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Big Data Platforms and Cloud-Based Analytics for Enterprise Digital Transformation in Saudi Vision 2030

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Abstract- Saudi Arabia's Vision 2030 has elevated enterprise digital transformation from a standalone IT initiative to a strategic driver of productivity, innovation, service quality, and economic development. Big data platforms and cloud-based analytics enable this shift by combining varied data, scaling analytics, and supporting knowledgeable decision-making. This review integrates evidence from 2020 to 2025 to clarify how these technologies generate enterprise value and the factors influencing adoption in Saudi Arabia. A structured integrative review included 30 peer-reviewed and policy sources, coded by platform architecture, analytics capability, adoption, governance, innovation, and Vision 2030 alignment. The results show that technology investment alone is not sufficient. Value is realized when elastic infrastructure, governed data, analytical skills, digital frameworks, and decision processes operate cohesively. Saudi evidence stresses the importance of organizational readiness, management support, security, skills, regulation, and provider trust. This paper describes a five-layer framework uniting data foundations, cloud platforms, analytics intelligence, organizational capabilities, and measurable business outcomes. Saudi enterprises should approach cloud analytics as an operating model, embedding governance, cybersecurity, cost accountability, interoperability, and workforce development from the outset.

Keywords: big data platforms; cloud analytics; enterprise digital transformation; saudi vision 2030; data governance; analytics capability; cloud computing

I. INTRODUCTION

Digital transformation allows firms to redesign processes, products, customer relationships, and decision systems. Contemporary enterprises generate data from transactions, customer channels, sensors, supply chains, web interactions, mobile platforms, and partner ecosystems. The value of this data depends on how quickly it can be combined, governed, analyzed, and applied. Big data platforms deliver scalable environments toward diverse information (Shahnawaz & Kumar, 2025), while cloud-based analytics provides elastic computing, managed data services, machine learning, visualization, and joint decision tools. Together, these technologies lessen reliance on fixed infrastructure and enable analytics to scale with demand (Kostakis & Kargas, 2021; Hai et al., 2023).

This combination is tactically important for Saudi Arabia. Vision 2030 connects competitiveness to digital government, data and artificial intelligence, private sector productivity, local capability development, and economic development. The national data and AI agenda integrates data-driven capability into the Kingdom's development framework (Memish et al., 2021). The Vision 2030 Annual Report for 2024 reports a digital economy valued at approximately USD 132 billion, or 15 percent of GDP, alongside substantial investment in AI and data center infrastructure (Saudi Vision 2030, 2024). While these figures do not confirm firm-level transformation, they indicate an environment where cloud analytics can serve as an enterprise foundation. However, access to technology alone does not guarantee improved performance for enterprises. Research regularly shows that the impact of analytics investment is mediated by organizational capabilities such as data-driven insight, innovation, platform and network capability, and the ability for adapting routines. Mikalef et al. (2020) found that analytics capability improves competitive performance through dynamic and operational strengths. Awan et al. (2021) linked analytics capability to decision quality and circular economy outcomes, while Ciampi et al. (2021) demonstrated that entrepreneurial orientation helps convert analytics capability into business model innovation. Recent studies show that digital transformation yields better results when analytics and innovation capabilities are developed together rather than separately (Orero-Blat et al., 2025).

Cloud adoption adds an organizational dimension. Elasticity, scalability, lower entry barriers, and managed services are attractive, but adoption depends on technological, organizational, and environmental conditions, and no single factor is sufficient across firms (Zhang et al., 2021). Reviews repeatedly identify security, cost, compatibility, readiness, leadership, skills, and external conditions (Jayeola et al., 2022; Omurgonulsen et al., 2021). Saudi studies stress management commitment, technological readiness, provider confidence, perceived benefit, and contextual barriers (Alqahtani et al., 2023; Alamri & Alzahrani, 2024). A Saudi migration case further shows that cloud modernization is more meaningful when connected to business processes instead than treated as a technical replacement (Alghamdi & Aboalela, 2023).

Studies offer strong evidence on analytics capabilities and cloud adoption, and Saudi research increasingly addresses local adoption conditions and national digital priorities. However, these areas are often studied in isolation. Big data research might focus on firm capability without tackling the underlying data architecture, while cloud studies may highlight adoption factors without explaining how analytical value is realized. Policy talks may emphasize digital ambition without translating it into an enterprise operating model. A review that integrates platform architecture, analytical capability, organizational adoption, governance, and Vision 2030 alignment can deliver a more comprehensive synthesis.

This review intends to explain how big data platforms and cloud-based analytics drive enterprise digital transformation in Saudi Arabia and identify the mechanisms required for value realization. The study has five objectives: map essential platform functions; synthesize how analytics capability influences performance, innovation, agility, and decisions; identify Saudi-specific adoption and implementation factors; integrate findings into a Vision 2030-aligned framework; and highlight research gaps for Saudi sectors. The research addresses four questions: Which platform capabilities are most critical? Through which organizational mechanisms is value created? What barriers and enablers affect Saudi adoption? How can platform investment be linked to measurable enterprise and Vision 2030 outcomes?

II. LITERATURE REVIEW AND CONCEPTUAL BACKGROUND

2.1 Big data platforms as an enterprise foundation

Big data platforms are coordinated data systems rather than single products. They ingest multiple sources, preserve information, provide metadata and discovery, support batch and streaming processing, and make governed data available to analytical applications. Data lake research clarifies the promise as well as failure modes of large repositories. Hai et al. (2023) show that data lakes require ingestion, metadata, discovery, integration, quality, security, lineage, and lifecycle management. Without those functions, scale produces accumulation rather than trustworthy analytical capability.

Platform value also depends on how users convert data into action. Mathrani and Lai (2021) connect data sources, processing, analytical methods, and business intelligence to decision requirements. Kostakis and Kargas (2021) likewise argue that big data management drives transformation when data practices back strategic change. An enterprise platform therefore needs reliable pipelines and governed datasets alongside accessible analytics, visualization, experimentation, and decision workflows.

Cloud computing separates analytical growth from fixed infrastructure procurement. Organizations can provision storage and compute on demand and use managed data services, yet flexibility changes architectural responsibilities. Cloud transformation still requires decisions about workload placement, integration, identity, resilience, cost, and data classification. The literature spans technical, organizational, economic, and governance concerns (Omurgonulsen et al., 2021), while practical transformation research recommends iterative alignment between business goals, technology, and innovation (Liu et al., 2021).

Cloud platforms might also make advanced analytics easier to operationalize. Rajendran et al. (2023), in a

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comparison of cloud providers for deep learning object detection deployment, illustrate how provider capabilities affect model deployment choices, performance, and operational design. Although that study is application specific, it demonstrates a wider enterprise principle: analytical value depends on the fit between workloads and platform services. Organizations therefore need architecture standards that allow different analytical patterns, including descriptive reporting, streaming analysis, predictive modeling, and artificial intelligence, while preventing unnecessary duplication. A modern data platform should make these patterns share a common governance and data foundation even when their compute requirements differ.

2.2 Big data analytics capability and enterprise value

A recurring finding in recent literature is that analytics technology creates value through organizational capability. Mikalef et al. (2020) conceptualize big data analytics capability as a combination of resources that helps firms sense opportunities, coordinate action, and improve performance. This energetic capability logic also enables sustainable competitive advantage through learning and reconfiguration (Shah, 2022). The difference lies in whether they can combine data, technical expertise, managerial knowledge, and routines in a way that changes decisions and operations. Awan et al. (2021) add that data driven insight constitutes a key mechanism connecting analytics capability to decision making and circular economy performance. The important unit of analysis is therefore not a dashboard or algorithm, but the capability to generate and repeatedly use reliable insight.

Innovation studies strengthen this interpretation. Ciampi et al. (2021) connect analytics capability with business model innovation through entrepreneurial orientation. Olabode et al. (2022) show that disruptive business models mediate part of the relationship with market performance. Bhatti et al. (2025) link analytics capability with digital platform, network, innovation, and financial effects, while Orero-Blat et al. (2025) find that digital investment needs complementary analytics and innovation conditions. Despite different methods, these studies converge: analytics creates more value when embedded in organizational learning and reconfiguration.

The same logic appears in operational situations. Yu et al. (2021) link big data analytics capability with supply chain integration and operational responsiveness, showing how information processing capability can support coordinated action across functions. Almulhim (2021) links digital technologies with smart supply chain performance, while AlNuaimi et al. (2021) show how analytics capability can support greener e-procurement outcomes. These outcomes are relevant to Saudi enterprises in sectors such as logistics, manufacturing, energy, aviation, healthcare, retail, and large project delivery, where value often depends on integrating information across organizational boundaries. Cloud analytics can shorten the distance between data generation and coordinated response, but only when governance and operating responsibilities are defined.

Policy and innovation environments are able to reinforce transformation effects. Peng and Tao (2022) report performance gains through cost, efficiency, revenue, and innovation mechanisms, with public policy influencing the relationship. For Saudi Arabia, national investment can reduce infrastructure constraints and encourage adoption, but firms still need internal mechanisms to turn enabling conditions into results. Cloud regions, data centers, regulation, and AI programs expand opportunity; they do not replace prioritization, process redesign, or capability building.

2.3 Adoption, readiness, and the Saudi enterprise context

The cloud adoption literature delivers a structured way to understand why enterprises progress at different speeds. Technology Organization Environment research stresses the combined effect of technological characteristics, organizational readiness, and external conditions. Skafi et al. (2020) found that cloud adoption in small and medium enterprises is affected by factors including relative advantage, security, top management support, technology readiness, and competitive pressure. Alismaili et al. (2020) similarly developed an

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organizational level assessment of cloud adoption that highlights readiness and surrounding factors. Zhang et al. (2021) extend this reasoning through configurational analysis, showing that multiple combinations can produce high cloud adoption. This is important for Saudi organizations because it discourages a single universal migration formula.

Saudi focused studies make the contextual implications more specific. Alqahtani et al. (2023) propose a cloud adoption model for Saudi small and medium enterprises that incorporates local technological, organizational, and environmental aspects. Alamri and Alzahrani (2024) identify perceived benefits, organizational factors, security concerns, expertise, and provider related conditions as important elements of adoption in Saudi SMEs. Alghamdi and Aboalela (2023) provide an enterprise case in which cloud migration is considered in relation to business processes and organizational effects. Almatrafi and Alharbi (2023), although focused on web analytics rather than cloud infrastructure, show the growing managerial relevance of analytics tools for Saudi SMEs and the need to connect data use with performance management.

Saudi enterprise transformation is therefore a maturity journey. Early stages may migrate selected workloads or improve availability; advanced stages require integrated data products, automated pipelines, governed analytical environments, and enterprise wide decision use. Progress depends on skills, leadership, architecture discipline, and trust. Reviews repeatedly return to organizational preparedness, security, governance, and environmental conditions (Jayeola et al., 2022; Omurgonulsen et al., 2021). Cybersecurity, sovereignty, privacy, resilience, and vendor management should consequently be design requirements, not approvals added after architecture decisions.

Government transformation research provides another relevant lens. Makki and Alqahtani (2022) model barriers to digital government implementation in Saudi Arabia and show that institutional and coordination challenges are able to reinforce one another. Enterprise settings differ from government settings, but the structural lesson is transferable: digital programs can be constrained by organizational habits, fragmented ownership, and weak coordination even when technology is available. National digital institutions address part of this problem by creating policy direction and capability building. Memish et al. (2021) describe SDAIA's role in advancing the Kingdom's data and AI agenda. For enterprises, the corresponding responsibility is to establish internal data accountability, decision rights, and operating processes that make national digital ambition executable at firm level.

III. REVIEW METHODOLOGY

This study adopted a structured integrative review design. An integrative approach was selected because the research question spans several evidence types: technical studies of data platforms, empirical studies of analytics capability and performance, cloud adoption research, Saudi organizational studies, and national policy material. A narrow meta analysis would be inappropriate because the studies use different constructs, samples, units of analysis, and outcome measures. The review nevertheless follows the transparency principles of PRISMA 2020 by defining the search scope, eligibility logic, screening approach, and synthesis procedure in advance (Page et al., 2021). Figure 1 summarizes the review workflow.

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Figure 1. Structured integrative review protocol used for evidence identification, appraisal and synthesis.

The publication window was 2020 through 2025. Evidence was identified through publisher and bibliographic records for ScienceDirect, SpringerLink, Emerald, IEEE, Wiley, MDPI, IGI Global, and other peer reviewed outlets, with targeted searches for Saudi Arabia and Vision 2030. Search concepts covered big data platforms and data lakes; cloud computing and analytics; digital transformation and enterprise performance; and Saudi Arabia or Vision 2030. Typical combinations included "big data analytics capability" AND "digital transformation," "cloud adoption" AND "SME," and "Saudi Arabia" AND "cloud computing." The official Vision 2030 Annual Report was included as a primary policy source.

Sources were eligible when they were published from 2020 to 2025, written in English, directly relevant to enterprise data, cloud, analytics, digital transformation, or Saudi digital adoption, and traceable through a DOI or stable official publisher record. Peer reviewed journal articles were prioritized. A book chapter was retained where it directly addressed Saudi SME cloud adoption, and the official Vision 2030 report was retained for policy evidence. Sources were excluded when they were outside the date range, duplicated a final published article, focused on a technical algorithm without meaningful enterprise or platform relevance, lacked verifiable bibliographic information, or offered opinion without a transparent research or institutional basis. The final review corpus contained 30 sources.

Quality appraisal was qualitative rather than numerical. Each source was assessed against four questions: Is the publication record verifiable? Is the research design or institutional basis transparent? Does the source directly inform at least one research question? Can its findings be transferred responsibly to the Saudi enterprise context? This appraisal prevented highly technical or weakly contextual evidence from controlling the synthesis. It also allowed Saudi specific empirical studies to be considered alongside broader international research without assuming that results from one market automatically generalize to another.

The analysis used thematic coding and concept mapping. First cycle coding captured platform functions, adoption factors, analytics capabilities, governance, performance mechanisms, innovation,

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and Saudi contextual factors. Second cycle coding consolidated these into five themes: governed data foundations; elastic cloud and analytics platforms; analytics enabled dynamic capabilities; adoption and operating model conditions; and Vision 2030 value alignment. Relationships were compared across studies to detect recurring mechanisms rather than frequency counts. Table 1 summarizes the evidence, and Figure 2 organizes the synthesis into a five layer model. No adoption percentages or pooled effect sizes were generated because the studies do not share a common measurement base.

Table 1. Evidence themes synthesized from the 30-source review corpus.

Evidence theme	Convergent finding	Saudi enterprise implication	Representative evidence
Governed data foundation	Metadata, quality, lineage, integration and discoverability are required for trusted scale.	Design domain ownership and governance with the platform, not after migration.	Hai et al. (2023); Mathrani & Lai (2021)
Elastic cloud architecture	Cloud expands provisioning and service options, but value depends on workload fit and controls.	Match workloads to sensitivity, latency, resilience, integration and cost requirements.	Omurgonulsen et al. (2021); Jayeola et al. (2022); Liu et al. (2021)
Analytics capability	Performance effects occur through insight, innovation, platform capability and dynamic routines.	Connect analytical products to business decisions, process owners and measurable outcomes.	Mikalef et al. (2020); Awan et al. (2021); Ciampi et al. (2021); Orero-Blat et al. (2025)
Adoption and readiness	Technological, organizational and environmental conditions act in combinations.	Use sector and firm-specific migration sequences rather than a universal cloud roadmap.	Skafi et al. (2020); Zhang et al. (2021); Alamri & Alzahrani (2024)
Saudi strategic alignment	National digital policy creates enabling conditions; firms must build internal execution capability.	Translate Vision alignment into operational, innovation and local capability indicators.	Memish et al. (2021); Saudi Vision 2030 (2024); Makki & Alqahtani (2022)

IV. RESULTS AND DISCUSSION

4.1 A governed data foundation is the first transformation layer

The review indicates that enterprise cloud analytics begins with data architecture rather than analytics software. Data lakes and related platforms can consolidate structured and unstructured information, but their value depends on metadata, discoverability, quality, lineage, security, and lifecycle management (Hai et al., 2023). This finding is strategically important because many transformation programs begin with tool acquisition and postpone data governance. The literature suggests the reverse sequence is safer: enterprises should define authoritative data domains, ownership, access policies, quality expectations, and integration patterns whereas the platform is being designed. Cloud scale increases the cost of weak governance because duplicated or poorly described data can proliferate faster.

A governed foundation also enables reuse. When customer, asset, financial, supply chain, or operational data is developed once as trusted data products, multiple analytical teams can build on the same definitions. This reduces reconciliation effort and makes performance indicators more consistent. Mathrani and Lai (2021) point out the importance of linking data processing to organizational use, while Kostakis and Kargas (2021) position big data management as part of transformation instead than an isolated technical function. In the Saudi context, this approach supports organizations that need to integrate legacy enterprise systems with cloud services while preserving control over sensitive or regulated information. The architecture can be hybrid, but the governance model should be unified.

4.2 Cloud elasticity creates options, not automatic value

The second finding is that cloud computing expands strategic options through elasticity, managed services, and faster provisioning, yet the value of those options depends on workload design and organizational readiness. Cloud literature consistently identifies scalability and flexibility as benefits, but it also identifies security, compatibility, provider dependence, cost, and skills as implementation concerns (Omurgonulsen et al., 2021; Jayeola et al., 2022). Saudi focused evidence reflects the same balance. Alamri and Alzahrani (2024) show that perceived benefits coexist with corporate and security challenges, while Alqahtani et al. (2023) argue for an adoption model sensitive to the Saudi SME environment. Alghamdi and Aboalela (2023) illustrate that migration has greater meaning when it supports business modernization.

This evidence argues against evaluating cloud success through migration volume alone. Moving servers to cloud infrastructure may improve flexibility but does not necessarily improve decision quality or innovation. A more mature transformation uses cloud services to redesign data ingestion, integration, experimentation, analytics delivery, and recovery. Liu et al. (2021) support an iterative transformation process that connects business, technology, and innovation. Rajendran et al. (2023) further demonstrate that analytical deployment choices can differ across cloud environments, underlining the need for workload fit. Enterprises should therefore assess each analytical workload by business criticality, latency, data sensitivity, scaling pattern, integration needs, and cost behavior before selecting a deployment pattern.

4.3 Analytics capability is the bridge from platform to performance

The strongest cross study convergence concerns analytics capability. Firms do not gain performance simply because they possess huge datasets or cloud services. They gain when they can repeatedly convert data into insight and action. Mikalef et al. (2020) connect analytics capability to competitive performance through dynamic and managerial capabilities. Awan et al. (2021) demonstrate the role of data driven insight in decision making. Ciampi et al. (2021) link analytics capability to business model innovation, and Olabode et al. (2022) show that business model mechanisms and competitive conditions determine market performance effects. Bhatti et al. (2025) and Orero-Blat et al. (2025) extend the argument by connecting analytics with digital platform, network, innovation, and efficiency capabilities.

For Saudi enterprises, this means cloud analytics should be governed by business use cases and decision cycles. A predictive maintenance model has value only if maintenance planning, work order prioritization, and spare parts decisions can use its output. Customer analytics has value only if commercial teams can change offers, journeys, or service responses. Executive dashboards have value only if metric definitions are trusted and management routines act on variances. Analytics teams therefore need close links with process owners. The operating model should include product managers, data engineers, analysts, domain experts, information security specialists, and business decision makers with explicit accountability for outcomes.

Operational studies reinforce this point. Yu et al. (2021) show that analytics capability supports integration and flexibility in complex supply chains, while Almulhim (2021) connects smart supply chain practices with performance. Almatrafi and Alharbi (2023) demonstrate that analytics tools can contribute to SME performance when used managerially. These results indicate that high value Saudi use cases are likely to emerge where data fragmentation currently slows coordination: integrated planning, supply chain visibility, asset reliability, service personalization, financial prediction, project controls, medical services, and demand management. The common requirement is not a particular cloud product but a repeatable path from trusted data to action.

4.4 Adoption is a configuration of technology, organization, and environment

The review also shows that adoption barriers should not be treated as a checklist with one dominant factor. Skafi et al. (2020) and Alismaili et al. (2020) identify multiple technological and organizational determinants, while Zhang et al. (2021) show that different combinations of conditions can produce high adoption. This configurational view is useful for Saudi Arabia because firms vary greatly in size, sector, legacy architecture, regulatory exposure, internal skills, and vendor relationships. A large bank, industrial enterprise, retailer, healthcare provider, and SME may all pursue cloud analytics, but the sequence and control model should differ.

Three cross cutting conditions appear consistently important. The first is leadership alignment: management must connect platform investment to business priorities and tolerate the organizational redesign needed to use data properly. The second is trust: security, privacy, resilience, provider assurance, and data governance influence willingness to move critical workloads. The third is capability: teams need architecture, engineering, analytics, product, and governance skills. Saudi digital institutions can strengthen the external environment, but in-house transformation is a firm responsibility. Makki and Alqahtani (2022) show how institutional and coordination barriers can obstruct digital implementation, and Memish et al. (2021) illustrate the national effort to build data and AI capability. Successful enterprises need an equivalent internal governance structure that turns broad digital ambition toward prioritized programs, architecture standards, and measurable accountability.

4.5 An integrated framework for Vision 2030 aligned enterprise transformation

The synthesis produces a five layer framework. Layer one is the governed data foundation: enterprise sources, external data, metadata, quality, lineage, classification, and stewardship. Layer two is the cloud and platform layer: scalable storage, processing, integration, orchestration, security, observability, resilience, and cost controls. Layer three is analytics intelligence: business intelligence, advanced analytics, machine learning, streaming analysis, and reusable decision services. Layer four is organizational capability: data driven routines, product ownership, cross functional collaboration, experimentation, innovation, and change management. Layer five is value realization: productivity, service quality, agility, new revenue, resilience, sustainability, as well as strategic contribution to Vision 2030. Governance, cybersecurity, skills, and financial accountability operate across all five layers rather than sitting in a separate final stage.

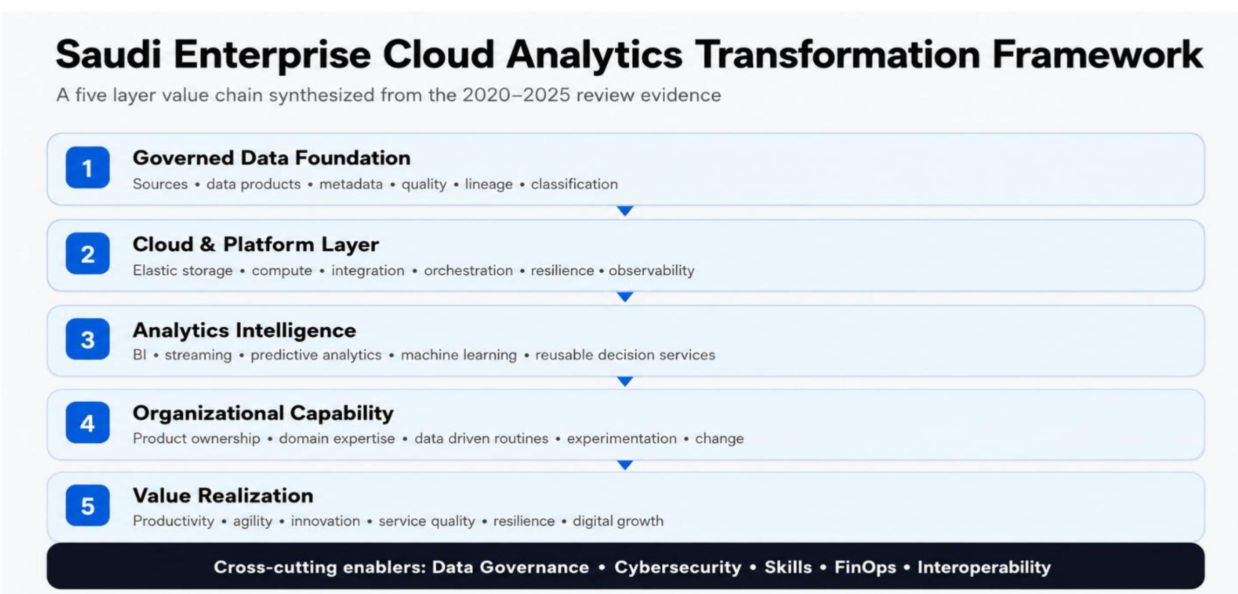

Figure 2. Five-layer Saudi enterprise cloud analytics transformation framework. The framework is a conceptual synthesis, not an empirical maturity score.

This system explains why isolated modernization efforts often disappoint. An enterprise may have high quality cloud infrastructure but weak data ownership, producing inconsistent analytics. It may have sophisticated models but no process integration, producing demonstrations rather than decisions. It may have strong data teams but weak financial governance, allowing consumption costs to rise absent clear value. Conversely, organizations that connect the layers can create cumulative capability. Platform reuse lowers the marginal cost of new use cases; better governance increases trust; repeated delivery develops skills; and visible business outcomes strengthen executive support. This reinforcing cycle is more consistent with the dynamic capability literature than a one time migration program.

The framework delivers a practical link to Vision 2030, whose agenda emphasizes a flourishing digital economy, innovation, productivity, data and AI leadership, and digital services (Saudi Vision 2030, 2024; Memish et al., 2021). Cloud analytics contributes when it improves resource scheduling, services, asset management, innovation, and local capability. Peng and Tao (2022) identify efficiency and advancement pathways from digital transformation to performance. Vision alignment should therefore be translated into enterprise indicators such as cycle time, forecast accuracy, asset availability, digital revenue, resolution time, automation, analytical reuse, local skills, and governed data coverage.

Table 2. Enterprise cloud analytics transformation blueprint and example value indicators.

Layer	Primary design focus	Embedded controls	Example value indicators
1. Governed data foundation	Reusable data products, metadata, quality, lineage, classification and stewardship.	Ownership, access policy, retention, data quality rules.	Governed data coverage; reconciliation time; reuse rate.
2. Cloud and platform	Elastic storage/compute, integration, orchestration, resilience and observability.	Identity, encryption, resilience, vendor management, FinOps.	Unit cost; deployment lead time; availability; recovery performance.
3. Analytics intelligence	BI, streaming, predictive models, ML and reusable decision services.	Model lifecycle, monitoring, explainability and analytical standards.	Forecast accuracy; decision latency; model adoption; automation.
4. Organizational capability	Product ownership, domain expertise, cross-functional delivery and change routines.	Decision rights, portfolio governance, skills plans and outcome ownership.	Use-case cycle time; adoption; skills depth; experimentation rate.
5. Value realization	Productivity, service quality, agility, innovation, resilience and digital growth.	Benefits tracking and executive accountability.	Cycle time; asset availability; digital revenue; customer outcomes.

V. MANAGERIAL IMPLICATIONS, RESEARCH AGENDA, AND LIMITATIONS

Several managerial implications follow. Executives should fund data foundations and governance as shared enterprise capabilities. Cloud programs should pair technical indicators such as availability, latency, unit cost, and deployment frequency with decision speed, process performance, customer outcomes, or revenue. Cloud financial management should begin early so elasticity does not become uncontrolled expense. Data classification and cybersecurity should shape workload placement and access from the outset. Workforce development should include domain professionals as well as technical specialists

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because valuable analytical questions are embedded in operational knowledge.

A staged sequence is preferable. Enterprises can select a few high value domains with clear business ownership and establish reusable ingestion, quality, identity, metadata, and analytical patterns. They can then expand cross domain data products and governed self service analytics prior to scaling advanced analytics and AI with model monitoring and decision accountability. This progression reflects evidence that transformation requires complementary capabilities rather than technology investment alone (Mikalef et al., 2020; Orero-Blat et al., 2025) and reduces the risk of building a large platform before value is demonstrated.

Subsequent research should test the proposed framework empirically in Saudi sectors. Longitudinal studies are needed to distinguish short term migration effects from sustained capability development. Sector comparisons could examine whether regulated industries require different governance sequences from retail, logistics, construction, or manufacturing. Research should also investigate cloud cost governance, data product operating models, sovereign workload patterns, and the relationship between local cloud infrastructure and enterprise innovation. Because analytics capability is repeatedly associated with innovation and outcomes, Saudi studies could test which combinations of technical skills, executive sponsorship, data governance maturity, and process redesign most strongly predict value realization. Mixed methods designs would be particularly useful because they can combine measurable performance outcomes with evidence about organizational change.

This review has limitations. The 2020 to 2025 window increases contemporary relevance yet excludes earlier fundamental work. The evidence base is intentionally heterogeneous and therefore supports thematic synthesis rather than pooled effect sizes. English language publication criteria may omit relevant Arabic evidence. Saudi specific peer reviewed enterprise studies remain smaller in number than the international analytics literature, so some mechanisms are transferred cautiously from other contexts. The review also relies on published and official evidence rather than proprietary enterprise performance data. These limitations define a research opportunity rather than weakening the central conclusion: the technical availability of cloud analytics is only one part of transformation, and the Saudi context needs more firm level evidence on how architecture, governance, skills, and decision routines interact over time.

VI. CONCLUSION

This review examined big data platforms and cloud based analytics as enabling capabilities for enterprise digital transformation under Saudi Vision 2030. Across the 30 sources, the evidence is consistent on one central point: enterprise value is created by a system of complementary capabilities, not by technology acquisition alone. Big data platforms deliver expandable integration and governed access to heterogeneous information. Cloud services add elasticity, managed capabilities, and faster provisioning. Analytics converts trusted data into insight, but performance depends on organizational routines that can interpret that insight, redesign processes, and act. Adoption is further conditioned by leadership, skills, security confidence, provider trust, regulation, compatibility, and financial governance.

For Saudi enterprises, the practical implication is to frame cloud analytics as an operating model. A mature program connects governed data foundations, scalable cloud platforms, analytical services, cross functional capabilities, and measurable business outcomes. Cybersecurity, data governance, skills, interoperability, and cost accountability should cut across the entire model. This approach is better aligned with Vision 2030 because it turns national digital infrastructure and policy momentum into firm level productivity, innovation, service improvement, and knowledge capability. The proposed five layer framework gives a structure for that translation and a basis for future empirical testing. As Saudi Arabia's digital economy expands, the organizations most likely to benefit will be those that treat data not simply as an asset to store, but as a governed organizational capability that improves decisions repeatedly and at scale.

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