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Mechanisms for Scaling Product Initiatives from Pilot Project to Corporate Standard Level

Garg Nitin

Senior Product Manager (Product Manager III) at Amazon Web Services, Washington, USA.

Abstract

The article explores the mechanisms that enable the successful scaling of product initiatives from pilot projects to corporate standard level. While pilot projects are widely used to validate technologies, processes, and business assumptions under controlled conditions, many fail to transition into sustained, organization-wide practices. Building on recent literature across innovation management, digital transformation, Industry 5.0, and operational governance, the article synthesizes how technical, organizational, and socio-technical mechanisms jointly shape scaling outcomes. The article uses a structured qualitative synthesis of peer-reviewed studies and documented pilot-to-scale cases, complemented by an illustrative practice-based healthcare example from the author's professional experience. The main results are the identification of a coherent set of scaling mechanisms, including pilot lines as validation infrastructures, formalized innovation governance, capability diffusion through standardized practices, data and process orchestration architectures, and iterative evaluation loops that institutionalize learning. Together, these mechanisms explain how pilots evolve from isolated experiments into repeatable, auditable, and scalable corporate standards. The article will be useful to researchers seeking an integrated theoretical view of pilot-to-scale transitions and to practitioners designing governance structures, operational models, and innovation systems that support reliable scaling under conditions of complexity, uncertainty, and organizational interdependence.

Keywords: *Pilot Projects, Scaling Mechanisms, Corporate Standardization, Innovation Management Systems, Industry 5.0.*

INTRODUCTION

A recurring difficulty in innovation management involves taking what works in a pilot and embedding it as a consistent, organization-wide standard. Pilot efforts are commonly used to evaluate new technologies, processes, or collaborative setups in a limited setting [5]. Yet many of these trials fail to scale, and their outcomes often stay tied to individuals or specific teams, rather than evolving into broadly applicable routines. This challenge has gained renewed relevance in the context of Industry 5.0, which extends prior efficiency-driven paradigms by emphasizing sustainability, human-centricity, and system resilience. Within this setting, scaling a pilot initiative is not limited to technical deployment. It requires alignment across multiple organizational layers, including infrastructure, data and process architectures, governance arrangements, and routines that balance operational stability with continued exploration [2]. Failure to coordinate these layers frequently leads to fragmentation, duplication of effort, or loss of pilot-generated knowledge during broader rollout.

In practice, organizations approach the pilot-to-standard transition through a set of partially developed and often disconnected arrangements. In many organizations, formal innovation procedures have been introduced to structure experimental efforts. Meanwhile, digital transformation initiatives often rely on dedicated governance teams or coordination units to manage implementation across internal boundaries [2]. On the technical side, investments in shared infrastructure—such as platform layers or data pipelines—aim to make pilot outcomes more broadly reusable [4]. Yet these components are often developed in isolation rather than as part of a single, coordinated system. Governance, infrastructure, and process routines tend to evolve separately, which can lead to fragmented approaches that respond to local needs but fall short of enabling sustained adoption across the organization [9]. As a result, the links between technical and organizational elements often remain underdeveloped, weakening the transition from pilot to standard.

Consequently, there remains a lack of integrative frameworks that explain how validated pilot initiatives evolve into embedded corporate standards in practice. In particular, prior work provides limited insight into how mechanisms such as process validation, uncertainty reduction, standardization,

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governance, and feedback loops combine to support scalable adoption across diverse organizational contexts. This limitation is especially visible in service-sector settings such as healthcare, where the author's professional experience suggests that pilot validation alone is insufficient unless accompanied by financial evaluation, rollout governance, and capability-building mechanisms.

The goal of this article is to address this gap by synthesizing evidence from recent peer-reviewed studies and documented pilot-to-scale cases to identify and structure the key mechanisms that enable successful scaling of product initiatives from pilot project to corporate standard level. By articulating these mechanisms and their interdependencies, the article contributes an integrated perspective on pilot-to-scale transitions that is relevant to both researchers and practitioners designing innovation systems capable of reliable scaling under conditions of complexity and uncertainty.

METHODS AND MATERIALS

This work is a synthesis of evidence from sources that examine pilot-to-scale transitions from multiple angles. Each source was reviewed for its core contributions to understanding scaling mechanisms. In addition to these studies, the discussion is selectively informed by an illustrative practice-based case from the author's professional experience in healthcare service deployment.

Alonso et al. provides a review of automation and robotics pilot lines in an Industry 5.0 context, framing pilot lines as a bridge between laboratory research and full production [1]. Arslan et al. investigates the effects of Standardized Innovation Management Systems (SIMS) on organizational innovation ambidexterity and performance [2]. Awad & Martín-Rojas present a systematic literature review examining how digital transformation (DT) contributes to organisational resilience and competitive advantage through learning and innovation [3]. Baslyman proposes a conceptual model for digital transformation from an industry perspective, based on interviews with senior practitioners [4]. Fleacă et al. explores a pilot testing process for workforce training programs aimed at enhancing "greening" practices in enterprises [5]. Khan et al. examines stakeholder interdependencies in a collaborative innovation project (an Industry 4.0 co-innovation initiative) [6].

Kreuzberger et al. provide an overview of Machine Learning Operations (MLOps), defining its principles, components, and roles as an architectural blueprint for scaling AI/ML pilot projects into production systems [7]. Kruachottikul et al. propose an "Augmented Stage-Gate" framework for taking deep-tech academic research through product development to commercialization [8]. Newrzella et al. develops a methodology for prioritizing and implementing digital twin use cases, introducing tools like Use Case Mode and Effects Analysis (UCMEA) and the "House-of-DT" (House of Digital Twin) framework [9]. Pompilio et al. examines innovation management practices in Brazilian industries using a fuzzy TOPSIS multi-criteria approach [10]. It evaluates 27 ISO 56002-based innovation practices (PR1–PR27) in small/medium (SMIs) vs. large industries (LIs), revealing a clear maturity gap: SMIs had no practices at the highest adoption level ("well-structured") whereas LIs showed at least some well-structured practices across multiple areas. Ronchel et al. documents a comprehensive program for scaling up small-scale bio-based solutions via a multi-layered support structure in six European regions [11].

A review of the sources shows that they approach the pilot-to-standard transition from different starting points, including technical infrastructure, process arrangements, and organizational or ecosystem-level considerations. When read side by side, however, these contributions reveal clear limits. Some of the sources narrow in on a single area—for example, [7] focuses on DevOps and MLOps practices, and [6] highlights coordination among stakeholders. But these elements are rarely examined together or traced beyond their immediate function. In contrast, [1] and [11] report on particular pilot cases tied to specific regional programs. The insights are substantial, though it's not always clear how far they carry beyond those original settings. The literature lacks an integrative framework that connects these diverse findings into a unified view of scaling. This article responds by synthesizing the above material into a discussion of mechanisms that collectively enable pilot initiatives to become embedded corporate standards. By tracing recurring patterns across varied domains – manufacturing, digital platforms, workforce development, AI/ML deployment, and bio-innovation – the discussion outlines how standardization, governance, feedback systems, and capability-building operate together in support of scale-up.

RESULTS AND DISCUSSION

A recurring theme across the sources is the pivotal role of standardization – of processes, interfaces, and management systems – in enabling scale. Formal standards provide a scaffold that transforms the one-off success of a pilot into a repeatable model for the entire organization. For instance, implementing a standardized innovation management system (SIMS) establishes common processes and nomenclature for innovation activities. Arslan et al. [2], drawing on empirical comparisons, found that firms using ISO 56002-aligned innovation systems performed more effectively on measures of ambidexterity and innovation output than those lacking formal structures. When a pilot leads to something novel—whether a process or product—a company operating under a SIMS framework is often in a better position to absorb it into routine operations. At the same time, the structure leaves room for further experimentation, which makes sustained scaling more likely. Standardization thus acts as a scaling mechanism by ensuring that the pilot's outcomes are not ad-hoc or person-dependent but are codified into the organization's routines and standards. This notion aligns with Pompilio et al.'s findings [10] that large firms (which presumably have more structured systems) more frequently achieve "well-structured" practice adoption (the highest maturity level) across innovation activities than smaller firms. Clearly, establishing standard processes – whether through international standards like ISO 56002 or internal corporate guidelines – provides a stable backbone on which pilot innovations can be grafted company-wide. Figure 1 synthesizes the results by positioning pilot-derived mechanisms according to two critical dimensions: the degree of standardization and their potential for reuse across the organization.

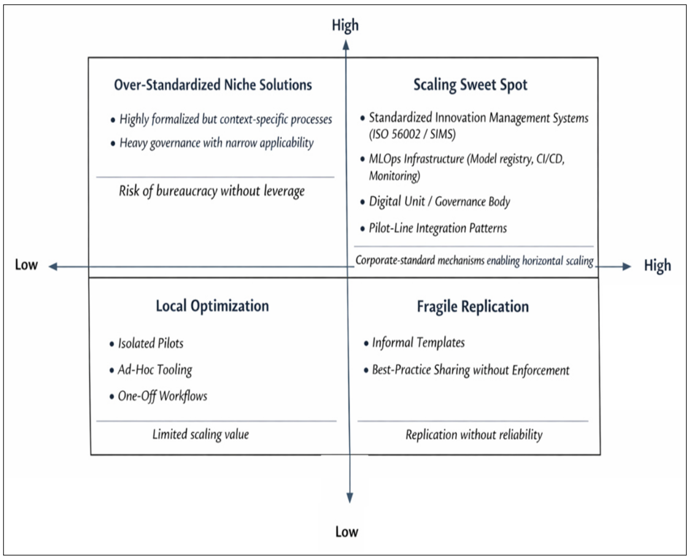

Figure 1. Scaling leverage matrix positioning pilot-derived mechanisms by standardization depth and organizational reuse potential by the author

The lower-left quadrant in Figure 1 represents pilot implementations that remain isolated—characterized by context-specific workarounds, non-standard tools, and workflows that deliver value locally but offer limited potential for transfer or replication. When such efforts are reused without sufficient structure, they shift into the adjacent quadrant: "Fragile Replication." Here, informal templates and loosely shared practices may spread, but the absence of formal governance often results in inconsistency and reduced reliability. The upper-left quadrant, by contrast, reflects a different challenge: standardization applied too narrowly. When processes are formalized around highly specific conditions, they often become too inflexible to generalize across departments or use cases. In contrast, the upper-right quadrant—identified as the "Scaling Sweet Spot"—refers to configurations that manage to align reuse with structured governance. Examples include innovation frameworks based on ISO 56002, MLOps setups designed for modular deployment, governance structures with cross-pilot oversight functions, and integration patterns developed through pilot-line repetition. These allow scaling without re-engineering each case from scratch. Such mechanisms provide a structured basis for horizontal scaling and the institutionalization of validated innovations as corporate standards.

Technical standardization is equally important. Alonso et al. [1] illustrate this through the GAMHE 5.0 pilot line, where each workstation node "speaks" its native industrial protocol (OPC DA, EtherCAT, etc.) but interfaces with a unified MQTT message bus. This protocol-bridging design is a concrete example of converting heterogeneity into a uniform interface: it allowed legacy machines and new robotic cells to coexist, with the MQTT-based middleware serving as a candidate corporate standard for factory-floor communications going forward. By standardizing the communication layer in the pilot, the company created a template that can scale horizontally to other lines or plants without reinventing integration for each machine. Similarly, in the digital domain, Kreuzberger et al. [7] emphasize version control, containerization, and modular architecture as means to standardize how machine learning models are developed and deployed. Their MLOps principles P1–P4 (version everything, automate CI/CD, test, monitor) ensure that a model that works in a pilot environment can be reliably reproduced and governed under the same rules in production. The introduction of components like a model registry or feature store as part of an enterprise ML architecture is essentially creating standard infrastructure; once in place, any new AI pilot can plug into this infrastructure, accelerating its path to a scalable product [7]. The broader point is that scaling is accelerated by early investments in standardization – whether managerial (process standards, playbooks) or technical (common platforms, integration standards). Rather than stifling innovation, these standards reduce friction when expanding an innovation's footprint.

Standardization also links to governance structures. Baslyman [4] advocates for establishing a permanent digital unit before scaling digital transformation initiatives. This echoes the idea that companies should not rely on ad-hoc project teams alone to propagate a pilot; instead, a dedicated body sets standards, aligns pilots with the overarching digital strategy, and manages the transition into the operational model. By separating vision and strategy (the "what" and "why" of innovation) from execution details (the "how"), the digital unit helps maintain consistency and alignment as multiple pilots evolve into a standardized program [4]. Such governance ensures, for example, that two independent pilot projects in different departments don't implement conflicting solutions to the same problem, but rather leverage a coherent technology stack and contribute to a unified strategic goal. A comparable pattern can be observed in the author's healthcare case, where committee-based review and executive approval functioned as governance mechanisms that translated a validated clinical pilot into a controlled multi-clinic rollout. In summary, standardization – in technology protocols, in innovation processes, and in governance – emerges as a foundational mechanism that underpins successful scaling. It creates an organizational memory and infrastructure so that pilot learnings are preserved and replicated, rather than lost or siloed. Figure 2 illustrates how successful pilot initiatives are translated into repeatable corporate standards through multi-layer standardization.

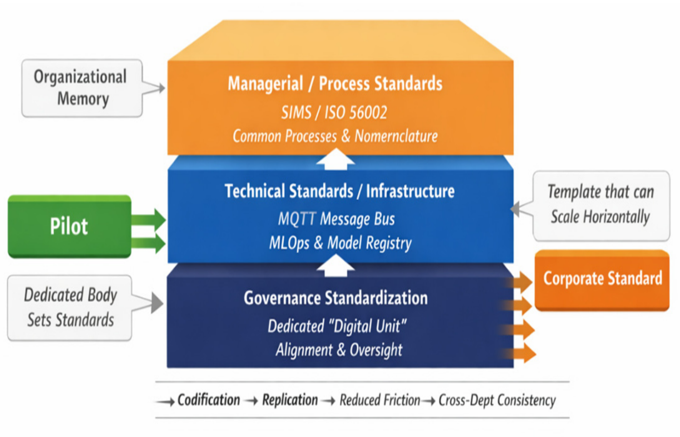

Figure 2. Standardization stack linking pilot outcomes to repeatable corporate standards (the author's illustration)

On the left in Figure 2, pilots tend to produce small-scale workarounds and bits of tacit knowledge. Some of this eventually gets written down and reused in other settings. The stack breaks this out into three overlapping areas. One has to do with how teams manage process—for instance, shared naming conventions or templates that help with routine decisions. A second area is technical: message formats, deployment flows like MLOps, component libraries. These lower the effort needed to repeat or adapt earlier work. Finally, governance is represented by coordinating roles or bodies that align priorities across pilots and prevent fragmentation as scaling proceeds. Arrows across the stack show how codified practices are replicated across units, progressively reducing coordination friction and enabling cross-department consistency. The callouts ("organizational memory," "template that can scale horizontally," and "dedicated body sets standards") emphasize that scaling is not driven by technology alone, but by the interaction of process discipline, infrastructural reuse, and formal governance that together convert isolated pilots into organization-wide standards.

Another critical mechanism for scaling is the use of iterative validation processes and feedback loops to progressively reduce uncertainty. By their nature, pilot projects deal with unproven ideas, and scaling them up involves risk. Effective organizations therefore implement stages or cycles where feedback is collected, lessons are learned, and adjustments are made before full rollout. This principle is evident in the Augmented Stage-Gate model proposed by Kruachottikul et al. [8]. In that framework, each of the six stages (from ideation to scale-up) is followed by a gate where a committee evaluates the pilot's outcomes against predefined criteria, including both technical viability and business readiness. Crucially, embedded in the early stages is a build–measure–learn cycle – essentially a validated learning feedback loop drawn from lean startup methodology. By the time a pilot reaches the later gates (e.g., "Go to commercial launch"), much of the uncertainty has been wrung out through successive rounds of prototyping, user testing, and market feedback. This gated feedback mechanism ensures that only pilots that have demonstrated evidence of success (or the ability to adapt from failure) are scaled. It protects the organization from committing large resources to unproven concepts and fosters a culture of learning where negative results in a pilot can lead to constructive pivots, not just project cancellation. Figure 3 depicts an augmented Stage-Gate process designed to reduce uncertainty as product initiatives progress from early ideation to scale-up.

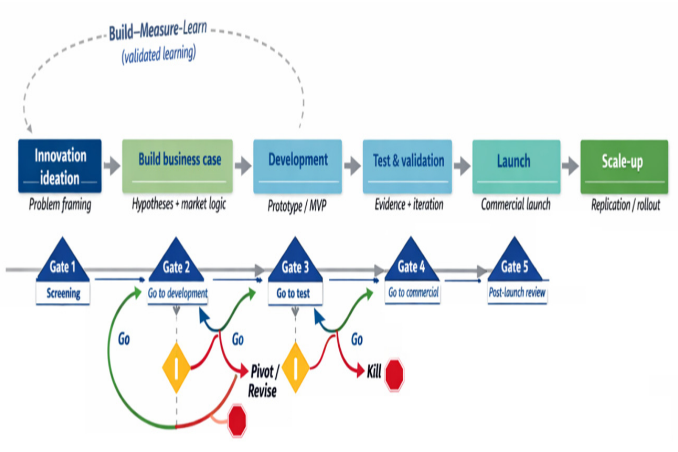

Figure 3. The author's illustration of Augmented Stage-Gate as an uncertainty-reduction mechanism

The upper row in Figure 3 shows a six-stage development pipeline—from innovation ideation and business case formulation to development, testing, launch, and eventual scale-up—while the lower row introduces five decision gates that punctuate this progression. In the early stages, a build–measure–learn feedback loop enables validated learning through iterative hypothesis testing, prototyping, and evidence generation before major resource commitments are made. At each gate, a committee evaluates both technical viability and business readiness, supported by dual technology readiness (TRL) and investment readiness (IRL) assessments. Gate outcomes explicitly allow for three paths: projects may proceed ("Go"), be redirected through constructive pivots or revisions, or be terminated ("Kill") if evidence does not support continuation. Together, the staged structure and feedback loops illustrate how systematic evaluation and learning mechanisms prevent premature scaling while enabling informed progression toward commercialization and replication

Continuous feedback loops are not limited to stage-gate processes; they are equally vital in post-deployment scaling. In the MLOps context, Kreuzberger et al. highlight that deploying an AI model is not the end – the model's performance in production must be continuously monitored (Principle P8) and fed back to the development cycle for updates (Principle P9). For example, if an ML pilot is turned into a live service, data from real users can reveal drift or new patterns; a feedback loop allows the team to retrain or adjust the model, thereby institutionalizing improvement. This loop effectively reduces uncertainty over time, as the product becomes more robust with each iteration. In a scaled environment, such mechanisms are formalized: dashboards trigger alerts when performance deviates beyond thresholds, and governance policies (Principle P6 "Govern") specify actions (e.g., rollback or model update). The presence of these feedback and control mechanisms differentiates a pilot solution (which might degrade without oversight) from a true corporate standard that remains reliable under changing conditions.

Pilot lines in manufacturing also demonstrate iterative learning in action. The GAMHE 5.0 pilot line [1] was explicitly used to experiment with incremental integration of new components – adding an autonomous mobile robot here, a machine vision system there – to observe system behavior and fine-tune the workflow. Each addition provided feedback on system flexibility and identified any interoperability issues. Over a series of case studies on that line, Alonso et al. were able to demonstrate flexibility and adaptability as key attributes, essentially proving that the line could accommodate change without failure. This "reconfigurability sandbox" approach is a feedback-driven scaling mechanism: the pilot line becomes a microcosm for the larger production system, where changes can be tested and their effects observed in a contained environment. By the time the configuration is standardized and rolled out to full production, the uncertainties related to integration have been substantially mitigated. The feedback loop here is experimental – try a new configuration, measure outcomes (cycle time, error rates, operator feedback), and incorporate that knowledge into the next design iteration. Thus, from software to hardware and processes to people, feedback loops convert pilot experiences into knowledge that informs standard practices.

In addition to internal feedback loops, external stakeholder feedback plays a role in scaling decisions. Ronchel et al. [11] employed a broad survey of regional stakeholders to identify priority needs and interests (such as infrastructure logistics being a top concern for bio-based scale-ups). By quantifying which issues stakeholders rated as most critical, the program could focus its support and resources on those areas first. This is effectively an outside-in feedback mechanism: rather than the pilot team internally guessing what needs attention to scale, the broader ecosystem "feeds back" its pain points and expectations. Tools like Newrzella's UCMEA [9] formalize this process by scoring stakeholder needs and satisfaction to compute an Opportunity Score for each prospective use case. A high Opportunity Score indicates a large gap (important need, low current satisfaction), guiding the organization to invest in pilots that address that gap. In scaling terms, this means the company is listening to where the impact will be greatest and using data to reduce uncertainty about market or user acceptance. By the time such a pilot is scaled, there is already evidence that it addresses a validated need, thereby reducing the risk of scaling something misaligned with stakeholder priorities.

In summary, iterative validation mechanisms – whether stage-gates, continuous monitoring, experimental sandboxes, or stakeholder-driven scoring – are indispensable for de-risking the transition from pilot to full-scale standard. Feedback mechanisms give teams space to test, adjust, and draw conclusions—often in ways that reduce uncertainty more reliably than front-loaded planning ever could. Beyond improving the pilot itself, this process tends to increase internal buy-in, since teams feel more confident scaling something they've seen evolve in practice. Organizations that treat feedback as part of the system—not just a post-mortem—are more likely to build innovations that survive beyond the initial trial.

A complementary illustration from the author's professional experience in healthcare service deployment further clarifies how iterative validation, governance review, and capability-building can interact during the transition from pilot initiative to organization-wide standard. In one multi-clinic vascular care organization, radiofrequency ablation (RFA) was evaluated as a new treatment modality for chronic venous insufficiency in parallel with the organization's established use of endovenous laser ablation (ELA). The pilot phase was coordinated with a medical evaluation committee, which reviewed clinical evidence and oversaw approximately one hundred procedures across several clinics over a three-to-four-month period in order to assess patient outcomes and procedural performance. In parallel, reimbursement patterns, supply costs, and vendor quotations were reviewed to estimate the financial implications of broader adoption. After favorable clinical and economic results had been confirmed, the initiative proceeded to executive and board review, followed by a structured rollout plan that specified KPIs, physician training requirements, and risk-mitigation measures. Particular attention was directed to portfolio substitution risk, including the possibility that increased RFA volumes could influence pricing tiers for existing ELA supplies. This issue was addressed through supplier negotiation, while adoption risk was reduced through mandatory in-clinic physician training incorporated into the vendor agreement. During the first year, roughly half of eligible procedures shifted to RFA, generating significant incremental operating profit while maintaining patient outcome standards. As a practice-based case, the example illustrates a broader pattern: scaling depended not only on pilot success but also on the combination of evidence generation, staged governance review, operational preparation, and capability development.

While technology and process get much attention in scaling, human and organizational capabilities are equally crucial mechanisms. Scaling an initiative often falters not because the idea is flawed, but because the organization is not ready – lacking the skills, mindsets, or structures to support the innovation on a large scale. Thus, a pilot-to-standard playbook must include deliberate capability building and cultural alignment.

The importance of workforce development is evident in Fleacă et al.'s pilot training program for greening practices [5]. They discovered that even if top management is committed to a green initiative, the employees' skill gaps (for example in digital eco-innovation or sustainable thinking) can impede implementation. By using standardized competency frameworks (like GreenComp for sustainability skills) and assessing employees against these, the pilot identified concrete learning objectives (e.g., improving "digital problem solving" which had the lowest baseline score). The training intervention, delivered in a structured 30-hour program, significantly raised these competencies, after which the new practices were far more likely to be adopted in daily operations [5]. The mechanism here is institutional learning: the pilot was not only a test of a new practice but also a vehicle to train trainers or create internal champions who could propagate the practice. In scaling, the firm extended the training curriculum as a standard program for other departments, thus embedding the new capabilities organization-wide. This case exemplifies how treating a pilot as a learning platform – for both the organization and individuals – enhances scaling prospects. It also underscores the feedback principle: measure capability gaps, address them in the pilot, and use the results to refine the training before scaling it up, thereby ensuring that human capacity grows in tandem with technical deployment. Similar capability diffusion can be seen in the physician training arrangements described in the author's healthcare case.

Closely related is the concept of organisational ambidexterity from [2], which has a human and structural dimension. To scale an innovation, an organization's people need to both exploit the new system efficiently and explore further improvements or next-generation ideas. Arslan et al.'s results [2] can be interpreted as a call to invest in systems that encourage learning and flexibility. This includes leadership that promotes an innovation culture (one of the ISO practices, PR4, is fostering a culture where creativity coexists with daily operations) and structures that enable cross-functional collaboration (e.g., PR7 and PR24 emphasize defining clear innovation roles and ensuring communication flows). When scaling a pilot, having multidisciplinary teams (as seen in [7]'s enumeration of roles from business stakeholder to ML engineer) and communities of practice (as in [11]'s regional and inter-regional networks) can facilitate knowledge transfer and problem-solving. Essentially, scaling is a team sport: a diverse set of competencies and a shared language (terminology and standards) are needed so that the innovation does not remain confined to its original team.

Stakeholder management also falls under human factors. As Khan et al. [6] articulate, when a pilot project scales, the web of stakeholders often expands – from a tight-knit R&D trio to multiple departments, external partners, end-users, and possibly regulators. The study of an Industry 4.0 collaborative project revealed that where interdependencies were actively acknowledged and managed, participants saw benefits like efficient resource use and improved information sharing; but where they were neglected, issues like delays and confusion arose. One concrete mechanism from [6] is the use of an actor dependency model (adapted from an approach by Yu & Mylopoulos) to map out who depends on whom for goals, tasks, and resources. By surveying participants, Khan et al. could identify, for example, that those with prior collaboration experience perceived significantly higher goal dependency (mean 3.65 vs 3.00, $p = 0.045$) – meaning experienced stakeholders recognized how aligning goals was key to success. For a scaling initiative, this suggests implementing dependency mapping workshops or interdependency checklists during the planning phase, ensuring that as the pilot is rolled out, the organization proactively coordinates joint goals, schedules, and resource allocations across all affected units. It is a shift from a naive "siloed pilot" mindset to a system-level thinking mindset, where scaling is understood as a change that touches many parts of the organization. In large-scale programs like Ronchel et al.'s bio-based innovation scale-up [11], this is taken further by establishing governance platforms at the regional level to continuously facilitate stakeholder interaction and co-creation (in their case, bringing together farmers, companies, authorities to support bio-innovations). The creation of a Community of Practice extending beyond the initial pilots ensured that learnings and best practices were shared widely, effectively building a collective capability that outlives any single project.

Finally, scaling mechanisms should incorporate incentives and recognition to align human motivation. Although not explicitly covered by the provided sources, it is implied in several. For example, Pompilio et al. [10] mention measuring innovation performance (PR15) and aligning innovation initiatives with stakeholder needs (PR9) – these practices often involve setting KPIs and rewarding teams for meeting them. Ronchel et al. [11] tracked outcomes like new partnerships and market access achieved by pilot innovators; such metrics can be tied to internal incentives (e.g., business units that successfully scale a pilot get budget increases or public recognition). Ensuring that the people responsible for scaling feel ownership and see clear benefits is a soft mechanism that can greatly influence success. The organisational learning findings of Awad & Martín-Rojas [3] reinforce this: companies that nurture a learning-oriented culture (where taking calculated risks in pilots, sharing knowledge, and adapting to feedback are encouraged) become more resilient and better at scaling innovations in the long run. In practice, this could translate to creating safe spaces for experimentation, celebrating pilot successes (and thoughtful failures), and investing in training programs that equip employees with new skills required by the innovation.

In sum, scaling does not happen by technology alone – people and organisational capacity are at the heart of the transition. Mechanisms like structured training, leadership-driven culture, stakeholder interdependency management, and incentive alignment form the glue that holds the technical pieces together. Without these, even a brilliant pilot may never gain traction as a corporate standard.

The complexity of scaling often necessitates multi-layered orchestration, where interventions at different levels (team, organizational, industry ecosystem) are coordinated. Ronchel et al.'s study [11] provides a vivid illustration: to scale bio-based solutions, they simultaneously engaged at the micro level (mentoring individual innovators through the ISP), the meso level (regional platforms and training sessions to build local ecosystems), and the macro level (a transnational Community of Practice to diffuse knowledge). Each layer had its role: the Innovation Support Program gave bespoke guidance and resources to each pilot (e.g., help with regulatory approvals or business planning), which is a case-by-case acceleration mechanism ensuring that each innovation's specific barriers to scale were addressed. Meanwhile, the regional platforms tackled systemic issues like infrastructure and policy lobbying (for instance, connecting biomass suppliers with processing facilities), creating a favorable environment for any bio-based innovation to scale in that region. The training program and community built shared capacity and disseminated success stories, increasing the likelihood of adoption beyond the initial pilots. The author's healthcare case offers a compact organizational analogue: clinical evaluation, executive approval, contracting adjustments, and clinic-level training had to be synchronized across multiple layers of the organization. This comprehensive orchestration ensured that scaling was not left to chance or the efforts of a lone project team; instead, multiple coordinated actions smoothed the path.

Corporate environments can mirror this layered approach. Within a company, one can imagine a center of excellence (CoE) playing a similar role to the regional platform in [11], i.e., providing governance, templates, and perhaps a technology infrastructure for scaling innovation projects. Individual project management offices (PMOs) for each pilot could act like mini-ISPs, tailoring support to the needs of that project (e.g., connecting a pilot team to marketing experts or external partners when needed). At the top, an executive steering committee ensures alignment with corporate strategy and allocation of resources across pilots – analogous to the Community of Practice ensuring cross-region alignment in [11]. This multi-tier support addresses a key risk: that promising pilots fail to scale due to gaps in support at critical transition points (for example, a technical team finishes a pilot but has no channel to hand it over to operations, or a pilot needs funding to bridge the valley between prototype and product). By establishing formal mechanisms at each layer, the organization effectively institutionalizes the scale-up process.

Another aspect of orchestration is prioritization and sequencing of multiple initiatives. Rarely does a company have just one pilot; often there is a portfolio, and trying to scale all simultaneously can strain resources and attention. Here, methodologies like the one by Newrzella et al. [9] are invaluable. Their data-driven scoring of use cases offers a rational basis for deciding which pilot (or which features of a pilot) to scale first. For example, a use case with a very high Opportunity Score but low implementation effort might be fast-tracked to become a corporate standard, while another that is valuable but requires significant new infrastructure might be scheduled for a later phase (or bundled into a larger platform upgrade). By quantifying Scaling Potential vs. Effort for enabling technologies, management can orchestrate investments such that fundamental enablers (those with high reuse across use cases) are built early, creating a foundation for subsequent pilots to plug into. This is akin to building out a highway system before expecting a fleet of new model cars to travel efficiently – an orchestrated sequencing ensures that when individual pilots scale up, they benefit from an existing "infrastructure" (be it physical, digital, or procedural).

The concept of feedback orchestration also emerges when multiple scaled units are involved. Once several pilots have become standards in different parts of an organization, there is a need to coordinate feedback and improvements across them. For instance, Kreuzberger et al. [7] highlight collaboration and governance principles (P5 and P6) that ensure all roles are engaged and policies are followed. If one business unit discovers a better practice during scale-up, a mechanism should exist (e.g., regular cross-unit innovation forums or an internal knowledge repository) to propagate that insight to other units adopting similar innovations. This is essentially creating an internal community of practice, resonating with [11]'s external one, to keep the standards evolving and preventing silos of innovation. In regulated industries, orchestration might also involve aligning with external standards bodies or consortia so that corporate standards keep up with industry-wide changes (ensuring, for example, that a scaled solution remains compliant with new regulations or can interoperate with other companies' systems).

Finally, orchestration must consider the balance of exploration and exploitation at a portfolio level. A scaled innovation becomes part of the exploitation engine – it is the new normal. Yet competitive advantage often demands that scaling one innovation does not mean stopping all others. The ambidexterity notion [2] implies a top-level orchestration where some units or teams continue pioneering new pilots (exploration) even as others focus on exploiting the last successful pilot. Ensuring these two modes do not conflict – and indeed that they inform each other (explorers feed new ideas to exploiters, exploiters feed requirements and improvement ideas to explorers) – is a strategic orchestration challenge. It can be addressed by structural separation with bridging mechanisms: for example, having a dedicated R&D or innovation lab that works closely with operational units through liaisons or rotational programs. In Ronchel et al's program, this was mirrored by having both innovation developers (the pilot innovators) and more established industry players in the same platform, learning from each other's perspectives [11]. Arslan et al. [2] provide the reassuring evidence that organizations can indeed achieve this dual capacity when they put formal structures in place to support it.

In conclusion, scaling a pilot to a corporate standard is a multifaceted endeavor that benefits from orchestrated support at multiple levels. Companies that deliberately set up these layers – and manage the interplay between different initiatives and stakeholders – can dramatically improve their scaling success rate. The mechanisms discussed (support programs, centers of excellence, prioritization frameworks, communities of practice, and balanced exploration-exploitation governance) collectively ensure that scaling is planned and guided, not left to heroic efforts or luck.

CONCLUSION

Moving a product initiative from a pilot phase to a company-wide standard requires the coordinated alignment of infrastructure, governance arrangements, and internal capability development. Successful scale-up is consistently associated with the institutionalization of pilot outcomes, including the codification of workflows, the formalization of integration routines, and the establishment of durable feedback mechanisms. Pilot settings are valuable for testing and reducing uncertainty, but their outcomes rarely persist unless translated into structured innovation systems, operational procedures, and organizational habits. In this shift, ambidexterity becomes critical: organizations must integrate proven solutions at scale while also keeping space for ongoing experimentation and refinement.

Viewing scaling as its own stage in the innovation process—with design choices specific to that shift—can clarify how organizations move beyond the pilot phase. In cases where this transition succeeds, firms often begin by establishing technical integration patterns, followed by governance mechanisms that remain in place after the trial ends. Deployment efforts are often accompanied by internal capability-building, including structured training and the use of shared practices. Alongside these, evaluation and monitoring tools can help steady decision-making during scale-up, reducing the need for informal workarounds or subjective calls.

The main recommendation for future investigation is to explore the role of digital platforms and data analytics in managing scaling processes. The emergence of tools for portfolio management, AI-driven decision support and real-time collaboration could substantially assist orchestration efforts. Moreover, research could delve into the cultural and leadership aspects exploring what leadership styles or incentive systems encourage ambidexterity and risk-taking in pilots, yet maintain accountability and standardization during scale-up.

Overall, the transition from pilot to corporate standard is best understood as the transformation of localized experimentation into organizational capability. Rather than relying on abstract enablers or barriers, the analysis highlights how specific mechanisms—spanning infrastructure, governance, and learning—must be deliberately configured to support reuse, reliability, and institutional memory. While not exhaustive, these patterns provide a grounded basis for designing scale-up pathways that are resilient to organizational complexity and operational drift.

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