



Supplier Development: Insights from the Literature and Relevance to the Upstream Petroleum Industry in Nigeria

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ABSTRACT

Supplier development is increasingly recognised as a strategic element of supplier management, particularly in industries where buying firms depend on capable external vendors for operational performance. This paper reviews the literature on supplier development and considers its relevance to Nigeria's upstream petroleum industry. It synthesises existing research on direct and indirect supplier development practices, their underlying governance mechanisms, and their implications for supplier capability and performance. The review shows that supplier development is most effectively understood not as a narrow procurement tool, but as a relational, cross-functional, and capability-building process. It also identifies important gaps in the literature, including the disconnect between analytical models and industry practice, the persistence of transactional procurement approaches, and the limited attention given to long-term supplier capability development in institutionally complex settings. By connecting these insights to the Nigerian upstream petroleum context, the paper highlights the managerial importance of relational governance, knowledge transfer, and strategic supplier engagement. The study concludes with implications for supplier relationship management research and for managers seeking to strengthen supplier performance in complex and high-risk supply chains.



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Introduction

Nigeria possesses 37.5 billion barrels of proven oil and condensate reserves and 209 trillion cubic feet of natural gas reserves (NUPRC, 2024). Despite this substantial and geologically attractive resource base, however, the country's upstream oil and gas industry continues to underperform relative to global peers, as reflected in persistent cost overruns, schedule delays, and weaker safety and environmental outcomes (Rui et al., 2018). These performance deficiencies have become increasingly significant within a more competitive and globally integrated operating environment.

A useful point of departure for understanding these challenges is the structure of the upstream value chain. The upstream segment comprises operating companies, service companies, and contractors. Operating companies hold the rights to explore for and produce hydrocarbons and typically bear the primary financial and project risks. Service companies provide specialised technical inputs such as drilling, well intervention, maintenance, and equipment support, whereas contractors undertake defined tasks in areas such as engineering, procurement, construction, logistics, and other time-bound field services (Lavis, 2018). In practical terms, operators coordinate production while service companies provide technical expertise and execute specific operational packages in the field (API, 2007).

Within this structure, operators may be understood as the buying firm, while service companies and contractors function as suppliers or vendors. This framing is analytically important because it locates upstream operational outcomes not only in the capabilities of the operator, but also in the performance of the firms that provide goods and services to operators.

Upstream operators depend heavily on suppliers to execute a substantial share of exploration, drilling, production, and support activities. This reliance enables operators to concentrate on core competencies and manage operational and commercial risk, while contractors provide scalable labour, deployable technical capability, and specialised equipment in response to project demands across dispersed and changing geographic environments.

The implication is that the competitiveness of upstream operators depends, in part, on their ability to build, manage, and continuously improve a network of capable and reliable suppliers of services and materials. Supplier capability is therefore not a peripheral procurement concern; rather, it constitutes a strategic issue with

implications for cost, delivery, safety, environmental performance, and regulatory compliance.

Supplier development forms part of the broader business discipline of supplier management, within which the buying firm selects, evaluates, and develops vendors.

Against this backdrop, this paper reviews the literature on supplier development within the broader business context and considers its relevance to Nigeria's upstream oil and gas sector. It synthesises how supplier development has been conceptualised, examines the direct and indirect practices through which buying firms seek to improve supplier capabilities, and discusses the implications of these practices for cost, quality, delivery, safety, environmental performance, and regulatory compliance. In doing so, the paper positions supplier development as a strategic pathway through which upstream operators may strengthen supplier capability and improve operational performance in the Nigerian petroleum industry.

Key Concepts in Supplier Performance and Supplier Management

In this context, supplier performance refers to the extent to which a contractor or vendor meets the contractual and operational expectations of the buying firm (Akubuko et al., 2019). Bernard (1990) similarly defines supplier performance as the supplier's "ability to satisfy the requirements of the buying firm". In the upstream oil and gas sector, supplier performance is commonly assessed in terms of delivery reliability, conformity to quality standards, health and safety outcomes, social performance, and compliance with legal and regulatory requirements (Rui et al., 2017; Akubuko et al., 2019).

One response to weak or inconsistent supplier performance is supplier development. In the supply chain management literature, supplier development refers to deliberate actions undertaken by the buying firm to improve deficient supplier performance and strengthen the long-term capabilities of its supply base (Reed & Walsh, 2002). These efforts typically target technical, quality, delivery, and cost capabilities and are best understood as a sustained cooperative process between the buying firm and its suppliers (Watts & Hahn, 1993). Because such programmes cut across procurement, operations, quality, and leadership functions, their implementation is inherently cross-functional and requires top management support.

An important distinction in the literature is that between direct and indirect supplier development practices (Wagner, 2010).

Direct supplier development occurs when the buying firm allocates financial, technical, or human resources to improve a specific supplier. Typical practices include training, knowledge transfer, on-site consultation, technical assistance, investment in equipment or materials, and supplier financing.

Indirect supplier development, by contrast, involves limited direct resource commitment to any single supplier and instead relies on incentives, standards, and performance pressures to stimulate improvement across the supplier base. Common mechanisms include supplier evaluation and certification, formal performance requirements, competition among suppliers, and the conditional allocation of future business based on achieved targets. Such approaches are typically grounded in the buying firm's coercive or non-coercive power (Yawar & Seuring, 2018).

Studies by Wagner (2010) and Krause et al. (2000) show that firms in manufacturing and other industrial sectors often combine direct and indirect supplier development approaches to improve the performance of underperforming suppliers. Krause et al. (2000) and Modi and Mabert (2007) further argue that supplier incentives, together with evaluation and assessment, are important enablers of direct supplier development. Accordingly, supplier development is often most effective when it begins with indirect measures and then progresses to direct interventions such as operational knowledge transfer.

Theoretical Framework of Supplier Development

In general, supplier development is underpinned by governance mechanisms, which may be understood as the means through which power and risk are managed in inter-organisational relationships. In the context of supplier development, such power is typically exercised by the buying firm.

Direct supplier development, in which the buying firm plays an active role by dedicating human or financial resources to the improvement of a specific supplier, may be explained theoretically through transaction cost theory and the knowledge-based view of the firm (Wagner, 2010). By contrast, the relationship between indirect supplier development and supplier performance may be understood through goal-setting theory and influence strategy.

The Knowledge-Based View of the Firm

The knowledge-based view of the firm holds that knowledge is the most significant resource available to the firm in relation to performance and a critical input in

production, thereby constituting a central source of competitive advantage (Grant, 1996). From this perspective, the transfer of knowledge from the buying firm to the supplier can contribute to improved supplier performance. Knowledge may be classified as tacit or implicit, depending on its nature and the means through which it is transferred (Reber, 1989; Kelly et al., 2025). The transfer of implicit knowledge may occur through the sharing of documentation, whereas the transfer of tacit knowledge may take place through the co-location of staff (Wagner, 2010). Over time, suppliers may improve both performance and competitiveness by integrating external knowledge obtained from multiple buying firms.

The significance of this theory lies in its implication that a buying firm can enhance supplier performance by implementing strategies that facilitate the transfer of knowledge to the supplier.

Relational Exchange Theory

Relational exchange theory posits that successful long-term business relationships are built on trust and commitment developed through repeated interactions between firms, rather than through isolated transactional exchanges (Goles & Chin, 2002).

According to Fontenot and Wilson (1997), the core characteristics of relational exchange theory include cooperation, interdependence, commitment, trust, restraint from opportunistic behaviour, communication and conflict resolution, power, shared values, and expected relationship outcomes.

Review Methodology

This study adopts a structured narrative literature review approach to synthesise existing knowledge on supplier development and assess its relevance to the upstream petroleum industry, with particular emphasis on the Nigerian context. Given the fragmented and multidisciplinary nature of the supplier development literature, spanning supply chain management, procurement, strategic management, and inter-organisational governance, a narrative and integrative approach was considered appropriate for capturing both conceptual and empirical contributions.

Literature Search Strategy

The literature search was conducted across major academic databases commonly used in management research, including Scopus, Web of Science, Google Scholar, and ScienceDirect. Search terms included combinations of keywords such as "supplier development", "supplier performance", "supplier

relationship management”, “Strategic Procurement”, “buyer-supplier relationships”, “local content”, and “oil and gas supply chain”. Additional context-specific terms such as “upstream petroleum”, “emerging economies”, and “Nigeria” were also included to capture industry-relevant studies.

The literature search focused primarily on peer-reviewed publications published between 1990 and 2025. The starting point was selected because supplier development emerged as a distinct subject of procurement and supply chain research during the early 1990s, while more recent studies were included to capture contemporary developments in supplier relationship management, local content, and energy-sector supply chains.

Selection Criteria

Studies were selected based on their relevance to the following criteria:

- examination of supplier development practices,
- analysis of supplier performance outcomes,
- discussion of governance mechanisms in buyer-supplier relationships,
- focus on capability development, knowledge transfer, or supplier upgrades,
- relevance to industrial sectors, particularly energy, oil and gas, or emerging economy contexts.

Both empirical and conceptual studies were included to allow for a comprehensive understanding of the field. While priority was given to peer-reviewed journal articles, selected doctoral theses, policy-oriented studies, and practitioner-focused contributions were also incorporated where they provided context-specific insights, particularly in relation to local content and supplier capability development.

Analytical Approach

The reviewed literature was analysed thematically. Studies were categorised into broad analytical streams, including:

- Direct and indirect supplier development practices, focusing on mechanisms such as training, evaluation, incentives, and knowledge transfer;
- Governance and relational perspectives, examining trust, collaboration, power dynamics, and relational exchange mechanisms;

- Analytical and decision-oriented approaches, including optimisation models and multi-criteria decision-making frameworks;
- Context-specific and sectoral studies, particularly those addressing oil and gas industries and emerging economy settings.

Within each category, the analysis focused on identifying core constructs, underlying theoretical perspectives, methodological approaches, and reported outcomes.

The initial database search yielded approximately 159 records. Following the removal of duplicate publications, 126 records remained for screening. Titles and abstracts were reviewed to assess relevance to supplier development, supplier performance, governance mechanisms, and capability development. Studies focused exclusively on supplier selection without a developmental component, unrelated procurement issues, or contexts lacking relevance to organisational supplier relationships were excluded. Following full-text assessment, 21 studies were retained for detailed analysis and synthesis.

Synthesis Strategy

A critical synthesis approach was employed to integrate findings across these heterogeneous streams. Rather than aggregating results mechanically, the review identifies patterns, complementarities, and contradictions across different bodies of work. Particular attention was given to:

- the relationship between supplier development practices and outcomes,
- the role of governance mechanisms in mediating supplier performance,
- differences between analytical models and real-world practice,

The synthesis also emphasises the distinction between short-term performance improvement and long-term capability building, highlighting how different approaches contribute to each.

Scope and Limitations

The review focuses primarily on management and supply chain perspectives on supplier development, with selective inclusion of policy and development-oriented studies where they inform supplier capability and local content discussions. While the approach enables a broad and integrative understanding, it does not constitute a fully systematic or meta-analytic review. As such, the findings should be interpreted as conceptually

synthesised insights rather than statistically generalisable results.

Review of Supplier Development Literature

The empirical literature on supplier development consistently indicates that buying firms can enhance supplier performance through a combination of direct and indirect interventions. A seminal contribution in this regard is provided by Krause, Handfield, and Tyler (2000), who examined the ways in which manufacturing firms improve supplier performance through these complementary approaches. Using survey data from 322 purchasing managers and structural equation modelling with LISREL, the authors analysed the relationships among direct involvement, supplier incentives, competitive pressure, and performance improvement. Their findings demonstrate that supplier assessment and supplier incentives exert significant positive effects on supplier performance, while direct supplier development strategies have an especially strong positive influence.

Building on this foundational evidence, Ohrstrand and Hodne (2015) extend the discussion to the oil and gas sector by developing a conceptual guide for supplier development in African petroleum-producing countries. Drawing on secondary evidence from the extant literature, the study identifies the principal actors required for an effective supplier development programme and proposes a framework for coordinating their roles. The analysis highlights government, international oil companies, local suppliers, educational institutions, and aid agencies as central participants. It further recommends the use of incentives, including certification and the prospect of future business, as mechanisms for strengthening supplier performance.

At a broader sectoral level, Rocha (2012) examines the oil and gas industry as a potential platform for technological learning and capability building in resource-rich economies, thereby challenging deterministic interpretations of the resource curse. Drawing on innovation systems perspectives, the chapter argues that capability accumulation in oil and gas depends on coordinated learning processes involving firms, suppliers, national oil companies, and state institutions rather than on market forces alone. By highlighting experiences, particularly from Latin America, the study reframes natural resource sectors as possible engines of industrial upgrading when embedded within supportive institutional and policy frameworks. However, the analysis remains largely conceptual and illustrative, with limited systematic empirical evidence and minimal engagement with political economy constraints such as

power asymmetries, rent-seeking, and governance failures. Consequently, while the chapter offers a theoretically influential and policy-relevant contribution to debates on resource-based development, it also underscores the need for empirically grounded research on how capability-building mechanisms operate across diverse institutional contexts.

Turning specifically to the Nigerian context, Mogbolu (2021) examined how leaders in the oil and gas sector formulate strategies for local supplier development through a qualitative review of interviews and case studies. The study analysed organisational documents, including sustainability reports and procurement policies, using a systematic five-step process of compiling, disassembling, reassembling, interpreting, and concluding. The analysis identified several strategic themes associated with effective supplier development, including the creation of business opportunities, the use of institutional frameworks, sound financial management, the development of leadership and technical capabilities, collaboration with external stakeholders, and robust performance management. The study concludes that implementing these strategic themes can help address competency gaps and strengthen supplier performance within the industry.

This Nigeria-focused line of inquiry is further strengthened by Arimie and Adiele (2021), who investigated the relationship between supplier integration and competitiveness among oil and gas producing companies in the Niger Delta. Drawing on 112 valid questionnaire responses from a cross-section of 45 exploration and production companies, the study conceptualised supplier integration as collaboration and coordination with key suppliers through information sharing, joint planning, and the pursuit of mutual goals, while competitiveness was measured in terms of operational effectiveness, service quality, and responsiveness. The study found that supplier integration significantly improves all three dimensions, thereby establishing it as an important driver of competitiveness in the oil and gas industry.

Still within the Nigerian setting, Thomas (2021) examines the role of strategic alliances in fostering local capacity development in the oil and gas industry, situating the analysis within the Resource-Based and Knowledge-Based Views of the firm. Drawing on qualitative case studies involving alliances between international oil companies and indigenous firms, the study demonstrates that alliances can facilitate skills transfer and organisational learning, although outcomes are highly uneven and contingent on governance structures, partner

commitment, and the absorptive capacity of local firms. While regulatory pressure under Nigeria's local content regime encourages alliance formation, the findings indicate that compliance alone does not guarantee substantive capacity development. Although the study offers rich empirical insights and extends alliance theory into the extractive industries context, its firm-centric theoretical framing underplays broader institutional and political economy dynamics, and the absence of longitudinal performance measures limits causal inference. Nonetheless, the study provides a robust and contextually grounded contribution to the literature on local content implementation and alliance-driven capability development in oil-producing economies.

Related project-level evidence is offered by Egbumokei et al. (2024), who examine strategic supplier management as a means of optimising global project delivery in the energy and oil and gas sector, with emphasis on collaboration, digital integration, and risk mitigation within complex project supply chains. The study reinforces the increasingly accepted view that supplier relationships should be managed strategically rather than transactionally, particularly in capital-intensive and high-risk project environments. While the paper provides a useful synthesis of practitioner-oriented insights and highlights relevant managerial practices, its analysis remains largely descriptive and normatively framed. The absence of an explicit theoretical foundation, a systematic review methodology, or empirical validation limits its explanatory depth and academic contribution. Consequently, the study offers an incremental, practice-focused perspective that is valuable for contextual understanding, while underscoring the need for theoretically grounded and empirically rigorous research on strategic supplier management in oil and gas project delivery.

A related policy-oriented perspective is presented by Hanson and Nwakile (2025), who examine local content development in oil and gas contracting as a mechanism for community capacity building and empowerment. The study argues that local content policies should extend beyond employment targets to foster long-term skills development, indigenous enterprise growth, and socio-economic inclusion. In so doing, it highlights community-level outcomes in extractive industry contracting, an aspect often marginalised in supply chain and local content research. However, the analysis remains largely descriptive and normatively framed, lacking both an explicit theoretical foundation and empirical validation. Key concepts such as empowerment and capacity building are discussed conceptually rather

than analytically, while structural challenges such as governance weaknesses, power asymmetries, and implementation constraints are underexplored. As a result, the study offers a useful policy framing but also highlights the need for more analytically grounded research on community-level local content outcomes in the oil and gas sector.

Evidence from outside the petroleum sector likewise reinforces the performance significance of supplier development. Kwelle et al. (2023), for instance, examined the relationship between supplier development and competitiveness among bread bakeries in Rivers State, Nigeria. The study operationalised competitiveness in terms of adaptability, innovativeness, and product quality, and analysed questionnaire data collected from 88 bakeries. The results revealed a strong positive association between supplier development and the dimensions of adaptability and product quality, leading the authors to conclude that supplier development can function as a strategic instrument for enhancing firm competitiveness.

In another emerging-economy energy context, Rasheed (2025) examines supplier development practices within the gas sector supply chain of Pakistan, thereby providing empirical insight into an under-researched setting. Using a survey-based approach, the study finds that basic supplier development activities, particularly supplier evaluation, monitoring, communication, and limited training, are commonly adopted and positively associated with perceived supply chain performance. While the paper contributes context-specific evidence to the supplier development literature, its analysis remains largely operational and descriptive, without explicit theoretical grounding in relational or capability-based perspectives. Moreover, the reliance on cross-sectional, self-reported data constrains causal inference and offers limited insight into long-term supplier capability development. Consequently, the study provides an incremental empirical contribution while underscoring the need for theoretically informed and longitudinal research on supplier development in regulated energy supply chains.

While the previous studies focus primarily on observed performance effects, Resende et al. (2023) offer a broader methodological perspective through a review of 65 journal articles on quantitative decision-making models for supplier development programmes. Their review maps the field, identifies dominant trends and gaps, and outlines directions for future research. The findings indicate that quality, cost, financial strength, delivery, and price are the criteria most frequently monitored by

buying firms. The review also identifies capacity improvement, certification, training, knowledge transfer, and feedback as the most common supplier development initiatives. Methodologically, data envelopment analysis, non-linear programming, and fuzzy C-means emerge as the most widely used modelling approaches, while rough set theory is reported as the most frequently applied evaluation technique.

This methodological emphasis is further developed by Resende, Lima-Junior and Carpinetti (2023), who provide a state-of-the-art review of decision-making models for formulating and evaluating supplier development programmes within the supply chain and operations management literature. Their review reveals the strong dominance of multi-criteria decision-making techniques, particularly AHP, ANP, TOPSIS, and their fuzzy extensions, which are applied largely to supplier prioritisation rather than to the longitudinal evaluation of development outcomes. Moreover, most reviewed models are static and cross-sectional, offering only limited support for assessing dynamic capability development or programme effectiveness over time.

Sarfaraz et al. (2022) introduce a methodological innovation through a hierarchical fuzzy inference system (HFIS) for supplier selection and performance improvement in the oil and gas industry. By integrating fuzzy logic with a hierarchical structure and entropy-based weighting, the study addresses the uncertain and qualitative nature of supplier evaluation criteria while seeking to overcome rule explosion and subjectivity limitations commonly associated with conventional fuzzy multi-criteria decision-making approaches. A notable contribution lies in extending supplier evaluation beyond static ranking towards the development of a future cooperation roadmap, thereby aligning decision support more closely with supplier development objectives. However, the empirical validation is limited to a small expert panel within a single national context (Iran), and performance improvement outcomes are inferred rather than directly observed. Moreover, although methodologically rigorous, the study remains largely technique-driven, with limited engagement with broader strategic sourcing and supply chain governance theories.

From an analytical modelling perspective, Zhang et al. (2024) advance the supplier development literature by explicitly incorporating technical uncertainty into development investment decision-making, thereby addressing an important limitation of earlier deterministic models. Using a game-theoretic framework, the study examines how a manufacturer allocates development investments across competing suppliers

when technological improvement outcomes are uncertain. The findings demonstrate that investment success probabilities and supplier competition critically shape optimal development strategies, revealing nuanced trade-offs between single- and dual-supplier development and highlighting conditions under which supplier development may counterintuitively reduce supplier profits. While the paper makes a significant theoretical contribution by modelling uncertainty in a rigorous manner, its conceptualisation of supplier development remains narrowly confined to cost-reduction investments and overlooks relational, behavioural, and long-term capability-building dimensions. Moreover, the use of strong simplifying assumptions and the absence of empirical validation limit the external applicability of the findings beyond manufacturing.

Relatedly, Menhat et al. (2022) developed a performance measurement framework (PMF) for the oil and gas supply chain, grounding their analysis in the Resource-Based View of the firm by conceptualising performance measurement systems as strategic organisational resources. Drawing on exploratory expert interviews and a large-scale survey of firms operating in the United Kingdom and Malaysia, the study identifies key performance dimensions and reports a positive association between the use of the PMF and perceived organisational performance. The framework offers practical value by consolidating industry-specific performance measures and highlighting implementation challenges in the oil and gas supply chain context. However, the study relies on self-reported, cross-sectional data, thereby limiting causal inference and raising concerns about common method bias. Moreover, its theoretical contribution remains largely confirmatory, with limited integration of complementary perspectives such as sustainability despite their growing relevance in oil and gas supply chains.

Extending this to the strategic perspective, Alhammadi et al. (2023) critically examine procurement paradigms in the global petroleum and natural gas industry, arguing that prevailing approaches remain overly transactional and insufficiently attentive to buyer-supplier relationship dynamics. By synthesising literature across procurement and supply chain management, the paper highlights the strategic potential of relational governance, collaboration, and long-term supplier engagement in enhancing performance within complex, high-risk energy supply chains. While this conceptual critique is timely and consistent with broader shifts towards strategic sourcing, the analysis is only weakly anchored in established theoretical frameworks such as the relational

view or transaction cost economics, thereby limiting its analytical depth. Moreover, the review lacks a transparent and systematic methodology and provides no empirical or case-based evidence to substantiate its claims regarding the benefits of relational procurement. Consequently, the paper makes a useful problem-framing and agenda-setting contribution, while also underscoring the need for theoretically grounded and empirically validated research on buyer–supplier relationships in the petroleum and gas sector.

Complementing these governance-oriented perspectives, Yang et al. (2023) advance the supplier relationship management literature by examining how relational practices translate into supplier innovation outcomes through the integrated lenses of interorganizational learning and social exchange theory. Using survey data and structural equation modelling, the study demonstrates that supplier relationship management positively influences supplier innovation contribution, primarily through learning mechanisms facilitated by trust, reciprocity, and knowledge sharing. This relationally grounded explanation provides an important counterpoint to more transactional or power-based views of supplier management. However, the theoretical integration remains largely additive, with limited exploration of power asymmetries, value appropriation, or institutional constraints that frequently shape buyer–supplier interactions. In addition, the reliance on cross-sectional, perceptual measures of innovation constrains causal inference and obscures the longitudinal dynamics of capability development.

Taken together, these studies suggest that supplier development is not merely an operational intervention but also a governance process through which buying firms shape supplier capability and performance. This perspective is articulated most clearly by Benton et al. (2020), who provide an empirical examination of how supplier development programmes influence supplier performance by conceptualising such programmes as governance mechanisms rather than purely operational tools. Using survey data from first-tier automotive suppliers and structural equation modelling, the study demonstrates that supplier development initiatives do not directly improve performance unless they are mediated by relational mechanisms such as bilateral communication, cooperation, and commitment. These findings challenge purely coercive or incentive-driven views of supplier development and highlight the centrality of relational governance in translating development efforts into performance gains. Although the study makes a substantial theoretical and empirical

contribution by foregrounding relational mediation effects, its reliance on cross-sectional, perceptual data and a single industry context limits causal inference and generalisability. Nonetheless, it remains a foundational reference in supplier development research and provides an important bridge to governance-oriented explanations of supplier performance improvement.

Critical Synthesis

The literature on supplier development, procurement, and capability building in energy and oil and gas supply chains reflects a growing recognition that supplier relationships are central to performance, resilience, and long-term value creation in complex, capital-intensive industries. However, this body of work remains conceptually and methodologically fragmented, spanning analytical decision-making models, empirical studies in emerging economies, policy-oriented discussions of local content, and practitioner-focused procurement reviews. Across these streams, a persistent tension emerges between optimisation-driven approaches and context-sensitive, relational perspectives, with limited integration between the two.

A substantial portion of the literature adopts decision-centric and analytical approaches to supplier development. State-of-the-art reviews and modelling studies demonstrate a strong dominance of multi-criteria decision-making techniques, optimisation models, and game-theoretic formulations aimed at supplier prioritisation and investment allocation. Recent analytical advances address some limitations of earlier deterministic models by explicitly incorporating uncertainty, showing how investment success probabilities and supplier competition shape optimal supplier development strategies. While these contributions enhance methodological realism and analytical rigour, supplier development is typically conceptualised narrowly as a technological or cost-reduction investment. Relational dynamics, organisational learning, and long-term capability accumulation are largely abstracted away, and strong simplifying assumptions combined with a lack of empirical validation limit the applicability of these models to real-world energy supply chains.

In contrast, empirical and network-oriented studies provide richer insight into how supplier development unfolds in practice, particularly in emerging-economy oil and gas contexts. Qualitative analyses of indigenous supplier participation reveal that supplier underperformance cannot be explained solely by firm-level deficiencies but is embedded within broader industrial networks characterised by capital constraints,

skills shortages, weak institutional support, and pronounced power asymmetries between multinational operators and local firms. By reframing supplier development as a systemic and relational challenge rather than a technical problem, these studies make an important conceptual contribution. However, their focus on single-country settings and reliance on cross-sectional qualitative data constrain generalisability and limit understanding of long-term capability trajectories.

A related strand of literature examines local content policies and community-level capacity building in oil and gas contracting. Conceptual and policy-oriented studies argue that local content initiatives should extend beyond compliance-driven employment targets towards sustainable skills development, enterprise growth, and institutional strengthening. Empirical doctoral research further demonstrates that strategic alliances between international oil companies and local firms can facilitate knowledge transfer and learning under regulatory pressure, though outcomes are uneven and contingent on governance structures, absorptive capacity, and partner commitment. Nonetheless, much of the local content literature lacks systematic empirical case analysis and explicit theoretical grounding, often adopting a normative tone that limits explanatory depth and obscures why local content interventions frequently fail to deliver sustained empowerment.

Within the procurement and supplier relationship management literature, recent critical reviews challenge the persistence of transactional procurement paradigms in petroleum and gas industries, highlighting the strategic importance of collaboration, trust, and long-term buyer–supplier relationships. Practitioner-oriented studies similarly emphasise digital integration, risk management, and strategic supplier coordination in global project delivery. While these contributions successfully reposition procurement as a strategic rather than purely operational function, they often lack explicit theoretical anchoring and systematic methodological design, resulting in descriptive insights that are weakly connected to broader organisational or institutional theory.

Sector-specific empirical studies, including survey-based analyses of supplier development practices in gas supply chains, extend existing knowledge into under-researched contexts. These studies consistently find that basic supplier evaluation and monitoring practices dominate, while more advanced capability-building initiatives such as joint problem-solving and long-term skills development remain limited. However, reliance on perceptual, cross-sectional data and weak theoretical integration constrain causal inference and provide limited insight into the sustainability of observed performance improvements.

The reviewed literature show that supplier development efforts are more effective when technical interventions are supported by a relational governance structure where buying firm and supplier have trust and long-term commitment.

Also, indirect supplier development techniques may trigger immediate compliance. However, direct interventions are a precondition for long-term, sustained capacity building.

Table 1: Synthesis of Supplier Development Literature

Study	Context	Supplier Development Practice	Governance Mechanism	Key Findings/Outcomes	Implications
Krause et al. (2000)	Manufacturing	Direct and indirect supplier development	Supplier assessment, incentives, competitive pressure	Direct development has stronger positive effect on supplier performance; incentives and assessment support improvement	Supplier development is most effective when direct and indirect approaches are applied in combination.
Wagner (2010)	Manufacturing	Direct and indirect supplier development	Knowledge transfer and evaluation mechanisms	Both direct and indirect development positively influence supplier performance	Different approached when applied in a strategic fashion can generate complementary performance benefits
Ohrstrand & Hodne (2015)	African oil and gas developing countries	Supplier development programmes involving multiple stakeholders	Incentives, certification, institutional coordination	Effective supplier development requires coordinated action by government, operators, suppliers, and educational institutions	Supplier development is a system-level challenge rather than a firm-level activity
Rocha (2012)	Resource-rich economies/oil and gas	Capability building and technological learning	Innovation systems and institutional collaboration	Capability accumulation depends on coordinated learning processes among firms and institutions	Institutional support is critical to supplier upgrading
Mogbolu (2021)	Nigerian oil and gas	Local supplier development strategies	Leadership, stakeholder collaboration, performance management	Business opportunities, institutional frameworks, capability building, and collaboration improve supplier development outcomes	Supplier capability development requires strategic and organisational commitment
Arimie & Adiele (2021)	Nigerian upstream petroleum industry	Supplier integration	Collaboration, information sharing, joint planning	Supplier integration significantly improves competitiveness, operational effectiveness, and service quality	Close buyer-supplier relationships contribute to improved performance
Thomas (2021)	Nigerian oil and gas	Strategic alliances	Knowledge transfer and partnership governance	Strategic alliances facilitate learning and capability development, but	Knowledge transfer alone is insufficient without effective governance structures

				outcomes vary with absorptive capacity and governance	
Egbumokei et al. (2024)	Global energy and oil and gas projects	Strategic supplier management	Collaboration, digital integration, risk management	Strategic supplier relationships improve project coordination and performance	Procurement should be viewed as a strategic rather than transactional function
Hanson & Nwakile (2025)	Oil and gas contracting	Local content development	Community engagement and institutional support	Local content can support community empowerment and enterprise development	Supplier development should incorporate broader developmental objectives
Kwelle et al. (2023)	Nigerian light manufacturing (bakeries)	Supplier development practices	Supplier support and collaboration	Supplier development enhances adaptability and product quality	Benefits of supplier development extend beyond energy and heavy manufacturing industries
Rasheed (2025)	Pakistan gas sector	Supplier evaluation, monitoring, communication, training	Monitoring and communication mechanisms	Supplier development practices positively influence supply chain performance	Even basic supplier development interventions improve performance outcomes
Resende et al. (2023)	Multi-sector review	Training, certification, feedback, capability development	Decision-support models and evaluation systems	Quality, cost, delivery, and financial capability dominate supplier development programmes	Existing models focus heavily on operational metrics and decision-making optimisation
Sarfaraz et al. (2023)	Oil and gas industry	Supplier selection and improvement programmes	Fuzzy decision-support systems	Supplier evaluation can support future supplier improvement planning	Analytical models can support supplier development decisions but overlook relational dimensions
Zhang et al. (2024)	Manufacturing	Development investment strategies	Competitive and investment-based governance	Technical uncertainty significantly affects supplier development outcomes	Supplier development decisions are influenced by strategic and economic considerations
Menhat et al. (2023)	Oil and gas supply chains	Performance measurement systems	Resource-based performance management	Effective performance measurement contributes to supply chain performance improvement	Effective measurement systems support supplier development initiatives
Alhammadi et al. (2023)	Petroleum and natural gas	Strategic sourcing and supplier	Relational governance	Transactional procurement limits long-term supplier	Long-term collaboration is more effective than transactional

	industry	engagement		performance improvement		procurement
Yang et al. (2023)	Supply chain management	Supplier relationship management	Trust, reciprocity, inter- organisational learning	Relationship management improves supplier innovation through learning mechanisms		Relational governance facilitates supplier development capability
Benton et al. (2020)	Automotive industry	Supplier development programmes	Communication, cooperation, commitment	Supplier development improves performance through relational governance mechanisms rather than directly		Relational governance mediates supplier development outcomes

Three broad patterns emerge from the literature. First, supplier development initiatives consistently contribute to A second implication concerns the capability constraints that continue to affect many local suppliers operating in the Nigerian petroleum industry. The literature consistently identifies direct supplier development practices, including technical assistance, training, mentoring, financing support, and knowledge sharing, as important mechanisms for improving supplier performance. These findings are particularly relevant in an environment where many indigenous service companies face limitations in access to capital, specialised technology, advanced project management systems, and operational experience. The knowledge-based view suggests that buying firms can play an important role in addressing these capability gaps through the transfer of both explicit and tacit knowledge. Direct supplier development therefore represents a practical mechanism through which operators can strengthen local supplier competence while simultaneously improving operational reliability and project performance.

The literature also highlights the importance of relational governance as a complement to technical capability development. Studies by Benton et al. (2020), Yang et al. (2023), and Arimie and Adiele (2021) demonstrate that supplier development initiatives are most effective when supported by collaborative relationships characterised by trust, communication, commitment, and knowledge sharing. This insight is relevant to the Nigeria's upstream petroleum sector, where procurement relationships have historically been influenced by short-term contracting practices and a strong emphasis on compliance and cost control. The literature therefore suggests that operators should move beyond purely transactional relationships and adopt more collaborative engagement models with strategically important suppliers.

Another implication relates to the role of institutional and stakeholder coordination in supplier development.

Several studies reviewed in this paper emphasise that supplier upgrading is rarely achieved through the actions of buying firms alone. Ohrstrand and Hodne (2015), Rocha (2012), and Hanson and Nwakile (2025) highlight the importance of collaboration among industry participants, government agencies, educational institutions, financial institutions, and industry associations. This observation is particularly relevant for Nigeria, where supplier development outcomes are influenced not only by firm-level decisions but also by the broader institutional and regulatory environment. Effective supplier development may therefore require stronger coordination between operating firms, the Nigerian Content Development and Monitoring Board, training institutions, and the financial sector to address systemic constraints affecting Nigerian Vendors.

The literature further suggests that more value would be derived by viewing supplier development as a long-term capability-building process rather than a short-term performance improvement initiative. Indirect supplier development mechanisms, such as supplier evaluation, certification requirements and performance monitoring can promote compliance and stimulate immediate improvements in supplier performance in the short-term. However, the reviewed evidence indicates that long-term capability development depends more heavily on direct interventions involving investment in supplier knowledge, processes, and organisational capabilities. This distinction is particularly important in the Nigerian petroleum sector, where regulatory compliance and local content requirements often encourage supplier participation but do not necessarily guarantee capability upgrading. As a result, supplier development programmes should be designed not only to improve immediate contract performance but also to strengthen the long-term competitiveness of indigenous suppliers.

Finally, the review highlights the need to reconsider supplier development as a strategic element of operational performance within the upstream petroleum industry. Much of the traditional procurement literature

focuses on cost reduction, supplier selection, and contract management. However, the evidence reviewed here suggests that supplier capability significantly influences broader operational outcomes, including quality performance, delivery reliability, health and safety performance, environmental compliance, and project execution effectiveness. Given the technical complexity of upstream petroleum operations, the performance of suppliers can directly affect the competitive position of operators. Supplier development should therefore be viewed as an investment in operational capability and organisational resilience rather than just a procurement exercise.

improved supplier performance across industries and national contexts. Second, studies increasingly demonstrate that relational governance mechanisms, including trust, cooperation, communication, and knowledge sharing, play a critical mediating role in translating development efforts into supplier capability and performance improvements. Third, while analytical and optimisation-based approaches provide useful decision-support tools, they invariably neglect institutional and relational factors that appear particularly important in emerging economy settings. Collectively, the evidence suggests that supplier development may be best understood as a capability-building and corporate governance level process rather than a standalone procurement intervention.

Implications for Nigeria's Upstream Petroleum Industry

The literature reviewed provides several insights that are directly relevant to the Nigerian upstream petroleum industry. Although supplier development research originates largely from manufacturing sectors and developed economies, many of its core findings are indeed applicable to the challenges facing Nigeria's petroleum value chains. The Nigerian context introduces important institutional, regulatory, and capability-related considerations that affect how supplier development initiatives are implemented and how effective they are likely to be.

One of the most significant contextual factors is Nigeria's local content policy framework, particularly the Nigerian Oil and Gas Industry Content Development Act, which seeks to increase participation of Nigerian and Nigerian Firms in the Oil and Gas industry. The reviewed literature suggests that increased participation alone is insufficient to achieve sustainable supplier capability development. Studies such as Rocha (2012), Thomas (2021), and Mogbolu (2021) demonstrate that meaningful capability accumulation requires deliberate investment in knowledge transfer, skills development, organisational learning, and long-term supplier upgrading. Consequently, Nigerian content objectives are unlikely to be fully realised through procurement

quotas or localisation requirements alone. Rather, operators must complement compliance-focused procurement approaches with a structured supplier development initiatives that enhance the technical and organisational capabilities of indigenous suppliers.

Proposed Conceptual Framework

Building on the literature review, this paper proposes that Supplier Development complex industries such as Oil and Gas should be understood as a relationally driven capacity-building process rather than merely a procurement intervention. Existing models tend to focus on improving specific operational processes or using analysis to make resource allocation decisions.

The present review extends these perspectives by integrating direct and indirect supplier development practices with relational governance and institutional-context considerations. In doing so, it provides a conceptual framework that links supplier development activities to capability development and operational performance through trust-based and knowledge-sharing mechanisms.

Figure 1 synthesises the proposed relational capability-building framework for supplier development in the Nigerian upstream petroleum industry.

The framework suggests that supplier development occurs through the combined application of indirect mechanisms, such as supplier evaluation, certification, monitoring, and incentives, and direct mechanisms, including training, technical assistance, financing, and knowledge transfer. This is consistent with relational exchange theory and the knowledge-based view of the firm, the framework proposes that these interventions are most effective when supported by relational governance mechanisms characterised by trust, commitment, communication, collaboration, and knowledge sharing.

Relational governance processes facilitate supplier capability development, which in turn improves supplier performance across operational, quality, delivery, safety, and compliance dimensions.

Finally, framework further recognises that supplier development is influenced by the wider institutional environment, including regulatory requirements, local content policies, market conditions, and supplier capability constraints. In the context of Nigeria's upstream petroleum industry, these institutional factors shape both the implementation and effectiveness of supplier development initiatives.

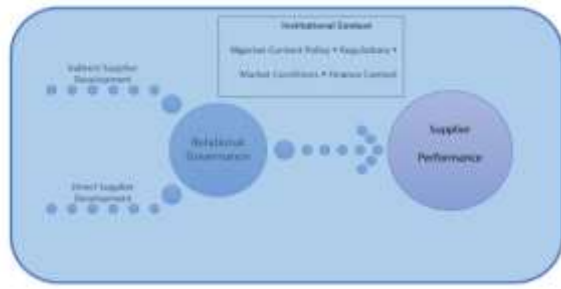


Figure 1: Relational Capacity-Building Framework for Supplier Development in the Nigerian Upstream Petroleum Industry

Conclusion

The reviewed literature reveals three interrelated gaps. First, supplier development research remains methodologically polarised, with analytically rigorous models disconnected from empirical and contextual realities, and context-rich empirical studies lacking formal decision integration. Second, supplier development and procurement are still predominantly framed as operational or compliance mechanisms, rather than as dynamic, relational, and institutionally embedded capability-building processes. Third, there is a notable absence of integrative and longitudinal research that combines analytical decision frameworks with empirical investigation of supplier learning, governance, and performance over time.

Addressing these gaps requires research approaches that bridge optimisation logic with relational and institutional perspectives, particularly in high-risk, regulated industries such as oil and gas, where uncertainty, power asymmetry, and policy intervention fundamentally shape supplier development outcomes.

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