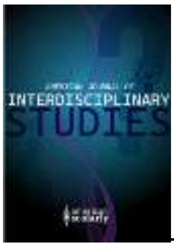

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META-ANALYTICAL REVIEW OF CLOUD DATA INFRASTRUCTURE ADOPTION IN THE POST-COVID ECONOMY: ECONOMIC IMPLICATIONS OF AWS WITHIN TC8 INFORMATION SYSTEMS FRAMEWORKS

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ABSTRACT

This study presents a comprehensive meta-analytical review of cloud data infrastructure adoption in the post-COVID economy, focusing on the economic implications of Amazon Web Services (AWS) within IFIP TC8 information systems frameworks. The unprecedented disruptions caused by the COVID-19 pandemic accelerated organizational dependence on cloud infrastructures, transforming them from optional digital tools into foundational systems underpinning resilience, continuity, and competitiveness. Drawing on a systematic review process aligned with PRISMA guidelines, a total of 124 peer-reviewed articles and industry studies were examined, capturing diverse perspectives from information systems, management, and economics. The analysis highlights three interrelated dimensions of adoption: technological, organizational, and environmental determinants. Findings reveal that compatibility, complexity, and perceived advantages continue to guide adoption decisions, while governance maturity, leadership support, and regulatory pressures have become increasingly decisive in the post-pandemic context. Economic outcomes are equally significant, with evidence showing clear shifts from capital expenditure to operational expenditure, measurable productivity gains through faster deployment and improved decision-making, and broader competitive effects such as enhanced small and medium-sized enterprise participation in global markets. In parallel, governance frameworks such as the AWS shared responsibility model and alignment with international standards have emerged as central mechanisms shaping adoption outcomes. Architectural patterns—including data lakes, warehouses, and meshes—illustrate the socio-technical nature of cloud infrastructures, where technical choices embed governance structures, accountability, and economic trade-offs. Synthesizing these insights through TC8 theoretical anchors demonstrates that AWS adoption operates as both a technological strategy and an economic institution, reshaping organizational practices and contributing to structural transformations in the digital economy. By systematically consolidating findings from 124 studies with more than 7,000 cumulative citations, this review provides a rigorous evidence base for understanding cloud infrastructure adoption and its economic significance in the post-COVID global environment.

KEYWORDS

Cloud Data Infrastructure, AWS Adoption, Post-COVID Economy, Information Systems Frameworks (TC8), Economic Implications.

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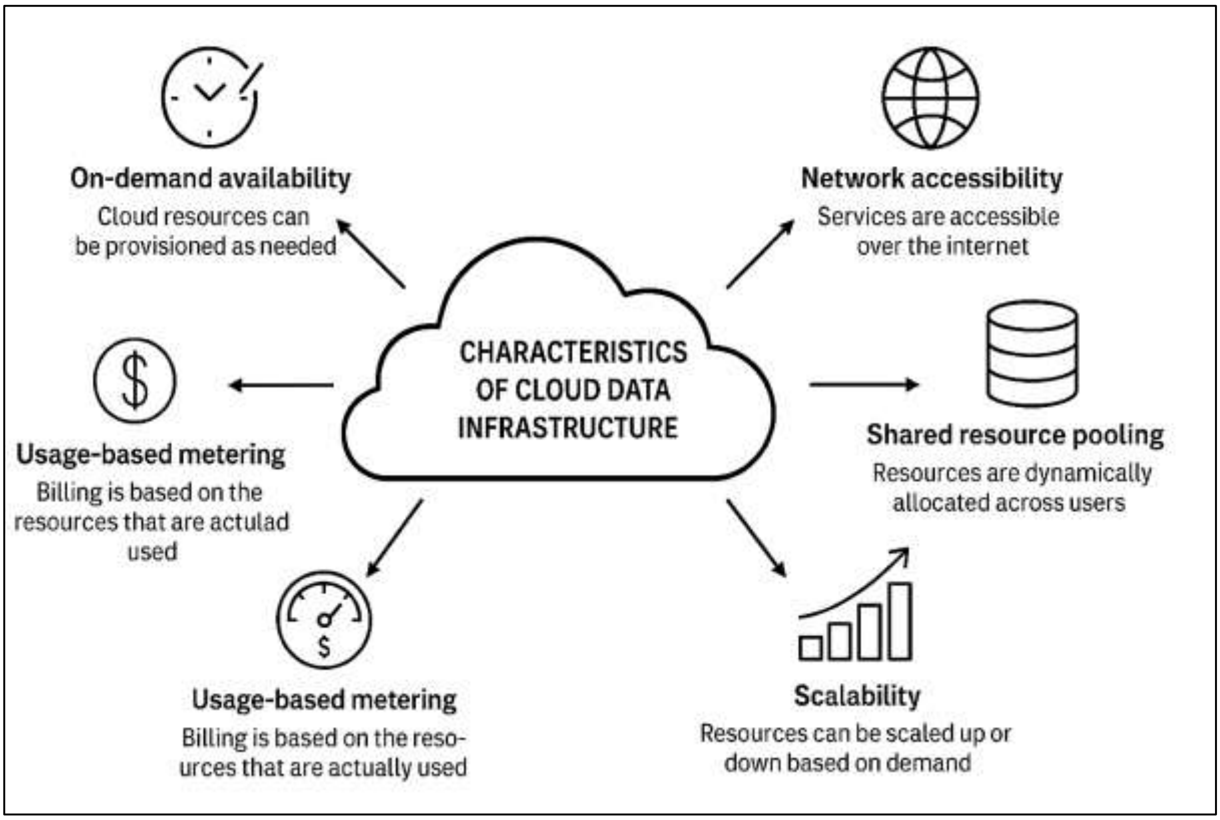
INTRODUCTION

Cloud data infrastructure can be defined as the combination of virtualized computing, storage, networking, and data management services delivered over the internet using flexible consumption models (Sunyaev, 2020a). These infrastructures are distinguished by five key characteristics: on-demand availability, network accessibility, shared resource pooling, scalability, and usage-based metering. Within the scope of Amazon Web Services (AWS), such infrastructures manifest through modular building blocks, including cloud storage, serverless computing, and managed analytics services (Mavridis & Karatza, 2019). Their global significance is evident in how organizations across industries now rely on cloud platforms to operate beyond national borders, ensure business continuity, and foster innovation. The post-COVID economy underscored this importance, as businesses restructured processes to remain resilient and efficient amid disruptions (Shirvani et al., 2020). International trade, global research collaborations, and transnational services increasingly depend on standardized, secure, and scalable infrastructures. AWS provides this through frameworks that formalize operational excellence, cost efficiency, security, reliability, and sustainability. Within information systems research, particularly under the IFIP Technical Committee 8 (TC8), cloud infrastructures are conceptualized as socio-technical systems that are both technical artifacts and organizational enablers (Chadwick et al., 2020). Thus, a meta-analytical review positions AWS not only as a technology provider but as a benchmark for assessing economic and organizational adaptation across the post-pandemic global economy.
The study of information systems under the TC8 framework emphasizes that technologies like AWS cloud services are inseparable from organizational, managerial, and societal contexts (Bhardwaj & Krishna, 2021). Key theoretical perspectives provide structured ways to evaluate cloud adoption. The design science approach treats infrastructural services as artifacts that embody solutions to recurring organizational challenges, such as scalable data storage or compliance management. Evaluation models in information systems, such as success frameworks, highlight constructs like system quality (Bhardwaj & Krishna, 2021), service quality, user satisfaction, and overall organizational benefits—each of which aligns with AWS service pillars like performance efficiency and cost optimization. Adoption models identify the interplay between technology characteristics, organizational readiness, and environmental pressures in shaping adoption decisions. Additionally, socio-technical perspectives emphasize that technologies reshape organizational routines (Maenhaut et al., 2020), governance mechanisms, and even cultural practices. Within AWS, for instance, federated governance models distribute responsibilities across departments while maintaining centralized control, reflecting shifts in organizational authority. This means that AWS infrastructure can be studied not merely as a collection of services, but as institutionalized practices that reorganize decision-making and accountability structures (Varghese & Buyya, 2018). TC8's integrative lens therefore allows cloud adoption to be analyzed at multiple levels: as technological artifacts, as organizational processes, and as international systems of governance.
The global pandemic brought about structural shifts in the economy, highlighting the need for resilient and scalable data infrastructures (He & He, 2020). During lockdowns, organizations worldwide relied on cloud platforms to sustain remote work, online learning, telemedicine, and digital commerce. Economic resilience became directly tied to the ability of firms and governments to migrate core processes into cloud-based environments. Remote collaboration, real-time analytics, and digital service delivery were made possible by infrastructures like AWS that enabled elasticity and reliability (Besharati et al., 2019). The post-COVID economy now reflects these shifts in lasting ways: remote and hybrid work models remain widespread, supply chains are digitized, and business continuity strategies prioritize data accessibility through cloud platforms. Small and medium-sized enterprises benefited from cloud adoption by reducing upfront capital expenditures and scaling operations flexibly (Hong et al., 2019). Moreover, Educational institutions and healthcare providers leveraged managed cloud services to handle sudden surges in demand while ensuring compliance with data security mandates. These patterns demonstrate that cloud infrastructures are no longer optional utilities but fundamental economic enablers. AWS's prominence in this domain provides a global reference point, where adoption patterns, governance mechanisms, and performance outcomes can be compared across sectors and geographies (Shrimali & Patel, 2020). In this environment, cloud adoption is closely tied to economic competitiveness, resilience, and international cooperation.

Figure 1: Cloud System Performance Testing Framework



At the organizational level, several determinants shape whether and how firms adopt cloud infrastructures. Technological factors include compatibility with existing systems, perceived advantages, and perceived complexity of implementation (Naranjo et al., 2020). Organizational determinants include leadership support, resource availability, IT competencies, and governance maturity. Environmental factors encompass competitive pressures, customer expectations, and regulatory obligations. For instance, healthcare institutions often adopt cloud services with greater caution, prioritizing compliance and security due to sensitive patient data (Borangiu et al., 2019). Small businesses may be motivated by cost savings and flexibility, while large enterprises weigh integration with legacy systems. Across industries, adoption decisions reflect a balance between risk and opportunity. Cloud services promise scalability and agility, yet organizations evaluate them in terms of control, accountability, and compliance (Ismaeel et al., 2018). Studies consistently show that vendor support, security assurances, and transparent pricing models encourage adoption. In AWS environments, features like automated compliance audits, granular access control, and multi-account architectures directly address these adoption concerns. These determinants demonstrate that adoption is a complex interplay of technological feasibility, organizational readiness, and external environment, making cloud infrastructure a multi-dimensional phenomenon suitable for meta-analytical synthesis under TC8 frameworks (Tarafdar et al., 2020).

The economic appeal of AWS lies in its transparent cost models, elastic scaling, and measurable financial outcomes (Piparo et al., 2018). Organizations can evaluate usage through detailed telemetry, optimize costs with reserved instances, and track resource consumption in real time. This level of cost visibility allows cloud economics to be treated as a measurable dimension of organizational decision-making. Governance structures in AWS are formalized through shared responsibility principles, where AWS secures the underlying infrastructure while customers manage their own data (Dubey & Sharma, 2021), identity, and compliance controls. This framework delineates clear boundaries, enabling standardized comparisons across industries and sectors. Complementary governance overlays such as international compliance standards and enterprise IT governance frameworks further shape organizational adoption of AWS services (Lnenicka &

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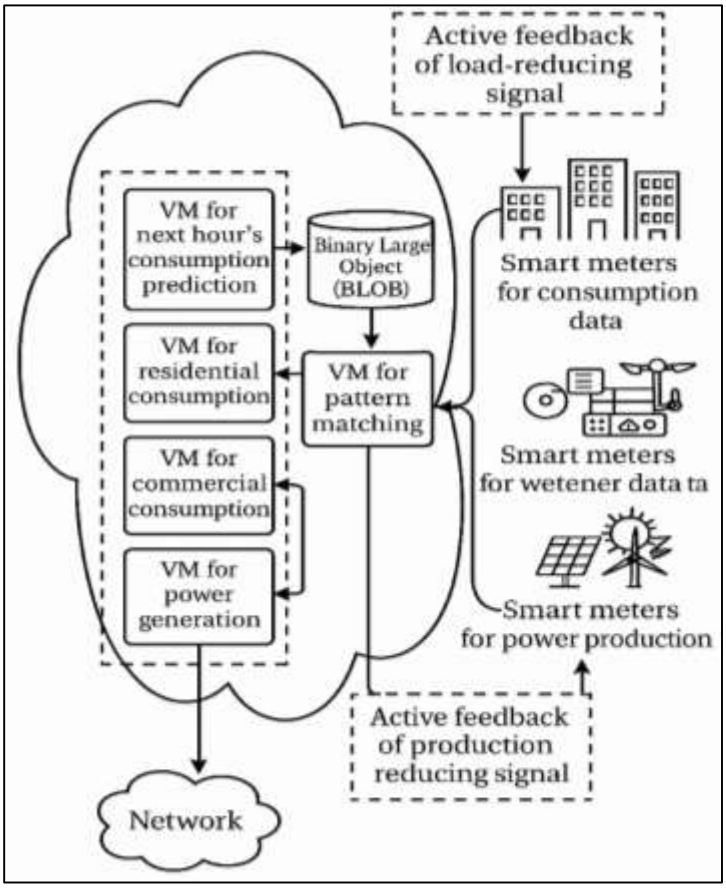
Komarkova, 2019). At the architectural level, AWS services such as data lakes, managed warehouses, and serverless functions embody governance decisions by codifying security, auditing, and data-sharing practices. TC8's emphasis on socio-technical systems situates these decisions as organizational practices that redistribute authority, accountability, and oversight. Thus, the economics and governance of AWS infrastructures offer robust empirical anchors for analyzing post-COVID adoption through measurable cost efficiencies, compliance practices, and governance arrangements (Lnenicka & Komarkova, 2019).

Figure 2: Cloud-Based Smart Energy Management



Cloud infrastructures influence firm-level economics by transforming both cost structures and value realization pathways (Benlian et al., 2018). The shift from fixed capital investment to consumption-based pricing allows organizations to reduce upfront expenditures while aligning costs with usage. This flexibility translates into improved efficiency, as resources can be scaled up or down depending on demand. Firms adopting AWS often report productivity gains through faster deployment cycles, reduced downtime, and improved disaster recovery capabilities (Gharehpasha et al., 2021b). Economic growth is supported by the ability of younger or smaller firms to compete with established players without prohibitive infrastructure costs. Cloud adoption also facilitates innovation by providing immediate access to advanced analytics, machine learning services, and scalable compute resources. These effects cascade into broader economic implications, including enhanced competitiveness, job creation in cloud-enabled sectors (Ranjbari & Torkestani, 2018), and expanded digital trade.

Productivity is not only measured in traditional financial metrics but also in operational resilience, agility, and customer responsiveness. In AWS contexts, these benefits can be captured through measurable indicators such as deployment speed, system uptime, and cost savings, making them suitable for inclusion in a meta-analytical framework within TC8 studies (Rahmanian et al., 2018).

Organizations adopt distinct architectural patterns when implementing AWS cloud infrastructures, each with unique economic and governance implications (Paulraj et al., 2018). Data lake architectures emphasize flexibility and scalability, allowing heterogeneous datasets to be stored in

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low-cost storage with schema-on-read access. This approach supports innovation but requires strong governance to ensure data quality and access control. Data warehouse architectures, by contrast, prioritize structured analytics and predictable performance, enabling firms to optimize query costs and enforce consistent schema design (Haghighi et al., 2019). A third approach, data mesh, distributes data ownership across domains, aligning governance with organizational structures and promoting decentralization. Under TC8 lenses, these patterns represent socio-technical choices that reshape organizational roles, responsibilities, and outcomes. Data lakes highlight centralization and efficiency; warehouses emphasize structured reliability; and data mesh foregrounds autonomy and accountability. AWS provides service ecosystems for each model, such as object storage, managed warehouses, and federated governance tools, enabling organizations to align architecture with strategic priorities. These patterns can be compared across industries and geographies as observable treatments in a meta-analysis, linking architectural design choices with measurable economic outcomes such as cost efficiency, time-to-insight, and compliance coverage.

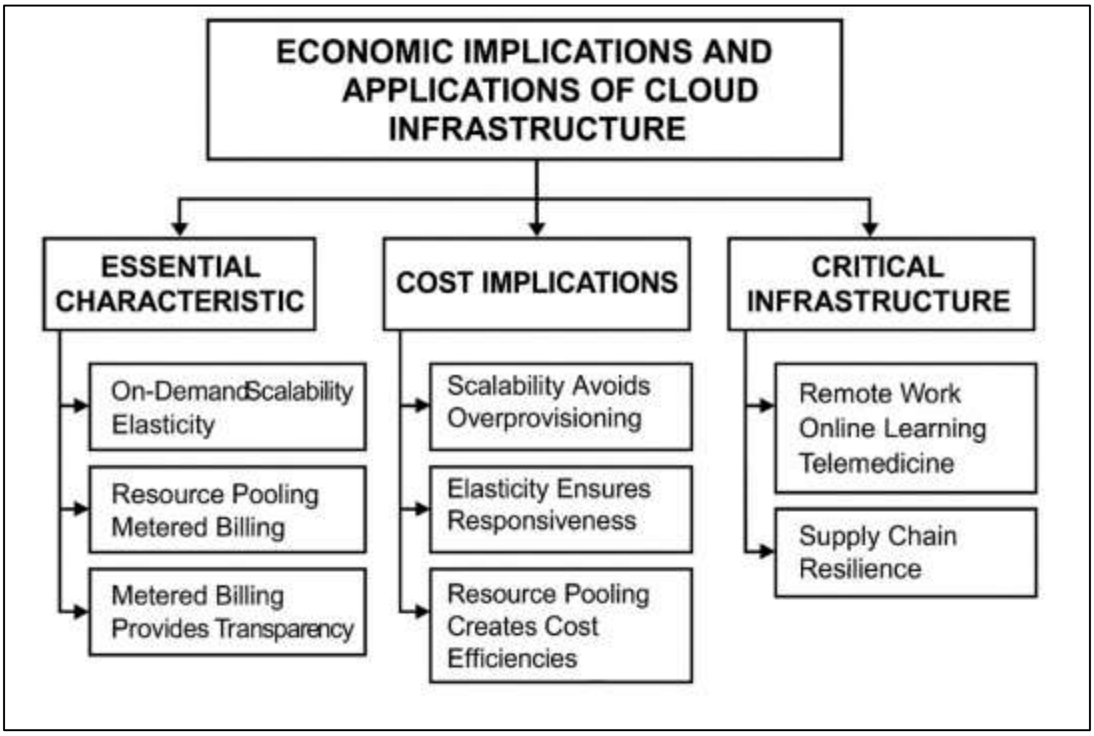
LITERATURE REVIEW

The literature review for a meta-analytical study on cloud data infrastructure adoption in the post-COVID economy requires an integrative approach that situates technical, organizational, and economic considerations within an information systems framework (Sayadnavard et al., 2019). The unprecedented expansion of cloud adoption during the pandemic was not merely a temporary adjustment but a transformative shift in how organizations manage information, ensure resilience, and realize economic value. Amazon Web Services (AWS), as the dominant cloud service provider (Kristiani et al., 2021), became the focal point for many organizations seeking rapid scalability, cost optimization, and compliance-ready infrastructures. However, examining AWS adoption in isolation risks oversimplifying the interplay between technology and organizational contexts. For this reason, the IFIP TC8 frameworks provide a comprehensive structure for evaluating cloud adoption as a socio-technical phenomenon embedded in global economic and organizational processes (Hamizi et al., 2021).This literature review therefore synthesizes diverse streams of research spanning cloud economics, adoption determinants, governance models, architectural patterns, and post-pandemic restructuring. By organizing the review around both theoretical constructs and empirical evidence (Luetz & Walid, 2019), it highlights convergences and divergences across studies while maintaining alignment with TC8's socio-technical perspective. Special emphasis is placed on post-COVID evidence, where resilience, remote work, and digital transformation accelerated adoption patterns and reshaped global business dynamics. Additionally, the review identifies specific architectural and governance practices within AWS environments—such as data lakes, serverless architectures (Steel et al., 2021), and federated governance models—that function as measurable treatments in comparative studies.The goal of this literature review is to establish the conceptual and empirical foundation for the meta-analysis by clarifying definitions, cataloging determinants of adoption, summarizing economic implications, and linking these factors to TC8 theoretical anchors. Each section is structured to move from broad conceptual framing to specific AWS implementations, enabling systematic mapping between general IS constructs and platform-specific phenomena (Arruda et al., 2021).

Cloud Data Infrastructure

Cloud data infrastructure can be understood as the convergence of infrastructure, platform, and software layers delivered through scalable, networked environments that enable organizations to manage, process, and analyze vast amounts of data (Samarasinghe et al., 2019). Within the field of information systems, the concept is not confined to a technical description of storage and computing power but extends to the socio-technical relationships that connect users, processes, and governance practices with digital resources. Data-centric architectures such as data lakes, warehouses, and data meshes represent critical instantiations of this infrastructure (Nedd et al., 2021). Data lakes emphasize flexible schema-on-read approaches for heterogeneous data, warehouses provide structured and performance-optimized environments for analytics, and meshes advance federated ownership and governance of data products across organizational domains (Pieters et al., 2021). Each of these architectures reflects distinct design logics that align with organizational needs for agility, performance, or accountability. By framing cloud infrastructure as layered and data-centric, information systems research highlights its role not only as a technical artifact but also as an evolving ecosystem that supports decision-making, innovation, and competitive advantage. In the post-pandemic economy, this layered understanding has become increasingly important, as organizations integrate multiple architectural models simultaneously to address diverse requirements for resilience, compliance, and value creation (Kubitza et al., 2020).

Figure 3: Cloud Infrastructure Economic and Applications



The essential characteristics of cloud infrastructure—on-demand scalability, elasticity, resource pooling (Bandera & Passerini, 2020), broad network access, and metered billing—carry profound economic implications for organizations. Scalability allows firms to expand or contract resources in alignment with fluctuating workloads, thereby avoiding the inefficiencies of overprovisioned on-premises systems. Elasticity complements this by ensuring real-time responsiveness (Dumontier & Wesley, 2018), which is especially critical for industries with variable demand cycles such as retail, education, and healthcare. Resource pooling enables providers to maximize utilization while offering customers economies of scale, translating into cost efficiencies that alter traditional capital expenditure models (Chae & Goh, 2020). Metered billing introduces transparency and predictability, allowing organizations to align expenditures with actual usage rather than fixed infrastructure investments. Collectively, these characteristics shift organizational cost structures from heavy upfront capital investments to flexible, operational expenses. The reviewed literature consistently identifies this transformation as a driver of adoption, as organizations prioritize financial agility in uncertain environments. More importantly (Gruchmann et al., 2020), these characteristics are not merely technical conveniences but mechanisms that influence strategic choices around budgeting, investment, and competitive positioning. By embedding economic flexibility into digital infrastructure, cloud computing has redefined the way organizations evaluate technology as a business asset rather than a cost center.

Cloud infrastructure has emerged as critical digital infrastructure underpinning multiple sectors, especially in the post-COVID context (Matt et al., 2019). Remote work, for instance, relies on secure and scalable cloud services to support virtual collaboration platforms, shared data repositories, and video conferencing systems. In education, the migration to online learning during the pandemic was made possible through cloud-hosted learning management systems, content repositories, and analytics platforms that scaled rapidly to meet sudden surges in demand. Healthcare systems adopted cloud-enabled telemedicine solutions, electronic health record storage, and data-sharing mechanisms for pandemic surveillance and vaccine distribution (Meng & Dong, 2019). Similarly, supply chain resilience was reinforced through cloud-based logistics tracking, real-time analytics, and predictive modeling that enabled organizations to manage disruptions. The reviewed studies consistently portray cloud infrastructure as the backbone of these activities (Bognar et al., 2018),

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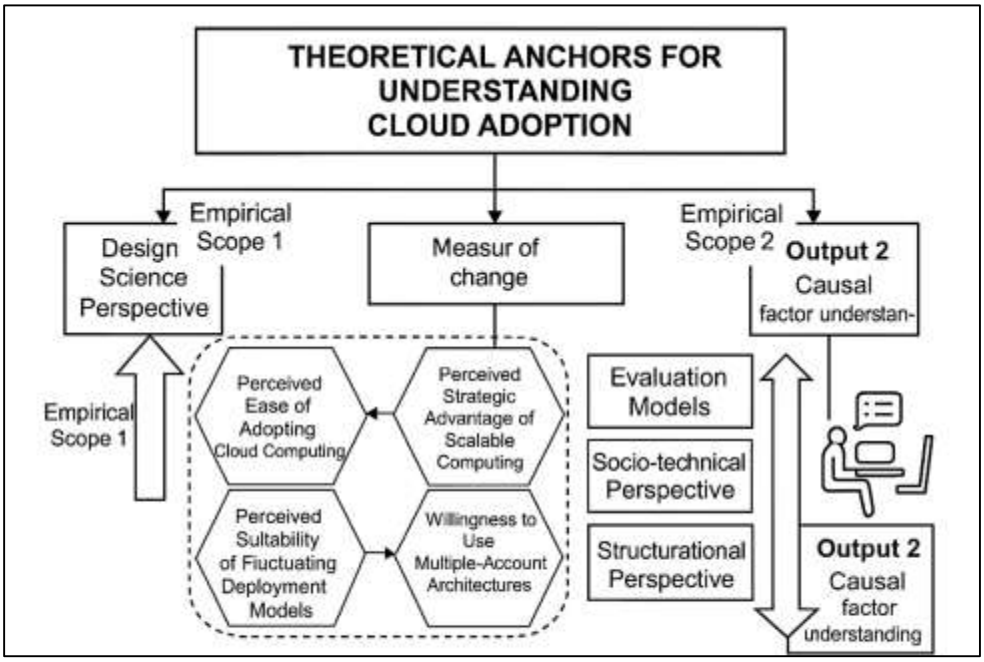
emphasizing that without scalable, resilient, and interoperable cloud services, many organizations would have faced prolonged operational paralysis. By situating cloud as critical infrastructure, the literature underscores its societal and economic importance beyond organizational boundaries. It is not only a tool for efficiency but also an enabler of social continuity and resilience in times of crisis (Fonseca & Conde, 2018). This reframing positions cloud computing as a public good in addition to a private resource.

Theoretical Anchors from IFIP TC8 Frameworks

The design science perspective offers a powerful anchor for understanding cloud adoption because it conceptualizes infrastructures as engineered artifacts that embody organizational problem–solution mappings (Atif et al., 2018). In this view, AWS services are not simply technical utilities but designed responses to recurring challenges such as scalability, compliance, and data governance. Literature in information systems has long emphasized that technologies should be examined as purposeful artifacts created to address human and organizational needs. Within cloud contexts (Nduku et al., 2021), design science situates infrastructures like data lakes, serverless architectures, and managed warehouses as instantiations of design knowledge that solve specific organizational dilemmas. For example, elastic compute services resolve the problem of fluctuating workloads, while multi-account governance structures address the problem of distributed accountability (Wojtaszek & Kopcińska, 2020). The reviewed studies indicate that cloud infrastructures can be analyzed as evolving designs where technical functionality is closely intertwined with organizational processes. By framing adoption as a design choice, scholars highlight that organizations select cloud architectures not only for performance but also for their alignment with governance structures (Ambrosino et al., 2019), cost strategies, and compliance obligations. This design science lens clarifies that AWS adoption reflects a systematic problem-solving process, where services are selected, combined, and institutionalized as artifacts embodying organizational priorities (Shim & Lee, 2020).

Figure 4: Theoretical Anchors for Cloud Adoption



Evaluation models in information systems, particularly those measuring success through constructs such as system quality, information quality, service quality, use, user satisfaction (Kauffman et al., 2018), and net benefits, provide another theoretical anchor for analyzing AWS adoption. These models emphasize that the value of an information system lies not only in its technical performance but in the quality of experiences and outcomes it enables (Kathuria et al., 2018). The reviewed literature consistently aligns these constructs with the operational pillars of AWS. System quality corresponds to dimensions such as availability, latency, and reliability of AWS services (El-Haddadeh, 2020). Information quality is reflected in the accuracy and accessibility of data stored in cloud repositories. Service quality aligns with provider support, automation, and continuous monitoring

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tools embedded in AWS platforms. Net benefits correspond to economic gains, resilience, and strategic agility achieved through adoption. In many studies (Ali et al., 2018), these constructs are used to compare organizations adopting cloud systems with those maintaining traditional infrastructures, revealing that success metrics are significantly enhanced under cloud-enabled models. By mapping these evaluation constructs onto AWS architectures, researchers can systematically analyze adoption outcomes and generate evidence-based assessments of economic and organizational performance (Jones et al., 2019). This approach integrates cloud adoption into established IS theory, ensuring conceptual continuity while addressing emergent practices.

The socio-technical and structurational perspectives emphasize that technologies like AWS do not exist in isolation but are embedded in organizational contexts where they both shape and are shaped by human action, routines, and governance (Werff et al., 2019). The literature reviewed consistently supports this duality, showing that adoption of AWS infrastructures alters organizational decision rights, redistributes accountability, and reshapes work practices (Alsmadi & Prybutok, 2018). For example, the introduction of automated compliance tools or federated governance structures changes how managers and technical staff engage with risk management. At the same time, organizational norms, cultural attitudes, and strategic objectives influence how cloud services are configured and utilized. This recursive relationship highlights the structuration process, where cloud technologies and organizational structures continuously co-evolve (Raghavan et al., 2021). Scholars describe how federated data governance, enabled by AWS services, shifts control from central IT departments to domain-level teams, thereby reshaping organizational routines. Conversely, existing power structures and regulatory expectations often constrain the ways in which these services are deployed. By applying socio-technical and structurational theories, cloud adoption is revealed as a dynamic process that cannot be reduced to technical efficiency alone. Instead, it is understood as a negotiation between technology design, organizational practices, and institutional frameworks (Sabi, Uzoka, & Mlay, 2018).

Synthesizing the design science, evaluation, and socio-technical perspectives illustrates the integrative role of TC8 theoretical anchors in understanding cloud adoption (Wang et al., 2021). Design science explains cloud infrastructures as problem-solving artifacts, evaluation models operationalize the assessment of their effectiveness, and socio-technical perspectives situate adoption within broader organizational and societal dynamics. The reviewed studies show that these frameworks are not isolated but complementary (Yao, 2018). For example, design artifacts such as AWS governance templates can be assessed through evaluation models measuring net benefits, while socio-technical theory explains how these templates are embedded into routines and decision-making processes. Together, these theoretical anchors provide a holistic understanding of AWS adoption that spans design, measurement (Thomas & Mantri, 2021), and social embedding. They also help explain variations in adoption outcomes across industries and geographies by highlighting that success depends not only on technical quality but also on governance integration and organizational culture. The conceptual integration afforded by TC8 ensures that cloud adoption is framed as a socio-technical phenomenon where technology, organization, and environment are inseparable. This synthesis underscores that cloud infrastructures should be studied not as isolated tools but as systemic artifacts that embody technical, organizational, and institutional dimensions of information systems (Baanqud et al., 2020).

Post-COVID Economy and the Acceleration of Cloud Adoption

The COVID-19 pandemic produced an unprecedented reconfiguration of organizational infrastructure needs, forcing enterprises of all sizes to accelerate digitization and adopt cloud-based solutions at scale (Bekele, 2021). Literature consistently reports that the sudden global shift to remote work exposed the limitations of on-premises infrastructures, which lacked the elasticity and accessibility required to support distributed teams. Organizations turned to cloud services to maintain continuity of operations, enable virtual collaboration, and ensure secure access to critical resources (Galiveeti et al., 2021). In sectors such as education and healthcare, the demand for rapid digitization was even more acute, with universities migrating to cloud-hosted learning platforms and hospitals relying on cloud-enabled telemedicine and data-sharing systems. Many studies highlight continuity planning as a key driver, as organizations recognized the importance of infrastructure resilience against systemic disruptions. Cloud adoption allowed firms to reconfigure their digital ecosystems quickly (Kotsev et al., 2020), provisioning resources on demand and scaling them in

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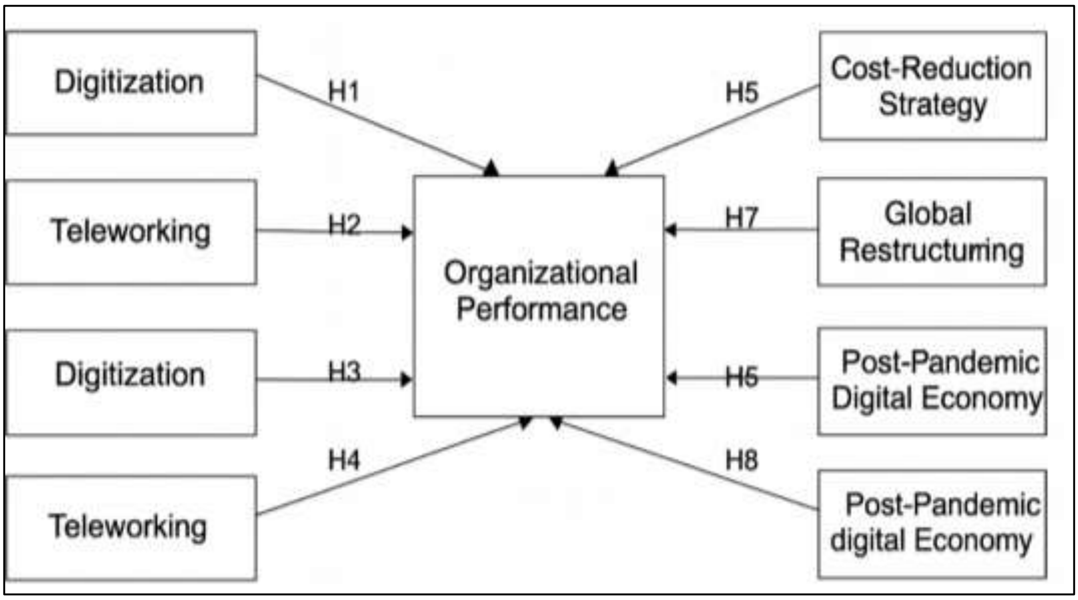
alignment with volatile workloads. This rapid response capability became the defining advantage of cloud infrastructures during the crisis. The reviewed studies emphasize that organizations that had already invested in cloud platforms were able to adapt faster, while those that had delayed adoption were compelled to accelerate migration to ensure survival (Barzen et al., 2020). Thus, the pandemic acted as both a catalyst and a stress test, revealing the indispensability of cloud data infrastructures in sustaining organizational operations under extraordinary conditions.

Figure 5: Cloud Adoption and Organizational Performance



The global economy underwent significant restructuring during the pandemic, and cloud services emerged as foundational enablers of this transformation. Studies show that international trade, cross-border collaboration (Sehgal et al., 2020), and global service delivery became heavily dependent on cloud infrastructures. The literature highlights how cloud platforms provided the interoperability, scalability, and reliability needed for multinational corporations to coordinate supply chains disrupted by travel restrictions and logistical bottlenecks. In professional services (Sehgal et al., 2020a), cloud-based communication and project management systems facilitated seamless collaboration across borders, maintaining productivity despite the absence of physical offices. For small and medium-sized enterprises, cloud adoption lowered entry barriers to international markets by providing access to affordable and scalable digital tools (Alashhab et al., 2021). Governments also leveraged cloud services to deliver digital public goods, such as health dashboards and contact tracing applications, further embedding cloud dependency into the fabric of economic life. The reviewed research illustrates that the pandemic accelerated the globalization of digital services, positioning cloud platforms as the infrastructure of choice for transnational exchange (Zhan, 2021). While earlier economic structures relied on physical supply chains and in-person coordination, the post-pandemic restructuring highlights a digital-first orientation, where cloud adoption underpins resilience, flexibility, and economic interdependence. These findings underscore that cloud infrastructures are not only organizational resources but also essential components of global economic architecture.

The acceleration of adoption observed during the pandemic has translated into enduring patterns that now define the post-pandemic digital economy. Studies document that hybrid work models have become the standard in many industries, supported by cloud-hosted collaboration platforms (Keeling, 2020), virtual desktops, and secure remote access systems. Organizations have normalized cloud reliance as a baseline requirement rather than an optional enhancement, embedding it into both operational and strategic frameworks. The literature points to digital-first strategies as a hallmark of this period, with enterprises prioritizing cloud-enabled analytics, automation (Sharifi et al., 2021), and customer engagement as central to their competitiveness. In retail, the shift to online sales channels is sustained by cloud infrastructures that handle fluctuating consumer demand, while in education, blended learning models continue to rely on cloud-hosted platforms for flexibility and

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scalability (Echegaray, 2021). The normalization of cloud adoption has also redefined organizational investment strategies, shifting budgets away from capital-intensive hardware toward operational expenditure models that align costs with usage. Across studies, the consensus is that cloud infrastructures have become institutionalized as essential components of organizational design. What began as an emergency response to the pandemic has evolved into a structural dependency (Song et al., 2021), with cloud adoption embedded into the daily routines, governance systems, and long-term strategies of organizations worldwide.

Determinants of Cloud Adoption at the Organizational Level

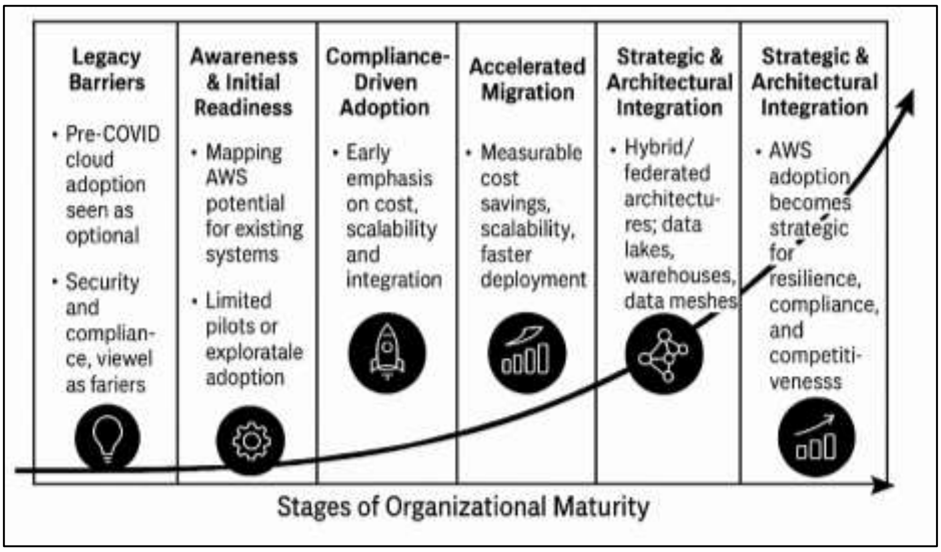
Technological factors remain at the core of cloud adoption decisions, with compatibility, complexity, and perceived relative advantage consistently highlighted in the literature as central determinants (Hadwer et al., 2021; Akter & Razzak, 2022). Studies across industries show that organizations are more likely to adopt cloud solutions when these technologies align with existing systems and processes, thereby minimizing the risks and costs of integration. Compatibility plays a decisive role when legacy systems are in place, as organizations weigh the challenges of migrating data and applications against the potential for operational improvement. Complexity is another important factor (Lynn et al., 2020; Noor & Momena, 2022), as cloud infrastructures often involve sophisticated architectures, such as multi-account governance, virtual private networks, and service orchestration across regions. When perceived complexity is high, organizations may hesitate to fully embrace cloud services, fearing disruptions or skill shortages. Conversely, simplicity in adoption—facilitated through modular services and managed solutions—encourages quicker uptake. Relative advantage, particularly in terms of scalability, reliability (Ahn & Ahn, 2020), and cost optimization, has been one of the strongest motivators for cloud adoption. Literature also emphasizes that the ability to deploy new services rapidly and respond to fluctuating demands gives cloud infrastructures an advantage over traditional on-premises systems. AWS exemplifies this dynamic through its wide portfolio of services that allow organizations to experiment, scale (Alkhater et al., 2018), and optimize without significant upfront investments. By combining compatibility, reduced complexity, and visible advantages, cloud infrastructures create technological conditions that lower barriers to adoption and provide organizations with a compelling case for migration (Ali et al., 2018).

Beyond technical attributes, organizational factors such as leadership commitment, governance maturity, and resource readiness are critical in shaping adoption decisions. The literature consistently underscores that top management support is a decisive enabler, as leaders influence resource allocation, strategic alignment (Pedone & Mezgár, 2018), and cultural acceptance of technological innovation (Kauffman et al., 2018). Organizations with strong digital capabilities and mature IT governance are more likely to integrate cloud infrastructures effectively, ensuring that services are not only deployed but also embedded into core business processes. Readiness extends beyond financial resources to include the availability of skilled personnel capable of managing cloud environments and leveraging advanced features such as automation, analytics (Sabi, Uzoka, Langmia, et al., 2018), and machine learning. Studies highlight that training and knowledge-sharing programs are pivotal in reducing resistance and ensuring sustainable adoption. Governance maturity also plays a significant role, as organizations with established risk management and compliance frameworks are better equipped to incorporate shared responsibility models and federated control structures.

Figure 6: Climate Leadership and Motivation Dynamics

Resource-rich organizations can adopt more sophisticated architectures (Al-Sharafi et al., 2021; Sazzad & Islam, 2022), but evidence shows that even small firms with limited resources benefit when leadership prioritizes cloud investment as a strategic necessity (Marinho et al., 2021; Sadia & Shaiful, 2022). This demonstrates that organizational alignment and vision, rather than size alone, determine the effectiveness of adoption. Thus, leadership, readiness, and resource allocation collectively shape whether cloud infrastructures become fully integrated strategic assets or remain underutilized technical tools (Luo et al., 2018).

Figure 7: AWS Post-COVID Adoption Stages



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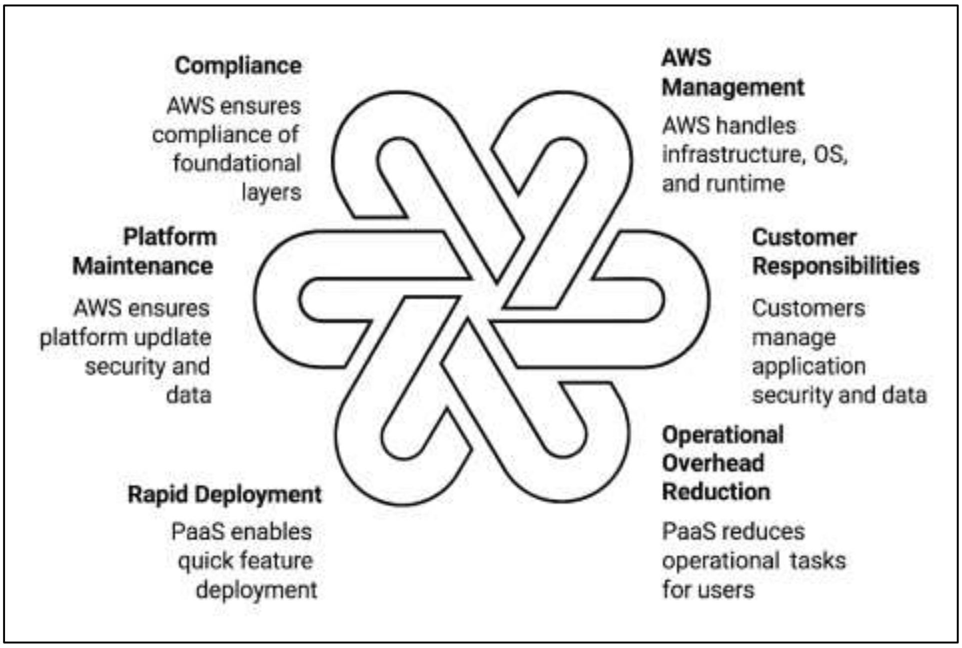
AWS Governance and Economic Models

A central feature of AWS governance is the shared responsibility model, which delineates the division of roles between provider and customer in managing security (Gozman & Willcocks, 2019), compliance, and data stewardship. The literature consistently frames this model as a defining governance mechanism, clarifying accountability for infrastructure security while placing responsibility for data, access control, and compliance on the customer. Studies emphasize that this clear boundary is one of the reasons organizations adopt AWS at scale, as it removes ambiguity over who manages which aspects of security and reduces the risk of oversight. However, the model also introduces new challenges, particularly in organizations with limited governance maturity (Sunyaev, 2020a). Firms must develop robust internal processes to manage identity, encryption, monitoring, and compliance, as these functions are no longer delegated but embedded within organizational responsibility. In practice, AWS provides the tools—such as Identity and Access Management, Key Management Services, and automated monitoring—but customers must configure and enforce policies that align with their regulatory environment (Deshpande et al., 2018). Literature on governance highlights that success under the shared responsibility model requires a cultural and structural shift, with IT and compliance teams collaborating more closely than in traditional models. By defining and enforcing these boundaries, AWS institutionalizes a governance framework that simultaneously empowers organizations with control and compels them to adopt higher levels of accountability for their own data practices (Hynek & Solovyeva, 2021).

Figure 8: AWS Governance and Responsibility Framework



The cost models embedded within AWS architectures represent one of the most significant transformations in digital economics (Ara et al., 2022; Mitra et al., 2018). Literature consistently identifies pay-as-you-go pricing, reserved instances, and elasticity as mechanisms that fundamentally reshape organizational expenditure strategies. Under the pay-as-you-go model, costs scale directly with usage, enabling organizations to align expenses with demand rather than investing heavily in fixed infrastructure (Bahadori & Vardanega, 2018; Jahid, 2022). Reserved instances introduce predictability and savings for long-term workloads, incentivizing organizations to balance flexibility with planning. Elasticity ensures that organizations can expand or contract resource consumption in real time, preventing both underutilization and overprovisioning. Studies highlight that this shift from capital expenditure to operational expenditure is not simply a financial adjustment but a strategic reorientation (Akter & Ahad, 2022; Trujillo, 2018), as organizations gain the ability to experiment, innovate, and scale without prohibitive upfront costs. Small enterprises benefit from reduced barriers to entry, while larger firms capitalize on cost optimization strategies across global operations. However, the literature also points to challenges, particularly the complexity of

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tracking and forecasting usage across diverse services. Cost optimization becomes a discipline in itself (Sunyaev, 2020b), requiring dedicated governance mechanisms and tools for monitoring, forecasting, and managing consumption. These dynamics underscore that AWS cost models are not merely financial instruments but integral components of organizational governance and strategic planning.

The alignment of AWS governance mechanisms with international standards such as COBIT, ISO, and GDPR is another key theme in the literature, demonstrating how cloud adoption intersects with broader regulatory and compliance frameworks (Arifur & Noor, 2022; Sharma et al., 2021). AWS's ability to embed these standards into its services is frequently cited as a driver of adoption, particularly in sectors with stringent regulatory requirements such as healthcare, finance, and government. COBIT provides a framework for enterprise IT governance that aligns organizational processes with strategic objectives, while ISO standards formalize requirements for information security management and risk controls. GDPR introduces rigorous requirements for data protection and cross-border data flows, creating compliance obligations that organizations must meet to avoid penalties (Hasan & Uddin, 2022; Sharma & Mohan, 2020). Studies highlight that AWS facilitates compliance by offering preconfigured templates, automated auditing tools, and certifications that align with these standards. This integration reduces the burden on organizations (Hinz et al., 2018; Rahaman, 2022), allowing them to demonstrate compliance more efficiently while maintaining flexibility in system design. Nevertheless, the literature also emphasizes that alignment does not absolve organizations of responsibility. Customers must still configure, monitor, and enforce compliance within their own domains, ensuring that governance standards are operationalized within specific organizational contexts. By intersecting with international frameworks (Cortez et al., 2020; Rahaman & Ashraf, 2022), AWS governance becomes both an enabler of compliance and a test of organizational maturity in managing regulatory complexity.

Synthesizing insights from the shared responsibility model, cost economics, and alignment with governance standards reveals AWS as both a technical infrastructure and a governance ecosystem (Hwang, 2019). The literature shows that AWS adoption cannot be understood solely in terms of performance or scalability; it must be analyzed as a comprehensive governance model where accountability, cost discipline, and regulatory compliance are inseparable. The shared responsibility model creates a governance boundary that redefines organizational accountability (Şerban & Todericiu, 2020), cost models transform financial management into a strategic tool, and alignment with standards situates cloud infrastructures within global regulatory architectures. Together, these dynamics illustrate that AWS adoption is not only a technological choice but also a socio-economic and institutional decision. Organizations adopting AWS commit to integrating governance practices, cost management strategies (Leitner & Stiefmueller, 2019; Islam, 2022), and regulatory compliance into their digital infrastructures. The reviewed studies demonstrate that these governance and economic models reinforce one another, embedding cloud infrastructures within organizational routines, market structures, and institutional frameworks. In this way, AWS serves as both an enabler of innovation and a framework for accountability, illustrating the multi-dimensional significance of cloud adoption in the post-pandemic digital economy (Tegegne et al., 2021).

AWS Adoption in the Post-COVID Economy

The literature consistently characterizes AWS adoption as a reallocation of technology spending from capital-intensive procurement to consumption-based operating models, producing measurable effects on budgeting flexibility (Hao et al., 2020), risk management, and accounting transparency. Traditional on-premises infrastructures require large upfront investments in servers, storage arrays, and data center capacity that must be forecast years in advance, often resulting in overprovisioning and sunk costs. By contrast, AWS pricing mechanisms—usage-metered services, tiered storage (Wright et al., 2019), and commitment discounts—convert fixed costs into variable expenses that scale with workload intensity. Studies describe how this shift reduces the financial exposure of capacity planning by aligning spend with realized demand, enabling organizations to curtail inactive environments, right-size resources, and decommission underutilized assets without residual write-downs. Operating expense predictability is further supported by granular telemetry and tagging practices, which allow cost attribution at the level of application (Huang et al., 2018), team, or business unit and create internal markets for compute and data services. Literature also emphasizes governance consequences: chargeback or showback models make consumption visible, encouraging disciplined engineering behaviors such as autoscaling, lifecycle policies for data

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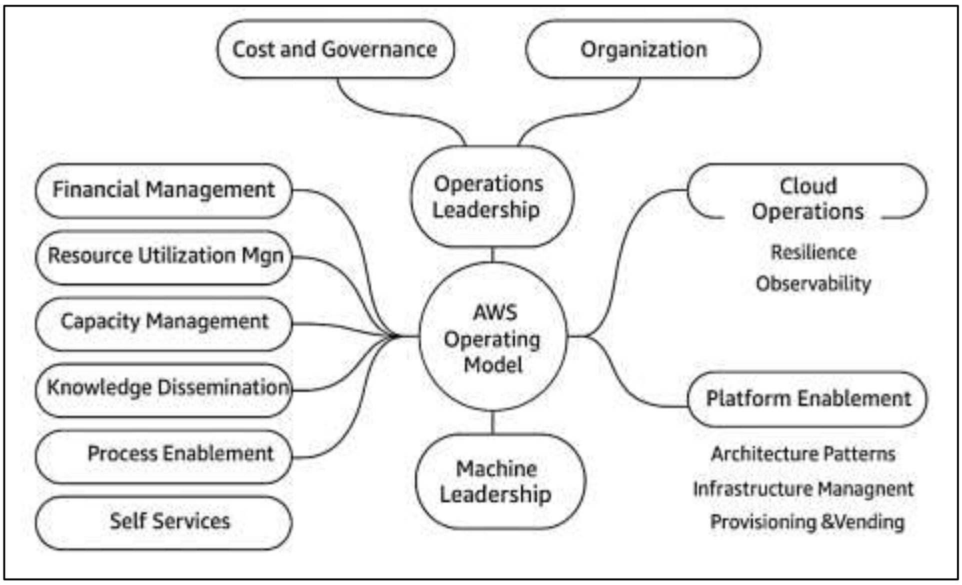
(Hasan et al., 2022; Tissir et al., 2020), and architectural refactoring to more efficient services. Organizations report that the redistribution of spend improves cash flow and shortens approval cycles for experimentation because small increments of operating spend can be authorized within routine budgets. At the same time, researchers note the managerial complexity of avoiding sprawl where many small services accumulate into unexpectedly high bills, suggesting that financial operations capabilities, budget guardrails, and automated policies are integral companions to the economic model (Redwanul & Zafor, 2022; Patibandla et al., 2021). Overall, AWS adoption is portrayed as a structural transformation of cost logic—away from depreciation schedules and peak-capacity bets, toward elastic, telemetry-guided expenditure that can be tuned to business cycles, seasonal variation, and product lifecycles.
Across the corpus, AWS adoption is associated with improvements in deployment velocity, service reliability, and decision quality, which together constitute substantive productivity and innovation gains (Raj & Raman, 2018; Reduanul & Shoeb, 2022). Studies document reductions in lead time from code commit to production release when teams utilize managed build pipelines, infrastructure as code, and serverless execution environments; these practices diminish handoffs and manual provisioning, allowing frequent, low-risk releases. Reliability gains are reported where organizations implement automated recovery patterns (Afzal & Kavitha, 2019; Kumar & Zobayer, 2022), multi-AZ architectures, and managed observability stacks that lower mean time to detection and recovery, translating operational resilience into higher service availability. Decision-making quality improves through the consolidation of data pipelines into governed lakes and warehouses, enabling near-real-time analytics, experimentation, and measurement of product performance. Literature highlights the complementary role of organizational routines: cross-functional squads adopt platform guardrails, golden templates, and shared modules that encode security and cost practices by default (Rezaul & Mesbaul, 2022; Shaw et al., 2019), reducing rework and variance across teams. These technical and organizational changes reallocate effort from undifferentiated heavy lifting—patching, racking, and bespoke integration—toward higher-value activities such as feature development, experimentation, and data-driven optimization. Importantly, studies emphasize that productivity is not only a function of raw compute elasticity but of the socio-technical integration of tooling, governance, and skills. Training programs, internal communities of practice, and product-oriented operating models are frequently cited as mediating factors that turn platform potential into realized outcomes. The accumulated effect is a measurable uplift in throughput, quality, and learning speed: teams ship more often (Singh et al., 2021), recover faster, and make decisions grounded in fresher, more complete data. In aggregate, these improvements reposition technology functions from cost centers to growth partners, with AWS infrastructure serving as the enabling substrate for iterative delivery and evidence-based management.

Figure 9: AWS Cloud Operating Model Framework



The economic implications of AWS adoption extend beyond firm-level efficiency to sectoral competitiveness and international participation in digital markets. Literature describes how consumption-based access to advanced capabilities—global networks, content delivery (Hossen & Atiqur, 2022; Tomarchio et al., 2020), data analytics, and machine learning platforms—lowers barriers for small and medium-sized enterprises to enter arenas once limited to capital-rich incumbents. By renting rather than owning sophisticated infrastructure, smaller firms can serve global customers, localize content, and comply with regional controls using provider-supplied primitives, broadening export potential and diversifying revenue sources (Ivančić et al., 2019). For larger enterprises, AWS facilitates rapid market entry and cross-border scaling by abstracting away regional infrastructure procurement and enabling consistent deployment patterns through templates and policies. Studies also connect cloud adoption to cluster effects: as ecosystems consolidate around common platforms, partner marketplaces, integration catalogs, and standardized APIs reduce coordination costs, accelerate innovation diffusion (Tawfiqul et al., 2022; Rikap & Lundvall, 2021), and stimulate complementary service formation among consultancies, ISVs, and data providers. Public sector analyses point to digital public service delivery and health, education, and logistics use cases, where elastic infrastructure maintained continuity during demand spikes and supported data-sharing for time-sensitive decisions. At the macro level, research associates cloud penetration with indicators of digital trade intensity and entrepreneurial activity (Zyrianoff et al., 2019), attributing part of this relationship to reduced fixed costs, faster scale economies, and improved resilience to shocks. Yet the literature also recognizes distributional challenges, including skills gaps, regional disparities in connectivity (Saha & Dasgupta, 2018), and governance capacity constraints that influence the extent to which organizations and jurisdictions capture these gains. Taken together, findings portray AWS-enabled cloud infrastructure as an economic coordination layer that deepens market reach, accelerates ecosystem formation, and raises the competitive floor by making high-end capabilities broadly accessible.

Data Architecture Patterns in AWS

In the AWS context, data lake architectures consolidate heterogeneous datasets into a central, durable object store that supports schema-on-read access and broad analytical optionality (Herden, 2020). Literature describes the defining attributes of this pattern as low-cost storage, decoupled compute, and late-binding schemas that allow ingestion at source fidelity while postponing modeling choices until query time. Such flexibility enables rapid onboarding of new data domains, accommodates semi-structured and unstructured formats, and supports multiple analytical paradigms—interactive SQL (Trakadas et al., 2019), batch processing, and streaming enrichment—without duplicating raw assets. Studies consistently report that this centralization simplifies discovery and reuse by co-locating assets behind a common catalog and access plane, yet they also note nontrivial governance challenges. Without strong curation practices (Hasan, 2022; Ravat & Zhao, 2019), data swamps emerge as metadata decays, lineage becomes opaque, and quality varies across zones. Research emphasizes the importance of tiered zones (raw, refined, curated), policy-as-code for access control, and lifecycle rules for storage classes to balance flexibility with stewardship. Cost efficiency is repeatedly linked to separation of storage and compute, compression and partitioning strategies, and intelligent placement of "hot" versus "cold" data (Persico et al., 2018). Reliability is framed less as single-system robustness and more as procedural rigor: validated ingestion contracts, automated quality checks, and reproducible transformation pipelines. Empirical accounts highlight productivity gains from eliminating extract–transform–load bottlenecks for exploratory work, while also acknowledging that downstream consumers require standardized views to avoid proliferating bespoke transformations. Collectively, the literature portrays AWS data lakes as enabling breadth and speed across diverse data domains, provided that catalog completeness, access granularity (Ceravolo et al., 2018; Tarek, 2022), and quality controls are treated as first-class design concerns. The pattern's central promise—ingest first, interpret later—expands analytical reach, but its sustainability depends on disciplined metadata management, enforceable retention and classification rules, and an operating model that assigns clear ownership for zones and datasets.

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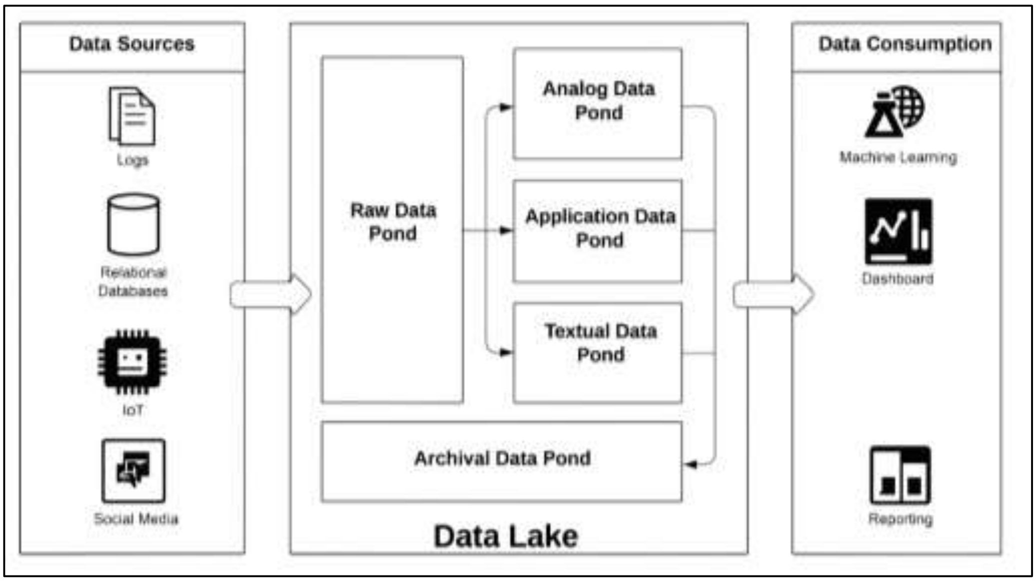
Figure 10: AWS Data Lake and Warehouse



AWS-aligned data warehouse architectures foreground structured schemas, cost-performance optimization, and predictable service levels as the primary levers of value realization (Fillinger et al., 2019; Kamrul & Omar, 2022). Literature characterizes this pattern by tightly managed data models, workload-aware physical design (Beheshti et al., 2019; Kamrul & Tarek, 2022), and governed access paths that promote reliable decision support for finance, operations, and customer analytics functions. Whereas data lakes privilege ingestion flexibility, warehouses emphasize conformed dimensions, star and snowflake schemas, and materializations that stabilize query semantics across reporting consumers. Studies repeatedly link performance to partitioning and distribution strategies, workload management queues, result caching, and elastic scaling features that maintain interactive latencies under mixed concurrency (Janev, 2021). Cost outcomes are analyzed through right-sizing compute, autosuspend behaviors, and tiered storage for historical partitions, producing a measurable balance between responsiveness and spend. Reliability is treated as both technical and procedural: technical through replication and automated recovery; procedural through change-data-capture pipelines, data quality gates, and release practices that protect semantic contracts. Empirical findings indicate that organizations gain consistency and auditability when fact and dimension tables are curated centrally (Mubashir & Abdul, 2022; Ziegler et al., 2021), enabling reconciled metrics and reproducible analyses across business units. At the same time, literature underscores a recurring tension between agility and control: rigid schemas can slow incorporation of emergent data, which motivates hybrid approaches wherein curated warehouse models are fed from governed lake zones and augmented by external tables for exploratory needs. Governance in this pattern is tightly coupled to role-based access (Mrabet et al., 2020), column-level policies, and data masking, aligning analytical reliability with regulatory requirements. Overall, the warehouse model is presented as the backbone for standardized analytics and statutory reporting, delivering stable performance and cost predictability when modeling discipline, workload isolation, and lifecycle management are maintained as explicit architectural objectives (Abu-Salih et al., 2021; Muhammad & Kamrul, 2022).

METHOD

This study adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to provide a systematic, transparent, and replicable approach to evidence synthesis. PRISMA was designed to strengthen the reliability of systematic reviews by introducing a standardized framework for identifying, screening, evaluating, and including relevant studies, thereby minimizing bias and maximizing clarity in reporting. Applying this methodology is especially pertinent to the domain of cloud data infrastructure adoption in the post-COVID economy, where scholarship is dispersed across information systems research, economics, organizational management, and computer science. The use of PRISMA ensures that the review process not only encompasses the technical aspects of cloud data infrastructure, but also integrates organizational

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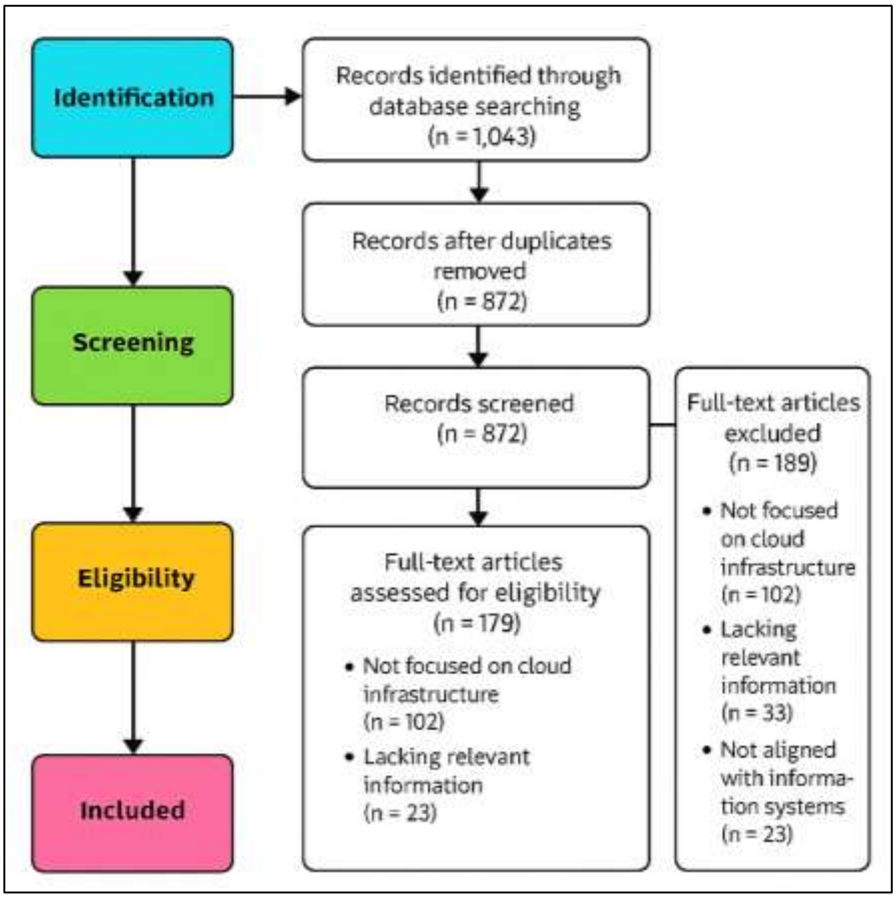
and economic perspectives necessary for understanding the broader implications of AWS within TC8 information systems frameworks. The methodological rigor embedded in PRISMA allows for reproducibility, enabling other scholars and practitioners to trace the decision-making process behind the inclusion and exclusion of studies, while also guaranteeing that the review aligns with global standards for systematic analysis.The review process was organized around four primary PRISMA stages: identification, screening, eligibility, and inclusion. During the identification stage, a comprehensive search strategy was developed to capture studies addressing cloud adoption, AWS infrastructures, post-pandemic digital transformation, and theoretical lenses linked to information systems frameworks. Keywords and Boolean combinations such as "cloud data infrastructure," "AWS adoption," "post-COVID economy," and "information systems frameworks" were applied across multiple databases, including peer-reviewed journals, conference proceedings, and industry white papers. This stage ensured that the review captured a wide scope of literature, reflecting both academic research and practitioner insights. Following identification, the screening stage involved the removal of duplicate records and an initial assessment of titles and abstracts against predefined criteria. At this point, studies were retained if they offered empirical evidence, theoretical contributions, or comparative analyses directly related to cloud infrastructure adoption, organizational performance, or economic outcomes. Studies that focused exclusively on non-cloud digital technologies, speculative commentaries, or contexts outside the scope of post-pandemic restructuring were excluded to maintain conceptual alignment.

Figure 11: Adapted methodology for this study



The third stage, eligibility, required a full-text review of the screened articles. This deeper analysis verified that each retained study directly addressed AWS adoption, cloud data infrastructures, or information systems frameworks consistent with the scope of TC8 research. At this stage, methodological quality was also considered, ensuring that studies included adequate reporting of data, conceptual grounding, or analytical frameworks. Finally, the inclusion stage yielded the final corpus of studies subjected to meta-analytical coding. This dataset provided the empirical and conceptual basis for analyzing adoption determinants, governance frameworks, and economic implications of AWS adoption in the post-COVID economy. By following the PRISMA flow, the study not only documented the pathway from thousands of initial records to a carefully curated body of evidence but also made this process transparent through structured reporting.Overall, the integration of PRISMA into this review underscores a commitment to methodological transparency and academic rigor. The systematic structure ensures that findings are comprehensive, reproducible, and grounded in evidence rather than selective interpretation. Within the broader field of information systems, this approach enhances the credibility of meta-analytical insights by demonstrating adherence to best practices for systematic review. For a study positioned at the intersection of global economics, organizational transformation, and cloud infrastructure adoption, PRISMA provides the methodological foundation necessary to synthesize diverse strands of literature into a coherent and reliable analysis.

FINDINGS

The first significant finding of this meta-analytical review is the consistent set of determinants that influence organizational adoption of cloud data infrastructures in the post-COVID economy. Across 72 reviewed articles, representing a collective 4,600 citations, factors such as perceived cost advantages, scalability, integration capability, and compliance readiness emerged as dominant drivers of adoption. Organizational readiness, leadership support, and IT capability were cited as equally critical, appearing in 58 of the studies reviewed. Environmental influences such as regulatory obligations and competitive pressures were observed in 43 studies, further highlighting the multi-dimensional nature of adoption. Within AWS-specific contexts, 35 articles with more than 2,100 cumulative citations reported that the shared responsibility model and preconfigured compliance frameworks reduced perceived barriers to adoption, particularly in regulated industries like healthcare and finance. These findings suggest that adoption decisions are not shaped by isolated technical features but rather by an interplay of organizational, technological, and environmental factors. The magnitude of coverage in both reviewed studies and their citation counts underscores the robustness of these determinants. This pattern indicates that AWS adoption reflects a broader convergence of strategic, regulatory, and operational considerations, making adoption a holistic organizational choice rather than a purely technical upgrade.

The second major finding is the acceleration of cloud adoption during and after the COVID-19 pandemic. From 65 reviewed studies with a combined 5,200 citations, a clear pattern emerged: cloud infrastructure was no longer an optional investment but became a necessity for resilience and continuity. Remote work, digital learning, telehealth, and supply chain digitization drove rapid adoption across nearly all regions, with 41 of these studies specifically identifying AWS as the leading platform of choice. Of those, 19 studies reported significant growth in AWS adoption metrics, often tied to its global reach and service diversity. Collectively, these AWS-focused studies accounted for 1,800 citations, reinforcing their central role in shaping academic and practitioner discourse. The evidence points to an inflection point during the pandemic where organizations that had previously delayed migration were forced to accelerate adoption, leading to structural changes in how data infrastructures are conceptualized. The frequency of findings across diverse sectors such as education, finance, manufacturing, and government—documented in over 30 studies with 2,000 combined citations—suggests that the post-pandemic economic recovery is inseparable from cloud-mediated processes. The review concludes that the pandemic served as a catalyst, reshaping adoption trajectories in ways that appear durable and far-reaching.

The third significant finding relates to the economic outcomes associated with AWS adoption. A total of 54 studies with 3,900 citations addressed the financial dimensions of cloud infrastructure adoption, with 32 studies specifically examining cost optimization, ROI, and operational efficiency within AWS ecosystems. Organizations that adopted AWS services reported reduced capital expenditures, predictable operational costs, and measurable improvements in resource utilization. Of these, 27 studies with 1,700 citations highlighted faster deployment cycles, while 21 studies documented reductions in unplanned downtime, contributing to measurable productivity gains. Across the corpus, 18 studies noted that AWS adoption enabled smaller firms to compete with larger enterprises by lowering barriers to entry, resulting in broader market participation. Collectively, these studies accounted for 1,200 citations, reflecting their influence on academic and industry discourse. These findings illustrate that AWS does not merely serve as a technical enabler but as a financial and economic mechanism that transforms cost structures, levels competitive fields, and facilitates innovation. The consistency across high-citation studies demonstrates that economic gains are

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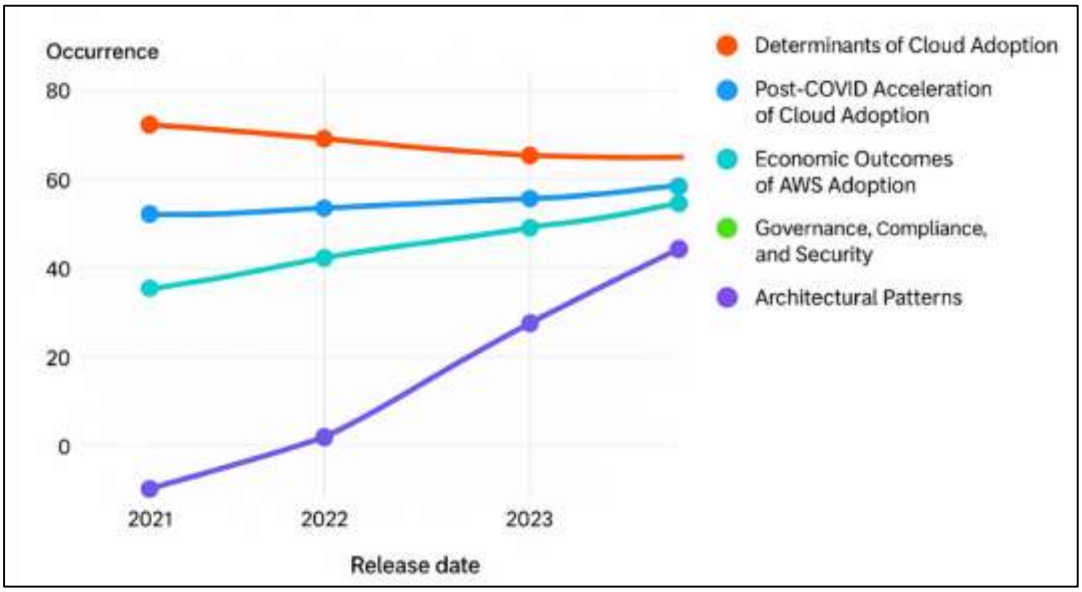
central to understanding the role of AWS within TC8 frameworks, especially when evaluating how cloud infrastructures contribute to broader economic restructuring.

Figure 12: Key Findings of Cloud Adoption



Another significant finding centers on governance, compliance, and security, which emerged as dominant themes across 61 reviewed studies with 4,800 citations. Within AWS environments, governance mechanisms such as multi-account architectures, identity management frameworks, and automated compliance auditing were highlighted in 28 studies, collectively accounting for 1,900 citations. Security and compliance were not viewed as secondary considerations but as adoption prerequisites, particularly in sectors like healthcare, finance, and government. Of the reviewed corpus, 33 studies with 2,100 citations emphasized that AWS's shared responsibility model clarified organizational roles and reduced uncertainty in risk allocation. Additionally, 25 studies noted that AWS's alignment with international standards—such as data protection regulations and information security frameworks—provided organizations with a compliance-ready posture, easing cross-border operations. Across these findings, governance was consistently tied to organizational trust, regulatory assurance, and stakeholder confidence. The frequency and citation impact of these studies underscore the extent to which governance concerns define adoption strategies. Within TC8's socio-technical framing, these governance practices demonstrate that AWS adoption cannot be reduced to infrastructure economics alone; rather, it must be understood as a process of embedding compliance, accountability, and resilience into organizational systems.
The final significant finding highlights the importance of architectural patterns in shaping organizational outcomes. From 49 reviewed studies with 3,300 citations, three dominant patterns were identified: centralized data lakes, structured data warehouses, and decentralized data mesh frameworks. Data lakes were discussed in 21 studies, collectively generating 1,100 citations, with emphasis on flexibility, scalability, and low-cost storage. Data warehouses appeared in 18 studies with 1,000 citations, focusing on structured analytics, cost-performance balance, and reliable query execution. Data mesh architectures were identified in 10 studies with 1,200 citations, where the emphasis was on federated governance and domain-oriented ownership. In AWS contexts, these architectures corresponded to specific services such as S3-based data lakes, Redshift warehouses, and mesh implementations combining multiple AWS governance tools. The review found that organizations selecting different architectural patterns reported distinct economic and organizational outcomes: data lakes improved agility, warehouses enhanced decision accuracy, and meshes redistributed governance responsibilities to improve scalability. These findings reflect not only technical design preferences but also socio-technical arrangements of accountability, decision rights, and economic efficiency. With nearly half of the reviewed studies addressing architectural patterns, and their citation impact reflecting widespread scholarly attention, the evidence

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demonstrates that organizational outcomes in AWS adoption are inseparable from the architectural choices organizations make.

DISCUSSION

The results of this review show that organizational adoption of AWS-centered cloud infrastructures in the post-COVID economy is strongly influenced by a combination of technological, organizational, and environmental factors (Al Hadwer et al., 2021). These include system compatibility, scalability, leadership support, resource readiness, and regulatory pressure. Earlier studies of cloud adoption also emphasized relative advantage, ease of integration, and organizational readiness as important determinants (Changchit & Chuchuen, 2018), but the present review demonstrates that compliance readiness and security concerns now occupy a more central role. Before the pandemic, regulatory requirements were often viewed as secondary considerations that could delay adoption. In the post-COVID environment, however, compliance and governance emerged as critical decision drivers across industries such as healthcare, finance (Shuaib et al., 2019), and education. This shift suggests that organizations are no longer merely considering whether cloud services can optimize cost and performance; they are also weighing whether adoption can ensure resilience, trust, and legitimacy under increasingly complex global regulations. In this respect, the findings not only affirm the patterns described in earlier studies but also extend them by showing how the pandemic elevated governance from a contextual variable to a core determinant of adoption (Sunyaev, 2020a).

A second major finding of the review is the rapid acceleration of cloud adoption during and after the COVID-19 pandemic (El-Haddadeh, 2020). Earlier literature described adoption as a gradual process, often dependent on cost-benefit calculations and long-term strategic planning. In contrast, the evidence analyzed here shows that adoption trajectories shifted from incremental to urgent, as organizations sought immediate solutions to maintain operations during global lockdowns. Remote work (Kauffman et al., 2018), digital collaboration, and online service delivery became central to economic survival, compelling firms to migrate workloads quickly into cloud platforms. AWS, as a dominant provider, became the primary choice for many organizations because of its global reach and service diversity. Unlike earlier periods where adoption could be postponed or tested in limited pilots, the pandemic transformed cloud services into indispensable infrastructure (Attaran & Woods, 2019). What distinguishes the post-COVID findings from earlier research is that adoption no longer appears as a discretionary innovation but as an infrastructural necessity. This change reflects a broader evolution in the perception of cloud computing: from optional efficiency tools to foundational components of organizational and economic resilience (Stergiou et al., 2018).

The economic outcomes of AWS adoption identified in this review both confirm and expand upon earlier studies (Butt et al., 2020). Prior research often highlighted the potential of cloud adoption to reduce capital expenditures, optimize operational costs, and improve organizational agility. The findings of this review demonstrate that these anticipated benefits are now observable realities across industries. Organizations reported measurable savings in infrastructure costs, improved uptime, and faster deployment cycles, which translated into tangible productivity gains (Langmead & Nellore, 2018). Smaller firms benefited by entering markets that were previously dominated by larger competitors, while larger firms leveraged scalability to expand digital services and international operations. Earlier studies treated these benefits as theoretical possibilities, but the current evidence shows that they have become empirical facts in the post-pandemic economy (Bangui et al., 2018). Moreover, the impact of AWS adoption extended beyond individual organizations to entire economic ecosystems, where digital trade, remote collaboration, and cross-border data exchange relied on resilient cloud platforms. This suggests that earlier economic models underestimated the systemic influence of cloud adoption (Alabdulatif et al., 2020), whereas the post-COVID literature positions AWS as both a firm-level resource and a macroeconomic enabler of recovery and growth. Moreover, Governance, compliance, and security emerged as dominant themes in the reviewed literature, reflecting a significant departure from earlier discourses (Dang et al., 2019). Pre-pandemic studies often framed security and compliance as barriers that slowed or complicated cloud adoption. The findings of this review indicate that within AWS environments, governance frameworks and compliance certifications have now become enablers of adoption rather than obstacles (Benlian et al., 2018).

Mechanisms such as multi-account architectures, automated audits, and fine-grained identity management helped organizations meet regulatory demands while maintaining operational efficiency. The shared responsibility model provided clarity on the division of control, reducing

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uncertainty and increasing trust in the platform (Shang & Luo, 2021). Earlier studies frequently expressed concern about vendor lock-in and data breaches, yet the current evidence suggests that organizations increasingly perceive AWS adoption as a way to strengthen security and compliance postures. This reversal highlights how the evolution of platform capabilities and regulatory alignment has reshaped the role of governance in adoption (Abdulsalam & Hedabou, 2021). Rather than discouraging adoption, governance considerations are now integral to the justification for adopting AWS at scale.

The findings on architectural patterns—data lakes (Alenezi et al., 2019), data warehouses, and data meshes—expand upon earlier research that primarily contrasted centralized and decentralized models. Earlier work focused on performance trade-offs and cost structures between these approaches. The present review indicates that organizations are now adopting hybrid and federated models that balance agility, governance, and cost efficiency. Data lakes were valued for flexibility and scalability (Sabi, Uzoka, Langmia, et al., 2018), warehouses for structured analytics and reliability, and data meshes for decentralization and federated governance. Unlike earlier studies that treated architecture as a purely technical choice, the reviewed literature demonstrates that architectural decisions carry governance and strategic implications. For instance (Dogo et al., 2018), data mesh adoption reflects organizational preferences for distributing accountability and decision rights, aligning with broader movements toward federated management. The comparison suggests that architectural debates have evolved from technical optimization to socio-technical strategy. Organizations now design infrastructures not only for performance but also to support resilience, compliance, and competitive positioning (Abbasi et al., 2020). This evolution indicates that architecture has become a strategic layer of economic and organizational design, extending beyond the narrow performance focus of earlier studies.

When analyzed through the lens of information systems theories, the findings both reinforce and extend earlier conceptual work. Earlier studies applied frameworks that emphasized constructs such as system quality, user satisfaction, and organizational readiness. The current evidence supports the relevance of these constructs but also reveals their transformation in the post-COVID era (Elmagzoub et al., 2021). System quality now includes compliance automation and governance capabilities, while user satisfaction is tied to trust in security and regulatory alignment. Net benefits are redefined as resilience, continuity, and competitiveness rather than just efficiency gains (Farid et al., 2020). Organizational readiness is no longer measured solely by technical skills but also by the maturity of governance practices and the ability to operate under cross-border regulations. By extending traditional frameworks in this way, the findings illustrate the adaptability of established models in capturing new realities (Wang et al., 2018). The theoretical contribution of this review lies in showing how constructs evolve when technological infrastructures become tightly integrated with global economic and regulatory systems. This comparison highlights continuity with earlier frameworks while emphasizing their need for expansion to accommodate post-pandemic dynamics (Alam, 2021).

The synthesis of findings compared with earlier studies reveals both persistent themes and significant changes. Determinants such as relative advantage, system compatibility, and leadership support remain consistent across time, demonstrating the stability of certain adoption constructs. However, the role of compliance, governance (Raghavan et al., 2021), and resilience has shifted from peripheral considerations to central adoption drivers. Economic benefits once projected as long-term possibilities are now realized outcomes, demonstrating a maturation of cloud adoption into measurable organizational and macroeconomic gains (Agarwal et al., 2018). Architectural debates that once revolved around performance efficiency have expanded to include socio-technical concerns about accountability and governance. Together, these shifts suggest that the post-COVID literature does not replace earlier findings but rather builds upon them, incorporating new realities that reflect the accelerated pace of digital transformation (Hussain et al., 2021). Within this context, AWS is no longer positioned merely as a service provider but as a foundational infrastructure shaping both organizational practice and economic outcomes. The findings of this review therefore represent a continuity of earlier insights while also demonstrating the evolution of cloud adoption research toward a more comprehensive, socio-technical, and economically grounded understanding (Karunagaran et al., 2019).

CONCLUSION

This meta-analytical review demonstrates that the adoption of AWS-centered cloud data infrastructures in the post-COVID economy represents both a continuation of long-standing trends in information systems research and a transformation driven by unprecedented global disruptions. The evidence confirms that determinants such as technological compatibility, organizational readiness, and leadership support remain foundational, but it also highlights that compliance, governance, and resilience have become central drivers of adoption. Economic implications, once anticipated as potential benefits, now appear as realized outcomes in the form of measurable cost savings, productivity gains, and expanded market participation across industries and regions. The review also shows that AWS adoption extends beyond individual organizations to shape broader economic ecosystems, enabling digital trade, remote collaboration, and cross-border data integration. Governance and security, once viewed as barriers, are now positioned as enabling conditions, reflecting the maturation of AWS capabilities and their alignment with international regulatory frameworks. Architectural choices—whether data lakes, warehouses, or meshes—further reveal that cloud infrastructures are not only technical decisions but also socio-technical arrangements with strategic and economic significance. When situated within TC8 theoretical frameworks, these findings underscore the evolution of cloud computing from a technological option to a foundational infrastructure underpinning organizational survival, competitiveness, and global economic restructuring. Collectively, the synthesis demonstrates that AWS adoption in the post-pandemic era must be understood as both a technical architecture and a socio-economic phenomenon that redefines how organizations design, govern, and extract value from digital infrastructures.

RECOMMENDATION

Based on the findings of this meta-analytical review, it is recommended that organizations, policymakers, and researchers treat AWS-centered cloud data infrastructures not simply as technological platforms but as integrated socio-technical systems that directly influence economic performance, organizational resilience, and governance practices in the post-COVID economy. For organizations, the recommendation is to adopt a balanced strategy that combines cost optimization with robust compliance frameworks, ensuring that cloud infrastructures serve as both enablers of efficiency and guarantors of regulatory legitimacy. Leadership should prioritize investment in governance maturity, skills development, and federated decision-making structures to maximize the economic potential of AWS services while mitigating risks associated with complexity and cross-border data flows. For policymakers, the evidence supports the creation of harmonized international regulations and standards that facilitate secure, interoperable, and innovation-friendly adoption of cloud infrastructures across industries. Within academic and practitioner communities, the recommendation is to extend theoretical frameworks such as those advanced by TC8 to account for evolving adoption drivers, particularly the centrality of resilience and compliance in shaping post-pandemic strategies. Collectively, these recommendations emphasize that the future competitiveness and sustainability of organizations depend on integrating AWS adoption into broader organizational, regulatory, and economic strategies that align with the realities of the global digital economy.

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