

Challenges and solutions in migrating legacy procurement systems to oracle fusion

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Abstract

The conversion of the archaic procurement system to Oracle Fusion is a radical transformation in enterprise resource planning (ERP), which enables suppliers to operate more effectively, manage information, automate operations, and become cost-effective. However, this migration is described by several concerns, such as issues with supplier onboarding, poor data structure, complexities of integration, and compatibility of the system. In this paper, the key barriers that organizations face during this transition have been summarized, and viable and strategic solutions to these issues are determined using the available academic and technical literature. The key points, such as master data transfer, robotic process automation, the usage of blockchain, and AI-inspired testing, are addressed to begin with in order to present an overall picture of the modernization of the procurement system. The findings reveal that the migration process is complex yet manageable with the help of an organized structure, a gradual deployment strategy, and investment in new technologies that will enable Oracle Fusion to be a flexible and consistent solution in procurement in the future.

Keywords: Oracle Fusion; Procurement Migration; Data Governance; Robotic Process Automation

1. Introduction

Business procurement has been digitized very quickly, whereby a business does not need to utilise old systems but rather upgrade to cloud-based procurement software, including Oracle Fusion. The changes are not just technological upgrades but involve deep structural changes in workflow, integration strategies, data management, and regulations. Oracle Fusion Procurement is a modern integrated environment with the capability of streamlining sourcing, supplier management, and contract lifecycle business processes. However, the replacement of old procurement systems with Oracle Fusion is a process that is associated with several technical and organizational problems. These include data migration and integration complexities, issues surrounding supplier onboarding, process automation, and change management.

This paper identifies the fundamental issues that are experienced whenever such migrations occur and the strategic and technical solutions that have been developed to mitigate those issues in a systematic way. It relates to such issues as working with suppliers, the transfer of master data, data integrity, automation of robotic processes, and testing in organizations. The analysis is founded on a broad array of recent academic and technical papers that provide useful data on the implementation of Oracle Fusion and modernization of the enterprise.

2. Supplier Collaboration Challenges and Integration with Oracle Fusion

Among the most prominent problems of relocating older procurement systems, it is possible to mention the need to permit efficient cooperation with suppliers on newer platforms. Legacy procurement systems have been operating in silos, which do not have standard protocols for communicating with suppliers. These systems tend to use various data

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formats, and hence integrating with the Supplier Qualification and Supplier Portal modules of Oracle Fusion may not be an easy task.

The Supplier Collaboration feature in Oracle Fusion is designed to increase open and real-time communication with suppliers. However, it requires significant effort to modify legacy suppliers to fit this new framework in terms of education, integration, and process redesign. Current suppliers may be incompatible or unable to satisfy new online modes of communication. Furthermore, data discrepancies between the information maintained by former suppliers and the data model of Oracle do not permit synchronization and, in the vast majority of cases, necessitate cleansing and transformation procedures.

To address this, Supplier Qualification Management (SQM) tools have been introduced in Oracle Fusion that allow enterprises to screen and onboard suppliers through automated surveys, scoring, and performance evaluation. The irregularities in information and unavailability of suppliers remain major challenges despite these tools. In this respect, strategic partnerships and supplier enablement programs are needed to get all stakeholders on the same digital procurement agenda [1].

3. Master Data Migration and Integration Strategies

Any procurement system migration heavily depends on the successful migration of master data such as suppliers, purchase orders, contracts, and catalogs. Data in legacy systems is normally not standardized and is discontinuous. This discrepancy poses a significant problem when attempting to align it with the data structure in Oracle Fusion.

An effective data migration plan to Oracle Fusion must entail profiling, cleansing, standardization, validation, and enrichment of master data. It is also essential to ensure that data is properly transferred between the old system and the Oracle Fusion environment with the help of middleware and integration solutions. Besides that, there exist risks of corruption and inconsistency connected with difficulties in data duplication, semantics, and regional procurement regulations.

To solve these issues, businesses are inclined to employ data integration systems that are compatible with the Oracle Universal Data Loader or Oracle Integration Cloud (OIC). These help in safe and regulated data transfer since they support APIs, adapters, and established data formats. Staged migration processes (such as sandbox and UAT systems) also ensure early detection of anomalies and progressive refinement of transformation logic in a cyclical way [2].

4. Ensuring Data Integrity with Product Data Hub

Data integrity is also an imminent issue in the migration of procurement systems. Procurement processes typically rely on correct product and item catalogs to negotiate with suppliers and to place orders accurately. Older systems may have duplicate or outdated catalog entries, which are not accepted by the validation mechanisms of Oracle Fusion.

In Oracle Fusion, there is a powerful Product Data Hub (PDH), which enables centralized management and certification of product data across procurement systems and supply chains. The transition to PDH must be carried out with meticulous checks, such as item type, UOMs (units of measure), levels, and supplier-specific pricing configurations.

The problems in this case are that business rules must be consistent across various departments, must be backward compatible with existing historical data, and users may resist new cataloging practices. Business firms ought to make use of data stewardship models whereby business individuals are responsible for maintaining product master data through prescribed approval mechanisms. Such governance significantly improves the quality and reliability of migrated data.

Oracle PDH also supports long-term data integrity through version control and data lineage, all of which are needed to ensure audit capabilities. These capabilities form the basis for gaining credibility in migrated procurement information [3].

5. Legacy System Compatibility and Modernization Frameworks

Former procurement systems are usually deeply integrated into the firm. They may be created internally or be off-the-shelf programs that have been massively customized, reflecting decades of organizational experience and workflow

particulars. Migration to Oracle Fusion is associated with mapping and sometimes abandonment of these old ways of operation, which causes both work and emotional resistance.

In the context of modernization, such transitions can be discussed using the Transplantability–Tailoring model. The ability of the standardized modules of Oracle Fusion to be integrated with a minimum level of customization represents transplantability, while the ability to recreate or enhance specific legacy capabilities in Oracle Fusion represents tailoring.

Organizations are left in a dilemma: either re-engineer existing processes to align with the best practices of Oracle Fusion or adjust Oracle to fit the present workflow. The most appropriate approach that is recommended is to emphasize transplantability and reorganize business operations to the standardized flows suggested by Oracle, where possible. Tailoring should be utilized sparingly and only in areas where legacy differentiators provide competitive advantages or regulatory compliance requirements [4].

This decision-making process is carried out by a cross-functional governance board that is able to judge the trade-offs between system standardization and business agility. As IT and business objectives align, companies will be able to build a long-term path for Oracle Fusion procurement implementation.

6. Automating Processes with Robotic Process Automation

Another enormous challenge in the migration of procurement systems is the automation of manual or semi-automated processes in legacy systems. The majority of traditional systems require procurement employees to use spreadsheets, email requests, and informal supplier verification. Many of the processes performed in Oracle Fusion require replication or enhancement through configuration and automation.

Automated processes involve Robotic Process Automation (RPA) systems, e.g., UiPath, where routine procurement processes such as invoice matching, purchase orders, and contract renewal reminders are automated. RPA in Oracle on-premise environments helps fill process gaps by interacting with ERP user interfaces, and repetitive actions are carried out with increased accuracy.

Since the migration is to Oracle Fusion, such automation scripts must be modified or rewritten to fit the cloud environment. The shift to the cloud changes system interfaces and involves the utilization of APIs rather than front-end bots. Organizations should also invest in bot security, exception handling, and performance management governance to ensure that automation does not disrupt procurement processes but enhances them.

However, RPA provides a temporary solution between previous operations and the capabilities of Oracle Fusion. It allows companies to gain early benefits in the automation process as they work toward deeper system integration over time [5].

Table 1 Summary of Migration Challenges and Solutions

Challenge Area	Legacy Issue	Oracle Fusion Solution
Supplier Collaboration	Fragmented communication and manual onboarding	Supplier Qualification Management (SQM), integrated supplier portal
Master Data Migration	Inconsistent, duplicated, or outdated data	Data cleansing, Universal Data Loader, Oracle Integration Cloud
Data Integrity	Poor product catalog management and redundant entries	Centralized governance with Product Data Hub (PDH)
System Modernization	Customized legacy workflows and poor documentation	Transplantability-Tailoring framework
Process Automation	Manual PO/invoice handling and unstructured workflows	RPA with UiPath, API-driven automation in Oracle Fusion

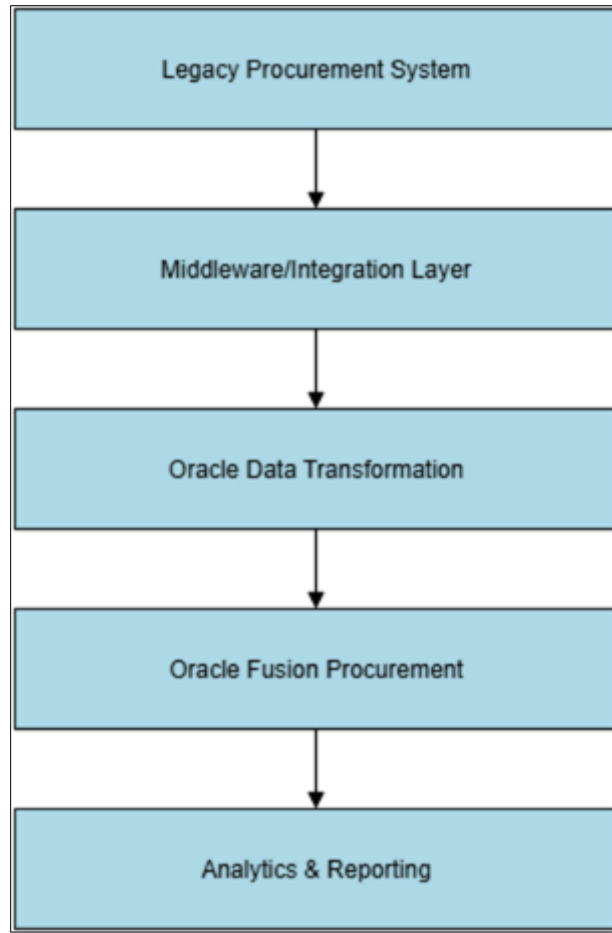


Figure 1 High-level architecture for migrating legacy procurement systems to Oracle Fusion, showing data flow, middleware integration, and modular deployment. Source: Adapted from Oracle Cloud Migration Playbook. Adapted from [1]

Figure 1 presents a structured view of the migration process from legacy procurement systems to Oracle Fusion. It outlines the sequential flow of data through extraction layers, middleware, and into Oracle's modular architecture. The diagram emphasizes system interoperability and the integration of analytics and supplier interfaces in the new environment.

7. Blockchain Integration and Data Security Considerations

The security of data and data provenance is one of the emerging issues of concern in modern procurement systems, especially when involving multiple vendors and third-party suppliers. Legacy systems do not necessarily include strong audit trails, but Oracle Fusion environments are becoming increasingly advanced with blockchain technologies to preserve transaction visibility and data immutability.

The implementation of Chainlink oracles into procurement services is one possible avenue, where off-chain events such as delivery confirmation, quality control, and payment triggering can be verified. These decentralized oracles, which offer cryptographically verifiable data entries, reduce the trust gap between enterprise ERP systems and external parties.

Although such blockchain-enabled procurement practices are still in their early phases of implementation, their capabilities for fraud reduction, dispute reduction, and trust building in procurement networks are significant. Companies planning to migrate to Oracle Fusion should consider the readiness of their ecosystem partners and initiate pilot projects where blockchain can deliver actual security benefits [6].

8. Financial Performance Impact Post-Migration

Among the most discussed topics in the migration of procurement systems is the financial return on investment (ROI) that companies can expect after switching to Oracle Fusion. While legacy systems often operate with hidden costs in terms of inefficiencies, compliance failures, and poor data quality, Oracle Fusion aims to standardize procurement operations, resulting in cost savings, improved supplier negotiation, and better visibility of expenditure.

However, initial implementation and migration costs can be high. These include software licensing, consulting, training, and temporary loss of productivity due to user unfamiliarity. In addition to these sunk costs, businesses are often required to run both legacy and cloud platforms simultaneously during the transition period, which further contributes to operational overhead.

Irrespective of these challenges, longitudinal and case review studies suggest that companies are likely to achieve better financial outcomes following migration. Procurement cycle times, compliance rates, and reduced maverick spending show measurable improvements. When procurement is fully integrated with Oracle Cloud Financials, advanced analytics are available to support budgeting, forecasting, and supplier performance monitoring more effectively.

Additionally, the transformation of capital expenditure (CAPEX) into operating expense (OPEX) through cloud subscription technologies allows enterprises to align IT expenditure with usage, scale efficiently, and avoid large initial investments. This model is particularly beneficial for procurement departments that experience periodic fluctuations in workload. All these financial optimizations enhance the strategic value of procurement functions within the enterprise [7].

9. Multi-Cloud Challenges and Procurement Interoperability

As the IT environments of enterprises grow in diversity, they are increasingly opting for a multi-cloud strategy to avoid vendor lock-in and gain economies of scale and resilience. However, integrating Oracle Fusion Procurement in this type of multi-cloud implementation has some difficulties. These include API disparities, data control differences, latency, and authentication issues between incompatible cloud settings.

Legacy systems are also usually hosted in on-premises data centers with very minimal external integration. Migration to Oracle Fusion in a multi-cloud environment requires organizations to ensure interoperability with Salesforce, AWS, Azure, and other potential platforms hosting related procurement, CRM, or supply chain systems.

A systematic solution to these integration issues can be provided using a middleware layer or service mesh. API gateways and iPaaS (Integration Platform as a Service) solutions are implemented to create a unified interface that enables easier communication between Oracle Fusion and other systems. Access control mechanisms and security policies must also be consistent across the board to avoid data leakage or compliance breaches.

Additionally, the selection of data exchange protocols (e.g., REST or GraphQL) and centralized identity management systems (e.g., OAuth 2.0, SAML) helps simplify cross-cloud operations. The sophistication of such integrations is offset by the scalability and modularity they offer, although they may be expensive to implement, particularly for large international businesses where procurement departments are decentralized [8].

10. Key Migration Challenges Within Oracle Fusion Procurement Adoption

The technical and organizational pitfalls that involve strategic planning and implementation phases are significant in the process of moving from old procurement systems to Oracle Fusion. Old procurement systems are not always well organized in their workflow, and process logic has been accumulated over the years; therefore, mapping old functions to the standardized and modular structure of Oracle Fusion is challenging [1].

Among such critical issues, it is important to note that legacy systems did not have end-to-end visibility, and these systems were not primarily built around a common data model or a unified supplier engagement model. The pre-existing structures in Oracle Fusion procurement modules necessitate a readjustment of old procedures. This involves initial process identification through modeling tools, as well as aligning processes with those embedded in Oracle best practices [2].

Another significant challenge is data transformation. Traditional procurement systems tend to be based on loosely defined data standards, leading to semantic inconsistencies, redundancies, and gaps. Migration to Oracle Fusion must be comprehensive in terms of data extraction, cleaning, validation, and enrichment. Oracle Integration Cloud and the Oracle Universal Data Loader can be applied as tools to offer a structured transformation process without data loss and to support an incremental deployment strategy [2], [3].

Another success factor is change management. In most cases, resistance to new systems is observed among procurement personnel who are accustomed to old working systems. The Oracle Fusion interface, despite being modern and streamlined, represents a paradigm shift in the way tasks are performed. To address this, organizations implement change management programs that involve stakeholder alignment, reassignment of process ownership, phased training, and long-term user engagement initiatives [4].

A phased rollout of modules has been an effective method for reducing disruption. Companies frequently begin with basic procurement processes such as supplier registration and requisition processing, and then move to contract lifecycle management and advanced sourcing services. Such a plan allows teams to test configurations in real-life scenarios, collect user feedback, and adjust rollout plans where needed [5].

It is significant that automation enhances the effectiveness of migration. Oracle Fusion integration with legacy environments often involves the application of Robotic Process Automation (RPA) systems like UiPath to bridge gaps between systems, especially during temporary coexistence. These bots help automate invoice matching, purchase order creation, and approval routing until native Oracle Fusion processes are fully implemented [5].

To achieve long-term success, the governance mechanism adopted during migration is important. Cross-functional governance boards consisting of procurement, IT, finance, and compliance stakeholders are common in organizations. These teams make joint decisions on data mapping, process prioritization, and the extent of customization. It is also advised that Oracle Fusion remain configurable rather than heavily customized to facilitate maintainability and keep up with quarterly updates [1], [4].

Finally, AI-based testing and validation systems are increasingly deployed when implementing Oracle Fusion procurement. These tools can simulate test cases using historical procurement data, generate regression tests automatically, and identify weak areas in configuration logic. This is especially important in Oracle Cloud environments, where continuous releases require ongoing system verification to ensure integrity [9].

All these approaches form a comprehensive and Oracle-centric plan for digitalizing procurement operations and replacing legacy systems. By focusing on standardization, automation, phased implementation, and AI-based quality control, organizations can maximize the potential of Oracle Fusion Procurement while minimizing operational risks.

11. AI-Driven Testing and Quality Assurance

In ERP migration, testing is a mandatory process, and traditional manual testing methods cannot be used effectively in cloud environments. Oracle Fusion applications are constantly updated with Oracle's quarterly release schedule and must be re-tested to remain stable.

The solution to this issue is the development of powerful AI-based testing frameworks that address this challenge. These frameworks use machine learning algorithms to analyze test coverage, predict risk areas, and automatically generate test scripts based on previous usage patterns. In this way, enterprises are able to quickly test large procurement processes, including purchase order processing, supplier negotiations, and approval workflows.

AI testing tools can also be integrated with CI/CD (Continuous Integration/Continuous Deployment) pipelines and are therefore applicable in a DevOps context, where changes must be tested rapidly. They are particularly useful for simulating multi-user procurement environments, validating API endpoints, and detecting non-obvious failures in supplier configurations or data mapping.

By adopting AI-based testing frameworks, companies reduce the risk of post-migration failures, enhance confidence in system stability, and improve user trust in the new Oracle Fusion environment. These frameworks also provide dashboards and visualizations that help procurement managers assess test coverage and quality metrics without relying heavily on technical teams [10].

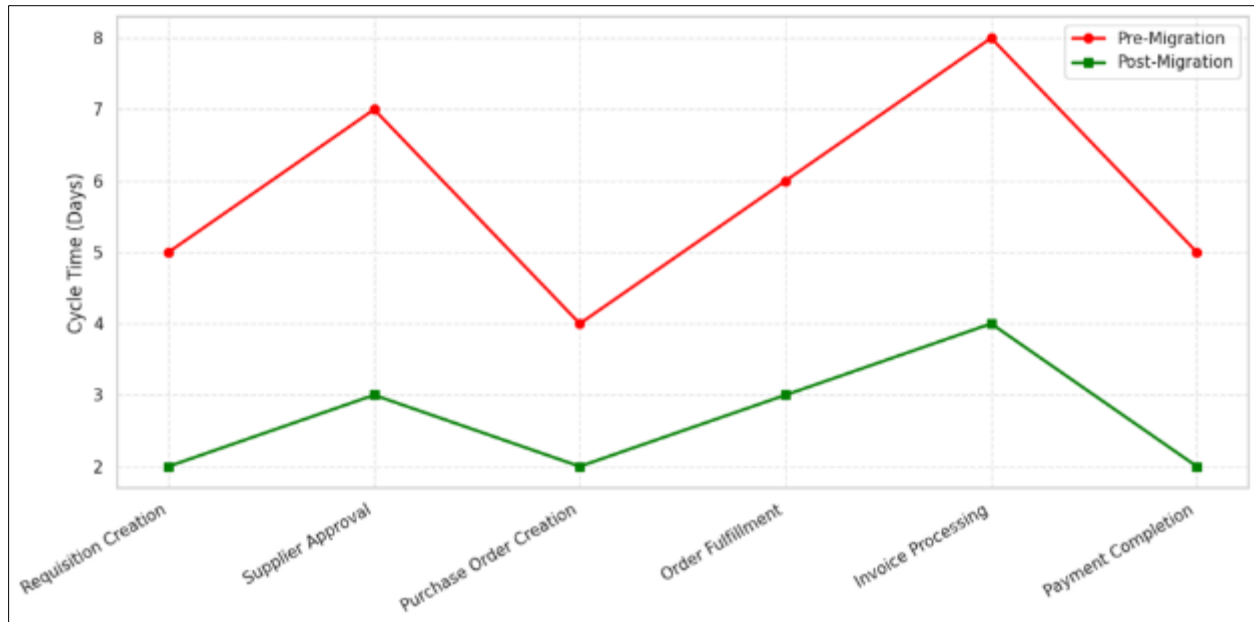


Figure 2 Pre- and Post-Migration Procurement Cycle Time Comparison. Adapted from [7]

This graph illustrates a noticeable reduction in procurement cycle times across all key stages post-migration to Oracle Fusion. The improvement reflects increased process automation, better data integration, and streamlined supplier interactions. It highlights Oracle Fusion's role in enhancing overall procurement efficiency.

12. Discussion

The migration of old procurement systems to Oracle Fusion is a complex process demanding attention to technological, operational, and human aspects. Migration stages have distinct and challenging issues that require specific solutions and strategic approaches. Organizational culture, processes, and data alignment with the capabilities of Oracle Fusion contribute to a successful transition, along with effective technical implementation.

One of the most sensitive areas of change is supplier collaboration, where technological integration and relationship management are essential. The potential of strong supplier engagement modules in Oracle Fusion is only realized when suppliers are digitally qualified and organizationally prepared to collaborate.

Data migration is another important area. Although data quality and governance require organizations to invest significantly to ensure long-term reliability, tools such as Oracle Integration Cloud and Universal Data Loader can facilitate the process. This can be supported by the Product Data Hub (PDH), which offers a model for data ownership and stewardship.

The process of modernizing a legacy system is not easy and involves making difficult decisions regarding process redesign. The transplantability-tailoring framework provides a methodical approach to evaluating which processes should be retained, modified, or discarded. Business objectives, along with technical feasibility, must guide these decisions.

RPA automation serves as a short- to mid-term transition mechanism, enabling companies to maintain operations during core function migration. However, surface-level automation should eventually be replaced by native Oracle Fusion functionalities in the long term.

New technologies such as blockchain and AI-based testing contribute to the future resilience and quality of procurement systems. However, they require foundational readiness in terms of infrastructure, governance, and stakeholder alignment to be implemented successfully.

Financially, the migration is justifiable based on improved spend management, operational efficiency, and compliance. These benefits should not be evaluated solely on direct ROI but also in terms of risk mitigation and strategic enablement. A multi-cloud setup introduces additional integration complexity but provides greater flexibility and scalability.

13. Conclusion

Switching to Oracle Fusion is a strategic initiative that can transform procurement into a value-based strategic enabler instead of a transactional process. However, there are barriers related to this change, including supplier enablement, data governance, process alignment, integration complexity, and quality assurance.

These issues have been discussed with reference to recent literature and industry knowledge in this review. All the solutions listed above, such as complex data migration strategies and AI-based testing models, demonstrate that the journey to Oracle Fusion is not one that can be pursued without proper planning and appropriate tools. As cloud ERP systems continue to evolve, with new technologies such as blockchain and AI being integrated into the platform, the value proposition of Oracle Fusion will expand further, making it a key instrument for digital procurement in the modern enterprise.

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