

Vendors as institutional actors: how external providers enable enterprise blockchain assimilation and institutionalisation

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Abstract

Purpose – Despite extensive experimentation, many enterprise blockchain initiatives fail to progress beyond proof of concept. While prior research has focused on adoption determinants, less is known about how blockchain becomes embedded in organisational routines and scaled across inter-organisational environments. This paper examines how external vendors contribute to and shape progression from initial exploration to routinised and institutionalised use.

Design/methodology/approach – The study adopts an interpretive qualitative design grounded in staged technology assimilation and institutional theory. Data were collected through semi structured interviews with vendor-side professionals across infrastructure providers, consultants, application developers, legal specialists and standards actors. An abductive analysis was conducted to examine how vendor activities evolve across assimilation stages and mediate institutional pressures.

Findings – Interview accounts suggest that vendors act as conditional institutional actors performing stage-contingent work. Participants described vendors as reducing cognitive uncertainty through education, constructing legitimacy and organisational alignment, simplifying technical complexity through abstraction and supporting governance through monitoring and compliance mechanisms. At later stages, vendors support coordination across organisational boundaries and contribute to ecosystem legitimacy. Participants described these activities as responses to different institutional pressures that evolve over time, helping organisations move from early experimentation towards broader enterprise integration.

Originality/value – The study extends assimilation theory by showing, from vendor accounts, how vendors may play a sustained but varying role across assimilation patterns. It advances institutional theory by showing how institutional work is distributed and cumulative over time. It conceptualises vendors as conditional institutional actors and provides a stage-based framework to guide enterprise adoption and management.

Keywords Enterprise blockchain, Technology assimilation, Institutional theory, Vendors, Inter-organisational systems

Paper type Research article

1. Introduction

Blockchain is widely presented as a foundational infrastructure for digital transformation. It promises shared data, improved transparency and new forms of coordination across organisations (Casino *et al.*, 2019; Xu *et al.*, 2019). Yet in practice, most enterprise blockchain initiatives fail to move beyond proof of concept. Organisations experiment and invest, but struggle to embed blockchain in routine operations (Rahman *et al.*, 2024). This gap between adoption and use is well established in information systems research. Technologies may be adopted but not integrated into organisational practice (Cooper and Zmud, 1990;



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Gallivan, 2001). Value emerges through assimilation, where systems become embedded in workflows, roles and governance structures over time (Zhu *et al.*, 2006). In the case of blockchain, this progression is particularly challenging. Projects stall due to regulatory uncertainty, integration complexity and unclear value (Han *et al.*, 2024).

Most existing research focuses on adoption. Studies examine readiness, perceived benefits and environmental drivers (Risius and Spohrer, 2017; Kshetri, 2018; Campagna and Bhada, 2024). While this explains initial uptake, it does not explain what happens after adoption. It further fails to explain why initiatives don't scale, or how technologies become part of everyday organisational routines (Gallivan, 2001; Assadi, 2025). Recent work highlights the importance of post adoption factors such as governance, capability building and shared understanding (Yu Chung Wang *et al.*, 2022). However, a key element remains under explored. Enterprise blockchain systems are rarely developed in-house (Han *et al.*, 2024). Organisations depend on external vendors, including infrastructure providers, consultants, legal specialists and application developers. These actors do more than deliver technology. They shape how blockchain is interpreted, implemented and governed. Research on digital infrastructures suggests that such external actors play an important role in stabilising emerging systems across organisational boundaries (Henfridsson and Bygstad, 2013; Palmer *et al.*, 2022). Blockchain applications have expanded beyond experimental settings into domains such as food safety, agriculture and distributed supply chains, where they are used to enhance transparency, traceability and coordination. For example, blockchain-based systems have been deployed to improve food quality assurance and compliance processes (Sugandh *et al.*, 2023). Enterprise blockchain adoption is therefore not simply a technical decision, but a multi actor, inter-organisational challenge.

This creates an unresolved issue. Vendors are often treated as technical suppliers, yet their activities extend beyond implementation (Jemine and Guillaume, 2022; Cuel *et al.*, 2024). They frame the technology, translate regulation and help establish governance structures. In doing so, they influence both technical outcomes and questions of legitimacy. These activities resemble forms of institutional work, understood as efforts to create and stabilise social structures (Lawrence and Suddaby, 2006; Scott, 2008). However, their role in this process remains unclear. At the same time, vendor involvement does not guarantee successful outcomes. Blockchain initiatives frequently stall despite external support. Organisational resistance, strategic misalignment and institutional uncertainty persist (Zhu *et al.*, 2006; De Filippi *et al.*, 2022). This raises a central question. What role do vendors actually play in enabling, shaping or hampering blockchain assimilation?

To address this question, this paper integrates staged technology assimilation theory with institutional theory. Assimilation models conceptualise implementation as a multi-stage process from initiation to routinisation and infusion (Cooper and Zmud, 1990; Gallivan, 2001). Institutional theory explains how practices become legitimate through cognitive, normative and coercive pressures (DiMaggio and Powell, 1983; Scott, 2008). Bringing these perspectives together allows us to examine both the process and legitimacy, and how they interact over time. The central argument of this paper is that vendors perform stage-dependent institutional work. Their reported role varies across assimilation patterns. At early stages, vendors reduce uncertainty and shape how blockchain is understood. At intermediate stages, they support integration and alignment with existing practices. At later stages, participants described vendors as helping to establish governance, monitoring and compliance structures. However, this influence is conditional. Vendor activity interacts with organisational priorities and institutional context and does not uniformly lead to successful outcomes. This study is guided by three research questions:

RQ1. How do vendors influence progression through blockchain assimilation stages?

RQ2. How do vendors act as institutional actors shaping legitimacy and institutionalisation?

RQ3. How do vendor activities mediate cognitive, normative and coercive pressures across stages?

Drawing on qualitative interviews with vendor-side professionals, the study identifies six reported mechanisms of vendor institutional work. These include sensemaking, regulatory translation, abstraction, governance, automation and ecosystem participation. The paper makes three contributions. First, it extends assimilation theory by showing that progression depends not only on internal capability but also on sustained external vendor involvement (Cooper and Zmud, 1990; Gallivan, 2001). Second, it advances institutional theory by demonstrating how institutional work is distributed across actors and unfolds over time (Lawrence and Suddaby, 2006). Third, it conceptualises vendors as conditional institutional actors whose influence varies across stages and contexts, rather than as fully autonomous institutional entrepreneurs.

2. Theoretical background

2.1 Blockchain assimilation as an interorganisational challenge

Blockchain is commonly framed as a foundational digital infrastructure that enables shared data and coordination across organisational boundaries (Casino *et al.*, 2019; Xu *et al.*, 2019; Rahman *et al.*, 2024). Its value lies in facilitating distributed trust and reducing reliance on central intermediaries (Saber *et al.*, 2019). However, these characteristics also create implementation challenges that differ from traditional enterprise systems. Most enterprise technologies can be deployed within organisational boundaries while blockchain cannot. It requires alignment across multiple organisations, shared governance arrangements and coordination with regulators and standards bodies. As a result, implementation is not simply a technical problem, it is a collective and institutional one (Han *et al.*, 2024; Rahman *et al.*, 2024). This places enterprise blockchain close to the inter-organisational systems tradition, where adoption and use depend not only on one organisation's internal readiness but also on governance, coordination and consequences across organisational boundaries (Robey *et al.*, 2008). This distinction is important because it explains why many blockchain initiatives stall after proof of concept. The challenge is not only integration with existing systems, but alignment across organisations with different incentives, capabilities and regulatory constraints. Existing research has not adequately explained how this alignment is achieved in practice. This is especially relevant for enterprise information management, where integration, architecture and interoperability across organisational boundaries are central concerns (Zhao and Xia, 2014; Hodapp and Hanelt, 2022).

2.2 Limits of technology assimilation models

Technology assimilation research provides a process view of how innovations become embedded over time. Models developed by Cooper and Zmud (1990) and extended by Gallivan (2001) describe a staged progression from initiation to routinisation and infusion. This perspective shifts attention from adoption decisions to sustained use and highlights the importance of organisational alignment and capability development (Zhu *et al.*, 2006). Prior studies have already linked institutional forces to technology assimilation. Purvis *et al.* (2001), for example, show that complex technologies must be assimilated into work processes rather than merely adopted, while Liang *et al.* (2007) demonstrate that institutional pressures influence enterprise system assimilation through managerial mediation. The gap addressed here is therefore not the absence of institutional explanations in assimilation research, but the limited understanding of how external vendors mediate these pressures across inter-organisational blockchain settings. Nevertheless, assimilation theory is built on an implicit assumption. It treats implementation as primarily an intra organisational process as the focus is on how a single organisation integrates a technology into its structures and routines. This assumption does not hold in blockchain contexts. Here, systems span organisational

boundaries and require coordination between multiple actors. As such, assimilation models struggle to explain how progression occurs when control is distributed. They do not fully account for the role of external actors who shape implementation across organisational contexts. This limitation becomes critical in later stages, where governance, compliance and standardisation depend on alignment beyond the primary organisation (Yu Chung Wang *et al.*, 2022; Assadi, 2025). This limitation highlights a more fundamental gap. Existing assimilation frameworks explain how technologies become embedded within organisations, but do not fully account for how this process unfolds across inter-organisational settings characterised by distributed control, diverse actors and institutional uncertainty. Addressing this requires a complementary theoretical lens capable of explaining how legitimacy is constructed, coordination is achieved and uncertainty is managed across organisational and regulatory boundaries.

2.3 Explaining legitimacy with institutional theory

Institutional theory addresses a different aspect of the problem. It explains how organisational practices become stabilised and legitimate within broader social systems. Organisations respond to cognitive, normative and coercive pressures that shape what is considered appropriate and acceptable (DiMaggio and Powell, 1983; Scott, 2008). This perspective is particularly relevant for blockchain. Regulatory uncertainty, evolving standards and contested meanings create substantial institutional ambiguity (De Filippi *et al.*, 2022). Organisations must decide not only how to implement blockchain, but whether it is legitimate to do so. Institutional work theory addresses this by focusing on how actors actively construct and stabilise institutions (Lawrence and Suddaby, 2006). However, institutional theory has its own limitations in this context as it tends to focus on field-level dynamics or organisational responses to pressure. It provides less insight into how institutional alignment is achieved during implementation, particularly across multiple organisations and stages. In other words, institutional theory explains why legitimacy matters but not how it is operationalised during technology assimilation (Sminia, 2024).

2.4 Vendors as boundary spanning institutional actors

The limitations of both perspectives point to a missing factor. Blockchain assimilation depends on actors who operate between organisations and institutional environments. Vendors occupy this position. Traditional information systems research treats vendors as technical suppliers that deliver solutions to clients (Bakos and Brynjolfsson, 1993; Lacity and Willcocks, 1998). This view assumes stable requirements and clearly defined organisational boundaries. In blockchain contexts, neither assumption holds as vendors operate across multiple organisations simultaneously. They work with clients, regulators, infrastructure providers and standards bodies (Cuel *et al.*, 2024; Kari *et al.*, 2025). They translate between technical systems and institutional expectations. This builds on research on boundary spanning and knowledge brokering, where actors translate across professional or organisational domains (Pawlowski and Robey, 2004; Levina and Vaast, 2005). However, blockchain vendors differ because their work extends beyond internal knowledge transfer. They operate across client organisations, technical infrastructures, regulators and ecosystem participants, while also shaping how legitimacy, compliance and governance are understood. This creates a distinct structural position that they must occupy. Vendors do not simply implement technology, they mediate between competing logics, including technical feasibility, regulatory compliance and organisational priorities (Henfridsson and Bygstad, 2013; Palmer *et al.*, 2022). This role aligns with institutional work. Vendors contribute to sensemaking, standard setting and governance design. In this respect, their work also relates to organising vision research, which shows how inter-organisational communities support interpretation, legitimation and mobilisation around information systems innovations (Swanson and Ramiller, 1997). However, they are not institutional entrepreneurs in the classical sense. Institutional entrepreneurship implies actors

that intentionally reshape fields and possess significant control over institutional change (Battilana *et al.*, 2009). Most vendors do not meet these conditions. Instead, their influence is constrained, and vendors must align with client requirements, regulatory frameworks and technological limitations. Their role is therefore better understood as conditional and iterative as they support alignment rather than drive transformation. Their influence depends on context, capability and stage of implementation (Faik and Gwee, 2022). This distinction is important as they become positioned as boundary crossing institutional actors whose influence is significant but not deterministic.

2.5 A stage-contingent model of vendor institutional work

Bringing these perspectives together allows a more precise understanding of blockchain assimilation. Assimilation is shaped by changing institutional pressures and mediated by external actors. Early stages are characterised by cognitive uncertainty, as organisations often lack a clear understanding of blockchain and its relevance. As projects move towards adoption and adaptation, normative concerns become more visible because blockchain must be made acceptable, useable and aligned with existing organisational practices. In routinisation and infusion, coercive pressures become more prominent as governance, compliance, monitoring and cross-organisational accountability increase. These pressures overlap rather than replace one another, and their relative importance varies across contexts. However, this process is not linear. Organisations may stall, revisit stages or resist vendor interventions. This leads to a central theoretical proposition: vendor institutional work is stage contingent. Different forms of work are required at different points in the assimilation process, and vendor influence varies accordingly. This integrated perspective extends existing theory in two ways. First, it links assimilation stages to institutional pressures, showing how legitimacy concerns evolve over time. Second, it highlights the role of external actors in mediating this process across organisational boundaries. This framework guides the empirical analysis. The framework should be interpreted as a heuristic representation of recurring assimilation patterns rather than a fixed or deterministic sequence. While the stages are analytically distinct, organisations may revisit earlier challenges, encounter multiple institutional pressures simultaneously, or stall between stages. The framework therefore serves as an organising device for understanding recurring patterns in vendor accounts rather than a universal process model. Institutional pressures operate as both structuring conditions and evolving constraints within the assimilation process. At early stages, cognitive pressures act as antecedents shaping initial engagement. As organisations move towards adoption, normative pressures facilitate the translation of understanding into organisational acceptance. At later stages, coercive pressures function as constraints that validate and stabilise practices. Vendor activities interact with these pressures by shaping their interpretation and operationalisation, thus influencing, but not determining the progression of assimilation.

3. Methodology

3.1 Research design

This study adopts an interpretive qualitative design to examine how vendors influence blockchain assimilation over time. Interpretive approaches are appropriate where technologies are still emerging and meanings are not yet stabilised (Walsham, 1995; Klein and Myers, 1999). Blockchain systems are characterised by evolving practices, contested interpretations and ongoing institutional uncertainty. Understanding these dynamics requires attention to how actors construct meaning and respond to changing conditions in practice. As such, an abductive research strategy was employed. This involved iterative movement between empirical observations and theoretical concepts (Dubois and Gadde, 2002; Timmermans and Tavory, 2012). Rather than testing predefined hypotheses, the analysis sought to refine theoretical understanding of vendor roles through engagement with empirical material. Initial

insights were generated inductively from the data and subsequently interpreted through existing theoretical frameworks. This approach is well suited to contexts where prior theory provides only partial explanations.

3.2 Analytical framework

The analysis was guided by staged technology assimilation models and institutional theory. These frameworks were used as sensitising devices rather than prescriptive templates (Blumer, 2017). Assimilation theory provided a process perspective on how technologies become embedded over time (Cooper and Zmud, 1990; Gallivan, 2001), while institutional theory informed interpretation of legitimacy, norms and regulatory pressures shaping adoption (DiMaggio and Powell, 1983; Scott, 2008). Importantly, these theoretical lenses were not imposed on the data at the outset. The analysis proceeded in stages. First, recurring vendor activities were identified inductively. Second, these activities were grouped into higher level patterns through comparison across participants. Third, these patterns were interpreted in relation to assimilation stages and institutional pressures. This iterative process allowed the theoretical framing to be refined in response to empirical observations, rather than predetermined.

3.3 Sampling strategy and research participants

The study employed purposive sampling to capture informed vendor perspectives on enterprise blockchain implementation. Participants were selected based on direct involvement in designing, delivering or supporting blockchain-based solutions. For this study, a vendor is defined broadly as an external actor involved in providing, configuring, advising on, governing or operationally supporting blockchain-based services for adopting organisations or ecosystem participants. The unit of analysis is therefore the vendor role in blockchain assimilation, rather than the adopting organisation, individual project or industry sector. Where participants had experience in both vendor and adopting organisation roles, they were included only where the interview focused on their external advisory, implementation, infrastructure or ecosystem support role. The sample includes infrastructure providers, consultants, application developers, legal specialists and ecosystem coordinators. This diversity was intended to capture variation in vendor roles rather than represent a single category of actor. The study was not designed as a systematic comparison across industries. Industry diversity was included to broaden the range of implementation contexts represented in the data rather than to generate comparative sectoral findings. The final sample consists of eleven participants occupying senior or specialist roles. These individuals had visibility across multiple projects, organisations or industry contexts. This enabled identification of patterns that extend beyond single implementations. The relatively small sample size reflects the study's focus on depth rather than breadth. Following the principle of information power, sample adequacy depends on the specificity of the research aim, the quality of dialogue and the expertise of participants (Malterud *et al.*, 2016). All participants had substantial experience in blockchain implementation, increasing the relevance and richness of the data. Saturation was assessed iteratively during analysis. Core themes such as education, abstraction, governance and regulatory translation recurred consistently across interviews, although variation across vendor types and sectors is interpreted more cautiously. Accordingly, the findings are intended to provide theoretically informed and illustrative insights into vendor mediated assimilation rather than generalisable claims about all blockchain implementations. An overview of participants, anonymised by identifier, industry, role, organisational size and region, is provided in Table 1.

3.4 Data collection

Data were collected through semi structured interviews conducted between 2023 and 2025. Interviews lasted between 40 and 75 min and were conducted remotely. All interviews were

Table 1. Participant list and profile

Participant ID	Industry	Company size	Role	Region
P1	Legal and Regulatory Consulting (Blockchain/Digital Assets)	Large	Partner/Financial Regulation Expert	Europe
P2	Blockchain Infrastructure Provisioning	Medium	VP Operations	Global
P3	Consulting (Blockchain Advisory)	Large	Director/Senior Consultant	EMEA
P4	Sustainability/Web3 (Plastic Recovery Tokens)	SME	CEO/Founder	Global
P5	Blockchain Infrastructure Provisioning	Medium	R&D Lead	Global
P6	AgriTech/Blockchain Standards & Innovation	SME	Founder/Standards Lead	Europe
P7	Blockchain Infrastructure (Service Management)	Medium	Head of Service Management	Global
P8	Web3 Technology (Decentralised Compute Infrastructure)	SME	Co-founder/CTO	Europe
P9	Web3 Technology (Artistic Asset Tokenisation)	SME	CEO	Europe
P10	Beverage/Supply Chain (Blockchain Traceability)	SME	CEO	Europe
P11	Blockchain Infrastructure Provisioning	Medium	Principal Engineer	Global

Source(s): Authors' own work

recorded and transcribed verbatim with participant consent. The interview protocol focused on vendor experiences in onboarding and supporting blockchain adoption. Participants were encouraged to discuss specific projects, interactions with clients and challenges encountered during implementation. Questions probed areas such as knowledge transfer, integration practices, governance and interactions with regulators and ecosystem partners. To reduce reliance on abstract accounts, participants were prompted to discuss concrete implementation episodes, including setbacks, turning points and instances where adoption failed to progress. This enabled both structured comparison across interviews and exploration of unique or unexpected perspectives (Myers and Newman, 2007). The data reflect a particular historical context. Interviews were conducted during a period of increased regulatory scrutiny and reduced market optimism following the decline of cryptocurrency markets. These conditions likely influenced participant accounts, particularly in relation to risk, legitimacy and adoption barriers. Findings should therefore be interpreted as situated within this environment.

3.5 Data analysis

Data analysis followed a multi-stage abductive process. In the first stage, transcripts were open coded to identify recurring activities, practices and concerns expressed by participants (Charmaz, 2014). These first-order codes were closely grounded in participant language, capturing terms such as “education”, “security concerns”, “uncertainty” and “ease of use”. In the second stage, codes were grouped into broader categories through constant comparison (Strauss and Corbin, 1998). This process involved identifying similarities and differences across participants, including variation across vendor roles and contexts. In the third stage, these categories were interpreted as higher level concepts and related to assimilation stages and institutional pressures. This resulted in a stage-contingent framework of vendor activity across cognitive, normative and coercive dimensions. Analytical traceability was maintained throughout. Coding decisions, category development and theoretical interpretations were documented to ensure transparency. Representative quotations are presented in the findings to demonstrate how interpretations are grounded in empirical data. To ensure analytical

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transparency, we explicitly document how empirical observations were progressively abstracted into theoretical constructs. Table 2 illustrates the relationship between representative quotations, first-order codes and higher level concepts, showing how interpretations are grounded in the data. This provides a clear audit trail linking raw empirical material to the analytical framework developed in the study. Table 2 summarises this analytical progression.

3.6 Addressing bias and reflexivity

A key limitation of the study is its reliance on vendor perspectives. Vendors have an underlying incentive to emphasise their role in successful implementations and may understate challenges or failures. This introduces a systematic bias. Rather than treating these accounts as objective representations of reality, they are interpreted as situated narratives shaped by professional position (Walsham, 1995). The analysis therefore focuses on patterns of meaning rather than factual verification of claims (Braun and Clarke, 2021). To mitigate bias, several strategies

Table 2. Code quote traceability table

Analytic code	Illustrative participant quotation	Participant role context
Detechicalising blockchain	“We deliberately avoid even mentioning NFTs or smart contracts. If you start with that, people switch off immediately. We frame it in terms of cost and speed instead.”	Application layer vendor, creative industries
Detechicalising blockchain	“After a while, we realised there was no point saying it was blockchain. It should just run in the background like email.”	Adopting organisation CEO, consumer goods
Educating sceptical stakeholders	“We would run workshops for the wider organisation, not just the innovation team. A lot of it was reassurance rather than technical training.”	Consulting partner
Educating sceptical stakeholders	“With Web2 companies, the biggest work is education. They just don’t know what decentralised infrastructure means.”	Infrastructure vendor
Mapping regulation	“The answer was usually that it didn’t fit neatly into existing regulation, so our role was explaining what that actually means and what risks are manageable.”	Legal and regulatory advisor
Mapping regulation	“We have to constantly interpret changing sanctions, compliance requirements and jurisdictional rules for clients.”	Infrastructure provider, legal function
Abstracting infrastructure	“Clients don’t want to manage nodes or protocols. They want an AWS style interface where they just click a button.”	Infrastructure vendor
Abstracting infrastructure	“Universal APIs meant teams could interact with multiple chains without needing specialist protocol knowledge.”	Blockchain infrastructure R&D lead
Normalising operations	“The focus shifts to SLAs, incidents, uptime and monitoring. Blockchain has to be treated like any other service.”	Service management lead
Normalising operations	“Once the pipeline was built, adding new products became routine. It stopped being a blockchain project.”	Adopting organisation executive
Champion enablement	“You need local champions who can translate this into the language of their community.”	Agri tech vendor and standards actor
Ecosystem and standards work	“We sit on working groups helping to define governance and standards so this becomes a normal part of the industry.”	Legal and institutional actor
Source(s): Authors’ own work		

were adopted. First, patterns were identified across participants with different roles, including infrastructure providers, consultants and legal specialists. Convergence across these groups was interpreted cautiously, recognising that shared professional framing may influence narratives. Second, the analysis explicitly pays attention to uncertainty, ambiguity and variation in accounts, instead of presenting a uniformly positive view of vendor influence. Reflexivity was maintained throughout the research process. Analytical decisions and interpretations were critically reviewed to minimise the influence of prior assumptions. Particular attention was given to avoiding overly deterministic interpretations of vendor effectiveness.

3.7 Ensuring research quality and rigour

Research quality was assessed using established criteria for interpretive research (Guba and Lincoln, 1994; Klein and Myers, 1999). Credibility and transparency were supported through systematic comparison across participants, illustrative quotations and an audit trail of coding and analytical decisions. The study does not aim for statistical generalisation, but seeks analytical generalisation to similar inter-organisational digital innovation contexts (Yin, 2013).

4. Findings

The findings suggest, from vendor accounts, that vendor activities vary across recurring assimilation patterns and overlapping institutional pressures. Rather than performing a single role, vendors engage in different forms of institutional work as projects move between initiation, adoption, adaptation, routinisation and infusion. Figure 1 summarises this heuristic pattern, which is then unpacked in detail across the findings. The process is indicative rather than strictly sequential, with stages overlapping and organisations potentially revisiting earlier phases.

4.1 Initiation

Early engagement is often unclear. Many clients do not fully understand what blockchain is or what they want from it. One participant stated, “a lot of clients don’t know what they want . . . they’re not sure what they’re trying to get” (P9). This confusion is not just technical, it is conceptual. Vendors respond by simplifying the conversation. They avoid technical detail.

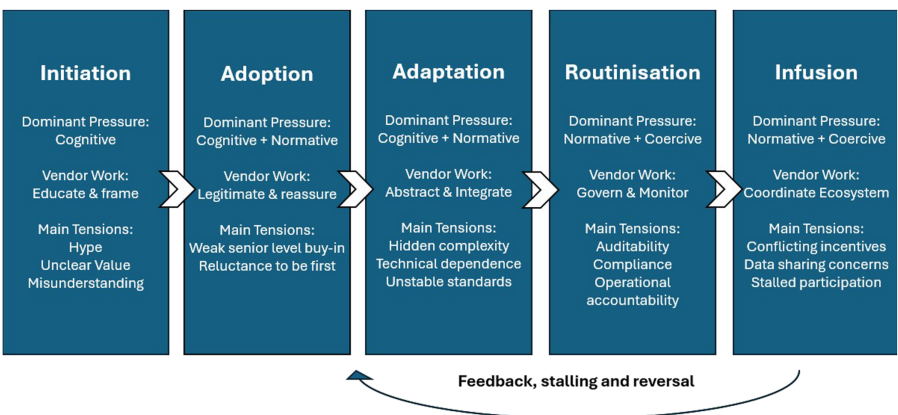


Figure 1. Heuristic representation of vendor institutional work across recurring blockchain assimilation patterns and overlapping institutional pressures. Source: Authors’ own work

One participant explained, “we try to keep it very very high level ... don’t mention tokenization ... don’t mention (non-fungible tokens) NFTs or what the blockchain and how the blockchain works” (P6). Instead of explaining architecture, vendors focus on outcomes such as cost or efficiency. This reflects a process of sensemaking. Early adoption depends on how actors interpret the technology (Weick, 1995; Rogers, 2003). Vendors shape that interpretation. They translate complexity into something useable. However, this process does not always succeed as misunderstanding continues. As one participant noted, “people were almost thinking of the technology as a solution rather than a tool” (P1). In these cases, clarification can lead to rejection rather than adoption.

4.2 Adoption

Once initial understanding is achieved, the issue becomes organisational acceptance. Adoption depends on internal alignment. “You need buy-in from the top ... otherwise projects fail” (P4). Without senior support, progress is limited. Vendors work to build legitimacy. They provide assurances that reduce perceived risk. One participant described how “being able to give that legal opinion ... allowed them to go to management” (P3). Legal framing helps move decisions forward. Vendors also rely on precedent. Organisations look to others before acting. As one participant put it, “nobody likes to be first” (P6). Demonstrating prior success reduces uncertainty. These patterns reflect institutional theory. Organisations seek legitimacy before committing to new technologies (DiMaggio and Powell, 1983; Scott, 2008). Vendors help provide that legitimacy. Resistance remains common. Some organisations simply opt out. One participant observed, “50% of the companies ... it’s not for me” (P7). This resistance is often tied to uncertainty, not technical failure. Vendors can influence decisions, but they cannot remove all hesitation. In several cases, vendor efforts actively failed to convert interest into adoption, as organisations disengaged after initial exploration, despite extensive education and pilot activity.

4.3 Adaptation

When organisations adopt blockchain, the challenge becomes practical. The technology is complex and integration is not straightforward. Vendors respond by reducing that complexity. They build systems that hide the underlying mechanics. One participant explained, “you don’t need to care about underlying nodes anymore ... we manage all of that for you” (P2). Another stated, “you don’t care what is happening behind them ... you just need to have the service” (P7). In addition, another infrastructure provider described working with a logistics firm that struggled to manage validator nodes. By introducing an application programming interface (API)-based interface, the organisation was able to interact with the system without direct exposure to blockchain protocols, reducing deployment time and enabling integration with existing systems. The goal is to make the system useable. Interfaces are designed to feel familiar. This aligns with existing work on technology adoption, where ease of use influences acceptance (Venkatesh et al., 2002). At the same time, the technical environment remains unstable as standards are not established. One participant stated clearly, “there is no industry standards ... how monitoring should work” (P9). This creates tension. Vendors simplify the front end, but the back end continues to evolve. This stage is defined by that tension. Simplicity for the user is achieved, but only through ongoing vendor intervention.

4.4 Routinisation

As blockchain becomes part of daily operations, attention shifts to control. The focus moves to risk, governance and compliance. Participants consistently highlighted security. “Security is a huge, huge one” (P2). At the same time, regulation is uncertain. “There is quite a lot of uncertainty around regulations” (P2). These concerns shape how organisations use the technology. Vendors respond by formalising processes. They build systems to verify and

validate activity. One participant described how “we validate the invoice . . . proof of payment . . . receipt” (P5). These practices generate trust and accountability. This reflects coercive pressures. Organisations must meet external expectations and requirements (Scott, 2008). Vendors act as intermediaries in this process. However, stability is not fully achieved. Regulation continues to evolve and requirements vary across contexts. Vendors must continuously adapt their practices. Governance becomes an ongoing activity rather than a fixed solution. Participants also described cases where emerging compliance requirements reopened questions that organisations believed had already been resolved during earlier adoption discussions. This illustrates how later stage pressures can reactivate earlier concerns around legitimacy, value and risk.

4.5 Infusion

At later stages, the scope expands. Blockchain is no longer confined to a single organisation. It operates across networks. This changes the problem. Coordination becomes central. Vendors take on new roles as facilitators. One participant explained, “we bring scientists and farmers together” (P8). Vendors connect different actors. Blockchain systems depend on those networks as value is created across relationships (Adner, 2017). Vendors help align those relationships, but alignment is not simple as stakeholders have different incentives. As one participant noted, “you need a strong business case for everyone in the network” (P4). Without alignment, progress stalls. Several participants noted that ecosystem expansion frequently progressed more slowly than expected because stakeholders differed in their incentives, resources or willingness to share data. Vendor efforts could facilitate coordination but could not eliminate these tensions. At this stage, vendor influence becomes more limited. Vendors can enable coordination, but they do not control the ecosystem. Outcomes depend on the actions of multiple actors.

4.6 Cross-stage interpretation

The analysis suggests a perceived shift in how vendors operate across assimilation patterns. In the early stages, vendor work is primarily cognitive. Vendors focus on explaining and reframing the technology. They reduce confusion. They simplify. As one participant noted, clients often begin from a position where “they’re not sure what they’re trying to get” (P9). Participants described the vendor’s role here as making engagement possible. As organisations move forward, the focus changes and the challenge becomes legitimacy rather than understanding. Vendors work to secure acceptance within organisations by providing reassurance, evidence and validation. This reflects a shift from cognitive work to normative alignment. Organisations do not adopt blockchain simply because they understand it, they adopt it when it becomes acceptable to do so. This transition is not always smooth and some organisations stall at this stage. As one participant commented, “50% of the companies . . . it’s not for me” (P7). This highlights a key discontinuity. Understanding does not guarantee adoption. Vendors cannot always bridge this gap. In several accounts, organisations moved backwards rather than forwards. Participants described situations where initial enthusiasm led to pilot projects, but governance concerns, cost pressures or shifting priorities eventually halted further development. These examples suggest that assimilation is vulnerable to reversal as well as progression. Once adoption decisions are made, vendor activity becomes more technical and operational. The emphasis moves to usability and integration. Vendors simplify systems and hide complexity. They enable organisations to use blockchain without needing deep expertise. This stage reflects a practical reworking of the technology to fit organisational routines. At this point, a second shift occurs. Vendor work becomes more structured and formal. Governance, security and compliance become central. Participants consistently emphasised that “security is a huge, huge one” (P2). Vendors respond by introducing controls, validation processes and service frameworks. This reflects coercive pressures. Organisations must now operate within regulatory and operational constraints.

These pressures do not replace earlier concerns; they build on them. Cognitive, normative and coercive elements overlap rather than occur in isolation. Vendor work therefore becomes layered. In practice, these dynamics overlap and interact, with organisations frequently revisiting earlier challenges or encountering multiple pressures simultaneously rather than progressing in a strictly linear sequence. This progression reflects the shifting nature of institutional pressures. Early stage ambiguity creates predominantly cognitive uncertainty (Scott, 2008). As adoption proceeds, organisational acceptance introduces normative concerns linked to legitimacy and conformity. At later stages, formal governance and regulatory requirements intensify coercive pressures. This mapping is therefore not imposed but emerges from the varying constraints organisations face over time. In later stages, the scope expands again, blockchain is no longer confined to a single organisation. It operates across networks of actors and as such, vendor roles shift towards coordination. They connect stakeholders and support collective participation. As one participant described, “we bring scientists and farmers together” (P8). This highlights a final transition. Vendor work was described as moving from support for individual adoption towards support for collective action. At this point, outcomes depend less on the vendor and more on the network. As another participant observed, “you need a strong business case for everyone in the network” (P4). Without shared alignment, progress stalls.

Taken together, these findings suggest that vendor institutional work was perceived as staged but cumulative. Early activities focus on reducing uncertainty and later activities focus on managing legitimacy, enabling use and coordinating actors. These stages are connected. Each builds on the previous one but introduces new challenges. This pattern aligns with staged models of assimilation (Cooper and Zmud, 1990; Gallivan, 2001), but extends them by showing how vendor roles shift alongside institutional pressures. Rather than acting as static enablers, vendors continuously adjust their role in response to changing organisational and environmental demands.

5. Discussion

This study set out to explain why enterprise blockchain initiatives frequently stall after adoption and how vendors contribute to and shape progression towards routinised and institutionalised use. The findings show that blockchain assimilation is not primarily a technical challenge. It is an institutional and process orientated one. Progression depends on how organisations resolve uncertainty, align practices and establish governance structures over time. The analysis makes three interrelated theoretical contributions.

5.1 Extending technology assimilation theory

Existing models show that value emerges through sustained use rather than initial adoption (Cooper and Zmud, 1990; Gallivan, 2001). However, these models focus largely on internal organisational processes and pay limited attention to external actors. Recent research has begun to recognise the importance of ecosystem influences in post adoption stages (Yu Chung Wang *et al.*, 2022; Assadi, 2025). This study extends that view by showing how vendors perceive progression as being shaped by external support that persists across stages and becomes more complex over time. Vendor accounts suggest that vendors do not simply support adoption; they may help organisations address points where progress typically stalls, particularly at transitions between stages. At the same time, vendor influence is not uniform. Their ability to shape outcomes varies depending on organisational readiness and context. This suggests that assimilation is not a linear process guided by structured stages, but a more contingent and interdependent process involving both internal and external actors. Assimilation therefore needs to be understood as a networked rather than purely organisational phenomenon.

5.2 Developing institutional theory in digital contexts

Prior work has shown that technologies become embedded when they align with cognitive, normative and coercive pressures (Scott, 2008). This study shifts attention to how such pressures are actively mediated. Vendor accounts suggest that vendors do not operate within a fixed institutional context but participate in shaping how it is interpreted. Participants described vendors as translating technological meaning, constructing legitimacy and helping stabilise practices as adoption progresses. This extends institutional work theory by highlighting how work is distributed across multiple actors rather than confined within organisations (Lawrence and Suddaby, 2006; Gegenhuber *et al.*, 2022). Importantly, institutional pressures are not static. Their relative importance shifts over time, but they do not disappear. Cognitive uncertainty persists alongside regulatory ambiguity, even in later stages. This produces a dynamic environment where vendors must simultaneously address multiple forms of pressure. Institutional work therefore emerges as cumulative and adaptive rather than sequential. This finding also reinforces recent work on digital platforms and ecosystems, where intermediaries play a central role in building legitimacy and coordinating participation (Faik and Gwee, 2022; Gegenhuber *et al.*, 2022; Palmer *et al.*, 2022). Institutionalisation in this context is not achieved within a single organisation but across a network of actors.

5.3 Conceptualising vendors as conditional institutional actors

Prior work typically portrays vendors as technical integrators (Chatterjee *et al.*, 2002; Risius and Spohrer, 2017), while more recent studies position them as institutional entrepreneurs (Greenwood *et al.*, 2017; Gegenhuber *et al.*, 2022). The findings refine both views. Vendors do not consistently act as institutional entrepreneurs. Their influence is conditional and varies across stages of assimilation, organisational contexts and levels of institutional uncertainty. Unlike internal actors, vendors operate across multiple client organisations and regulatory environments simultaneously. This exposes them to heterogeneous and often conflicting institutional pressures, distinguishing them structurally from actors typically considered in institutional entrepreneurship research. In practice, vendor influence is often incremental instead of transformative. Participants described vendors as translating regulatory expectations, standardising practices and supporting governance structures. This influence was often exercised through legitimacy building rather than direct organisational authority. As P3 explained, regulatory assurance “allowed them to go to management” and helped “bring along senior management” where projects otherwise faced hesitation. Vendor influence therefore frequently depended on translating uncertainty into actionable organisational decisions. Only in specific contexts, such as standards formation or ecosystem coordination, do they act at a broader field-level. This distinction avoids overstating vendor agency while still recognising vendors as important actors in blockchain assimilation. The concept of conditional institutional actors therefore captures the hybrid position vendors occupy. Participants also recognised clear limits to vendor agency. As P11 observed, “the vendor really needs to understand the need for in-house champions” and must also “understand the limits of what that role is and what it can be”. This reinforces the argument that vendors occupy an intermediate position between technical suppliers and institutional entrepreneurs. The term conditional institutional actor is used deliberately to distinguish vendors from both technical suppliers and institutional entrepreneurs. Technical suppliers primarily deliver and maintain technology within defined project boundaries. Institutional entrepreneurs are generally characterised by field-level agency and an explicit capacity to reshape institutional arrangements (Battilana *et al.*, 2009). Vendors in this study occupy an intermediate position. They contribute to legitimacy building, governance translation and coordination, but do so within constraints imposed by client objectives, regulatory requirements and ecosystem conditions. Their institutional influence is therefore significant but bounded. Rather than creating institutions autonomously, they help interpret, operationalise and stabilise them across stages of assimilation.

5.4 Explaining variation and limits of vendor influence

The findings also highlight variation in outcomes. Participants did not describe vendor activity as sufficient to ensure successful assimilation. Several participants emphasised that organisational and interpersonal barriers often remained more significant than technological ones. As P4 succinctly noted, “the problem’s not the technology, it’s the people”. Even where technical solutions were available, competing priorities, resistance to change and weak organisational alignment frequently constrained assimilation. Several factors shape whether progression occurs. First, strategic alignment is critical. Initiatives stall when they are not clearly linked to organisational priorities (Zhu *et al.*, 2006). Second, internal champions play an important role. Without internal support, vendor efforts have limited impact (Howell and Higgins, 1990; Gallivan, 2001). Third, institutional uncertainty remains a persistent barrier. In the absence of clear standards, vendors must define governance practices themselves, leading to variation across implementations. These findings introduce an important tension; vendor influence is necessary but not sufficient. Vendors can reduce uncertainty and support alignment, but they cannot ensure adoption or progression. Vendor efforts were also constrained by the willingness of other actors to participate. As P4 explained, “you really need a strong business case for everyone in the network”, because where the problem belongs to only one actor, “you’re not really going to get engagement”. This highlights the collective nature of blockchain assimilation and the limits of vendor influence in the absence of shared incentives. Outcomes depend on the interaction between vendor activity, organisational capability and the broader institutional environment. This highlights a key boundary condition. Vendor institutional work operates within constraints that cannot be fully controlled. Assimilation therefore remains contingent rather than guaranteed.

6. Implications for practice and enterprise information management

The findings show that blockchain assimilation is not a onetime implementation decision. It is an evolving process shaped by changing organisational requirements and institutional pressures. This has implications for how organisations, vendors, policymakers and information management functions engage with the technology. Rather than applying static strategies, actors must adapt their approach over time. The implications therefore concern how capabilities and relationships evolve, rather than what should be done at a single point.

6.1 Implications for enterprise organisations

For organisations, blockchain adoption should be managed as a staged and iterative process. Vendor selection is not a onetime decision but an ongoing alignment exercise. Early stages are characterised by uncertainty, where the key challenge is understanding relevance rather than solving technical problems. Organisations benefit from vendors who can translate blockchain into clear business terms through education, abstraction and governance support (Weick, 1995; Rogers, 2003; Yu Chung Wang *et al.*, 2022). As adoption progresses, the focus shifts to organisational alignment. Internal stakeholders should be engaged, and vendor interaction becomes more than technical delivery. It involves workshops, co-creation and internal advocacy.

At later stages, operational concerns dominate. Reliability, governance and integration become critical. Organisations may therefore evaluate vendors not only on technical capability but also on their ability to provide structure, monitoring and accountability. Blockchain systems are expected to meet the same standards as other enterprise systems. Finally, as blockchain extends across organisational boundaries, the ability to participate in ecosystems becomes central. Vendor involvement in external networks, standards bodies and partnerships influences long-term viability. Organisations must therefore assess vendors as collaborative partners rather than discrete suppliers. Overall, effective adoption depends on recognising that requirements change over time and that vendor relationships must evolve accordingly.

6.2 Implications for vendors

For vendors, the findings highlight the need to develop adaptive capabilities. Success depends less on static expertise and more on the ability to shift roles over time. In early engagement, vendors should reduce complexity and articulate value. Technical sophistication alone is insufficient (Lawrence and Suddaby, 2006). As projects progress, vendors should support integration and organisational alignment. This includes developing abstraction layers, enabling usability and working closely with internal teams. Vendors that fail to reduce complexity risk slowing adoption or creating dependency. At later stages, expectations change again. Vendors should provide governance, monitoring and operational reliability. Vendors that remain focused on early stage capabilities struggle to support routinisation. Finally, vendors may engage beyond individual client relationships. Participation in ecosystems, standards development and regulatory dialogue becomes increasingly important. This supports legitimacy and enables scaling across-organisational boundaries (Gegenhuber *et al.*, 2022; Palmer *et al.*, 2022).

6.3 Implications for policymakers

The findings highlight the role of vendors as intermediaries between regulation and implementation. Policy development often assumes that adopting organisations is the main actor. In practice, vendors interpret and operationalise regulatory requirements. Policymakers could therefore engage vendors more directly, including through sandbox initiatives and policy design processes. The findings also highlight the need for standardisation. The absence of shared standards increases reliance on vendor-specific approaches. This can lead to fragmentation and inconsistent practices. Policymakers can support institutionalisation by facilitating common standards and certification mechanisms.

6.4 Implications for enterprise information management

Blockchain adoption expands enterprise information management because data are shared and validated across networks rather than confined within organisational boundaries. Vendors shape how this data are structured and governed through APIs, validation mechanisms and monitoring tools. Enterprise information management (EIM) functions must therefore engage earlier in the adoption process. Vendor abstraction layers, particularly API-based interfaces, significantly reshape enterprise data governance architectures. By decoupling the underlying blockchain infrastructure from user facing systems, vendors shift control over data validation and access from internal IT functions to vendor-managed environments. This raises new questions around data ownership, accountability and auditability, as organisations rely on external providers to resolve how data are structured, verified and accessed across inter-organisational systems. It also raises familiar information systems sourcing concerns around dependency, control and accountability in vendor relationships (Bakos and Brynjolfsson, 1993; Lacity and Willcocks, 1998).

The findings also reinforce that blockchain stabilises, rather than resolves, data quality issues. Poor data inputs become embedded and harder to correct. This places greater emphasis on upstream data processes. Finally, monitoring and audit capabilities should be treated as part of broader governance systems. These tools must be integrated into existing control frameworks rather than managed as isolated technical features. This aligns with research emphasising the integration of digital technologies into organisational information ecosystems (Yu Chung Wang *et al.*, 2022). Table 3 summarises stage specific managerial priorities, highlighting how organisations can align vendor roles with evolving assimilation challenges.

7. Limitations and future research

This study has several limitations that shape how the findings should be interpreted. First, the analysis is based on vendor perspectives. This provides insight into how these actors

Table 3. Stage-specific managerial actions for blockchain assimilation

Assimilation pattern	Core challenge	Dominant vendor role	Managerial focus
Initiation	High uncertainty and unclear value	Educator and translator	Clarify business relevance and scope. Select vendors who simplify and frame value in non-technical terms
Adoption	Lack of organisational alignment and legitimacy	Legitimiser and validator	Build internal support. Engage senior stakeholders. Use vendor expertise to demonstrate credibility and precedent
Adaptation	Technical complexity and integration challenges	Simplifier and integrator	Prioritise usability and integration. Leverage APIs and abstraction layers while maintaining oversight of system design
Routinisation	Reliability, governance and regulatory pressure	Governor and operator	Strengthen monitoring, automation and compliance. Ensure blockchain aligns with enterprise operational standards
Infusion	Coordination across multiple actors	Orchestrator and ecosystem facilitator	Align incentives across stakeholders. Evaluate vendor ecosystem involvement and support for standards and partnerships

Source(s): Authors' own work

understand their role but introduces bias. Vendors may emphasise their contribution or underplay challenges. Given the vendor centric and cross sector sample, the findings illustrate patterns of vendor influence rather than establishing a universal or predictive model of assimilation across contexts. Future research should incorporate adopter perspectives to examine how vendor actions are received and interpreted. Second, the study relies on retrospective accounts, which limits insight into sequencing and causality. The findings should therefore be interpreted as informed reconstructions rather than precise chronological accounts. Longitudinal research would provide richer insight into how vendor roles evolve and how transitions between stages occur. Third, the sample supports theoretical development but limits systematic comparison. Differences across vendor types, sectors and contexts were observed but not fully analysed. Accordingly, industry variation should not be interpreted as comparative evidence of sectoral differences in assimilation outcomes. Future research should examine these differences more explicitly. Fourth, regulatory environments were not analysed in depth. Given their importance in later stages, comparative research across jurisdictions would provide valuable insight. Finally, future studies should examine whether similar patterns apply to other emerging technologies such as artificial intelligence.

8. Conclusion

This study examined how vendors influence enterprise blockchain assimilation beyond initial adoption. The findings show that adoption alone does not lead to sustained use because continued progression depends on resolving uncertainty, aligning organisational practices and establishing governance over time. Vendor accounts indicate that vendors can play an important role in this process. Their influence evolves from shaping understanding to enabling integration and supporting coordination across organisational boundaries. This progression should be viewed as an indicative pattern rather than a universal sequence, as organisations may revisit earlier challenges, experience stalled transitions or encounter overlapping institutional pressures. However, this influence is conditional. It depends on alignment with organisational priorities and the broader institutional environment. By combining staged assimilation and institutional theory, the study reframes blockchain adoption as a co-produced

and evolving process. It highlights that the transition from experimentation to routine use is not automatic. It requires sustained, coordinated effort across actors. Understanding vendors as conditional institutional actors clarifies how emerging technologies become embedded in enterprise systems.

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Further reading

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