# Entrepreneurial Scale-Up and Organisational Routines: A Theoretically Informed Integrative Synthesis, 1990-2025

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**Abstract**

This paper examines how organisational routines shape entrepreneurial execution and scale-up strategies in digital and platform-dominant contexts between 1990 and 2025. It addresses a persistent gap in scaling research by explaining how growth intent becomes repeatable delivery through routinised action.

The paper develops a theoretically informed conceptual and integrative synthesis. It combines a Scopus-based literature corpus with foundational scholarship on routines, capabilities, learning, coordination, replication and boundary governance. The evidence base is used to discipline the conceptual argument and to identify how different routine families become salient under changing execution conditions.

The synthesis indicates that scale-up execution depends on five routine families: coordination, replication, control and measurement, learning and search, and boundary routines. Their role changes across successive execution periods. Control and coordination routines support operating-core stabilisation in the 1990s; coordination and boundary routines become central in modular and alliance-based scaling in the

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2000s; replication and measurement routines dominate platform-oriented scale-up in the 2010s; and learning, boundary and control routines become critical under shock-prone and nonmarket selection conditions after 2020.

The analysis relies on an English-language, Scopus-indexed evidence base and on interpretive synthesis rather than direct empirical testing. The findings should therefore be read as theoretically grounded propositions for future longitudinal and cross-sectoral research.

The paper contributes a historically informed trigger-to-mechanism framework showing how the same routine family may shift from enabling to constraining scale-up as execution conditions change. It advances scaling-as-capability research by specifying the organisational mechanisms through which routines support or limit repeatable growth.

*Keywords:* Scale-up; entrepreneurial execution; organisational routines; structured historical synthesis; boundary governance; Historical periodization

*Crescita dimensionale delle imprese imprenditoriali (scale-up) e routine organizzative: una sintesi integrativa fondata su prospettive teoriche, 1990–2025*

**Sommario**

Il presente contributo analizza il ruolo delle routine organizzative nei processi di esecuzione imprenditoriale e di scale-up nei contesti digitali e dominati dalle piattaforme tra il 1990 e il 2025. Attraverso una sintesi concettuale e integrativa teoricamente fondata, basata su un corpus Scopus e su contributi fondamentali relativi a routine, capacità, apprendimento, coordinamento, replicazione e governance dei confini organizzativi, il paper esamina come l'intenzione di crescita possa trasformarsi in capacità di esecuzione ripetibile.

L'analisi individua cinque famiglie di routine – coordinamento, replicazione, controllo e misurazione, apprendimento e ricerca, routine di confine – il cui ruolo varia in funzione delle condizioni storiche di esecuzione. Il contributo propone un framework trigger-to-mechanism che mostra come le routine possano agire sia come fattori abilitanti sia come vincoli dello scale-up. In tal modo, il lavoro contribuisce alla prospettiva dello scaling-as-capability, offrendo proposizioni teoricamente fondate per future ricerche longitudinali e intersettoriali.

*Parole chiave:* Scale-up; esecuzione imprenditoriale; routine organizzative; sintesi integrativa; governance dei confini organizzativi; periodizzazione storica



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## 1. Introduction

Scale-up is often described as the 'valley of death' between invention and impact: ventures can demonstrate product–market fit yet fail when episodic entrepreneurial action must be converted into repeatable execution (Aulet, 2013; Markham *et al.*, 2010). This transition is not reducible to resources or market opportunity; it is fundamentally an organising problem – how dispersed know-how, fragile coordination, and improvisational problem-solving are translated into reliable patterns of action. Routines- recurrent patterns that connect coordination, cognition, and motivation- provide a privileged lens on that problem, explaining both stability and endogenous change in organisational action (Nelson and Winter, 1982; Feldman and Pentland, 2003).

The execution problem has grown more consequential in the 2020s as scale-up unfolds within data-intensive digital/platform ecosystems and distributed production networks, under heightened nonmarket selection and shock-prone operating environments (Gawer and Cusumano, 2014; Eggers, 2020; Polidoro, 2020). Founders, managers, investors, and policy actors therefore need a mechanism-explicit account of how execution infrastructures evolve under shifting historical constraints, rather than generic 'success factor' catalogues.

Recent integrative work has clarified the concept of scaling, conceptualising it as a dynamic capability and harmonising definitions (Jansen *et al.*, 2023; Coviello *et al.*, 2024). What remains underspecified is the mechanism-level answer: through which routines does growth intent become repeatable delivery, and how can the same routine family shift from enabling to constraining scale-up as execution contexts change? This paper addresses that gap by asking two research questions:

**RQ1:** *Which families of routines dominate successive periods of scale-up execution, and what historically situated triggers accompany their emergence?*

**RQ2:** *Through which mechanisms do these routine families contribute to scale-up?*

**Definition-Execution strategy:** the routinised configuration of managerial decision rights, coordination mechanisms, performance and learning systems, and boundary governance that translates growth intent into repeatable delivery at increasing scale. Product-market positioning, financing choices, and founder traits are explicitly excluded from the scope of this paper.



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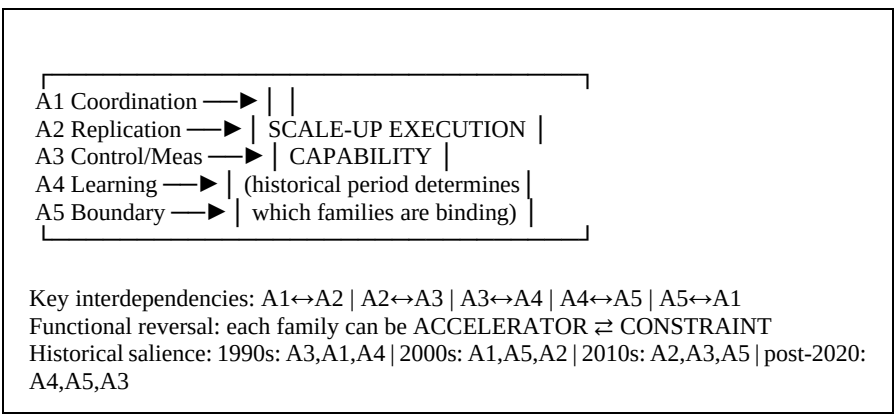
This paper makes three contributions. First, it synthesises five streams of routine scholarship around a common execution-capability argument rather than a descriptive taxonomy. Second, it provides a historically informed trigger-to-mechanism mapping that specifies when and why routine configurations shift from accelerators to brakes. Third, it derives five propositions for future empirical examination, each anchored in documented mechanisms and bounded by contextual conditions.

The paper is structured as follows. Section 2 builds the theoretical framework around a shared execution-capability argument and identifies the unresolved gap each stream contributes to. Section 3 describes the synthesis approach and evidence base. Section 4 presents the periodised findings. Section 5 discusses cross-period tensions and derives propositions. Section 6 concludes.

## 2. Theoretical Background: Routines as Execution Infrastructure

This section builds a cumulative theoretical argument in five steps. The connecting thread is an unresolved question in scaling research: if routines explain how organisations coordinate, replicate, learn, and govern boundaries, why does the same family of routines sometimes accelerate scale-up and sometimes constrain it? Each subsection identifies what an existing stream of scholarship contributes to answering this question and what it leaves underspecified. Section 2.6 synthesises the streams into the gap this paper addresses. Figure 1 illustrates the logic of the section.

*Fig. 1: Routine Families as Execution Infrastructure (Schematic)*






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## *2.1 Routines, Stability, and Endogenous Change*

Understanding why scale-up execution so often fails despite apparent organisational capability requires a theory of how routines generate both reliability and unintended drift. The evolutionary tradition establishes that routines economise on cognition and coordinate under bounded rationality (Nelson and Winter, 1982). Routine dynamics research shows that this reliability coexists with endogenous change: ostensive understandings provide continuity, yet performative enactments vary, creating micro-variations from which selection and retention reshape the routine over time (Feldman and Pentland, 2003). Large-scale evidence confirms that 'the same' routine can generate many unique patterns without external intervention (Pentland *et al.*, 2011), while generative models formalise how variation and selective retention suffice to explain routine change (Pentland *et al.*, 2012). Materiality and distributed agency add a further layer: routines are mediated by artefacts and technologies that both constrain and enable performance (D'Adderio, 2008).

What this stream leaves open for scaling research is the directional question: under what conditions does enactment generate convergence toward reliable execution rather than performative drift? The stability-change duality is foundational for scale-up- the execution process requires an operating core reliable enough to meet unit economics thresholds while preserving reconfiguration capacity. These conditions depend on the execution context and selection environment examined in the remaining subsections.

## *2.2 Learning, Search, and Adaptation-Selection Interdependence*

A second unresolved tension for scale-up concerns the relationship between routinised learning and external selection. Classical models emphasise adaptive search under limited cognition and the persistent tension between exploration and exploitation (Levinthal and March, 1981; March, 1991). Levinthal (1991) argues that adaptation and environmental selection are interrelated: ventures learn while being selected, and what is learned is shaped by the feedback environment. Deliberate learning mechanisms- experience accumulation, knowledge articulation, and codification- transform local trial-and-error into transferable capability (Zollo and Winter, 2002), reducing the risk that scaling amplifies errors faster than learning can correct them. Longitudinal models further suggest that sustained performance often requires episodic reorientation rather than incremental refinement alone (Lant and Mezias, 1992).

The gap is that whether routinised learning translates into scalable



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delivery depends on the external selection environment- ventures must secure resource access and legitimacy while surviving market and nonmarket selection pressures. What counts as adequate learning varies with the competitive and regulatory environment in which scaling unfolds, motivating the historically situated perspective in Section 4.

### *2.3 Coordination and Authority in the Management of Interdependencies*

Scaling intensifies coordination demands by expanding the division of labour and multiplying interdependencies among tasks, decisions, and units. Coordination perspectives show that authority and organisational design help discover workable alignments among technologically interdependent activities (Foss, 2001), while the knowledge-based view stresses that firms embody social knowledge of coordination that is difficult to price or contract (Kogut and Zander, 1996). Computational evidence confirms that design elements interact: hierarchies, incentives, and decision decompositions exhibit complementarities that either stabilise execution or induce failure when misaligned (Rivkin and Siggelkow, 2003). At the micro-process level, interdependent routines require ongoing 'routine work'- flexing, stretching, and improvisation- to align performances across actors and situations (Deken *et al.*, 2016), and clusters of routines can constrain change even when individual routines vary (Kremser and Schreyögg, 2016).

The key insight for scale-up is that performance depends not on 'having coordination routines' but on building compatible bundles that absorb complexity without collapsing decision velocity. Which routines complement each other and at which scale- the bundle logic- is what the literature leaves unmapped across historical contexts, and it is precisely this mapping that the trigger-to-mechanism analysis in Section 4 provides.

### *2.4 Routine Replication, Communities, and Incentives*

Replication is the mechanism through which scale-up converts a local solution into multi-site performance. Yet replication is rarely literal: it combines templates with situated adaptation, and failures typically arise from neglecting tacit components and conditions of use (Friesl and Larty, 2013). Communities within firms localise know-how and define incentive and identity structures that shape replication power, inertia, and search potential (Cohendet and Llerena, 2003). More recent work conceptualises replication as



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co-creation: crafting 'the same' routine across locations requires effortful repair and sociomaterial distribution rather than passive rollout (D'Adderio and Pollock, 2020), and replication can support innovation when it preserves a recognisable core while enabling recombination (Schmidt *et al.*, 2019).

What the replication literature does not specify is how the design of replication routines must change as execution contexts shift. The social and artefact infrastructure required to replicate a lean manufacturing template in the 1990s differs from that needed to replicate a platform onboarding playbook in the 2010s or a regulatory compliance protocol post-2020. This historically contingent dimension of replication motivates the periodised perspective in Section 4.

### *2.5 Boundary Routines: Alliances, Ecosystems, and Nonmarket Selection*

As scale-up increasingly unfolds across organisational boundaries-through partnerships, platforms, and regulated value chains- execution routines must extend beyond the firm. Interorganisational routines governing collaboration, knowledge sharing, and coordination have been shown to predict alliance performance (Zollo, Reuer and Singh, 2002), and alliance management capability can be conceptualised as a routinised second-order competence comprising coordination, learning, and transformation routines across an alliance portfolio (Schilke and Goerzen, 2010). Beyond markets, regulatory review functions as a nonmarket selection regime in which agency cognition shapes evaluation duration (Polidoro, 2020).

The literature establishes that boundary routines matter but does not specify when they become the primary constraint on scale-up rather than a supporting function. The post-2020 period provides a useful context for examining when boundary governance becomes constitutive of execution capability rather than merely contextual. This possible shift is interpreted in Section 4.4.

### *2.6 Synthesis: The Unresolved 'How' in Scaling-as-Capability*

The five streams converge on a common lacuna. Recent integrative work positions scaling as a dynamic capability comprising routines for expansion, replication, and synchronisation (Jansen *et al.*, 2023), and definitional harmonisation clarifies the distinctions among scaling, scalability, and scale-up as a developmental phase (Coviello *et al.*, 2024). What remains unspecified is the mechanism-level logic: (i) which routine families are foregrounded



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under which execution conditions; (ii) through what mechanisms they contribute to scale-up; and (iii) when and why the same family shifts from enabling to constraining. This paper addresses that triple under-specification by organising the five streams into a historically informed trigger-to-mechanism framework in which execution conditions- infrastructure, selection environment, interdependence structure- determine which routine families become binding at each period.

Read through a knowledge-management lens, these five families represent the mechanisms through which firms articulate, codify, transfer, monitor, and govern execution knowledge under changing scale-up conditions.

## 3. Research Design: A Conceptual and Integrative Synthesis with Historically Informed Periodisation

### *3.1 Methodological Approach*

This paper adopts a theoretically informed conceptual and integrative synthesis. Its purpose is not to provide a systematic review, a bibliometric study or an archival historical analysis, but to develop a mechanism-based conceptual explanation of how organisational routines contribute to entrepreneurial scale-up execution under changing contextual conditions.

The synthesis draws on two complementary sources: a Scopus-based literature corpus and a mechanism-centric set of foundational contributions on routines, capabilities, learning, coordination, replication and boundary governance. The Scopus corpus is used for descriptive transparency and topical orientation, not for statistical inference or for detecting turning points. The foundational literature is used to build the conceptual mechanism linking routine families to scale-up execution.

The paper is historically informed in a limited and specific sense. Periodisation is used as an analytical organising device to distinguish successive execution conditions, not as evidence of definitive historical ruptures. This positioning is consistent with calls for reflexivity in the use of historical framing in management and organisation studies, where period labels should be treated as interpretive choices rather than neutral containers or causal variables (Rowlinson, Hassard, and Decker, 2014; Wadhwani, Suddaby, Mordhorst, and Popp, 2018).

The resulting contribution is therefore conceptual. The paper proposes an interpretive trigger-to-mechanism framework that can be refined, challenged and tested by future longitudinal, archival or comparative empirical research.



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### 3.1.1 Periodisation Logic: Analytical Markers of Changing Execution Conditions

The paper distinguishes four broad execution periods: 1990–1999, 2000–2009, 2010–2019 and 2020–2025. These periods should not be interpreted as statistically detected breaks or as historically definitive ruptures. They are used as analytical markers that organise changes in the execution conditions under which scale-up takes place.

The first period, 1990–1999, is treated as an ideal-typical baseline for operating-core stabilisation, process discipline and basic coordination beyond founder-centric control. The second period, 2000–2009, captures the growing relevance of modularity, outsourcing and alliance-based scaling, which increased the importance of coordination and boundary routines. The third period, 2010–2019, reflects the diffusion of digital platforms, cloud infrastructures, ecosystem orchestration and measurement-based replication. The fourth period, 2020–2025, captures the heightened salience of shocks, regulatory scrutiny, resilience and nonmarket selection.

The periodisation is therefore not used to claim that routines changed abruptly at fixed calendar boundaries. Rather, it provides a structured way to compare how different routine families may become more or less salient as execution environments evolve. The framework should be read as a conceptual interpretation of temporal change, not as a definitive historical reconstruction.

## *3.2 Evidence Base and Source Selection*

The evidence base was constructed in two stages. First, a Scopus search was conducted to identify publications combining organisational routines or capabilities with entrepreneurship, scaling, scale-up, firm growth or related execution-oriented terms. The search covered the period from 1990 to 2025 and was conducted in February 2026 using TITLE-ABS-KEY fields. The initial search returned 229 records.

Second, the Scopus-based corpus was complemented by a mechanism-centric seed set of 24 foundational works on routines, learning, coordination, replication, capabilities, boundary governance and scaling-as-capability. These works correspond to the foundational contributions used in Section 2 to define the five routine families and to position scale-up as an execution capability. They provide the conceptual basis for interpreting how routine families contribute to scale-up execution.

The seed set was constructed according to three inclusion criteria. First, a



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work was included when it introduced or substantially refined one of the mechanism categories used in the paper. Second, it was included when it provided a recognised theoretical anchor for one of the five routine families. Third, it was included when it was necessary to interpret how routines operate as execution mechanisms under changing scale-up conditions. The seed set is therefore theoretical and mechanism-oriented rather than statistically representative.

The 24 foundational works are grouped as follows:

*Table 1: Mechanism-centric seed set*

| *Mechanism category* | *Foundational anchor works* |
|---|---|
| Routine stability and change | Nelson & Winter (1982); Feldman & Pentland (2003); Pentland *et al.* (2011); Pentland *et al.* (2012); D'Adderio (2008) |
| Learning and search | Levinthal & March (1981); March (1991); Levinthal (1991); Zollo & Winter (2002); Lant & Mezias (1992) |
| Coordination and interdependence | Foss (2001); Kogut & Zander (1996); Rivkin & Siggelkow (2003); Deken *et al.* (2016); Kremser & Schreyögg (2016) |
| Replication and transfer | Friesl & Larty (2013); Cohendet & Llerena (2003); D'Adderio & Pollock (2020); Schmidt *et al.* (2019) |
| Boundary governance and nonmarket selection | Zollo, Reuer & Singh (2002); Schilke & Goerzen (2010); Polidoro (2020) |
| Scaling-as-capability | Jansen *et al.* (2023); Coviello *et al.* (2024) |

*Source: Author's elaboration.*

The seed set is not treated as part of the Scopus core subset. Its role is to anchor the conceptual categories used to interpret the Scopus-based literature and to develop the trigger-to-mechanism framework. The Scopus corpus, by contrast, is used for descriptive transparency and topical orientation. Neither source is used to infer statistical trends or to detect historical turning points.

The Scopus search string was:

TITLE-ABS-KEY (routine* OR "organisational routine*" OR "routine dynamic*" OR capability OR "dynamic capability" OR coordination OR replication OR "interorganisational routine*") AND TITLE-ABS-KEY (scale-up OR scaling OR "firm growth" OR "high growth" OR entrepreneurship OR "new venture*" OR startup*) AND PUBYEAR > 1989 AND PUBYEAR < 2026.

## *3.3 Screening and Inclusion Criteria*

The 229 records retrieved from Scopus were screened at title and abstract level. A record was retained in the core subset when it met two conditions. First, it had to show a clear connection to organisational routines,



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capabilities, coordination, replication, learning, measurement or boundary governance. Second, it had to show a clear connection to scaling, scale-up, entrepreneurial growth, firm growth or execution processes.

Records were excluded when they focused only on individual-level entrepreneurship, purely technical domains, general innovation topics without organisational execution content, or growth outcomes without a meaningful connection to routines or capabilities. After this screening, 87 records were retained as the core subset.

The screening flow was as follows:

| *Screening stage* | *Records* |
|---|---|
| Initial Scopus export | 229 |
| Records excluded after title and abstract screening | 142 |
| Final core subset retained for conceptual synthesis | 87 |

The 142 excluded records were removed because they did not meet one or both of the two inclusion conditions specified above. At title and abstract level, exclusions were grouped into four substantive categories: individual-level entrepreneurship without organisational execution content; purely technical or domain-specific studies without a routine/capability mechanism; general innovation, growth or performance studies without a clear scaling-execution link; and records with insufficient relevance, ambiguous scope or no meaningful connection to the paper's routine-family framework.

Because the exclusion categories were applied during title and abstract screening as substantive relevance criteria rather than as mutually exclusive statistical bins, the figures reported above should be read as a transparent screening flow, not as a PRISMA-style systematic review procedure.

The core subset is used to support the conceptual synthesis and to provide evidence of topical relevance across the period examined. It should not be interpreted as a systematic review sample in the strict sense. The screening procedure was designed to discipline source selection and reduce arbitrariness, not to claim exhaustive coverage of the literature.

The 1990–1999 period includes only four records in the core subset. For this reason, it is treated as an ideal-typical baseline, triangulated with foundational routine and organisational learning scholarship, rather than as a robust corpus-derived finding.



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*Table 2: Evidence base and screening flow*

| *Evidence component* | *Records / works* | *Function in the synthesis* |
|---|---|---|
| Initial Scopus export | 229 | Provides the searchable literature space used for descriptive transparency and topical orientation. |
| Records excluded after title and abstract screening | 142 | Removed because they did not meet the inclusion criteria relating to organisational routines/capabilities and scaling/execution processes. |
| Scopus core subset retained | 87 | Supports the conceptual synthesis and provides evidence of topical relevance across the period examined. |
| Mechanism-centric seed set | 24 | Provides foundational theoretical anchors for the five routine families and for the scaling-as-capability argument. |
| 1990–1999 core-subset records | 4 | Used only for baseline triangulation; the period is treated as an ideal-typical baseline rather than as a robust corpus-derived finding. |

*Source: Author's elaboration.*

## *3.4 Analytical Classification and Synthesis*

The retained sources were interpreted through five routine families derived from the theoretical framework: coordination routines, replication routines, control and measurement routines, learning and search routines, and boundary routines. These categories are used as conceptual lenses for organising the synthesis, not as variables measured through a formal quantitative coding procedure.

For each source, attention was given to the routine-related mechanism most directly connected to scale-up execution. Where relevant, sources were associated with more than one routine family, since coordination, replication, learning, measurement and boundary governance often interact in practice. This interpretive classification supports the development of the trigger-to-mechanism framework presented later in the paper.

No formal inter-coder reliability statistics are reported, because the study is not designed as a systematic content analysis. The classification should therefore be read as a transparency-enhancing interpretive procedure, rather than as a fully replicable coding exercise. Future empirical research could extend this framework by applying double coding, reporting agreement statistics, and testing the salience of routine families across sectors, time periods and organisational contexts.

The synthesis was then developed by comparing how different execution conditions appear to make particular routine families more or less relevant for scale-up. The resulting framework does not claim to prove causal shifts in routine salience. Rather, it offers a theoretically grounded interpretation



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of how routines may support or constrain scale-up under different contextual conditions.

## 4. Findings: Periodised Patterns of Execution Routines (1990-2025)

This section presents an interpretive synthesis of period-specific execution conditions and routine-family salience. Period labels are ideal-typical analytical markers rather than empirically detected breaks. Table 1 summarises the evidence base and screening flow, while Table 3 provides an interpretive mapping between execution conditions, routine families and scale-up mechanisms.

### *4.1 1990–1999: From Entrepreneurial Improvisation to Disciplined Process*

*(Ideal-typical baseline; n=4 core-subset records; triangulated with foundational scholarship)* The 1990s scaling problem centres on stabilising basic process reliability as ventures grow beyond founder-centric coordination- a transition Nelson and Winter (1982) theorise as the shift from ad hoc action to recurrent patterns that encode learning and coordinate under bounded rationality. In practice, this period sees strong emphasis on quality routines, standard operating procedures, and early measurement and control: Kaplan and Norton's (1992) Balanced Scorecard becomes a canonical scalable performance system, and lean manufacturing diffuses as a discipline for variance reduction (Womack *et al.*, 1990). A concrete illustration is offered by the growth of franchise-based service chains such as McDonald's and Subway, where coordination routines and basic replication templates allowed rapid multi-site expansion while preserving operational consistency- a case where control/measurement routines (A3) and coordination routines (A1) act as growth accelerators.

As March (1991) cautions, early process discipline carries the risk of competence traps when exploitation crowds out exploration. For innovation-intensive scale-ups emerging in the late 1990s- early internet software ventures- this tension between routine stability and adaptive search becomes the central execution problem carried forward into the following period.



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### *4.2 2000–2009: Scaling through Reconfiguration, Modularity, and Alliance Routines*

The 2000s shift the execution problem from internal process stabilisation to managing interdependencies across units and partners. The internet and ERP platforms enable global modular production, redistributing coordination burdens across firm boundaries (Baldwin and Clark, 2000; Sturgeon, 2002). Authority and decision rights that once resided within a single management team must be distributed across networks of suppliers, licensees, and alliance partners- a configuration demanding both coordination routines (A1) and boundary routines (A5) as primary execution mechanisms (Foss, 2001; Kogut and Zander, 1996). Zollo, Reuer and Singh (2002) document empirically that interorganisational routines are the primary predictor of alliance performance, confirming that boundary governance is constitutive of scaling in this period.

Concrete examples include the expansion of Google's advertising ecosystem and Amazon's third-party marketplace through partner-governance and revenue-sharing routines; and the scaling of contract manufacturing networks in electronics- exemplified by the rise of Foxconn- through modular replication templates that reproduced production processes across dozens of sites (Baldwin and Clark, 2000; Sturgeon, 2002). Within the firm, reconfiguration becomes a key lever: Karim (2009) finds that business unit reorganisation relates non-linearly to innovation outcomes, with learning routines mediating the effect under structural change.

### *4.3 2010–2019: Replication Playbooks and the Rise of Scale-Up Management*

The 2010s witness the managerialisation of scale-up: playbooks, templates, and data-driven OKR systems are codified as explicit replication infrastructures in technology and service firms. Routine dynamics research provides the theoretical underpinning- routines change through enactment, and organisations can design replication while preserving adaptability (Feldman and Pentland, 2003; Pentland *et al.*, 2012). Canonical examples include the spread of Agile/Scrum frameworks as replication-and-adaptation routines in software development; the adoption of OKR systems, first at Google and subsequently across Silicon Valley, as measurement-discipline routines (A3) for aligning distributed execution; and the scaling of platform ecosystems – Uber, Airbnb, Spotify – through orchestration routines that governed complementors and enforced standards without direct ownership (Gawer and Cusumano, 2014; Jacobides *et al.*, 2018).



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Replication in this period is never simple copying. D'Adderio and Pollock (2020) document that crafting 'the same' routine across sites requires sociomaterial repair and artefact distribution. Cohendet and Llerena (2003) show that community context shapes replication power and inertia. Schmidt, Braun and Sydow (2019) demonstrate that replication can support innovation when it preserves a recognisable core while enabling recombination. Scaling success in the 2010s depends on orchestrating routine families as a configuration, not on optimising any single routine in isolation.

### *4.4 2020–2025: Regulatory Endurance, Crisis Routines, and Execution under Nonmarket Selection*

Post-2020 execution is reshaped by two converging forces: pervasive shocks – pandemic, supply disruptions, geopolitical instability – and intensified nonmarket selection through regulation, social legitimacy demands, and sustainability scrutiny. Polidoro (2020) shows that regulatory review is shaped by the cognitive structure of nonmarket selectors: greater knowledge about novel technologies can increase evaluation incongruities and lengthen review times, making routinised regulatory engagement a primary execution constraint in innovation-intensive sectors.

Concretely, COVID-19 forced healthcare delivery firms such as Teladoc and NHS digital services to rapidly scale remote consultation and triage routines, demonstrating the centrality of boundary and coordination routines under shock conditions. The GDPR compliance wave required SaaS scale-ups to institutionalise data-governance routines as a prerequisite for European market access. Berente *et al.* (2016) show that routines function as 'shock absorbers' during major system transformations, protecting the operating core. Tidhar, Hallen and Eisenhardt (2025) provide recent evidence that unit-economics discipline- a control/measurement routine (A3)- is associated with sustainable firm growth, suggesting that measurement routines may shift from growth accelerators to brakes against premature scaling depending on execution conditions.



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*Table 3: Periodisation of scale-up challenges and dominant routine families*

| *Period* | *Dominant execution problem* | *Routine families foregrounded* | *Illustrative evidence* |
|---|---|---|---|
| 1990–1999 (baseline) | Process reliability and basic coordination beyond founder-centric control | A3 Control/measurement; A1 Coordination; A4 Learning (emerging) | Kaplan & Norton (1992); Womack *et al.* (1990); Pentland & Rueter (1994); Nelson & Winter (1982); March (1991) |
| 2000–2009 | Managing modular interdependencies and scaling via partners and alliances | A1 Coordination by authority; A5 Boundary/alliance routines; A2 Replication | Baldwin & Clark (2000); Sturgeon (2002); Foss (2001); Zollo, Reuer & Singh (2002); Schilke & Goerzen (2010); Karim (2009) |
| 2010–2019 | Replicating playbooks while preserving adaptation at platform scale | A2 Replication templates; A3 Measurement discipline; A5 Ecosystem orchestration | Feldman & Pentland (2003); Pentland *et al.* (2012); D'Adderio & Pollock (2020); Gawer & Cusumano (2014); Jacobides *et al.* (2018) |
| 2020–2025 | Execution under shocks and intensified nonmarket selection | A5 Boundary/regulatory routines; A3 Measurement as brake; A4 Learning/search | Berente *et al.* (2016); Eggers (2020); Polidoro (2020); Anand *et al.* (2012); Tidhar *et al.* (2025) |

*Source: Author's elaboration.*



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*Table 4: Trigger-to-Mechanism Interpretive Mapping (RQ1)*[1]

| *Period* | *Trigger cluster* | *Execution constraint re-weighted* | *Routine families* | *Scale-up mechanism (RQ2)* | *Representative sources* |
|---|---|---|---|---|---|
| 1990–1999 | Quality/process movements; early enterprise IT; early globalisation | Stabilise operating core; coordinate under bounded rationality | A3, A1, A4 | Stabilising the operating core; synchronising interdependencies | Nelson & Winter (1982); Pentland & Rueter (1994); Kaplan & Norton (1992) |
| 2000–2009 | Modularity and outsourcing; global value chains; distributed alliances | Govern cross-firm interdependence; replicate templates across sites and partners | A1, A5, A2 | Synchronising interdependencies; multi-site replication; boundary governance | Baldwin & Clark (2000); Zollo *et al.* (2002); Karim (2009) |
| 2010–2019 | Cloud/mobile infrastructures; platform ecosystems; datafication | Scale replication with measurement discipline; govern complements and partner interdependence | A2, A3, A5 | Multi-site replication; preventing premature scaling; ecosystem governance | Gawer & Cusumano (2014); Jacobides *et al.* (2018); Pentland *et al.* (2012) |
| 2020–2025 | Systemic shocks; intensified regulation; resilience imperative | Reorient and maintain compliance; avoid premature scaling under high uncertainty | A4, A5, A3 | Enduring non-market selection; rapid reorientation; measurement as brake | Berente *et al.* (2016); Polidoro (2020); Tidhar *et al.* (2025) |

*Source: Author's elaboration.*

## *4.5 Answers to RQ1 and RQ2*

*Answer to RQ1.* The synthesis suggests that different routine families become more salient under different execution conditions. In the 1990s, coordination and control/measurement routines are foregrounded as mechanisms

[1] The table is an interpretive mapping rather than a causal test. It summarises theoretically plausible relationships between execution conditions, routine families and scale-up mechanisms, and is intended to be refined through future longitudinal, archival or comparative empirical research. Representative sources include both Scopus core-subset records and foundational anchor works. Foundational anchor works support mechanism interpretation, while core-subset records support topical relevance within the period examined. The 1990–1999 row should therefore be read as an ideal-typical baseline supported mainly by foundational routine and organisational learning scholarship and only four core-subset records.



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for stabilising process reliability beyond founder-centric orchestration. In the 2000s, reconfiguration and boundary routines become more relevant for governing modularity, outsourcing and alliance-based growth. In the 2010s, replication playbooks and measurement infrastructures become central to multi-unit and platform-oriented expansion. After 2020, regulatory-engagement, crisis-response and learning routines become more salient under heightened nonmarket selection and shock-prone conditions.

*Answer to RQ2.* The synthesis identifies five recurrent mechanisms through which routines may contribute to scale-up: stabilising the operating core; enabling multi-site replication; synchronising interdependencies; preventing premature scaling through measurement discipline; and supporting regulatory and ecosystem endurance through boundary routines.

## 5. Discussion: Toward a Historically Informed Theory of Execution Capability

The synthesis supports a theoretically delimited claim: across predominantly digital and platform-oriented contexts, scale-up execution appears to rely on a limited repertoire of routine families, but the role of those families varies with changing execution conditions. The contribution is not the routine-family taxonomy per se. Rather, the paper offers a historically informed conceptual framework for interpreting when and why routine configurations may shift from accelerators to constraints, thereby addressing the underspecification of the "how" in scaling-as-capability research (Jansen *et al.*, 2023; Coviello *et al.*, 2024).

Three cross-period tensions are particularly salient for theory development and motivate the propositions below.

### *5.1 The Measurement-Learning Tension*

Control/measurement routines that stabilise quality, cash, and unit economics both accelerate scaling and risk preventing it: the same discipline that reduces variance may crowd out exploratory learning when uncertainty remains high (Kaplan and Norton, 1992; March, 1991; Tidhar *et al.*, 2025). The OKR systems that fuelled growth at many platform firms in the 2010s became sources of execution rigidity when those firms attempted to innovate beyond their established models- a pattern consistent with March's (1991) exploitation-exploration trade-off. Managerially, this implies calibrating measurement discipline to uncertainty: high-variance environments require



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exploration buffers within the control system, while low-variance, high-scale environments reward tighter discipline.

### *5.2 The Replication-Adaptation Tension*

Replication routines are not simple copying: successful scale-up requires templating that preserves local adaptation, and transfer is co-created through artefacts and repair work (Friesl and Larty, 2013; D'Adderio and Pollock, 2020). Platform scale-ups expanding into new regulatory jurisdictions- as illustrated by the adaptation of host onboarding routines across different legal environments- must maintain templates standardised enough for consistent quality while remaining flexible enough to accommodate local constraints. The implication is that communities and incentive structures matter as much as templates for replication effectiveness.

### *5.3 The Boundary-Extension Tension*

Boundary routines increasingly reshape the nature of execution by extending coordination and learning beyond the firm and exposing growth to nonmarket selection. Alliance and ecosystem governance routines therefore become constitutive of what replication and coordination mean at scale- not ancillary to them (Zollo, Reuer and Singh, 2002; Schilke and Goerzen, 2010; Jacobides *et al.*, 2018; Polidoro, 2020). The post-2020 period makes this especially visible: scale-ups in healthcare, fintech, and climate technology face regulatory timelines that can dwarf internal execution cycles, making compliance-by-design routines a primary growth constraint rather than an administrative afterthought.

### *5.4 Propositions for Future Empirical Examination*

The following five propositions are directions for future research, derived from the cross-period tensions above. They are conjectures suitable for longitudinal or comparative examination using the routine-family framework in Appendix A, not hypotheses already prepared for falsification.

*P1- Interdependence-driven coordination:* As technical and organisational interdependence increases during growth, scale-up performance becomes contingent on coordination routines (A1) that routinise decision rights, sequencing, and cross-unit integration. This relationship is moderated



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by the degree of technological modularity in the firm's production architecture (Kogut and Zander, 1996; Foss, 2001; Jones and Schou, 2023).

*P2- Replication with social infrastructure:* The effectiveness of replication routines (A2) in accelerating expansion and reducing performance variance is strengthened when communities and incentive structures support faithful enactment with controlled local adaptation. Without social infrastructure, template-based replication reproduces drift alongside best practice (Cohendet and Llerena, 2003; Friesl and Larty, 2013; Schmidt *et al.*, 2019).

*P3- Measurement discipline and premature scaling:* Control/measurement routines (A3)- particularly unit-economics discipline and KPI cadence- reduce the likelihood of premature scaling and increase the probability of sustaining profitable growth; however, when technological uncertainty remains high, the same routines risk suppressing exploratory learning and stalling adaptation (March, 1991; Tidhar *et al.*, 2025).

*P4- Nonmarket selection and boundary routines:* In high-regulation or legitimacy-sensitive environments, boundary routines (A5)- regulatory engagement and compliance-by-design- become primary determinants of scalability, outweighing purely internal efficiency gains. This effect is stronger in sectors characterised by novelty-based regulatory review (Polidoro, 2020; Schilke and Goerzen, 2010).

*P5- Shock conditions and routine renewal:* Under pervasive shocks and major system transformations, ventures that combine shock-absorbing coordination routines with deliberate learning/search routines (A4) are more likely to renew execution capability without destabilising the operating core. Over-investment in control/measurement routines under shock conditions risks rigidity failure (Berente *et al.*, 2016; Anand *et al.*, 2012; Levinthal, 1991).

## 6. Conclusion

This paper reconceptualises scale-up as an execution capability: a routinised portfolio of coordination, replication, control, learning and boundary mechanisms that translates growth intent into repeatable delivery under changing contextual conditions. The analysis is presented as a theoretically informed conceptual and integrative synthesis. Periodisation is used as an analytical device for organising changes in execution conditions, while the trigger-to-mechanism framework is offered as an interpretive contribution to be refined by future empirical research.

Addressing RQ1, the synthesis suggests that routine-family salience varies across execution conditions. Coordination and measurement routines are



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foregrounded in the 1990s as mechanisms for operating-core stabilisation; coordination and boundary routines become more relevant in the 2000s as modularity and alliance-based scaling expand; replication and measurement routines become central in the 2010s as platform-oriented expansion intensifies; and learning/search and boundary routines become more salient after 2020 under shock-prone and nonmarket selection conditions.

Addressing RQ2, the paper identifies five mechanisms through which routines may support scale-up: stabilising reliability, enabling multi-site replication, synchronising interdependencies, disciplining unit economics and sustaining regulatory and ecosystem endurance.

Three integrative implications follow. First, routine families exhibit functional reversals: measurement and control accelerate scaling when variance reduction is the binding constraint, yet operate as brakes when exploration is required; boundary routines transform replication from copying into negotiated co-creation across sites and partners. Second, execution strategy is configurational: performance hinges on complementarities and sequencing among routine families, not their isolated presence. Third, the historical expansion of selection environments implies that scaling increasingly entails regulatory and ecosystem endurance, making boundary routines constitutive of execution capability.

The study has limitations. The evidence base privileges English-language, Scopus-indexed sources and relies on title and abstract screening for the core subset. The 1990-1999 period rests on only four core-subset records and is therefore treated as an ideal-typical baseline rather than as a robust corpus-derived finding. The proposed periodisation should be read as a conceptual scaffold, not as proof of historically definitive ruptures. Future research should test, refine or challenge the framework through longitudinal designs, archival reconstruction and process data on routine enactment, transfer and reconfiguration.

For practitioners, the framework treats scale-up governance as routine-portfolio design: clarify decision rights as interdependencies rise; invest in replication infrastructure that preserves local adaptation; institutionalise measurement discipline calibrated to uncertainty; and build boundary routines for ecosystem governance and regulatory engagement. Doing so makes ‘execution capability’ an explicit design object-one that can be built and rebalanced as historical conditions shift.



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# Appendix A. Routine Family Interpretive Scheme

This appendix provides conceptual definitions and decision rules for the five routine families. The scheme supports transparent interpretive classification and is intended primarily as a guide for future empirical replication. Scoring formulas and confidence-factor calculations are not included, consistent with the paper's positioning as a theoretically informed conceptual synthesis. Future empirical studies may operationalise this scheme through double-coding, source-to-category traceability and agreement statistics.

### *A.1 Routine Family Definitions*

*A1- Coordination Routines:* Recurrent practices managing interdependence under growth through decision rights, sequencing, bottleneck resolution, authority structures and cross-unit integration. Treat A1 as the primary interpretive category when coordination is specified as a routinised practice with a clear mechanism-to-outcome linkage, rather than through generic references to centralisation or hierarchy.

*A2- Replication Routines:* Practices enabling the transfer and reproduction of an operating model across sites, units or ventures, including templates, playbooks, training, artefacts, standardisation, mobility-based transfer and governance of the fidelity-adaptation trade-off. Treat A2 as the primary interpretive category when multi-site rollout or template transfer is the focal scaling mechanism.

*A3- Control/Measurement Routines:* Recurrent practices that make execution legible and governable, including KPI or OKR cadences, unit-economics tracking, quality assurance, stage-gate governance and budgeting cycles. Treat A3 as the primary interpretive category when performance legibility, variance reduction or prevention of premature scaling is the focal mechanism.

*A4- Learning/Search Routines:* A4- Learning/Search Routines: Recurrent practices for generating, evaluating, retaining and redirecting knowledge, including trial-and-error learning, feedback loops, aspiration adjustment, exploration-exploitation balancing and reorientation or pivot routines. Treat A4 as the primary interpretive category when adaptive reorientation or capability renewal under uncertainty is the focal mechanism.

*A5- Boundary Routines:* Practices governing the organisation's interface with external actors and institutions, including alliance governance, ecosystem orchestration, contracting, regulatory engagement and compliance-by-design. Treat A5 as the primary interpretive category when alliance, ecosystem, regulatory or legitimacy-related performance is central to the scaling outcome.



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### *A.2 Overlap Rules for Interpretive Classification*

1. A source may be associated with more than one routine family. Where one family is most directly implicated in explaining the scaling-related outcome, it should be treated as the primary interpretive category.
2. Replication and measurement: if transfer is the focal mechanism, A2 should be treated as primary; if legibility, discipline or variance reduction is focal, A3 should be treated as primary.
3. Boundary and coordination: if the outcome concerns alliance, ecosystem, regulatory or approval performance, A5 should be treated as primary; if the outcome concerns internal execution reliability under external dependence, A1 should be treated as primary.
4. Control and learning: A3 and A4 may be interpreted jointly where control routines enable learning discipline or, alternatively, suppress exploration.

### *A.3-Guidance for Future Empirical Replication*

The routine-family scheme can be operationalised in future empirical research. Such studies should apply double-coding to a defined share of the corpus, report agreement statistics and provide source-to-code traceability.

Future replications may independently classify at least 20% of the corpus or a minimum of 30 records, whichever is larger. Agreement may then be assessed through Cohen's kappa for categorical assignments and weighted kappa or ICC for ordinal assessments, where applicable.

Discrepancies should be resolved by reference to the interpretive rules in A.2 and to excerpt-level evidence. Any refinement of the rules should be recorded in a transparent change log.



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