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A Study on Software Project Management Challenges in ISP Network Expansion Projects in Developing Countries

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ABSTRACT

The article is a synthesis of recent studies (2023-2026) on the impact of software project management on the Internet Service Provider (ISP) network expansion projects in developing countries. Modern broadband expansion initiatives are no longer primarily hardware rollout and civil works, but rely more on the software-intensive elements of OSS/BSS configuration, service provisioning automation, network orchestration, multi-vendor interoperability, compliance documentation, and assurance processes. Such technical alterations merge with institutional reality typical of developing situations; regime fragmentation, regulatory multiplicity, capacity limitations, and resource ambiguity, generating an enduring risk of delay, price overruns and underperformance. A 2023-2026 reference set was used to select the 15 most important studies using a structured literature review methodology (with sparse use of older

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sources when needed to define the economic background). Thematic synthesis was used to code the chosen studies, which led to five interconnected challenge themes: (1) planning, requirements, and scope control weaknesses; (2) governance and regulatory complexity; (3) limitations in risk, cost, and schedule management; (4) project management capability constraints; and (5) technical integration and operational complexity. The results indicate that the results of a project in ISP expansion are not only determined by technical readiness, but also by the consistency of governance solutions, excellence of requirement management, resiliency-conscious planning and capacity to deal with integration and compliance within the heterogeneous vendor background. The paper ends by giving implications on the operators, regulators and implementing partners, with the need to be disciplined, requirements engineering, documentation, systematic risk management, and context-sensitive project governance to enhance the performance of delivery and inclusive connectivity.

Keywords— ISP network expansion; software project management; developing countries; telecommunications infrastructure; risk management; project governance; agile delivery; requirements engineering

1. Introduction

1.1 Background

Fast and consistent broadband now is a well-established pillar of economic activity, inclusion and service provision. Expanding connectivity in the developing countries may make productivity gains: access to information, friction of transactions, human capital development, and empowering market participation [1]. Economic data still confirms that the internet connectivity may drive significant effects on development achievements and living standards, but the benefits depend on the quality of the institutions and their adoption [2]. Nonetheless, there is a disparity in access to broadband in most developing situations, particularly between urban and rural populations. The new priorities of international development have therefore become bridging connectivity gaps and expanding digital ecosystems, such as in the form of national broadband strategies and investments in infrastructure, as well as regulatory reforms [3, 4].

Nevertheless, the expansion of ISP networks cannot be limited to the installation of towers, fibre, or routers. The contemporary expansion undertakings require software-based change in both operational and business systems. The tasks that were once manually configured are being automated as orchestration platforms, built-in OSS/BSS stacks, and service activation pipelines. Simultaneously, regulatory pressures on consumer protection, availability, resilience and service requirements are on the rise. This has made projects of ISP expansion hybrid endeavours wherein physical deployment has to be aligned with complicated software provision, continuous integration, interoperability among various vendors, and compliance documentation [5, 6].

These pressures in developing countries are exacerbated by institutional and ecosystem constraints. The critical situation under which network expansion can happen is usually a fragmented governance, right-of-way approvals delays, uncertainty in funding,

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insufficient project management capacity and technical capabilities. The constraints generate long term chains of project risk, which can be in terms of schedule slippage, increasing budget, incomplete delivery of coverage or quality. Project management, in this context, does not just play a coordination role but is a matter of life and death when it comes to the success or failure of network expansion [7].

1.2 Problem statement

In most developing countries, ISP network expansion projects often fail to achieve cost, schedule and performance targets despite extensive investments and national priorities being stated. There are usually delays, increasing budgets, and the performance of implementation is often not as high as initially projected. These issues are similar to wider trends in the context of the public ICT programs and e-government initiatives, where the projects are subjected to the risks of failure because of the complexity of governance, lack of institutional capacity, the mismatch of the stakeholder interests, and the unstable implementation climate [8, 9].

The expansion of telecommunication projects is even more complex due to the fact that it is based on dense stakeholder ecosystems: regulators, licensing agencies, infrastructure owners, civil authorities, communities, vendors, financiers, and customers. A large number of projects are implemented in a multi-vendor environment, where interoperability issues can slow down the process of commissioning and can introduce long-term operational instability [6]. Also, soft-heavy deployment methods (e.g., agile delivery to 5G expansion, automation platforms, and orchestrated service rollout) impose unique project risks in case documentation and requirements control are loose [5, 10].

The evidence base of these challenges is dispersed across many areas, such as software engineering, telecom policy, infrastructure governance, and ICT development, and practitioners find it hard to establish coherent, context-specific management responses. In the absence of synthesis, the project teams are likely to use generic project frameworks that are unlikely to accommodate the hybrid character of ISP expansion. This review thus seeks to unify the current findings in order to explain the most critical issues defining the outcome of ISP expansion projects.

1.3 Aim and research questions

This research is intended to summarize the recent literature on the software project management issues impacting the projects of ISP network expansion in developing nations. The questions that are answered in the review include:

1. Which project management issues are equally reported in the current literature applicable to ISP network expansion projects in developing countries?
2. What are the ways to bring these challenges together in a thematic set that then represents actual demand delivery pressures in software-intensive telecom rollout?
3. What are the implications of enhancing the performance of project delivery and decreasing the cost/schedule risk in ISP expansion?

1.4 Scope and delimitations

The research is targeted at expansion projects of ISP networks that contain software-intensive facilities like provisioning platforms, OSS/BSS modernization, network automation and multi-vendor integration. It is aimed at developing and resource-bound

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situations such as lower-middle-income economies where there is a high level of governance and capability constraints, which have significant effects on delivery. The article reflects on the synthesis of the results about project management as opposed to the elaboration of telecom engineering design. It also highlights current research (2023-2026) when necessary, but allows some use of previous evidence where necessary to provide a background of economic context.

2. Conceptual Framing

2.1 ISP expansion as software-intensive infrastructure delivery

Physical deployment and software delivery in most ISP expansion programs are simultaneous and interdependent. The rollout of network infrastructure (backhaul expansion, the deployment of access networks, and equipment set-up) is traditionally handled by infrastructure project processes. However, the business and functional sustainability of the extended network relies on built-in systems that facilitate customer lifecycle management, billing, service provisioning, fault monitoring, capacity planning and resilience operations. Complex software platforms and defined workflows are needed in these functions.

This is a characteristic that distinguishes ISP expansion projects from traditional infrastructure projects. The success of the delivery process requires integration between non-homogeneous systems and between vendors, and allows service continuity. Modernization and migration pressures make the problem of technical complexity even more complex because operators have to introduce new functionality and maintain old platforms at the same time. Multi-vendor SDN and interoperability settings emphasize the ways in which the uncertainties related to the integration can be directly translated into the schedule and cost risks [6].

What this means is that ISP expansion project management should integrate aspects of infrastructure governance, software project management, requirements engineering, risk management, coordination of stakeholders and compliance assurance. The failure of any of these elements may create a downstream disturbance throughout the rollout.

2.2 The role of uncertainty and requirements in project performance

The common problem with software-intensive projects is the presence of uncertainty, especially uncertainty related to defining the requirements, stakeholder expectations, and changing compliance requirements. In most settings, requirements are not complete when a project begins, and project teams make governance decisions as to whether control of requirements is centralized or decentralized. It has been suggested that centralization can be effective in enhancing coherence and compliance control but leads to lesser responsiveness to local realities, whereas decentralization allows agility and risks fragmentation [11].

It has been well known that requirement volatility is one of the main causes of rework and delay. Volatility can also be experienced in agile settings when stakeholders do not communicate effectively enough or when documentation is unproductive in maintaining traceability and regulated change [10]. Telecom growth complicates the situation as its requirements are subject to change depending on regulatory reforms, emergency preparedness or infrastructure factors. Thus, the scope management and requirement management become the driving forces of the project's success.

2.3 Governance and institutional context

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Project governance affects the speed of decision-making, alignment of the stakeholders, accountability processes, and conflict resolution. Systemic barriers can be created in developing contexts by fragmentation of governance, ineffective institutional coordination and insufficient implementation capacity. These relationships are recorded in the sources of literature on ICT and e-government, and such failures occur not due to the impossibility of the technical solutions, but due to the inability of the organizational structures to become consistent in delivery [8].

The research on infrastructure governance demonstrates that the legitimacy of stakeholders and the participation of stakeholders also influence the outcomes. The problem of participatory governance may lead to conflict or opposition that will contribute to delays and scope modification of projects [12]. The governance efficacy in telecom projects where coverage rollouts and infrastructure upgrades converge on the public space and local authorities is a determinant project management element.

3. Methodology

3.1 Research design

This paper uses the structured literature review methodology and has a clear selection criterion and thematic synthesis. Its design complies with the modern evidence-based methods of reviewing evidence in similar project management documents, and it is modified to correspond to the hybrid infrastructure/software foundation of the ISP expansion projects.

3.2 Search strategy

The contemporary literature that dealt with telecom project management, software engineering management, requirements engineering, infrastructure governance, agile delivery, multi-vendor integration, resilience planning, and broadband expansion constraints was found in a curated reference list. Peer-reviewed publications and high-quality institutional diagnostics were prioritized in relation to the development of digital ecosystems in developing countries.

3.3 Eligibility criteria

The studies included in the study had to fulfil the following criteria:

1. publication 2023-2026 (subject to some exceptions regarding the background economic context);
2. relates to the implementation of telecom infrastructure, the growth of ISPs, software-intensive infrastructure projects, or the delivery of ICT projects;
3. clear definition of project management issues (scope control, governance, risk, capability, integration);
4. applicability to emerging situations or generalizability of results to resource-limited implementation settings.

3.4 Study selection and data extraction

The process consisted of staged screening, which entailed relevance screening of titles/abstracts and was followed by full-text screening according to inclusion criteria. The core corpus was made up of fifteen studies, which had a lot of evidence that could be used to address the challenge of managing ISP expansion in developing settings.

Bibliographic details, region/context, sector/project type, research method and central project management challenges reported were all recorded in the data extraction

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process. Thematically analyzed coded, and extracted challenge statements were grouped.

3.5 Thematic analysis approach

Findings were synthesized across studies by using thematic synthesis in an attempt to establish a coherent challenge framework. Coding was done repeatedly, with project risks and constraints being associated with project lifecycle stages. Themes were narrowed down until five categories of challenges were identified. These are the themes that form the foundation of the results, which have been stated in the next section.

4. Results: Summary of Included Studies

4.1 Evidence overview

The covered studies presented are complementary to the requirements of software requirements management, telecom deployment management, infrastructure governance, and resilience planning. There are a few studies that are narrowed down to telecom rollout and technical integration [5, 6, 13, 14]. Some others offer more general and transferable data about requirements volatility, uncertainty management, regulatory compliance engineering, and project success drivers [10, 11, 15, 16]. The studies of infrastructure governance and risks provide evidence on the participation of stakeholders, their legitimacy, and cost overrun mitigation tools applicable to an infrastructure rollout shared by telecom projects [12, 17, 18].

Collectively, the corpus indicates a modern perspective on the limitations of project management on the growth of ISP expansion programs, especially in the developing environment where institutional and capability obstacles continue to play a major role.

4.2 Summary of included studies

Table 1. Summary of included studies (n = 15)

ID	Study	Country/Region	Sector/project type	Method	Key focus relevant to ISP expansion
1	Alfiani et al. (2024)	Developing countries	E-government / ICT programs	Systematic review	Institutional barriers, governance fragmentation, and capacity limits
2	Alkwai et al. (2025)	Telecom contexts	Agile 5G network projects	Empirical practice study	Documentation quality, traceability, and agile telecom delivery risks
3	Alsohybe & Mohmed (2024)	Yemen	Telecom advancement initiatives	Applied case-based analysis	PM techniques under instability/resource constraints
4	Canesi & Gallo (2023)	Cross-context	Infrastructure projects	Tool-based quantitative	Risk assessment to mitigate cost overruns
5	Deneke et al. (2024)	Multi-vendor	SDN in telecom	Technical evaluation	Interoperability/integration complexity

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		contexts	networks		as delivery risk
6	Esposito et al. (2023)	Case (transferable)	Megaproject governance	Case/policy analysis	Participation, legitimacy, governance conflict and delay drivers
7	Ezeigweneme et al. (2023)	Africa–USA synthesis	Telecom PM	Review	Lessons learned, best practices, recurring telecom PM risks
8	Iyer et al. (2025)	Cross-context	Software governance	Empirical/conceptual	Centralized vs decentralized requirements decisions
9	Jiang et al. (2025)	Global	Emergency management in telecom	Comparative policy analysis	Crisis readiness, coordination requirements, and resilience planning
10	Kosenkov et al. (2025)	Cross-context	Compliance software systems	Systematic mapping study	Regulatory compliance, RE practices, and assurance
11	Loureiro et al. (2024)	Cross-context	IS project success	Review/synthesis	Drivers and measurement of project success
12	Mohammad & Kollamana (2024)	Cross-context	Agile software projects	Review/synthesis	Requirement volatility causes + mitigation
13	Padi et al. (2025)	Developing contexts	Satellite backhaul for telemedicine	Applied study	Deployment risks and delivery constraints in rural connectivity
14	Shahzad (2024)	Telecom projects	Agile application	Applied case analysis	Agile execution, coordination and rollout bottlenecks
15	Umar & Lano (2024)	Cross-context	Automated requirements engineering	Systematic literature review	Tool support, traceability, and RE decision enhancement

5. Thematic Findings: Key Challenges Affecting ISP Expansion Projects

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5.1 Weak planning, scope definition, and requirements control

The initial one is the topic of scope and requirements instability. The start of ISP expansion projects is associated with uncertainty: the demand forecasts change, vendor solutions are changed, and regulatory conditions can change [19]. Most projects, however, still use planning methodologies that presuppose baselines that are constant. In the absence of sound requirements engineering and managed stakeholder interaction in defining scope, volatility is experienced throughout implementation and initiates rework and delays.

Agile software research has evidenced that requirement volatility is one of the most insidious disrupters of projects. They are poor goal definition among the stakeholders, a lack of analysis at the start, poor communication, and a lack of consistency in the availability of the stakeholders. In place of these drivers, agile methods may inadvertently transform into the sources of uncontrolled change instead of the planned adaptation [10].

There are other volatility drivers for the Telecom expansion projects. They are required to satisfy coverage requirements and performance criteria, and unforeseen site-level environments or enabling restrictions can modify deployment plans. In this case, the project teams have to determine the way requirements decisions are managed. Iyer et al. (2025) demonstrate that the centralized decision structure enhances the consistency and decreases the fragmentation in uncertain conditions, and the decentralized structure is more responsive but more prone to incoherence [11]. In the case of ISP expansion programs, a hybrid model may become essential: centralized control on core compliance and architecture decisions is necessary, but there has to be local rollout flexibility.

Also, requirements stability is affected by documentation practices. As Alkwai et al. (2025) indicate, delivery control is compromised in agile 5G deployment settings, where poor documentation and weak traceability practices exist [5]. The lack of proper documentation leads to requirement changes being hard to verify, the transfer of lessons learned is an ineffective process in cross-rollout waves, and operational handovers are weak. Documentation lapses become operational risk and slow benefits realization in the context of ISP expansion, where long-term maintenance and regulatory evidence may be of critical importance.

It is proposed in this theme that disciplined requirements engineering, clear scope baselines, strict change control, and documentation practices are the keys to the planning of maturity in the expansion of ISP.

5.2 Governance and regulatory complexity as delivery constraints

The second theme is that of fragmented governance and regulation. Projects of ISP expansion are integrated into institutional frameworks in which power is decentralized, and responsibility can be ambiguous. The implementation of infrastructure projects calls for coordination among regulators, licensing agencies, local government agencies, land owners, contractors, vendors and communities. In the case where the governance systems are weak, the process of making decisions becomes slow, conflicts arise, and there is a delay in project teams that cannot be resolved by technical solutions alone.

Literature on e-government has shown that governance obstacles are still at the centre of ICT implementation challenges in developing countries. Alfiani et al. (2024)

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demonstrate that poor coordination, institutional mismatch, and inadequate implementation capacity are the usual challenges [8]. These dynamics are directly applicable to the ISP expansion, especially when the rollout is dependent on several agencies in terms of permits, the rights-of-way, and enforcing the infrastructure sharing requirements.

Infrastructure governance studies also demonstrate that the legitimacy and involvement of the stakeholders affect project paths. As an example of how to redefine scope and timelines despite the apparent technical viability, Esposito et al. (2023) demonstrate how the conflict and legitimacy challenges in governance can be redefined. Telecom rollouts, though smaller than rail megaprojects, must nonetheless deal with stakeholder contestation of where to locate the site, land use, equity of access to the service, as well as the environmental or community impacts of the site [12].

Telecom-research also introduces more dimensions. Ezeigweneme et al. (2023) demonstrate that the delivery of telecom projects needs a disciplined approach of governance, adoption of best practices, and structured lessons learned to avoid failures in execution [20]. In the developing environment, however, the political turnover, uncertainty in the regulatory and financing instability compromise governance consistency.

The emergency preparedness is an added complication. Jiang et al. (2025) underline that the crisis-ready telecom systems must have coordinated frameworks and preparedness planning among regulators and operators [13]. Such requirements impose expansion project needs and coordination burdens, especially where the national priority is a resilient service.

In general, governance is not a background requirement; it is a project output. Effective ISP expansion programs thus need formal governance frameworks with accountability, escalation procedures, stakeholder interaction strategies and regulatory alignment mechanisms.

5.3 Gaps in risk management, cost control, and schedule performance

The third theme is the continuing lapses in risk management and cost/time management. Predictable risks exist in ISP expansion projects - allowing delays, contractor performance difficulties, supply risks, integration risks, weather risks, security breaches, and regulatory changes. However, such risks are not well managed because of inadequate risk assessment discipline, inadequate monitoring, and over-optimistic scheduling assumptions.

Canesi and Gallo (2023) demonstrate that cost overruns in infrastructure projects can be reduced with the help of structured risk assessment tools, as they allow identifying the risk drivers at an early stage and taking mitigation measures [17]. Proactive cost risk mitigation must be implemented in ISP expansion; resources are usually limited, and funding disparities may slow implementation.

Software uncertainty also turns out to be a risk and is most prevalent when requirements change and when integration dependency is taken. The studies of uncertainty governance underline the fact that risks are not technical but are formed by structures of decisions, alignment of stakeholders, and accountability [11]. Compliance and assurance requirements also contribute to an increase in project risk as they introduce verification, documentation, and traceability requirements that can lack sufficient

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resources [15].

Risk management becomes an operational practice, other than a paper exercise, and the project outcomes are enhanced. It is indicated that the use of information systems and digital management tools can reinforce risk governance through the enhancement of monitoring, reporting discipline, and risk indicators visibility across teams [18].

Another dimension of risk is the crisis preparedness introduced by the research on telecom resilience. As Jiang et al. (2025) point out, emergency management commitments necessitate the coordination of preparedness and planning [13]. When these requirements are not incorporated early in the process, they may manifest themselves as scope increases at the late stages of a project, leading to project delays and cost increases.

Therefore, to enhance ISP expansion delivery, risk integration between planning and implementation is needed, realistic scheduling, budget contingency structures, integration risk control, and deployment sequencing resilient to risk.

5.4 Capability constraints and inconsistent project management maturity

The fourth theme is related to project management capability limitations. The development of ISP networks requires multidisciplinary management: coordination of infrastructure deployment, the management of software delivery, the management of vendors, alignment of regulations and involvement of stakeholders. In developing settings, shortcomings in these aspects often diminish the quality of the plan, lax discipline in monitoring, and delay solving the problem.

The evidence in telecom project management has highlighted the importance of structured learning and formalized best practices towards success. One of the key aspects, according to Ezeigweneme et al. (2023), such as telecom delivery, is lessons learned, repeatable governance practices, and consistent monitoring routines [20]. In the case where organizations do not have mature project systems, they will make repeated errors at rollout waves, and then the delays will have predictable patterns.

In unstable environments, the problem of capability limits is even greater. Alsohybe and Mohmed (2024) demonstrate that the modern project management method and technology may be applied to telecom development projects in Yemen, but they should be modified to meet the needs of the unstable situation, labour shortage, and the lack of local infrastructure development [21]. Their indications suggest that methods are not enough, and capability formation must encompass training, internalization, and adjustment to practice.

The evidence of public ICT programs supports the argument. Alfiani et al. (2024) demonstrate that low capacity and weak institutional routines are still fundamental challenges in the development of digital efforts in countries [8]. These challenges lower the effectiveness of the governance and execution despite the availability of funding and technology.

The long-run project success literature indicates that the definition and measurement of success are also influenced by capability. According to Loureiro et al. (2024), the evaluation of project success relies on the use of consistent criteria and methods of measurement [16]. Where the stakeholders are different (regulators are interested in coverage, operators are interested in financial performance, communities are interested in access, vendors are interested in delivering milestones), weak success measurement

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frameworks may lead to conflict and less alignment.

As such, capability development must encompass the standardization of project processes, training, governance instilling and enhanced project success measurement to be adjusted to the realities of ISP expansion.

5.5 Technical integration and operational complexity in multi-vendor environments

The fifth theme is technical integration and complexity of operations. The growth in ISP has been relying on multi-vendor ecosystems, software-defined architectures and contemporary automation platforms. Integration risks do not occur at the fringes; they are core performance and delay determinants.

As Deneke et al. (2024) show, the problems of interoperability in multi-vendor SDN environments are present, and the problems of performance issues in the work of controllers have the potential to disrupt integration and operational stability [6]. In more real-world ISP projects, the symptoms of integration failure can be seen as commissioning delays, multiple testing cycles, poor performance on launch, and unstable behaviour that needs repeat work.

With an increase in complexity, documentation becomes critical. Evidence of Agile 5G projects suggests that the absence of documentation in projects decreases traceability, reliance on individual knowledge, and undermines handover [5]. In the case of ISP expansion, handover is bad in operations teams, service assurance processes and customer experience outcome.

Complexity is also added by the requirements of compliance. Ksenkov et al. (2025) reveal that regulatory compliance within the software system is largely reliant on the practice of requirements engineering that facilitates both the generation of traceability and evidence. Requirements engineering support [15]. Requirements engineering can be automated to enhance traceability, consistency, and quality of compliance documentation [22]. These are used to enhance compliance requirements and minimize the discontinuity in the verification phase in the ISP expansion.

The new patterns of complexity emerge due to the emerging technologies. Padi et al. (2025) demonstrate the way low-latency satellite backhaul may increase the range of connectivity when providing healthcare to rural areas [23]. Although it can be used to improve the inclusion results, it presents a new set of dependencies (vendor reliance, service-level variability, regulatory adaptation) that ought to be considered project risks and addressed in the structured integration planning.

This theme reaffirms the fact that integration management ought to be considered as a strategic project discipline which needs architecture governance, interoperability planning, serial testing, solid documentation and functional readiness control.

6. Discussion

The thematic results provide evidence that the expansion projects of ISP in developing situations encounter systematic project management issues that are not limited to technical engineering challenges. The uncertainty is increased by weaknesses in planning and volatile requirements, and it results in rework [24]. Fragments in governance slow down decisions and introduce a risk of delays, especially in cases where objectives of sequencing are determined by permits, rights-of-way, and regulatory requirements [25]. Lack of proper risk governance leads to cost increases

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and schedule volatility. Monitoring discipline is lessened by capability constraints, and escalation is not possible. Lastly, the complexity of integration in a multi-vendor environment is a high-impact delay driver and an augmented risk with regard to operational underperformance.

Notably, there is interaction between these themes. The uncertainty in governance may give rise to requirements volatility, i.e., the stakeholders change their expectations with changes in policy [26]. Complexity of integration exposes risks since failure to interoperate with other systems takes up time and resources as a surprise. Capability gaps minimize the possibility of teams using consistent change control and disciplined documentation [27]. The outcome will be a positive feedback loop that will create chronic underperformance in delivery.

Practically, the evidence suggests that enhancements to the work of ISP expansion need structural interventions. To begin with, even when delivering agile, requirements engineering should be reinforced through traceability and documentation practices [28]. Second, the governance of projects must be formalized with roles, accountability, escalation and strategy to engage stakeholders [29]. Third, the operational risk management should be operationalized in the form of monitoring tools and resilience planning. Fourth, the institution of best practices and systems of success measurement should be prioritized in order to build capability. Fifth, integration must be viewed as a strategic delivery stream and not a terminal technical activity.

The development diagnostics reiterate that the connectivity and inclusion goals rely on the capability of executing the project. According to OECD (2025) and ADB (2025), the divides in connectivity can only be bridged by not just money and technology but also a good implementation framework. World Bank (2024) also emphasizes the need to have practical governance in order to have resilience and infrastructure sustainability [30]. These findings corroborate the thematic evidence and affirm the conclusion that project management maturity is one of the key factors in ISP expansion outcomes.

7. Conclusion

This article has surveyed the emerging evidence (2023-2026) on the problems of project management in ISP network expansion projects in developing nations through a systematic review and thematic synthesis of fifteen relevant studies. They were found to be five challenge themes connected: (1) planning, requirements, and scope control weaknesses; (2) governance and regulatory complexity; (3) risk, cost, and schedule management gaps; (4) capability constraints and lack of project management maturity; and (5) technical integration and operational complexity.

Results indicate that ISP growth efforts are becoming more like software-intensive infrastructure projects, in which success is determined by rigorous requirements engineering, documentation and traceability, effective governance practices, risk planning, resilience and integration controls in heterogeneous vendor environments. Institutional fragmentation and small capacity are what add to these challenges in the developing contexts.

ISPs and policymakers should focus on structured project governance, develop more robust requirements and change control practices, invest in capability building, integrate operational risk management systems and consider integration planning as a strategic stream within a project to achieve better results. Empirical studies on ISP

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expansion delivery, in particular, within developing contexts should be extended in further research, including comparative assessments of technology deployment models and governance interventions that can be shown to yield performance improvements.

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