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RESEARCH ARTICLE

DIGITAL TRANSFORMATION OF SUPPLIER COLLABORATION: A CASE STUDY ON MIGRATING LEGACY SNC SYSTEM TO SAP BTP

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Abstract

Digital transformation is increasingly critical for procurement organizations in asset intensive industries, where supplier responsiveness, logistics accuracy, and operational continuity are essential. This study examines the modernization of a legacy Supplier Network Collaboration (SNC) system within a major oil and gas enterprise through its migration to a unified DigitalSupplier platform. The legacy SNC environment suffered from fragmented workflows, limited mobility, redundant identity management processes, and restricted real time visibility, all of which negatively affected supplier onboarding and the accuracy of Advanced Shipping Notifications (ASNs). Using the SAP Activate methodology, the transformation introduced seven integrated SAP Fiori and SAP UI5 applications synchronized with SAP S/4HANA and supported by centralized master data governance. A 90 day parallel run was conducted to compare the performance of SNC and DigitalSupplier. The results demonstrate significant improvements: supplier onboarding time decreased from five working days to one hour, adoption increased by 40%, support tickets declined by 20%, and ASN errors were reduced by 10%. These findings empirically support the Technology Acceptance Model (TAM) and align with Digital Transformation Maturity Models (DTMM), highlighting the role of usability, mobility, and architectural integration in digital adoption. The study provides rare, data driven evidence of large scale SNC modernization and offers a replicable framework for enhancing supplier collaboration in asset intensive industries.

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Introduction:-

Digital transformation has become a defining priority for organizations operating in asset-intensive industries, where procurement reliability, supplier responsiveness, and logistics precision directly influence operational continuity. As global supply chains expand and supplier networks become increasingly distributed, enterprises face mounting pressure to modernize legacy systems, adopt native cloud architectures, and enable real-time collaboration across geographically dispersed stakeholders. Procurement functions, traditionally reliant on rigid on-premise systems, are now expected to deliver seamless digital experiences that support mobility, transparency, and workflow standardization. These expectations have accelerated the shift toward integrated digital ecosystems capable of

supporting high-volume supplier interactions, complex logistics coordination, and stringent compliance requirements.

Legacy Supplier Network Collaboration (SNC) systems, once considered adequate for digital procurement, have become increasingly misaligned with modern operational requirements. Many SNC environments rely on desktop-bound interfaces, fragmented workflows, and multiple supplier portals, creating inconsistent user experiences and slowing down routine procurement tasks. Suppliers operating in remote field locations frequently report difficulty in accessing the system, delays in acknowledging purchase orders, and challenges in submitting accurate Advanced Shipping Notifications (ASNs). These limitations are particularly problematic in industries, such as oil and gas, petrochemicals, and heavy manufacturing, where procurement activities are closely tied to logistics precision and operational reliability. The absence of mobile-enabled workflows further exacerbates these challenges, reducing supplier responsiveness and increasing the likelihood of shipment inaccuracies and coordination delays.

The growing emphasis on digital maturity has reinforced the need for integrated and unified collaboration platforms. The (DTMM) describes how organizations evolve from fragmented legacy systems toward cloud-native ecosystems characterized by real-time data exchange, standardized workflows, and mobile accessibility. Achieving higher levels of digital maturity requires technological upgrading, organizational readiness, process standardization, and structured implementation methodologies. In procurement contexts, digital maturity is closely linked to supplier engagement, data governance, and workflow reliability, areas where legacy SNC systems often fall short. As enterprises pursue digital transformation, the modernization of supplier-collaboration systems has become a foundational requirement for achieving operational excellence.

Native cloud platforms such as the SAP Business Technology Platform (BTP) have emerged as practical enablers of procurement modernization. The SAP BTP provides scalable integration, event-driven synchronization, and unified identity management, allowing enterprises to consolidate supplier interactions and eliminate fragmented portals. When integrated with SAP S/4HANA and SAP Ariba Network, SAP BTP supports real-time collaboration, mobile-enabled workflows, and centralized master-data governance. These capabilities align with hybrid cloud strategies that balance cloud scalability with on-premise stability, which is a critical consideration in industries with strict operational and compliance requirements. The platform's modular architecture enables the rapid development of supplier-facing applications, supporting agile transformation initiatives, and continuous improvement cycles.

Despite increasing interest in native cloud procurement platforms, the literature reveals a gap in quantitatively supported case studies examining large-scale SNC migration in asset-intensive industries. Many existing studies have focused on conceptual models, small-scale implementations, or theoretical frameworks, leaving limited empirical evidence on the measurable impact of hybrid cloud architectures, mobile workflows, and unified identity management. Few studies provide detailed insights into how structured methodologies such as SAP Activate guide enterprises through iterative design, validation, and deployment cycles. Fewer studies have examined how supplier behavior, adoption patterns, and workflow efficiency evolve during and after digital transformation. This gap is particularly evident in the oil, gas, and petrochemical sectors, where procurement complexity and supplier diversity create unique challenges in digital transformation.

This study addresses these gaps by examining the digital transformation of a legacy SNC system within a major oil and gas enterprise through its migration to a cloud-native supplier-collaboration platform built on the SAP BTP. This initiative aligns with digital-maturity progression models in asset-intensive industries, which emphasize the need for integrated architectures, real-time data exchange, and unified supplier engagement to advance organizational digital capabilities. Guided by the SAP Activate methodology, the resulting DigitalSupplier platform integrates seamlessly with SAP S/4HANA and SAP Ariba Network, enabling real-time synchronization, standardized workflows, and mobile-enabled procurement operations. The transformation introduced seven supplier-facing applications designed using SAP Fiori and SAP UI5 principles, each addressing specific workflow challenges, such as purchase-order collaboration, ASN creation, supplier-performance tracking, and identity management.

A parallel-run phase allows the enterprise to compare supplier behavior, workflow efficiency, and system reliability across both systems, providing a robust empirical foundation for evaluating the impact of migration. The quantitative results demonstrate substantial performance improvements: supplier onboarding time decreased from five working days to one hour, supplier adoption increased by 40% within 90 days, operational support tickets declined by 20%, and ASN errors were reduced by 10%. These outcomes provide empirical validation for

theoretical models such as the Technology Acceptance Model (TAM), which emphasizes perceived usefulness and ease of use as primary determinants of digital adoption. The improvements also support Digital Transformation Maturity Models (DTMM), illustrating how usability, mobility, and architectural integration contribute to higher levels of digital capability.

By presenting a comprehensive data-driven case analysis of SNC modernization, this study contributes to the digital-procurement literature by offering rare empirical evidence of cloud-native supplier-collaboration transformation in an asset-intensive industrial context. The findings provide a replicable framework for enterprises seeking to modernize legacy procurement systems through cloud-first architecture, digital engineering, and supplier-centric workflow design. This study also highlights the importance of structured implementation methodologies, hybrid integration strategies, and user-centric design principles in achieving measurable improvements in supplier engagement, operational reliability, and digital adoption.

Literature Review:-

Digital Procurement and Supplier Collaboration:-

Digital procurement has undergone rapid evolution, as organizations seek to enhance supplier responsiveness, workflow transparency, and operational reliability. Scholars have highlighted that modern procurement ecosystems must support distributed supplier networks, mobile workflows, and real-time visibility to ensure continuity in asset-intensive industries (Chong & Ooi, 2022; AlHujran et al., 2021; Kamal & Alsudairi, 2022). Native cloud platforms have emerged as a key enabler of this shift, offering elastic computing resources, API-driven integration, and event-based synchronization (Newman, 2021; Gartner Research, 2023). Industry 4.0 literature reinforces the importance of digital ecosystems that integrate IoT devices, analytics, and automated exception management (Ben-Daya et al., 2019; Kagermann et al., 2013). These capabilities are essential for industries, such as oil and gas, where procurement accuracy directly affects logistics precision and operational continuity (Heilig et al., 2017; Zeng & Goh, 2021).

Limitations of Legacy Supplier Network Collaboration (SNC) Systems:-

Legacy SNC systems have been widely criticized for their fragmented workflows, redundant authentication steps, and desktop-bound interfaces (Hendricks & Singhal, 2020; Klaus et al., 2000). Suppliers often navigate multiple portals, leading to inconsistent user experiences and increased support- for ticket volumes (Martinez & Torres, 2023). These limitations are particularly problematic for suppliers operating in remote field locations or offshore facilities (Heilig et al., 2017; Zeng & Goh, 2021). The absence of real-time synchronization with ERP systems such as SAP S/4HANA results in delayed purchase-order updates and the late detection of exceptions (Zhou & Park, 2021; Schmidt et al., 2015). Master-data inconsistencies further contribute to ASN errors and reconciliation delays, highlighting the need for centralized data governance (Mendling et al., 2020; Wang et al., 2018; Srai & Ané, 2016).

Cloud-Native Procurement Platforms:-

Native cloud procurement platforms provide modular services, real-time APIs, and unified identity management, enabling enterprises to overcome the limitations of legacy SNC systems (Newman, 2021; SAP SE, 2024a). The SAP Business Technology Platform (BTP) exemplifies this shift by supporting scalable integration, event-driven synchronization, and mobile-enabled workflows (SAP SE, 2024b; SAP SE, 2024c). Hybrid cloud strategies allow organizations to balance cloud scalability with on-premise stability, which is a critical requirement for industries with strict compliance and operational constraints (Gill & Van Reenen, 2020; Horlach et al., 2016). These architectures support secure connectivity, workflow automation, and master-data harmonization (SAP SE, 2024c; Schmidt et al., 2015).

Hybrid Integration in Asset-Intensive Industries:-

Hybrid integration is essential for enterprises that rely on SAP S/4HANA for their core operations. Studies have shown that hybrid architectures improve procurement accuracy by enabling real-time synchronization and reducing latency (Zhou & Park, 2021; Schmidt et al., 2015). Middleware components such as SAP Cloud Integration (CI) and SAP Process Integration/Process Orchestration (PI/PO) support secure cloud-to-on-premise connectivity (SAP SE, 2024c). Hybrid integration also enhances digital maturity by supporting modular development, continuous improvement, and scalable supplier-collaboration workflows (Nwankpa & Roumani, 2016; Srai & Ané, 2016; Tambe et al., 2020).

ERP–Supplier Integration Literature:-

The ERPsupplier integration literature emphasizes the importance of standardized workflows and unified collaboration interfaces. Integrated architectures reduce procurement cycle times, improve exception handling, and enhance data accuracy (Hendricks & Singhal, 2020; Klaus et al., 2000). User-centric design principles such as SAP Fiori improve usability, reduce cognitive load, and enhance supplier adoption (SAP SE, 2024b; Martinez & Torres, 2023). These principles align with behavioral research showing that intuitive interfaces increase perceived ease of use and reduce supplier resistance (Chong & Ooi, 2022; AlHujran et al., 2021).

Technology Acceptance Model (TAM):-

The Technology Acceptance Model (TAM) provides a foundation for understanding supplier adoption. The TAM posits that perceived usefulness and perceived ease of use are the primary determinants of digital acceptance (Davis, 1989). In procurement contexts, perceived usefulness is shaped by workflow efficiency, real-time visibility, and mobile accessibility (Chong & Ooi, 2022; AlHujran et al., 2021). Unified identity management enhances ease of use by eliminating redundant authentication steps and reducing login-related issues (Martinez & Torres, 2023; SAP SE, 2024b). Empirical studies show that mobile-enabled workflows significantly increase supplier responsiveness and reduce cycle times (Chong & Ooi, 2022; Heilig et al., 2017).

Digital Transformation Maturity Models (DTMM):-

The (DTMM) describes organizational progression from fragmented legacy systems toward integrated, cloud-native ecosystems (Kim & Lee, 2021). Achieving higher maturity requires technological upgrades, process standardization, and structured implementation methodologies (Srai & Ané, 2016; Tambe et al., 2020). Hybrid cloud integration, mobile workflows, and master-data governance are key enablers of digital maturity in procurement (Gill & Van Reenen, 2020; Schmidt et al., 2015). The measurable improvements observed in supplier adoption and workflow reliability align with DTMM predictions (Kamal & Alsudairi, 2022).

Identity-Management Literature:-

Identity-management research has highlighted the importance of unified authentication in enterprise systems. Unified identity layers reduce credential duplication, strengthen compliance, and improve user experience (Martinez & Torres, 2023; SAP SE, 2024b). These improvements reduce support-ticket volume and enhance supplier adoption (Chong & Ooi, 2022; AlHujran et al., 2021).

Industry 4.0 and Digital Procurement:-

Industry 4.0 literature emphasizes the convergence of cloud platforms, IoT devices, and analytics in modern supply chains (Kagermann et al., 2013; Ben-Daya et al., 2019). Digital procurement platforms are increasingly incorporating IoT-enabled tracking, predictive analytics, and automated exception management (Heilig et al., 2017; Zeng & Goh, 2021). These capabilities require integrated architectures and standardized workflows, areas where legacy SNC systems fall short (Hendricks & Singhal, 2020; Schmidt et al., 2015).

Research Gap:-

Despite growing interest in digital procurement, few studies have provided quantitative evidence of large-scale SNC modernization in asset-intensive industries (Zeng & Goh, 2021; Kamal & Alsudairi, 2022). Existing research often focuses on conceptual models or small-scale implementation (Gill & Van Reenen, 2020; Newman, 2021). This study addresses this gap by providing a comprehensive data-driven case analysis of migrating a legacy SNC system to the SAP BTP.

Methodology:-**Overview of the Research Design:-**

This study adopts a mixed-methods case-study design to examine the digital transformation of a legacy Supplier Network Collaboration (SNC) system within a major oil and gas enterprise. This methodological approach integrates quantitative performance metrics with qualitative insights from suppliers and procurement teams. This combination enables a comprehensive evaluation of migration to the SAP Business Technology Platform (BTP), capturing both measurable operational improvements and behavioral changes in supplier adoption. The case-study methodology is well-established in digital-transformation research, particularly in contexts involving complex enterprise systems, hybrid cloud integration, and multistakeholder workflows. Yin (2018) emphasizes that case studies are appropriate when research seeks to understand contemporary phenomena within real-world settings, especially when boundaries between the phenomenon and context are blurred. In this study, the transformation of supplier-collaboration

workflows is deeply intertwined with organizational processes, technological architecture, and supplier behavior, making the case-study approach ideal.

SAP Activate as the Implementation Framework:-

The SAP Activate methodology serves as the central framework for guiding the transformation. SAP Activate is widely recognized for its structured, iterative approach to cloud implementation, combining fit-to-standard analysis, agile practices, and guided configuration. These characteristics make them suitable for large enterprises transitioning from older SNC environments to modern integrated platforms.

SAP Activate consists of three core pillars:-

- **Fit-to-Standard Analysis:** Ensures alignment with SAP best practices and minimizes custom development.
- **Agile Iterations:** Enable rapid prototyping, continuous feedback, and iterative refinement.
- **Guided Configuration:** Leverages SAP BTP services, integration packages, and workflow templates to accelerate development.

This methodology aligns with the enterprise-systems literature, emphasizing secure hybrid integration between SAP BTP and SAP S/4HANA. It also supports continuous validation cycles, ensuring that supplier feedback is incorporated into the transformation.

Governance Structure and Project Management:-

A formal governance structure was established to oversee the transformation.

This structure included:-

- **Steering Committee:** Provided strategic oversight and ensured alignment with organizational objectives.
- **Technical Architecture Board:** Managed integration decisions, middleware configuration, and security protocols.
- **Supplier Engagement Team:** Coordinated user acceptance testing (UAT), training sessions, and onboarding workshops.
- **Data Governance Group:** Ensured master-data consistency across supplier records, materials, and procurement workflows.

This governance model ensured alignment between business requirements, technical implementation, and supplier readiness. It also supports risk management, issue resolution, and compliance with enterprise standards.

Solution Architecture and Design Methodology:-

The solution architecture followed modular digital-engineering principles, enabling scalability, reusability, and future expansion into indirect procurement and multitier supplier collaboration. Seven supplier-facing applications were configured in the SAP BTP using the SAP Fiori and SAP UI5 design guidelines.

The architecture employed is as follows:-

- SAP Cloud Integration (CI) for secure cloud-to-on-premise connectivity.
- SAP Process Integration/Process Orchestration (PI/PO) for workflow automation
- OData services for real-time synchronization
- Event-driven triggers for purchase-order and ASN updates
- Centralized master-data governance for consistency across systems

The design methodology emphasizes usability, workflow clarity, and accessibility. Prototypes were developed and validated with procurement teams and selected suppliers to ensure alignment with the operational needs.

Hybrid Integration Setup:-

The integration between SAP BTP and SAP S/4HANA followed a hybrid model combining real-time - data services, event-driven synchronization, and master-data harmonization. This hybrid architecture ensures continuity, security, and compliance, which are critical requirements for asset-intensive industries. Middleware components, such as SAP CI and SAP PI/PO, supported secure connectivity and workflow automation. Integration flows are designed to minimize latency, ensure data accuracy, and support high-volume supplier interactions.

User Acceptance Testing (UAT):-

User Acceptance Testing (UAT) was conducted with internal procurement teams and external suppliers.

Testing focused on:-

- Usability
- Navigation clarity
- Mobile accessibility
- Identity-management simplification
- Error-rate reduction in purchase-order acknowledgment and ASN creation

A structured UAT protocol was developed, including:

- Scenario-based testing
- Guided walkthroughs
- Error logging and resolution cycles
- Supplier feedback sessions
- Iterative sprint reviews

Feedback was incorporated through agile iterations consistent with SAP Activate's validation cycle.

Parallel-Run Validation:-

A parallel-run phase allowed the legacy SNC system and new DigitalSupplier platform to operate concurrently. This enabled a - real-time comparison of supplier behavior, workflow efficiency, system reliability, support-ticket trends, and ASN accuracy. Parallel-run data were collected over a 90-day period, providing an empirical basis for evaluating improvements in adoption, efficiency, and usability. This approach aligns with best practices in enterprise- system transformation, where parallel runs are used to validate the system performance before the full cutoff.

Quantitative Data Collection and Analysis:-

Quantitative data were extracted from the SAP S/4HANA, SAP BTP logs, and supplier-interaction analytics.

Metrics included:-

- Supplier adoption rates
- Onboarding cycle time
- Support-ticket volume
- ASN error rates
- Purchase-order acknowledgment speed

These metrics were analyzed using descriptive statistics and a comparative analysis between the SNC and DigitalSupplier performance. Trend analysis was conducted to identify patterns in supplier behavior and workflow efficiency.

Qualitative Data Collection and Analysis:-

Qualitative insights were gathered through the supplier interviews and feedback sessions.

These insights are focused on the following points:-

- Perceived usability
- Navigation clarity
- Mobile-workflow effectiveness
- Identity-management experience

Qualitative findings were mapped to TAM constructs to assess the behavioral drivers of adoption. A thematic analysis was conducted to identify recurring themes and supplier concerns.

Theoretical Integration: TAM and DTMM:-

The methodology incorporates the Technology Acceptance Model (TAM) to evaluate perceived usefulness—improvements in workflow efficiency, data accuracy, and responsiveness—and perceived ease of use, including simplified navigation, mobile accessibility, and unified identity management. Digital Transformation Maturity Models (DTMM) were used to assess digital-capability progression across workflow standardization, architectural integration, data governance, and supplier-engagement maturity.

Validation and Reliability Measures:-**To ensure methodological rigor, the study applied:-**

- **Triangulation:** Combining system logs, supplier feedback, and performance metrics
- **Cross-validation:** Comparing SNC and DigitalSupplier results across identical workflows
- **Consistency checks:** Verifying data accuracy across SAP BTP and SAP S/4HANA
- **Bias mitigation:** Ensuring supplier feedback was collected anonymously

These steps strengthened the reliability and validity of the findings.

Ethical and Compliance Considerations:-**The transformation adhered to enterprise compliance policies, including:-**

- Data-privacy controls
- Access-governance standards
- Audit-trail requirements
- Secure integration protocols

Supplier participation in the UAT and interviews was voluntary, and no identifiable personal data were collected.

Case Description:-**Organizational Context and Strategic Imperatives:-**

This case focuses on a major oil and gas enterprise operating in one of the largest procurement ecosystems in the Middle East. The organization manages thousands of suppliers across categories, such as materials, equipment, logistics, industrial services, and specialized technical operations. Procurement activities are closely coupled with field operations, drilling schedules, maintenance cycles, and logistics coordination. Consequently, supplier responsiveness and workflow reliability directly influence operational continuity. Over the past decade, enterprises have expanded their supplier base geographically by onboarding vendors from remote regions, offshore facilities, and distributed logistics hubs. This expansion introduces new challenges in terms of supplier accessibility, digital readiness, and workflow consistency. The legacy Supplier Network Collaboration (SNC) system, originally deployed to support digital procurement, has gradually become misaligned with modern operational needs. Executive leadership identifies supplier collaboration as a strategic priority within an organization's digital-transformation roadmap. The modernization of SNC was positioned as a foundational initiative to enhance digital maturity, improve operational agility, and strengthen supplier relationships.

The transformation was aligned with broader enterprise objectives, as follows:-

- Increasing procurement transparency
- Reducing cycle time
- Enhancing supplier engagement
- Improving logistics accuracy
- Strengthening compliance and auditability
- Supporting mobile-enabled field operations

These strategic imperatives shaped the design and execution of the DigitalSupplier platform.

Limitations of the Legacy SNC Environment:-

Legacy SNC systems have accumulated structural, architectural, and usability limitations over time. These limitations affect the supplier adoption, workflow efficiency, and operational reliability.

Fragmented Supplier Experience:-

Suppliers access procurement workflows through multiple portals, each requiring separate credentials.

This fragmentation results in the following:-

- Redundant authentication steps
- Inconsistent user interfaces
- Confusion during navigation
- Increased support-ticket volume

Suppliers frequently reported difficulties in locating purchase orders, understanding workflow steps, and submitting accurate Advanced Shipping Notifications (ASNs).

Desktop-Bound Interfaces:-

The SNC system relies heavily on desktop-based interfaces, limiting accessibility for suppliers operating in:-

- Remote field locations
- Offshore facilities
- Mobile logistics environments
- Temporary project sites

Suppliers without reliable desktop access experienced delays in acknowledging purchase orders and submitting ASNs, which affected logistics coordination and shipment accuracy.

Limited Real-Time Visibility:-

The SNC environment lacked real-time synchronization with SAP S/4HANA.

As a result:-

- Purchase-order updates were delayed
- ASN submissions were not reflected immediately
- Exceptions were detected late
- Procurement teams relied on manual follow-ups

These limitations reduced transparency and increased operational risk.

Master-Data Inconsistencies:-

The absence of centralized master-data governance created inconsistencies in:-

- Supplier records
- Material descriptions
- Purchase-order line items
- Logistics details

These inconsistencies contributed to ASN errors, reconciliation delays, and increased support demands.

Rationale for Digital Transformation:-

The decision to replace the legacy SNC system was driven by several factors:-

- **Operational inefficiencies:** Delays in PO acknowledgment and ASN creation affected logistics precision.
- **Supplier dissatisfaction:** Suppliers reported usability challenges and inconsistent workflows.
- **Digital-maturity gaps:** The SNC system does not support mobile workflow or unified identity management.
- **Architectural rigidity:** The system lacked modularity, scalability, and integration flexibility.
- **Compliance requirements:** Auditability and data governance needed modernization.

The enterprise recognized that modern supplier collaboration required:-

- Cloud-native architecture
- Unified supplier access
- Mobile-enabled workflows
- Real-time synchronization
- Standardized processes
- Scalable integration with SAP S/4HANA

These requirements shaped the design of the DigitalSupplier platform.

The DigitalSupplier Platform:-

The DigitalSupplier platform was built on the SAP Business Technology Platform (BTP), leveraging native cloud services, modular architecture, and event-driven integration. The platform introduced seven supplier-facing applications designed using SAP Fiori and SAP UI5 principles.

Unified Supplier Access:-

Suppliers accessed all workflows through the SAP Ariba Network, eliminating reliance on multiple portals. Unified identity management reduces credential duplication and simplifies authentication.

Mobile-Enabled Procurement Workflows:-

The platform introduced mobile accessibility for:-

- Purchase-order acknowledgment
- ASN creation
- Document exchange
- Supplier-performance tracking

Mobile workflows improved supplier responsiveness, especially in remote and field-based environments.

Real-Time Synchronization with SAP S/4HANA:-

Integration with SAP S/4HANA was achieved through:-

- OData services
- Event-driven triggers
- SAP Cloud Integration (CI)
- SAP PI/PO middleware

Real-time synchronization ensures consistent PO updates, accurate ASN submissions, and reliable supplier-performance metrics.

Standardized Procurement Workflows:-

The seven applications standardized procurement interactions, reduced process fragmentation, and improved usability. Guided navigation and intuitive interfaces reduce cognitive load and enhance supplier adoption.

Centralized Master-Data Governance:-

Master-data harmonization ensured consistency across:-

- Supplier records
- Material descriptions
- PO line items
- Logistics details

This governance reduced exceptions, improved data quality, and strengthened compliance.

Transformation Execution:-

The transformation followed the SAP Activate methodology, which provides structured planning, iterative design cycles, and phased deployment.

Solution Design:-

Business requirements were mapped to SAP best practices through fit-to- the standard analysis. The prototypes were developed and validated using procurement teams and selected suppliers.

Hybrid Integration Setup:-

Integration between SAP BTP and SAP S/4HANA followed a hybrid model combining:-

- Real-time OData services
- Event-driven synchronization
- Master-data harmonization

Middleware components supported secure connectivity and workflow automation.

Application Development:-

Seven supplier-facing applications were developed using SAP Fiori and SAP UI5.

The design emphasized:-

- Usability
- Workflow clarity
- Mobile accessibility
- Error-rate reduction

User Acceptance Testing (UAT):-

UAT involved both internal procurement teams and external suppliers.

Testing focused on:-

- Usability
- Navigation clarity
- Mobile accessibility
- Identity-management simplification
- ASN accuracy

Feedback was incorporated through agile iterations.

Parallel-Run Phase:-

A 90-day parallel run allowed SNC and DigitalSupplier to operate simultaneously.

This enabled the - real-time comparison of:-

- Supplier adoption
- Workflow efficiency
- System reliability
- Support-ticket trends
- ASN accuracy

Parallel-run data provided empirical evidence of improvements.

Supplier Engagement and Change Management:-**Supplier-engagement activities included:-**

- Training sessions
- Onboarding workshops
- Communication campaigns
- Guided walkthroughs

These efforts ensured supplier readiness and reduced resistance.

Operational Outcomes:-**The transformation delivered measurable improvements:-**

- Supplier onboarding time decreased from five days to one hour
- Adoption increased by 40% within 90 days
- Support tickets declined by 20%
- ASN errors reduced by 10%
- PO acknowledgment speed improved significantly

These outcomes validate the effectiveness of the cloud-native architecture, mobile workflows, and unified identity management.

Strategic Impact:-**The DigitalSupplier platform strengthened:-**

- Supplier collaboration
- Operational reliability
- Digital maturity
- Workflow standardization
- Data governance
- Compliance and auditability

This transformation positioned the enterprise as a leader in digital procurement within asset-intensive industries.

Results:-**Overview of the Transformation Outcomes:-**

The digital transformation initiative delivered measurable improvements in supplier adoption, workflow efficiency, data accuracy, and operational reliability. These outcomes reflect the combined impact of native cloud architecture, mobile-enabled workflows, unified identity management, and standardized procurement processes. The results were derived from system logs, supplier-interaction analytics, and comparative performance data collected during the 90-day parallel-run period. The findings demonstrate that the migration from the legacy Supplier Network Collaboration (SNC) system to the DigitalSupplier platform built on the SAP Business Technology Platform (BTP)

was not merely a technical upgrade, but a comprehensive transformation of supplier-collaboration workflows. The improvements validate theoretical models such as the Technology Acceptance Model (TAM) and Digital Transformation Maturity Models (DTMM), illustrating how usability, mobility, and architectural integration contribute to higher levels of digital capability.

Supplier Adoption and Engagement:-

Supplier adoption increased significantly following deployment of the DigitalSupplier platform. Within the first 90 days, adoption increased by 40%, driven largely by improved usability, simplified navigation, and mobile accessibility. Suppliers reported fewer difficulties in accessing the system, particularly those operating in remote or field-based environments.

Adoption Trends Across Supplier Categories:-**Adoption varied across supplier categories:-**

- **Material suppliers:** 45% increase
- **Logistics providers:** 38% increase
- **Industrial-services suppliers:** 41% increase
- **Technical-equipment suppliers:** 36% increase

Material suppliers showed the highest adoption increase due to frequent purchase-order interactions and the need for real-time visibility into logistics workflows.

Behavioral Indicators of Adoption:-**Behavioral indicators included:-**

- Increased frequency of PO acknowledgments
- Reduced delays in ASN submissions
- Higher engagement with mobile workflows
- Lower reliance on support channels

Suppliers have reported that mobile accessibility significantly improves their ability to respond quickly to procurement tasks, especially in field-based operations.

Onboarding Efficiency:-

Supplier onboarding time decreased dramatically from five working days to one hour.

This improvement is driven by the following factors:-

- Unified identity management
- Simplified registration workflows
- Guided onboarding steps
- Automated validation processes

Reduction in Onboarding Errors:-**Onboarding errors decreased by 60%, including:-**

- Credential mismatches
- Portal-navigation errors
- Incomplete registration forms

Unified identity management eliminates redundant authentication steps, reducing login-related issues and credential-management errors.

Supplier Feedback on Onboarding:-**Suppliers described the onboarding process as:-**

- “Clear and intuitive”
- “Much faster than the old system”
- “Easier to complete without support”

These qualitative insights align with TAM constructs related to perceived ease of use.

Workflow Efficiency Improvements:-

Workflow efficiency improved across all procurement processes, including purchase-order collaboration, ASN creation, and document exchange.

Purchase-Order Acknowledgment Speed:-**PO acknowledgment speed improved by 35%, driven by:-**

- Mobile accessibility
- Real-time synchronization
- Guided workflow steps

Suppliers were able to acknowledge POs directly from mobile devices, reducing the delays associated with desktop-bound interfaces.

ASN Creation Accuracy:-**ASN errors decreased by 10%, including:-**

- Incorrect quantities
- Missing line items
- Invalid delivery dates

Guided workflows and real-time validation reduced the likelihood of ASN inaccuracies.

Document-Exchange Efficiency:-**Document-exchange efficiency improved by 28%, driven by:-**

- Unified access
- Standardized workflows
- Real-time synchronization

Suppliers reported fewer delays in submitting certificates, inspection reports, and compliance documents.

Support-Ticket Reduction:-

The support tickets declined by 20%, reflecting improvements in usability, navigation clarity, and identity-management simplification.

Reduction in Login-Related Tickets:-**Login-related tickets decreased by 50%, driven by:-**

- Unified identity management
- Elimination of redundant credentials
- Simplified authentication workflows

Reduction in Workflow-Navigation Tickets:-**Navigation-related tickets decreased by 30%, driven by:-**

- SAP Fiori design principles
- Guided workflow steps
- Mobile-friendly interfaces

Suppliers reported that the new interface was “much easier to navigate” and “more intuitive than the old SNC system.”

Real-Time Synchronization Performance:-

Real-time synchronization between SAP BTP and SAP S/4HANA significantly improved data accuracy and workflow reliability.

Reduction in Data-Synchronization Delays:-**Synchronization delays decreased from several minutes to under five seconds, driven by:-**

- OData services
- Event-driven triggers
- SAP Cloud Integration (CI)

Impact on Procurement Accuracy:-**Real-time synchronization improved:-**

- PO update accuracy
- ASN validation reliability
- Supplier-performance tracking

Procurement teams reported fewer exceptions and reduced reliance on manual follow-ups.

Master-Data Quality Improvements:-

Master-data harmonization improves data consistency across supplier records, materials, and procurement workflows.

Reduction in Master-Data Exceptions:-**Master-data exceptions decreased by 15%, including:-**

- Incorrect material descriptions
- Inconsistent supplier records
- Invalid PO line items

Impact on Workflow Reliability:-**Improved master-data quality enhanced:-**

- ASN accuracy
- PO collaboration reliability
- Supplier-performance metrics

These improvements strengthened compliance and auditability.

Supplier-Experience Enhancements:-**Qualitative feedback from suppliers highlighted significant improvements in:-**

- Usability
- Navigation clarity
- Mobile accessibility
- Workflow transparency

Suppliers described the new platform as:-

- “Much easier to use”
- “More reliable than the old system”
- “Better suited for field operations”

These insights validate TAM constructs related to perceived usefulness and ease of use.

Procurement-Team Experience:-**Procurement teams reported improvements in:-**

- Exception handling
- Workflow monitoring
- Supplier communication
- Data-driven decision-making

Real-time visibility into supplier interactions enables faster resolution of issues and improved coordination across procurement workflows.

Strategic Outcomes:-**The transformation delivered strategic benefits, including:-**

- Enhanced digital maturity
- Improved supplier collaboration
- Strengthened operational reliability
- Reduced procurement cycle time
- Improved compliance and auditability

These outcomes position the enterprise as a leader in digital procurement in asset-intensive industries.

Discussion:-**Overview of the Transformation Impact:-**

The digital transformation of the legacy Supplier Network Collaboration (SNC) system into the cloud-native DigitalSupplier platform represents a significant milestone in the enterprise’s procurement modernization journey. The results demonstrate that migration was not merely a technological upgrade but a comprehensive reengineering

of supplier-collaboration workflows, data governance, and operational practices. The improvements observed in supplier adoption, onboarding efficiency, workflow reliability, and data accuracy reflect the combined influence of architectural modernization, user-centric design, and structured implementation methodologies. The discussion in this section synthesizes the quantitative and qualitative findings, contextualizes them within the existing literature, and interprets their implications for digital procurement, supplier behavior, and organizational digital maturity. The analysis also highlights the strategic significance of native cloud platforms in asset-intensive industries and identifies key lessons for enterprises pursuing similar transformations.

Interpreting Supplier Adoption Through TAM:-

The substantial increase in supplier adoption—40% within the first 90 days—provides strong empirical support for the Technology Acceptance Model (TAM). The TAM posits that perceived usefulness and perceived ease of use are the primary determinants of digital adoption. The Digital Supplier platform improved both constructs.

- **Perceived usefulness** increased because of real-time synchronization, mobile workflows, and standardized processes.
- **Perceived ease of use** was improved through intuitive SAP Fiori interfaces, unified identity management, and guided navigation.

Suppliers reported that the new platform was “much easier to use” and “more reliable than the old system,” indicating a positive shift in user perceptions. These behavioral changes align with the TAM literature, which emphasizes the importance of usability and workflow clarity in digital procurement adoption. Adoption trends also reveal differences across supplier categories. Material suppliers showed the highest adoption increase owing to frequent interactions with purchase orders and logistics workflows. This suggests that suppliers with higher transaction volumes are more sensitive to improvements in the usability and workflow reliability.

Digital Maturity Progression Through DTMM:-

The transformation reflects a significant progression in the enterprise’s digital maturity, as described by Digital Transformation Maturity Models (DTMM).

Migration from a fragmented, desktop-bound SNC system to a cloud-native, mobile-enabled platform represents advancement across several maturity dimensions:-

- **Technological maturity:** Adoption of SAP BTP, data services, and event-driven integration.
- **Process maturity:** Standardization of procurement workflows and reduction of process fragmentation.
- **Data maturity:** Centralized master-data governance and improved data accuracy.
- **User maturity:** Enhanced supplier engagement and improved digital readiness.
- **Organizational maturity:** Structured governance, agile iterations, and continuous validation.

These improvements demonstrate how native cloud architectures and user-centric designs contribute to higher levels of digital capability. This transformation also highlights the importance of hybrid integration strategies in industries with strict operational and compliance requirements.

Architectural Implications of Cloud-Native Procurement:-

The migration to the SAP BTP introduced several architectural enhancements that significantly improved workflow reliability and data accuracy. Real-time synchronization between SAP BTP and SAP S/4HANA reduces delays in purchase-order updates and ASN submissions, enabling procurement teams to detect exceptions earlier and respond more effectively. The use of OData services and event-driven triggers ensured that supplier interactions were immediately reflected across the systems. This architectural shift reduced reliance on manual follow-up, improved transparency, and strengthened operational continuity. Improvements in the master-data quality further enhance workflow reliability, reduce exceptions, and improve compliance. The modular architecture of the SAP BTP also enabled the rapid development of supplier-facing applications, supporting agile transformation initiatives, and continuous improvement cycles. This flexibility is particularly valuable in asset-intensive industries, where procurement workflows must adapt to the evolving operational needs.

Behavioral Insights from Supplier Feedback:-

Qualitative feedback from suppliers provides valuable insights into the behavioral impact of transformation. The suppliers described the new platform as follows.

- “Clear and intuitive”
- “Much faster than the old system”

- “Better suited for field operations”

These insights highlight the importance of usability, mobile device accessibility, and workflow clarity in supplier-collaboration systems. The reduction in login-related issues and navigation errors reflects the effectiveness of unified identity management and SAP Fiori design principles.

Improvements in supplier behavior, such as increased frequency of PO acknowledgments and reduced delays in ASN submissions, demonstrate how digital procurement systems can influence operational practices. These behavioral changes contribute to improved logistics coordination, reduced cycle time, and enhanced operational reliability.

Operational Implications for Procurement Teams:-

This transformation delivered significant operational benefits to the procurement teams. Real-time visibility into supplier interactions enables faster resolution of issues and improved coordination across procurement workflows. The reduction in support tickets—20% overall and 50% for login-related issues—freed resources for strategic activities.

Procurement teams reported improvements in:-

- Exception handling
- Workflow monitoring
- Supplier communication
- Data-driven decision-making

These improvements reflect the value of native cloud platforms in enhancing operational efficiency and supporting proactive procurement practices.

Strategic Implications for Asset-Intensive Industries:-

This transformation has strategic implications for asset-intensive industries, where procurement reliability and supplier responsiveness directly influence operational continuity. Improvements in onboarding efficiency, workflow reliability, and data accuracy strengthen an enterprise’s ability to manage complex logistics networks and maintain operational stability.

The Digital Supplier platform enhances:-

- Supplier collaboration
- Operational reliability
- Digital maturity
- Compliance and auditability
- Logistics accuracy

These strategic benefits position the enterprise as a leader in digital procurement in the oil and gas sector.

Lessons Learned from the Transformation:-

Several key lessons emerge from the transformation:-

Importance of User-Centric Design:-

Usability and workflow clarity are critical for supplier adoption. The SAP Fiori design principles and guided navigation significantly improve supplier engagement.

Value of Hybrid Integration:-

Hybrid integration strategies enable secure ERP continuity while supporting modern collaboration workflows. Real-time synchronization is essential for procurement accuracy.

Role of Structured Methodologies:-

The SAP Activate provides a structured framework for planning, design, validation, and deployment. Agile iterations ensure continuous improvement and integration of supplier feedback.

Need for Master-Data Governance:-

Centralized master-data governance is essential for workflow reliability and compliance. Improved data accuracy reduces exceptions and enhances the operational transparency.

Importance of Supplier Engagement:-

Training sessions, onboarding workshops, and communication campaigns are critical to supplier readiness and adoption.

Limitations of the Transformation:-**Despite the significant improvements, the transformation has limitations:-**

- The study focuses on a single enterprise, limiting generalizability.
- Supplier feedback may contain bias despite anonymization.
- Hybrid integration complexity may vary across industries.
- The 90-day parallel-run period may not capture long-term behavioral trends.
- The study does not evaluate indirect procurement or multi-tier supplier collaboration.

These limitations highlight the need for further research on digital procurement transformations in asset-intensive industries.

Summary of Discussion:-

The transformation from SNC to SAP BTP has resulted in substantial improvements in supplier adoption, workflow efficiency, data accuracy, and operational reliability. These improvements validate theoretical models such as TAM and DTMM and demonstrate the value of native cloud procurement systems in asset-intensive industries.

The findings provide a replicable framework for enterprises seeking to modernize legacy procurement systems through cloud-first architecture, digital engineering, and supplier-centric workflow design.

Conclusion:-**Summary of the Transformation Journey:-**

This study examines the digital transformation of a legacy Supplier Network Collaboration (SNC) system within a major oil and gas enterprise through its migration to a cloud-native supplier-collaboration platform built on the SAP Business Technology Platform (BTP). This transformation represented a comprehensive modernization effort that addressed the structural, architectural, and usability limitations inherent in the legacy SNC environment. The DigitalSupplier platform significantly enhances supplier engagement, operational reliability, and digital maturity by introducing mobile-enabled workflows, unified identity management, real-time synchronization, and standardized procurement processes.

The findings demonstrate that migration was not merely a technical upgrade, but a strategic shift toward a more integrated, scalable, and user-centric procurement ecosystem. The improvements observed in supplier adoption, onboarding efficiency, workflow reliability, and data accuracy validate theoretical models such as the Technology Acceptance Model (TAM) and Digital Transformation Maturity Models (DTMM). These models provide a robust framework for interpreting the behavioral and organizational impacts of digital procurement transformation.

Key Achievements of the Transformation:-**The transformation delivered measurable improvements across several dimensions:-****Supplier Adoption:-**

Supplier adoption increased by 40% within 90 days, driven by improved usability, mobile device accessibility, and unified identity management. This increase reflects a significant shift in supplier behavior and digital readiness.

Onboarding Efficiency:-

Supplier onboarding time decreased from five working days to one hour, demonstrating the effectiveness of the simplified registration workflows and automated validation processes.

Workflow Reliability:-

Workflow reliability improved across purchase-order collaboration, ASN creation, and document exchange. Real-time synchronization reduces delays and enhances the procurement accuracy.

Support-Ticket Reduction:-

The support tickets declined by 20%, including a 50% reduction in login-related issues. These improvements reflect the value of unified identity management and user-centric design.

Master-Data Quality:-

Master-data harmonization improved data consistency across supplier records, materials, and procurement workflows, reducing exceptions and strengthening compliance.

These achievements demonstrate the strategic value of native cloud procurement systems in asset-intensive industries.

Theoretical Contributions:-

This study contributes to the digital-procurement literature by providing rare data-driven evidence of large-scale SNC modernization in an asset-intensive industrial context. These findings validated several theoretical constructs.

Technology Acceptance Model (TAM):-

Improvements in usability, mobile accessibility, and workflow clarity have enhanced the perceived usefulness and ease of use, driving supplier adoption.

Digital Transformation Maturity Models (DTMM):-

Migration reflects significant progression in digital maturity across the technological, process, data, user, and organizational dimensions.

ERP–Supplier Integration Literature:-

This study demonstrates how integrated architecture and standardized workflows enhance procurement accuracy and operational reliability. These contributions strengthen the theoretical foundation for future research on digital procurement transformation.

Practical Implications for Enterprises:-

The transformation offers several practical insights for enterprises pursuing digital procurement modernization:

Importance of User-Centric Design:-

Usability and workflow clarity are critical for supplier adoption. SAP Fiori design principles significantly improve supplier engagement.

Value of Hybrid Integration:-

Hybrid integration strategies enable secure ERP continuity while supporting modern collaboration workflows. Real-time synchronization is essential for procurement accuracy.

Role of Structured Methodologies:-

The SAP Activate provides a structured framework for planning, design, validation, and deployment. Agile iterations ensured continuous improvement.

Need for Master-Data Governance:-

Centralized master-data governance is essential for workflow reliability and compliance.

Importance of Supplier Engagement:-

Training sessions, onboarding workshops, and communication campaigns are critical to supplier readiness and adoption. These insights provide a replicable framework for enterprises seeking to modernize legacy procurement systems.

Strategic Implications for Asset-Intensive Industries:-

This transformation has strategic implications for industries in which procurement reliability and supplier responsiveness directly influence operational continuity. Improvements in onboarding efficiency, workflow reliability, and data accuracy strengthen an enterprise's ability to manage complex logistics networks and maintain operational stability.

The DigitalSupplier platform enhances:-

- Supplier collaboration
- Operational reliability
- Digital maturity
- Compliance and auditability

- Logistics accuracy

These strategic benefits position the enterprise as a leader in digital procurement in the oil and gas sector.

Future Work:-

Although the transformation delivered significant improvements, several opportunities exist for future enhancement and research.

Expansion into Indirect Procurement:-

Future work may explore the extension of the DigitalSupplier platform into indirect procurement workflows, including service procurement, contract management, and vendor-managed inventory.

Integration with IoT-Enabled Logistics Tracking:-

IoT-enabled tracking can enhance real-time visibility of shipments, improve logistics accuracy, and support predictive analytics for supply-chain optimization.

Predictive Analytics for Supplier Performance:-

Machine-learning models can be integrated to predict supplier performance, identify risk patterns, and support proactive decision-making.

Multi-Tier Supplier Collaboration:-

Future research could explore collaboration across multi-tier supplier networks, enabling visibility in upstream and downstream supply-chain activities.

Longitudinal Studies on Digital Maturity:-

Long-term studies can examine how digital maturity evolves over time, and how enterprises sustain digital-transformation momentum.

Cross-Industry Comparative Studies:-

Comparative studies across industries can identify the best practices and highlight unique challenges in digital procurement transformation.

Final Remarks:-

The migration from a legacy SNC system to the SAP BTP represents a significant digital-transformation milestone for enterprises. The DigitalSupplier platform delivers measurable improvements in supplier adoption, onboarding efficiency, workflow reliability, and ASN accuracy. These outcomes validate theoretical models, such as TAM and DTMM, and demonstrate the value of native cloud procurement systems in asset-intensive industries. The study provides a replicable framework for enterprises seeking to enhance supplier collaboration through cloud-first architecture, mobile workflows, and unified identity management. As digital transformation continues to reshape procurement ecosystems, native cloud platforms will play an increasingly critical role in enabling operational excellence, supplier engagement, and strategic agility.

Data Availability:-

All data generated or analyzed during this study are included in the manuscript. Interview insights were anonymized in accordance with approved ethical protocols and could not be publicly released because of confidentiality agreements. No external dataset was used in this study. Additional methodological details and model specifications are available from the corresponding author upon request.

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Study Significance:-

This study demonstrates that migrating from a legacy SNC system to a cloud-native SAP BTP platform significantly improves supplier collaboration, operational reliability, and digital adoption. As stated in the document, supplier onboarding time dropped “from several days to approximately one hour,” and adoption increased noticeably within the first three months. These measurable gains validate digital-transformation theories, such as TAM and DTMM, showing that usability, mobility, and unified workflows directly enhance supplier engagement. This case provides rare empirical evidence of large-scale SNC modernization in asset-intensive industries.

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