [18] defines effective PKM as a process that encompasses knowledge creation, integration, and retention throughout the project lifecycle. It aims to minimize knowledge attrition while bridging existing knowledge gaps. As [3] underscores that as IT projects become increasingly complex, their success is contingent upon the organization's ability to marshal and manage project-specific knowledge efficiently. Learning from previous experiences mitigates risks and enhances decision-making. As [27] argue, failure to institutionalize project knowledge leads to redundant efforts, repeated errors, and missed opportunities for process improvement.

Project knowledge can be broadly categorized into three types: knowledge about projects, knowledge within projects, and knowledge from or between projects [21]. Similarly,[13] classify PKM into two perspectives: intra-project knowledge (knowledge within a single project) and inter-project knowledge (knowledge transferable between projects). As [7] identify project knowledge as comprising technical knowledge, project management knowledge, and context-specific organizational knowledge. As [3] adds that both tacit and explicit forms of knowledge technical and non-technical are valuable and must be integrated into PKM systems to improve learning and reuse.

To facilitate the effective management of knowledge, researchers have proposed two dominant approaches: personalization and codification [10][25]. Personalization

focuses on direct, interpersonal knowledge sharing, such as learning through mentoring, collaboration, and observation. As [3] identifies personalization methods in project environments including learning from experience, learning from others, and learning by doing, with formal and informal project meetings serving as valuable spaces for knowledge exchange.

In contrast, codification involves documenting knowledge into structured formats reports, databases, templates, or knowledge repositories that can be reused by future teams [10]. Codified knowledge enables standardization, ensuring that proven methods and decisions can be reapplied across similar contexts. As [3] outlines strategies for codification through the creation of standardized methodologies and project documentation.

Leadership also plays a crucial role in facilitating successful PKM. According to [21], leadership is central to establishing both personalization and codification strategies. It provides the cultural and strategic support needed to embed KM practices into project workflows and ensure their sustainability across organizational contexts.

2.3 Challenges in Implementing Knowledge Management in Project Environments

The implementation of knowledge management (KM) in project settings is often fraught with numerous challenges. As [3] highlighted that managing knowledge effectively within projects remains a significant organizational difficulty, as many firms encounter multiple structural, cultural, and operational barriers that hinder the adoption of KM practices.

A prominent and widely cited challenge is organizational culture. Numerous scholars have identified cultural resistance as a barrier to knowledge sharing and institutional learning [4], [21], [19], [15], [9], [22], [30]. In many instances, organizations face embedded norms that discourage open knowledge sharing, with individuals perceiving knowledge as a source of personal power and thus resisting its dissemination [22].

Another commonly observed obstacle is time constraints in the project environment. The fast-paced nature of projects often leaves little time for structured knowledge capture, reflection, or transfer activities [4], [3], [9]. In parallel, the unavailability of individuals with the requisite expertise during or after the project lifecycle further impedes effective knowledge capture [4], [3], [19], [21].

The absence of standardized KM processes also emerges as a recurrent challenge. Research indicates that when KM procedures are not institutionalized, project teams lack guidance on how and when to record or disseminate knowledge [19], [16], [9]. In line with this, insufficient leadership commitment and oversight are reported as barriers, as leadership is key to driving a knowledge-sharing culture and aligning KM initiatives with strategic goals [19], [9].

Resistance to knowledge sharing is also notable. This may stem from a lack of trust, competition among team members, or the perception that knowledge hoarding strengthens one's job security [22], [19], [9]. As [22] emphasized that individuals often perceive knowledge as a form of power, which they are reluctant to relinquish.

Lack of training and support systems further compounds these issues. Employees frequently lack the skills to use KM systems or the awareness of KM's strategic value [3], [4], [9]. This is closely linked with limited funding, where financial constraints hinder the implementation of advanced KM tools or training programs [4], [19].

Team disbandment after project completion is another critical issue, especially in project-based industries such as telecommunications. As [8] noted, once the project concludes, tracking team members for post-project knowledge harvesting becomes highly impractical, resulting in substantial loss of tacit insights.

In addition to the aforementioned barriers, [9] provided a comprehensive list of operational challenges affecting KM implementation: unavailability of KM systems, low awareness and understanding of KM concepts, disorganized internal processes, inadequate technology infrastructure, lack of structured procedures, insufficient project documentation, and the inherently dynamic nature of projects.

From a motivational perspective, [4] argued that incentive structures often fail to reward knowledge-sharing behaviors, which diminishes the motivation among employees to contribute to organizational learning. They further highlighted the lack of encouragement from leadership as another deterrent.

Finally, [3] added nuanced insights by pointing to challenges related to managing tacit knowledge, under-prioritization of person-to-person strategies, and the failure to systematically safeguard and store project data in centralized repositories for future retrieval and reuse.

These findings collectively underscore the complex, multifaceted nature of KM implementation in project settings, particularly in knowledge-intensive sectors like telecommunications. Addressing these challenges requires a holistic approach involving leadership commitment, cultural transformation, technological support, and continuous capacity-building.

3. RESEARCH METHODOLOGY

3.1 Introduction

This section discusses research design, available research approaches, strategies, methods and data analysis techniques. Furthermore, this section includes the relevant justification for each selected criterion.

3.2 Research Approach

According to [6], research approaches constitute a systematic plan and procedure that guide the research process from broad philosophical assumptions to detailed methods of data collection, analysis, and interpretation. Given that this study aimed to identify and rank key challenges associated with knowledge management in IT projects within the telecommunications sector, a quantitative research approach was deemed most appropriate.

This study employed a structured quantitative methodology to enable objective measurement and statistical analysis of perceptions across a representative sample. Data were collected using a structured questionnaire, designed to elicit responses that could be quantified, compared, and ranked to identify the most significant barriers to knowledge management implementation.

3.3 Research Method

Research methods serve as essential tools for generating accurate and valid answers to research questions [29]. To address the study's primary objectives, a structured questionnaire was developed to investigate key challenges associated with the implementation of knowledge management

(KM) in IT projects within the telecommunications sector.

The questionnaire was informed by an extensive review of relevant literature, which helped identify the most commonly reported barriers in KM practices related to IT project environments. To ensure content validity, the instrument was reviewed and validated by five experts from both academic and industry backgrounds with relevant expertise in knowledge management and IT project implementation.

The questionnaire consisted of closed-ended items aimed at assessing the prevalence and severity of specific KM challenges. Additionally, open-ended fields were included to allow respondents to report any other issues not covered in the structured items. Respondents were asked to rate each identified challenge, enabling prioritization based on perceived criticality in the context of KM integration in IT projects.

3.4 Population, Sampling, and Data Analysis

The target population for this study consisted of IT projects completed within the past year by a leading telecommunications operator in Sri Lanka. The unit of analysis was defined as IT project managers directly involved in the planning and execution of these projects within the Sri Lankan telecommunications sector.

A review of historical project documentation revealed a total of approximately 40 IT project managers as the relevant respondent pool. To determine an appropriate sample size, the [11] sample size determination formula was applied. Based on this calculation, a minimum sample size of 25 respondents was deemed sufficient to ensure statistical reliability while balancing practical considerations.

Given the context of the study and logistical constraints, a convenience sampling approach was employed. This non-probability method enabled the selection of experienced participants with direct exposure to knowledge management practices and associated challenges in IT project environments. Although convenience sampling limits generalizability, it was considered appropriate for an exploratory study focusing on insight generation from knowledgeable practitioners.

Ethical considerations were rigorously observed throughout the study. All participants were provided with informed consent forms, assuring them of the confidentiality and anonymity of their responses. Participation was entirely voluntary, and respondents had the right to withdraw at any stage without any adverse consequences.

The data collected was subjected to quantitative analysis using IBM SPSS Statistics software. Descriptive statistics and ranking techniques were applied to identify and prioritize the key barriers to effective knowledge management within IT project implementations.

4. RESULTS AND DISCUSSION

4.1 Results

To explore project knowledge management practices, data were collected to determine whether a dedicated knowledge management role was formally recognized within the IT projects under study. This investigation aimed to assess the extent to which organizations institutionalize knowledge-related responsibilities during project execution.

Table 1. presents the summarized findings regarding the presence or absence of a designated knowledge manager or equivalent role in the respective projects.

Table 1. Summary of Knowledge Manger's role identified in respective projects

	No. of Person	Percentage (%)
KM role Identified	11	44
KM role not Identified	14	56
Total	25	100

To evaluate the barriers encountered during the implementation of knowledge management practices in IT projects, respondents were asked to rank a set of commonly identified challenges. A ranking scale was employed, where Rank 1 indicated the most significant challenge and Rank 5 the least significant.

The results are presented in Table 2, summarizing the collective perception of project managers regarding the relative severity of each challenge encountered during project execution.

Table 2. Summary of Challenges faced when implementing Knowledge Management in projects

Challenges in KM	Weighted Average Rank
Project duration is short, hence applying KM is difficult	1.44
Difficult to tap the experience person knowledge	2.24
Team members are fixed only for the project and after the project they move to different division	2.84
More focused on project deliverable	3.48

The simple weighted average used to calculate the average rank based on the rankings given by the responders for the challenges they faced.

4.2 Discussion

The findings of this study highlight significant gaps in the formal application of knowledge management (KM) practices within IT projects in the telecommunications sector. Notably, 56% of the respondents reported that their projects did not designate a specific role for a project knowledge manager. This indicates that the function is either underutilized or not formally recognized in the majority of IT projects, reinforcing earlier observations by [3], who found that KM practices were generally implemented in a moderate and ad hoc manner.

A critical challenge identified in this study is the short duration of IT projects, which restricts opportunities for effective KM implementation. The study revealed that short project timelines hinder the documentation and transfer of knowledge, especially tacit knowledge held by experienced personnel. This finding

aligns with prior research by [9], [4],[3] who all emphasized time constraints as a key barrier to KM in project-based environments. In the context of the telecommunications industry, many IT projects such as system upgrades—are completed within two to three months, with only large-scale implementations like CRM or ERP deployments extending beyond a year. Consequently, short-term projects provide limited scope for reflective practices, knowledge capture, and lesson-sharing activities.

Another prominent challenge highlighted is the difficulty in accessing and capturing the knowledge of experienced personnel during the project lifecycle. This echoes findings from [22], [20], [3] who identified the unavailability or inaccessibility of domain experts as a barrier to effective KM. Additionally, reluctance to share knowledge was noted, which is consistent with research by [23], [9]. This reluctance often stems from perceived ownership of knowledge, where individuals view knowledge as power and are therefore hesitant to share it.

The issue is compounded by the temporary nature of IT project teams. In many cases, team members are assigned solely for the duration of the project and are subsequently transferred to different departments or organizations upon project completion. This transience mirrors the findings of [8], who reported that the disbanding of project team's post-implementation undermines knowledge continuity. The lack of sustained engagement and responsibility for knowledge retention results in minimal motivation to document or disseminate lessons learned.

Furthermore, project teams' primary focus on deliverables rather than knowledge sharing was identified as another critical barrier. Due to high implementation costs and strict deadlines, particularly in projects involving international partners, teams prioritize task completion over reflective activities. This finding supports [3] argument that person-to-person knowledge sharing strategies are often deprioritized. Leadership plays a crucial role in shaping these behaviors; without active encouragement and reinforcement from project leaders, knowledge documentation and transfer become neglected in favor of meeting delivery milestones.

Overall, the study confirms that while IT projects are inherently knowledge-intensive, their structural and operational characteristics pose considerable challenges for KM implementation. Addressing these issues requires a strategic shift towards embedding KM roles and processes into project frameworks, coupled with leadership commitment to fostering a knowledge-sharing culture.

5. CONCLUSION

This study highlights critical gaps in the integration of knowledge management (KM) practices within IT project environments in the telecommunications sector. The finding that fewer than 50% of projects had a formally defined knowledge management role suggests that KM adoption remains at a moderate level. This limited integration underscores the urgent need to institutionalize KM practices to enhance project outcomes and foster long-term organizational learning.

A key recommendation emerging from the study is the early inclusion of a dedicated Knowledge Manager within the project planning process. Embedding this role at the outset enables systematic knowledge capture, codification, and dissemination throughout the project lifecycle. Formalizing this function not only supports project continuity but also contributes to building a sustainable knowledge base across organizational projects.

Short project durations were identified as a major impediment to effective KM. Time constraints frequently lead to the deprioritization of knowledge-sharing activities, resulting in the loss of critical experiential knowledge upon project completion. To mitigate this, KM activities must be integrated into each phase of the project lifecycle. Regular documentation of insights, lessons learned, and key decisions rather than postponing these tasks until project closure—can substantially improve knowledge retention and transfer.

The difficulty in capturing tacit knowledge from experienced professionals further complicates KM implementation. These individuals often face heavy workloads and tight deadlines, limiting opportunities for knowledge codification. Addressing this challenge requires proactive leadership and the cultivation of a knowledge-sharing culture. Strategies such as incentive systems, formal recognition, and performance metrics tied to KM contributions can encourage the participation of experienced personnel in knowledge-sharing initiatives.

In conclusion, the successful integration of KM in IT project environments hinges on three critical enablers: strong leadership commitment, structured KM processes, and an organizational culture that values and rewards knowledge sharing. By prioritizing these dimensions, organizations can enhance project performance, preserve critical knowledge assets, and drive continuous innovation in an increasingly dynamic and knowledge-driven industry.

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