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RESEARCH ARTICLE

EVALUATING THE IMPACT OF CLOUD-BASED ERP MIGRATION ON BUSINESS PROCESS EFFICIENCY AND DATA-DRIVEN DECISION-MAKING IN SAUDI INDUSTRIAL ENTERPRISES

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Abstract

Cloud based enterprise resource planning (ERP) migration is increasing ly presented as a route to industrial agility, although the conditions under which it improves actual process efficiency and managerial judgement remain insufficiently differentiated. This integrative review examines how moving from locally hosted ERP configurations to cloud-delivered enterprise platforms could affect end-to-end workflows and evidence - based decisions in Saudi industrial enterprises. A structured, purposive synthesis of DOI-traceable academic publications dated 2015–2025 combines empirical ERP research, cloud adoption and implementation studies, manufacturing digitalisation, and Saudi-specific investigations. Evidence was interpreted through a migration-to-value pathway that separates platform conversion from process redesign, information integration, user assimilation, and realized perfor mance. The synthesis indicates that cloud deployment can reduce infrastructure rigidity and improve the accessibility of common enterprise information, but the operational gains depend on master-data integrity, integration with production systems, redesigned controls, and sustained user engagement. Decision-making benefits additionally require timely, governed data, analytical competencies and clear accountability for actions informed by dashboards or forecasts. A four-stage evaluation framework is proposed, accompanied by a before–after measurement architecture and transparent numerical scenarios illustrati ng performance and total – cost – of - ownership calculations. These numbers are demonstrations, not observations from Saudi firms. The paper contributes a conditional and testable explanation of cloud ERP value creation within an industrial environment shaped by production continuity, diverse legacy applications and local governance requireme nts. Future longitudinal, multi-plant studies are needed to determine causal magnitudes, implementation heterogeneity and durable benefits.

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Introduction:-

Enterprise Resource Planning Systems Integrate Purchasing, Production Planning, Inventory, Finance, Sales And Workforce Transactions Around Shared Information Structures. Their Significance For Industrial Firms Extends

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Beyond Transaction Processing: Production Orders Influence Material Availability, Procurement Affects Supplier Commitments, Inventory Movements Alter Working Capital, And Financial Reporting Depends On Timely Reconciled Operational Records. When These Relationships Are Visible, Managers Can Compare Cost And Service Consequences Before Acting. When They Are Obscured By Inconsistent Records Or Disconnected Interfaces, Even Sophisticated Analytical Tools Reproduce Incomplete Representations Of Enterprise Activity. Erp Modernisation Therefore Concerns The Architecture Of Organisational Coordination As Much As The Location Of A Database (Nour, 2023; Liutkevičienė Et Al., 2022).

Cloud-based ERP moves some combination of application hosting, platform maintenance, upgrades, infrastructure provisioning and service continuity to an external service model. A frequently asserted benefit is replacing substantial upfront infrastructure expenditure with more adaptable subscription expenditure. Other potential benefits include configurable services, remote access, standardized interfaces and shorter technical upgrade cycles. Yet these features are not equivalent to improved manufacturing performance. Moving existing configurations without repairing fragmented master data may preserve inefficient approvals; standardising workflows without addressing factory execution requirements may interrupt critical interfaces. Evidence on embedded enterprise infrastructures highlights precisely these dependencies (Hustad et al., 2020; Christiansen et al., 2022; Haddara et al., 2022).

Saudi Arabia provides a consequential setting for this distinction. Industrial diversification and higher-value manufacturing increase the importance of traceable inventory, responsive planning and productivity. Firms may operate combinations of modern ERP modules, older bespoke applications and shop-floor technologies that were never designed for seamless integration. Many organisations must also coordinate suppliers, international procurement flows and multiple sites. Saudi research connects cloud ERP adoption to organisational and environmental factors rather than technical suitability alone; studies of ERP and business intelligence within the Kingdom identify data quality, user capability, training and access controls as material influences on decision-making (AlBar & Hoque, 2019; Jaradat et al., 2024). The national context should consequently be treated as an institutional and operational setting, not as evidence that every migration project yields the same benefit.

A useful review must address three separable questions: whether migration changes technical delivery; whether it changes the effectiveness of cross-functional processes; and whether managers actually use improved evidence to make better decisions. The second and third outcomes may develop at different speeds. Infrastructure can be moved during a project, whereas disciplined use of new planning routines may take several production cycles. Post-implementation ERP research reports mixed aggregate performance effects and points to organisational fit and elapsed time as important moderators (Nour, 2023). This challenges simple before–after claims that attribute every later improvement to software hosting.

The contribution of the present review is a context-specific evaluation architecture. Instead of measuring success by deployment completion or nominal cloud adoption, it traces migration choices through data and organisational mechanisms to measurable process and decision outcomes. It connects ERP migration research with evidence on manufacturing analytics and process management, specifies plausible counterfactuals, and distinguishes supported qualitative mechanisms from numerical illustrations. The resulting framework is intended as a research agenda and an evaluative instrument, not as an assertion of unobserved Saudi enterprise results.

Aim, objectives and review questions:-

The aim is to critically evaluate the conditions under which migration to cloud-based ERP can improve business process efficiency and the quality of data-driven decision-making in Saudi industrial enterprises, while clarifying how those effects should be measured. This aim is deliberately different from studying willingness to adopt a product: the emphasis is on the value pathway after a migration decision has been made.

Four objectives direct the synthesis. First, to distinguish hosting-related efficiencies from operational redesign benefits across procurement, manufacturing, inventory and financial control. Second, to examine how data integration, information quality, analytical literacy and decision rights mediate the relationship between migration and managerial judgement. Third, to identify technical, organisational and Saudi-contextual risks capable of delaying or reversing benefits. Fourth, to develop a feasible longitudinal evaluation model with outcome definitions, baselines and cost-sensitivity checks. These objectives correspond to three questions: Which mechanisms produce demonstrable process improvement? Under what conditions does shared ERP information improve managerial decisions rather than merely reporting speed? How can Saudi manufacturers attribute net outcomes to migration amid concurrent process and market changes?

Review design and methodological boundaries:-

This article uses a structured integrative review and theory-led evidence mapping rather than primary experimentation or statistical meta-analysis. An integrative design is appropriate because the specified outcome—cloud ERP migration value in Saudi industrial enterprises—cuts across cloud adoption, ERP implementation, manufacturing operations and managerial analytics. These fields employ different units of analysis, including surveys of users, organisation-level studies, case investigations and technology reviews; the resulting effect sizes cannot be combined defensibly without comparable interventions and measures. The design therefore aims for transparent analytical synthesis rather than an artificially precise pooled estimate (Vial, 2019; Ben Slimane et al., 2022).

The evidence base consists of 30 academic works published between 2015 and 2025 and traceable through DOI-bearing journal or proceedings records. Sources were identified through targeted combinations of 'cloud ERP', 'ERP migration', 'business process', 'manufacturing', 'industrial performance', 'Saudi Arabia', 'business intelligence', 'data quality' and related expressions in scholarly and publisher-indexed search results, supplemented by backward inspection of relevant references. To be retained, a work had to explain ERP migration or implementation mechanisms, ERP-related process or decision outcomes, or a relevant industrial/organisational capability. Saudi-context evidence received interpretive priority when directly applicable; non-Saudi evidence was used to examine mechanisms and boundary conditions, not to manufacture local statistics.

For each retained work, the review mapped publication year, geographical or industry scope, study design, apparent unit of analysis, proposed mechanism, outcome construct and major caveat. A narrative matrix was then coded into four analytical families: migration determinants; process integration; data-enabled decision capability; and realised cost, reliability or performance. Claims were graded in the discussion according to whether they arose from observed empirical findings, literature-based synthesis or the present article's own theoretical inference. Because this was targeted, purposive evidence mapping rather than an exhaustive database census, no total search-hit count or universal screening-completeness claim is made. The final set of 30 references is the mapped literature used for conceptual synthesis; it should not be mistaken for every publication addressing the topic.

Table 1. Selected empirical and review evidence relevant to the proposed causal pathway

Study	Design / evidence size	Relevant inference	Boundary
Nour (2023)	Survey; 200 firms	Process fit and information quality matter	General ERP; cross-sectional
Habahbeh et al. (2018)	SMEs; 394 observations	Perceived utility, security and support	Adoption intentions; Jordan
Wamba et al. (2017)	Survey; 297 respondents	Dynamic capabilities link analytics to value	Analytics, not ERP migration
Zheng et al. (2021)	Review; 186 studies	Connected digital tools span factory processes	Broad manufacturing digitalisation
Alsughayer (2025)	Cases; 2 Saudi SMEs	Accounting and decision routines can change	Not cloud-only; small case base
Nour (2023)	Performance moderators	Size, industry and elapsed time condition effects	Same study; different claim

Note. Study counts are taken from the cited source descriptions; the table is selective, not a meta-analytic dataset.

The citation window is deliberately restricted to works published from 2015 through 2025. Research published outside this window was not entered into the formal evidence matrix, regardless of its possible thematic relevance.

The manuscript does not claim factory interviews, access to enterprise records, deployment of an ERP product or measured treatment effects. All numerical examples introduced below are explicitly constructed scenarios, used to demonstrate how future research could operationalise and test the proposed framework.

Methodological quality was considered through construct alignment, temporal ordering, sample specificity and causal identification. Cross-sectional associations were not interpreted as proven before–after migration effects. Studies of generic ERP were kept distinct from those specifically about cloud ERP; studies of service-sector SMEs informed capability logic but did not substitute for evidence from continuous manufacturing plants. The synthesised propositions were checked for conceptual consistency: migration acts through mechanisms, and reported efficiencies require observable workflow or decision changes. This distinction is particularly important where favourable survey attitudes coexist with unresolved data or integration faults.

Theoretical foundations and evidence synthesis:-

The technology–organisation–environment perspective usefully explains why otherwise comparable firms may select different migration routes. Technical readiness covers application compatibility, interoperability, network reliability and cyber controls; organisational readiness covers investment capacity, executive sponsorship, skills and change governance; environmental conditions include supplier ecosystems, competition and applicable rules. The Saudi cloud ERP adoption study by AlBar and Hoque (2019) helps locate these factors in the national setting. A later review of cloud ERP adoption determinants identifies vendor dependence, perceived benefit, managerial support and external pressures among salient considerations (Christiansen et al., 2022). Related research on small-firm cloud readiness and adoption reinforces the importance of user capability and perceived fit (Habahbeh et al., 2018; Raut et al., 2017). These frameworks clarify selection and implementation, but they are insufficient explanations of realised operational value unless subsequent workflow changes are observed.

A complementary process-capability account treats data, technology, skills and routines as interdependent resources. Analytical potential becomes valuable when personnel have authority to act on timely information and when processes can respond to identified deviations. Research on big-data capability and firm performance suggests that capabilities and strategic alignment shape outcomes rather than analytics investment alone (Akter et al., 2016; Wamba et al., 2017). Similarly, the meta-analytic assessment of analytics capability reports meaningful contextual moderation, implying that effect magnitudes should not be transported mechanically between industries (Ansari & Ghasemaghaei, 2023). Under this logic, a cloud ERP subscription is an enabling resource, whereas effective order promising, exception management and planning discipline are organisational accomplishments.

Infrastructural embeddedness introduces a further constraint. ERP applications are coupled to barcode systems, production scheduling, engineering bills of materials, quality records, logistics providers and accounting control practices. Migrating an application therefore changes a web of operational dependencies, not a self-contained information system. Hustad et al. (2020) identify legacy data, process fit, integrations, compliance and continuity among major concerns. The cloud model may simplify central maintenance while making application programming interfaces, network resilience and configuration governance more important. The analytical unit should be a business process spanning systems, not the hosted application considered in isolation.

Saudi-focused ERP research reinforces this boundary. Jaradat et al. (2024) evaluate the integration of ERP and business intelligence in the Kingdom's industrial sector, placing emphasis on information quality, user training, security and infrastructure readiness. Alsughayer (2025), examining Saudi SMEs, describes changes in accounting analysis and reporting after ERP implementation, while also highlighting organisational context. Neither study establishes that all improvements result specifically from relocation to a cloud infrastructure. Their importance for the present title lies in identifying mechanisms through which integrated enterprise information could improve judgement. These mechanisms must still be distinguished from the migration intervention itself.

An evidence synthesis across ERP settings reaches a consistent caution: implementation completion, user satisfaction, information quality, process efficiency and financial performance are different constructs. Nour (2023), for example, documents a moderated ERP-performance relationship, while studies of cloud ERP in SMEs highlight organisational support and service-provider capabilities (Gupta et al., 2018; Barbieri et al., 2024). The defensible proposition is conditional: cloud migration expands the opportunity for standardisation and analysis; integration, governance and assimilation determine how much of that opportunity is converted into operational and strategic value.

Migration architecture and process redesign:-

A migration programme generally confronts three architectural choices. Rehosting retains much of the existing application logic while changing infrastructure delivery. Replatforming introduces managed components and technical adjustments without fundamental process replacement. Replacement with a cloud-native ERP suite can introduce new data structures, workflow configurations and interfaces. These choices imply different combinations of speed, disruption and transformation potential. A limited rehosting project might reduce infrastructure exposure but leave duplicated supplier records untouched; a wider replacement project might standardise purchasing across plants but create substantial change and conversion risk. The migration mode is therefore a substantive explanatory variable rather than a binary label (Chi, 2024; Hustad et al., 2020). Research on firms progressing from basic accounting software to ERP also suggests that selecting an enterprise-wide system is itself a strategic, risky commitment (Kosalge & Ritz, 2017).



Figure 1. ERP migration layers and enterprise information exchange (original conceptual diagram).

Before choosing a route, firms should build a dependency inventory including ERP modules, custom reports, plant-control interfaces, master-data objects, integration frequencies and owners of critical decisions. Industrial information is particularly sensitive to timing: a production order updated several hours late can alter a line schedule even where monthly financial statements remain correct. Inventory synchronisation between a warehouse system and enterprise ledger similarly requires precise definitions of event timing, item identifiers and reconciliation rules. Migration tests need to reproduce peak-load operation and exception conditions, not just demonstrate that records can be displayed in a new interface (Saraswat & Choudhari, 2025; Zheng et al., 2021).

Process redesign is a stronger candidate mechanism for productivity than hosting location alone. A cloud suite may provide a common purchase-requisition workflow, electronic approvals and consolidated supplier profiles, but cycle time will improve only if approvals are rationalised, exceptions assigned promptly and rework eliminated. The interaction between ERP and structured process improvement is illustrated by Liutkevičienė et al. (2022), who place digital systems alongside continuous-improvement practices. For Saudi plants, the appropriate change may include harmonised materials naming, revised authorisation thresholds, purchase-order status visibility and a common escalation rule for delayed critical parts. Every proposed automation should be accompanied by a process owner and an exception path.

Master data migration has implications far beyond technical conversion. A product code may carry different units of measure across sites; supplier names may be duplicated; manufacturing routes may be obsolete; historical inventory transactions may have incomplete dimensions. Transferring such defects to an accessible cloud service can accelerate circulation of misinformation. A credible migration plan therefore needs explicit rules for deduplication, lineage, validation, ownership and controlled cutover. The evidence on SME adoption challenges consistently identifies capabilities and usability as potential constraints, while the manufacturing case research shows the relevance of organisational capability when analytics are added to existing ERP arrangements (Awan et al., 2021; Saraswat & Choudhari, 2025).

A phased approach protects production continuity. A pilot may begin with reporting or a selected procurement workflow while shop-floor transactions remain under controlled interfaces. Subsequent deployments can add plants and modules only after reconciliations, fallback arrangements and actual operator proficiency meet predefined gates. Crucially, the project should report both progress and residual risk: percentage of reconciled master records, failures per interface, processing latency, users proficient on representative tasks, and unresolved critical defects. These leading measures predict whether reported benefits are operationally credible, although they are not benefits in themselves. Small-business cloud ERP cases similarly indicate that implementation success is contingent on contextual integration and workflow fit (Zadeh et al., 2018).

Business process efficiency: measurement and plausible effects:-

Process efficiency has several dimensions that should not be reduced to an imprecise claim of 'faster operations'. Cycle-time performance measures elapsed time from initiation to completion; labour productivity measures human effort per transaction or unit; service reliability measures adherence to agreed fulfilment dates; and quality measures errors, rework or conformance. A firm can improve one while deteriorating another. For example, aggressively shortening invoice approval may reduce administrative delay but weaken segregation of duties. Evaluation of cloud migration should accordingly use paired metrics for speed, quality, control and economic cost rather than a single composite score (Nour, 2023; Khandaqji et al., 2022; Harun et al., 2022).

In procurement, relevant stages are requisition, supplier selection, authorisation, purchase order, goods receipt and invoice matching. ERP standardisation could reduce manual transfer between departmental registers and support more transparent exception tracking. However, bottlenecks also arise from vendor lead times, engineering approvals and physical inspections—activities not removed by hosting architecture. Case-based manufacturing work demonstrates the usefulness of recording process performance before and after ERP implementation, although such comparisons still require careful causal interpretation (Kalwar et al., 2022). The strongest evaluation uses timestamps and event logs to separate waiting time, processing time and external supplier time. A reduction in purchase-order cycle time can then be attributed more cautiously to the workflow segments actually modified. Performance comparisons should stratify routine replenishment orders and urgent engineered purchases rather than average unlike tasks.

Manufacturing execution presents a different challenge. Planning data may originate in ERP, but machine events, in-process quality and actual material use often flow through manufacturing execution systems or local devices. Cloud ERP can help consolidate planning information while still requiring robust edge connectivity and latency management. A plant that depends on uninterrupted shop-floor dispatch should not assume internet-dependent transactions are suitable for every control loop. Research on Industry 4.0 observes the interconnected roles of production technologies, data capture, transmission and decision application; technical integration and operational value remain distinct stages (Oztemel & Gursev, 2020; Zheng et al., 2021).

Inventory performance should combine record accuracy, stock-out incidence, days of inventory and the time delay between a physical event and its enterprise representation. Cloud-enabled common records may improve multi-site visibility, but a faster dashboard cannot correct systematic counting errors. Likewise, reductions in average stock must be interpreted alongside changes in order fill rate and production interruptions. If safety stocks decline during a demand contraction, the observed change does not necessarily show improved planning. Researchers should control for product mix, seasonality, supplier disruption and policy changes, ideally using plant-level panels or matched processes that migrated at different times.

Financial close is a useful cross-functional outcome because it depends on procurement, inventory valuation, intercompany transactions and posting discipline. Improved transaction standardisation might shorten reconciliations and reduce period-end adjustments. A credible benchmark counts business days from period close to approved management accounts, together with late journal entries, unresolved reconciliations and control exceptions. A shorter close with more retrospective adjustments represents a questionable benefit. Alsughayer (2025) identifies changes in the analytic role of accounting after ERP adoption in Saudi SMEs, providing a relevant conceptual bridge from operational records to management advice.

Table 2 presents constructed measurement examples to show how percentage changes should be reported. The baseline and illustrative follow-up values are not observations, averages from the selected studies or estimates of Saudi enterprise performance. They are deliberately heterogeneous business metrics and should not be pooled as an average improvement. Five examples use 'lower is better' measures; on-time-in-full fulfilment is included as a 'higher is better' measure so that management cannot equate cost or speed reduction with service improvement. The associated figure plots relative reductions in selected adverse measures solely to demonstrate a possible evaluation display.

Table 2. Illustrative evaluation metrics for a hypothetical industrial migration

Metric (direction)	Baseline	Post-migration	Change
Purchase-order cycle (↓)	8.2 days	5.4 days	−34.1%
Inventory-data latency (↓)	24.0 h	2.0 h	−91.7%
Monthly close (↓)	12 days	8 days	−33.3%

Metric (direction)	Baseline	Post-migration	Change
Forecast MAPE (↓)	22%	16%	−6 pp / −27.3%
Planning labour (↓)	420 h/month	300 h/month	−28.6%
On-time-in-full (↑)	82%	89%	+7 percentage points

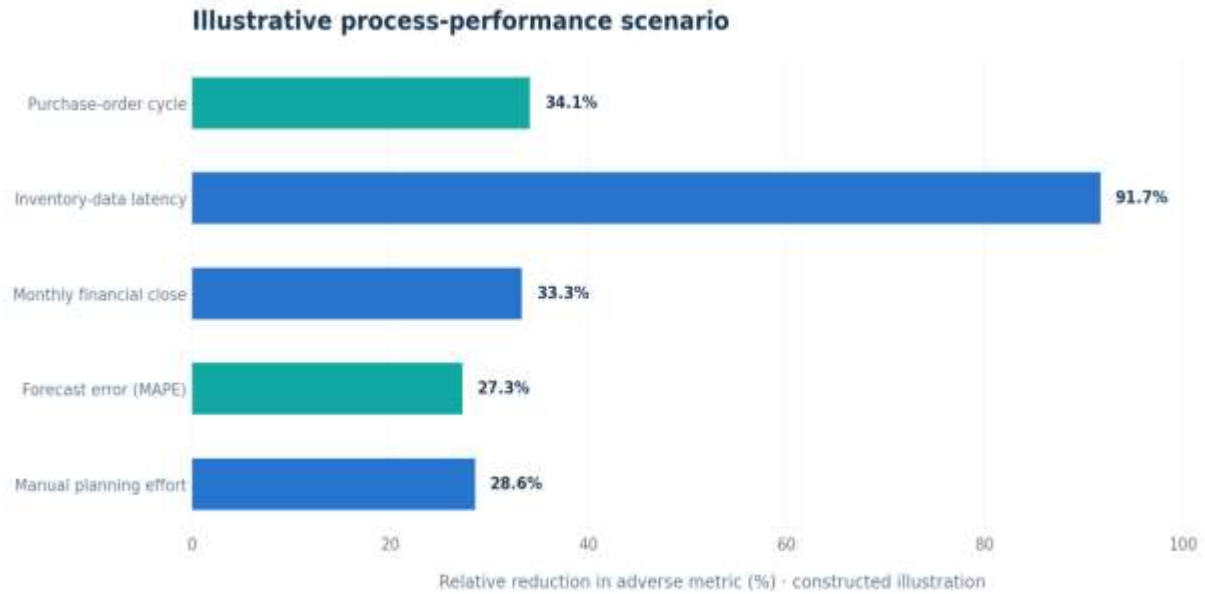


Figure 3. Constructed relative changes in selected process metrics; illustrative, not observed data.

Future research should record at least six months of stable pre-migration operations and multiple post-migration checkpoints. The transition interval deserves separate treatment: an implementation can initially reduce productivity as employees learn and controls are recalibrated. Interrupted time-series designs, paired plant comparisons or difference-in-differences models may offer more convincing attribution than immediate pre/post averages, provided intervention dates and parallel process changes are documented. Without an adequate baseline and counterfactual, benefits should be described as associations or operational improvements observed after migration, not causal effects of cloud architecture.

Data-driven decision-making and information governance:-

Decision-making quality is distinct from report-generation speed. A manager may receive a dashboard sooner without choosing a more effective production schedule. Evaluation therefore has to consider data correctness, accessibility, interpretability, decision latency and decision outcome. The chain begins with common and trusted transactional semantics: purchase commitments, available-to-promise inventory, machine capacity, customer orders and cost centres must describe comparable phenomena across sites. The managerial advantage of a single cloud interface disappears if modules disagree about when an order is complete or which item identifier is authoritative (Jaradat et al., 2024; Nour, 2023).

A useful distinction is between descriptive, predictive and prescriptive uses of ERP information. Descriptive capability makes cross-functional performance visible; predictive capability estimates demand, delays, costs or equipment risks; prescriptive support recommends actions subject to resource and governance constraints. ERP migration does not automatically supply all three. Predictive models require historical coverage, data-quality controls, validation across operating regimes and procedures for monitoring model drift. Prescriptive recommendations additionally require explicit constraints and decision authority. The case of manufacturing cloud and big-data integration demonstrates that analytical capability must be developed alongside enterprise infrastructure (Saraswat & Choudhari, 2025).

Operational decisions differ in reversibility and risk. A replenishment suggestion can often be reviewed daily; a major production sequencing change can affect service commitments and labour utilisation; long-term capacity investment carries much greater irreversibility. The appropriate information standard should increase with

materiality. For high-impact decisions, managers need source lineage, assumptions, confidence ranges and traceable approvals. The metric 'number of dashboards viewed' is at best a usage indicator, not evidence of improved decision effectiveness. Stronger measures include time to resolve a stock-out, forecast calibration, frequency of preventable expedited orders and documented reasons for deviations from suggested actions.

Data governance must be built into the migration boundary. Access rights should reflect role separation, such as preventing the same person from creating a supplier and unilaterally approving payment changes. Master-data stewardship should specify who may alter item definitions or accounting mappings; interfaces should preserve audit trails and detect unexpected reconciliation differences. The Saudi business setting requires an organisation-specific review of personal-data handling, tax-related systems, contractual processing, service-provider obligations and applicable hosting or transfer restrictions, rather than a blanket assumption that cloud services are compliant. This article does not assess any vendor's regulatory certification, and decisions must be based on current authoritative requirements and legal review.

Human capabilities determine whether better information becomes better action. An executive may sponsor the migration, yet supervisors and planners may continue working in shadow spreadsheets because the new screens do not represent their operational exceptions. Targeted training should include interpretation, exception resolution and data ownership, not simply button-level familiarity. Evidence from cloud ERP implementation highlights management support, supplier dependency and usability, while broader digital-transformation work stresses complementarities between technology and organisational practices (Gupta et al., 2018; Ben Slimane et al., 2022). Adoption rates should be segmented by job and process criticality rather than aggregated into a single log-in statistic.

A decision-quality study could use paired vignettes in which managers review equivalent operational problems before and after the availability of integrated data; expert raters can assess correctness, risk recognition and resource trade-offs. Alternatively, researchers can compare planning errors and realised service outcomes while controlling for demand volatility. Both designs require transparent records of the information available at decision time. Such designs move beyond confidence surveys to evaluate whether the platform supports more accurate, timely and accountable judgement.

Saudi industrial context and asymmetric constraints:-

The relevance of Saudi industrial enterprises arises from the interaction of industrial diversification, manufacturing development and heterogeneous digital maturity. Some facilities may operate integrated platforms and dedicated analytics teams, while smaller suppliers depend on spreadsheets, stand-alone accounting applications and manual hand-offs. A migration model suited to a multi-plant manufacturer may exceed the technical and financial capacity of a smaller enterprise. Conversely, a minimal off-the-shelf setup may be inadequate for complex bills of materials, regulated production, maintenance histories or traceability requirements. Adoption studies specific to Saudi Arabia should therefore be interpreted through firm size, sector and operating model rather than treated as universal prescriptions (AlBar & Hoque, 2019; Alsughayer, 2025). Experience with ERP transformation in a neighbouring Gulf SME setting likewise underscores contextual variation rather than simple transferability (Alsharari et al., 2020). Industrial supply-chain visibility has particular importance where manufacturers integrate imported machinery or inputs with increasingly local supplier networks. Cloud ERP may support standard supplier and materials data, cross-site inventory access and consistent procurement reporting. Those possibilities align with the practical ambitions of higher-value industrial production, but they must not be represented as direct measured consequences of a national programme. Comparative work on Saudi manufacturing digitalisation reports differing maturity conditions and highlights the need for coordinated capability development (Sarfraz et al., 2024). The implication is that benefit horizons and required complementary investments will vary substantially.

Migration risk is asymmetric. A delayed management report can be inconvenient; an interruption to production issue posting, material availability or dispatch confirmation may stop a line. Enterprise evaluation should separate safety-critical or continuity-critical interfaces from ordinary administrative reporting. Contractual service levels also require examination of recovery time objectives, data restoration, local network resilience and incident responsibility. Vendor lock-in is relevant when the new platform embeds proprietary configurations, making later migration or integration expensive. Technical standardisation may reduce one form of complexity while increasing dependence on another (Christiansen et al., 2022; Haddara et al., 2022).

Local managerial capability is equally important. A migration may standardise technical workflows but clash with established delegation practices or plant-specific operational realities. Effective governance permits justified variation while preventing uncontrolled customisation. It should define which practices must be common—item classification, financial definitions, identity administration, audit evidence—and which may differ by manufacturing process. The best implementation strategy is thus neither indiscriminate standardisation nor preservation of every legacy exception. It is selective harmonisation guided by process risk, measurability and identifiable economic value.

Integrated migration-to-value framework and propositions:-

Figure 2 formalises a migration-to-value pathway with three linked stages: migration configuration, enabling organisational mechanisms and realised outcomes. The first stage contains architecture choice, deployment scope, integration policy and vendor arrangement. The second contains clean master data, reliable interfaces, shared process definitions, analytical literacy, access governance and managerial authority. The third contains observable process measures and decision performance. Baseline complexity, firm scale, production interdependence and regulatory exposure moderate the links. This specification prevents a category error in which a service-delivery change is treated as equivalent to a business outcome.

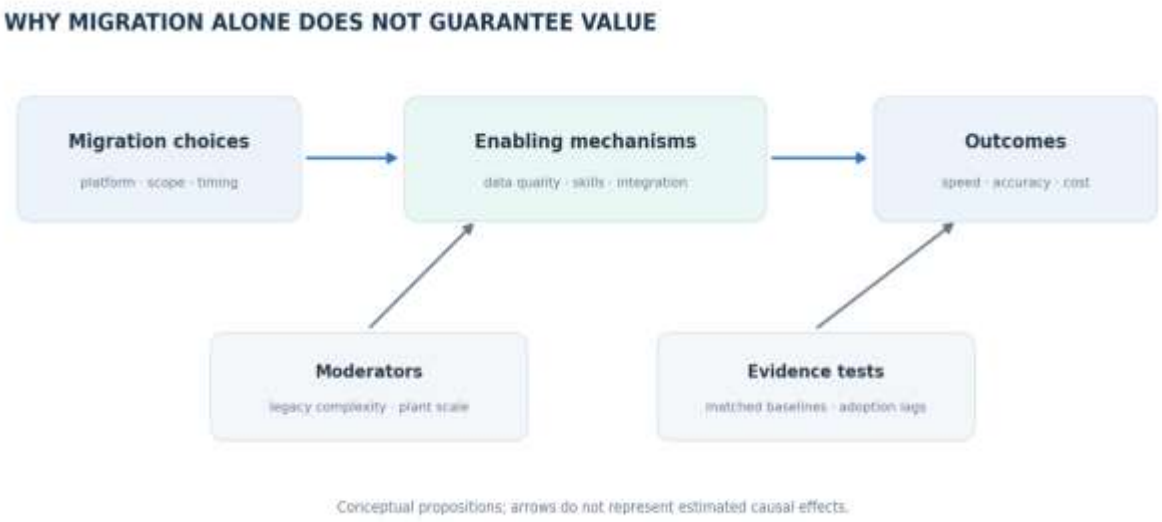


Figure 2. The conditional pathway from migration configuration to enterprise outcomes (conceptual synthesis).

Proposition 1 states that cloud ERP migration is more strongly associated with reduced administrative cycle time when business-process redesign and master-data harmonisation accompany the technical transition. Proposition 2 states that improvements in managerial decision quality are mediated by reconciled cross-functional data and user ability to interpret or act on it; frequency of dashboard access alone will not adequately capture this relationship. Proposition 3 states that the relationship between migration and realised value is weaker in operations with high legacy-interface dependence unless decoupling and resilience controls are implemented. Proposition 4 states that financial benefits vary by migration scope and time horizon, and should be evaluated net of transition expenditure, subscription growth, integration, retraining and risk-control costs.

These are propositions derived from synthesis, not tested hypotheses. Their originality lies in pairing an ERP deployment decision with distinct process and judgement outcomes while making migration and assimilation lags explicit. A multi-site study could estimate process-level effects using plant fixed effects and event-time indicators, supplemented by qualitative accounts of exceptions. Implementation intensity could be represented by the proportion of transactions on the new platform, degree of master-data standardisation and number of stable integrations. This approach would distinguish nominal 'live' status from substantive organisational use.

The financial component should resist simplistic licence-versus-hardware comparisons. Table 3 demonstrates a five-year, undiscounted illustrative total-cost-of-ownership comparison in Saudi riyals. The hypothetical on-premise

continuation case includes annual support and a required technology refresh. Each cloud scenario includes recurring charges and a one-off transition package. The base case appears favourable, but a conservative cloud scenario becomes more costly than keeping the existing system. The exercise is not a Saudi market quotation and cannot establish typical return on investment. Its purpose is to show sensitivity to omitted implementation and service costs; actual decisions require cash-flow discounting, taxation treatment where relevant and risk-adjusted scenario analysis.

Table 3. Constructed five-year cost-sensitivity comparison (SAR million; undiscounted)

Scenario	Annual run	One-off	Five-year total	Saving vs legacy
On-premise continuation	0.76	0.90	4.70	Reference
Cloud: conservative	0.65	1.55	4.80	−0.10
Cloud: base	0.53	1.35	4.00	+0.70
Cloud: optimistic	0.44	1.20	3.40	+1.30

Note. Constructed assumptions, not vendor quotations or measured costs. Five-year total = 5 × annual operating spend + one-off migration/refresh cost; positive saving favours cloud.

Implications for managerial practice and future research:-

Managers should begin with a performance charter written before vendor selection. Each critical process requires a baseline metric, a named owner, a target justified by operational analysis and a measure of possible harm. Procurement cycle time, stock reliability and finance-close duration are useful starting points, but continuity, audit exceptions and user burden should be monitored in parallel. The charter should specify what is expected from cloud hosting, what requires process redesign, and what depends on advanced analytics. This separation discourages overstating benefits that belong to concurrent organisational change.

Vendor assessment should include process fit, data-exit rights, interface patterns, resilience, security configuration, auditability and the cost of subsequent module or user expansion. A short proof-of-concept cannot demonstrate long-run maintainability or complete reconciliation. Decision-makers should request evidence of peak-load behaviour, error recovery and integration with the actual shop-floor environment. Change governance should record decisions about retaining, retiring or redesigning customisations, including operational reasons for exceptions. Those choices can have more enduring performance consequences than the specific location of compute resources (Hustad et al., 2020; Barbieri et al., 2024).

Implementation should progress through defensible assurance gates. The initial gate certifies process baselines and a complete dependency map. A pilot gate verifies data quality, security, recovery and representative user performance. A scale gate requires acceptable interface reliability and reconciled master data across additional plants. A benefits gate checks realised process measures after the learning period and compares them with credible control processes. Figure 4 expresses these steps in indicative planning windows, not universal project durations. Governance should preserve the option to defer a production-critical cutover when controls fail, even if the programme is under scheduling pressure.



Figure 4. Stage-gated cloud ERP migration and post-implementation evaluation (proposed roadmap).

Researchers can contribute by moving beyond intention surveys to long-term process outcomes. A valuable design would follow firms from pre-selection through migration, stabilisation and at least a year of normal operation, distinguishing greenfield deployment from legacy replacement. Outcomes should be reported by industry, establishment size and process type. Interviews with finance, operations and IT can explain mismatches between system indicators and actual practices, while event logs provide auditable evidence about transactions. Where randomisation is not feasible, matched staggered deployments and sensitivity analyses should acknowledge remaining selection bias.

Measurement standardisation is another priority. 'Business process efficiency' should be disaggregated into cycle time, touch time, error frequency and unit cost; 'data-driven decision-making' should separate data availability, forecast performance, decision latency and realised action quality. Studies must identify the numerator, denominator, units, period and direction of improvement for each indicator. Organisational learning can change results after deployment, and concurrent investment or demand changes can contaminate naive before–after comparisons. Transparent design choices would make studies from Saudi facilities more cumulative and comparable with international evidence.

Limitations:-

The review is constrained by its purposive selection of 30 DOI-traceable academic sources, which is suitable for conceptual integration but not an exhaustive count of all relevant research. The literature combines cross-sectional adoption surveys, case studies, systematic reviews and general ERP performance studies, restricting causal comparability. Some cited studies concern SMEs or firms outside Saudi Arabia; their mechanisms are informative, but local effect sizes should not be inferred. Important differences between rehosting, managed-platform conversion and replacement with a cloud-native suite are not consistently measured in published studies.

The paper contains no original firm-level dataset, interviews, econometric estimation or live platform assessment. Consequently, its figures are conceptual or illustrative; numerical tables do not report measured Saudi outcomes. The five-year cost model excludes discounting and intentionally varies only a limited set of expenditures. Finally, governance expectations and technology offerings change over time. Researchers and practitioners must verify current local requirements and actual vendor arrangements before implementing the suggested controls.

Conclusion:-

Cloud ERP migration offers Saudi industrial enterprises a plausible route to more adaptable enterprise operations, but neither cloud deployment nor increased reporting capacity guarantees measurable value. The reviewed evidence supports a conditional account: process outcomes depend on workflow redesign, integration and master-data

reliability; decision outcomes depend further on analytic competence, governance and accountable use of information. Industrial continuity, organisational heterogeneity and service-provider dependency can complicate both pathways. A structured migration-to-value framework makes these assumptions testable and directs attention to process-specific baselines, integration resilience, decision outcomes and full lifecycle cost. Future longitudinal evidence from Saudi manufacturing plants is essential to establish which combinations of cloud architecture and organisational capabilities produce durable improvements, for whom and under what operating conditions.

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