

INNOVATION CAPABILITY AND ADAPTIVE COMPETITIVENESS OF MSMEs: AN INTEGRATIVE FRAMEWORK FOR SUSTAINABLE BUSINESS GROWTH

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Abstract

Background: MSMEs face persistent pressure to adapt products, processes, market channels, and organizational routines under resource constraints. Innovation capability offers a useful lens for explaining why some enterprises convert limited resources and external knowledge into sustained adaptation while others remain vulnerable to environmental change.

Aims: This article develops an integrative conceptual framework linking innovation capability, absorptive capacity, dynamic capabilities, organizational learning, networks, and adaptive competitiveness in MSMEs.

Research Method: The paper uses an integrative conceptual review of established literature published before the July 2024 issue placement. It does not claim primary survey, interview, experimental, or statistical data.

Results and Conclusion: The synthesis identifies six mutually reinforcing capabilities: opportunity sensing, knowledge acquisition and assimilation, resource recombination, experimentation, commercialization, and learning-based reconfiguration. Innovation strengthens adaptive competitiveness when MSMEs connect internal routines with customers, suppliers, universities, communities, and other ecosystem actors while maintaining disciplined evaluation of cost and value.

Contribution: The article proposes an MSME Innovation Capability Cycle, practical capability indicators, and research propositions that can guide future empirical studies and enterprise-development programs.

Keywords: Innovation Capability; MSMEs; Dynamic Capabilities; Absorptive Capacity; Adaptive Competitiveness

INTRODUCTION

Micro, small, and medium enterprises contribute to employment, local value creation, and entrepreneurial activity, yet their limited financial, managerial, and technological resources can make adaptation difficult. Competitive pressure does not arise only from large firms. Changes in customer expectations, digital channels, input costs, regulation, supply conditions, and business models can rapidly alter the viability of established routines.

Innovation is therefore important, but it should not be reduced to high-technology research and development. For MSMEs, innovation can include product modification, improved packaging, new service arrangements, digital ordering, process redesign, new supplier relationships, market repositioning, or changes in revenue models. The economic significance of an innovation depends on whether it creates value and improves the firm's ability to respond to change.

The resource-based view explains how valuable, rare, difficult-to-imitate, and organizationally embedded resources can support sustained advantage (Barney, 1991). However, in changing environments, possession of resources is insufficient. Teece et al. (1997) emphasize dynamic capabilities: the capacity to integrate, build, and reconfigure competences. Teece (2007) further organizes these processes around sensing, seizing, and transforming.

Absorptive capacity complements this perspective by explaining how firms recognize, assimilate, transform, and exploit external knowledge. Cohen and Levinthal (1990) established the foundational idea, while Zahra and George (2002) reconceptualized absorptive capacity as a dynamic capability. For MSMEs, external knowledge is particularly important because internal specialist resources are limited.

Organizational learning provides another mechanism. Innovation depends on experimentation, feedback, interpretation, and retention of useful knowledge. March (1991) distinguishes exploration of new possibilities from exploitation of existing knowledge. MSMEs need both: excessive

exploitation can create rigidity, while excessive exploration can consume scarce resources without producing returns.

Networks and ecosystems expand the knowledge and resource base available to small firms. Granovetter (1985) highlights the embeddedness of economic action in social relations. Spigel (2017) and Stam (2015) show that entrepreneurship is shaped by systemic and relational conditions. Customers, suppliers, universities, associations, financial institutions, and community organizations can become sources of information, capabilities, and opportunities.

This article develops an integrative framework for understanding how innovation capability contributes to adaptive competitiveness in MSMEs. It identifies six connected capabilities: opportunity sensing, knowledge acquisition and assimilation, resource recombination, experimentation, commercialization, and learning-based reconfiguration.

RESEARCH METHOD

This article uses an integrative conceptual review. The purpose is to connect theoretical perspectives that explain different parts of the MSME innovation process, including the resource-based view, dynamic capabilities, absorptive capacity, organizational learning, open innovation, entrepreneurial orientation, networks, and entrepreneurial ecosystems.

References were selected for conceptual relevance, scholarly traceability, and publication before the July 2024 issue placement. The manuscript does not claim a systematic-review sample, database search count, survey respondents, interview participants, experiments, or statistical estimates.

The analytical process involved four steps. First, core innovation-capability constructs were identified. Second, the constructs were mapped to stages of MSME adaptation. Third, enabling conditions and risks were examined. Fourth, the relationships were synthesized into an Innovation Capability Cycle and a set of propositions for future empirical testing.

The framework should be interpreted as conceptual rather than causal evidence. Future studies can operationalize the proposed capabilities and test their relationships with innovation outcomes, resilience, productivity, growth, or competitiveness.

RESULTS AND DISCUSSION

OPPORTUNITY SENSING AND PROBLEM RECOGNITION

Innovation begins with attention to change. Opportunity sensing involves recognizing unmet customer needs, process inefficiencies, emerging technologies, regulatory changes, competitor moves, and new combinations of resources. Teece (2007) treats sensing as a foundational dynamic capability because firms cannot respond effectively to changes they fail to notice.

MSMEs can develop sensing routines without sophisticated research departments. Customer questions, complaints, repeat purchases, lost orders, supplier conversations, employee suggestions, digital interactions, and industry networks all provide information. The managerial challenge is to convert scattered signals into structured questions.

Problem recognition is as important as opportunity recognition. A decline in sales may result from product quality, price, distribution, customer experience, or market shifts. Innovation efforts are more likely to create value when the underlying constraint is diagnosed before a solution is selected.

Sensing also requires external orientation. Firms that rely only on existing customers and familiar partners may overlook emerging alternatives. Weak ties and cross-sector contacts can expose entrepreneurs to new information, although external ideas must still be evaluated for local relevance.

ABSORPTIVE CAPACITY AND EXTERNAL KNOWLEDGE

Cohen and Levinthal (1990) argue that prior related knowledge shapes a firm's ability to recognize and use new information. Zahra and George (2002) distinguish acquisition, assimilation, transformation, and exploitation. This distinction is useful for MSMEs because access to information does not guarantee productive application.

Knowledge acquisition includes interaction with customers, suppliers, universities, consultants, associations, digital communities, trade events, and public programs. Assimilation requires the enterprise to understand the relevance of that knowledge. Transformation connects new knowledge with existing experience, while exploitation applies it to products, processes, or market activities.

Training programs often focus heavily on acquisition. Participants receive information but may lack time, follow-up, or internal routines to apply it. MSME support becomes more effective when learning activities include practical implementation, mentoring, peer discussion, and review of results.

Absorptive capacity is cumulative. Firms that maintain records, document experiments, and develop employee skills become better able to interpret future knowledge. Capability building therefore creates path dependence: previous learning influences the value of later opportunities.

RESOURCE RECOMBINATION AND BRICOLAGE

Small firms rarely possess all resources needed for innovation. They often innovate by recombining existing assets, skills, relationships, and accessible technologies. This logic is consistent with entrepreneurial bricolage, in which actors create solutions by making do with resources at hand.

Resource recombination can involve using an existing distribution relationship for a new product, repurposing equipment, combining digital tools with manual processes, sharing facilities, or partnering with another organization. The objective is not improvisation for its own sake but economical experimentation under constraint.

Resource scarcity can stimulate creativity, but it can also limit quality and scale. Managers should distinguish productive frugality from chronic underinvestment. Some innovations require external finance, specialized expertise, certification, or technology that cannot be substituted indefinitely.

Partnerships can extend the resource base. Collaboration with suppliers, universities, communities, and other firms can provide knowledge and assets that would be expensive to build internally. Clear expectations and responsibilities are necessary so that collaboration does not create new dependencies.

EXPERIMENTATION AND LEARNING

Experimentation allows MSMEs to test assumptions before making large commitments. A firm can pilot a product variant, trial a new sales channel, test a packaging change, or introduce a process improvement on a limited scale. Small experiments reduce the cost of error and generate information.

Effective experimentation requires an explicit question. Managers should define what is being tested, what outcome would indicate improvement, and what resources are at risk. Without these criteria, activity can be mistaken for learning.

March (1991) highlights the tension between exploration and exploitation. MSMEs need to preserve reliable operations while allocating some attention to new possibilities. A portfolio of small experiments can balance these demands more effectively than repeated large changes.

Failure can produce useful knowledge when causes are examined. Firms should distinguish between an idea that was intrinsically weak and an implementation that failed because of timing, communication, capability, or execution. This distinction improves future decisions.

COMMERCIALIZATION AND VALUE CAPTURE

Innovation creates economic value only when customers, users, or partners adopt the resulting product, service, or process. Commercialization therefore connects novelty with willingness to pay, cost structure, distribution, customer experience, and operational feasibility.

MSMEs should evaluate innovation economics early. A product can attract attention while generating weak margins because of packaging, delivery, platform fees, returns, or production complexity. Simple contribution-margin analysis can prevent growth in unprofitable activity.

Customer feedback should continue after launch. Early adopters may reveal usability problems, service gaps, or unexpected applications. Firms can refine the offer while monitoring whether changes improve retention, repeat purchases, or margins.

Value capture also involves protecting strategically important knowledge where appropriate. Formal intellectual-property protection is not always necessary or feasible, but firms can protect advantage through speed, relationships, brand trust, specialized know-how, quality, and continuous improvement.

LEARNING-BASED RECONFIGURATION

The final capability in the cycle is reconfiguration. Innovation changes routines, resource allocation, skills, supplier relationships, and sometimes the business model. Firms need to integrate successful experiments into normal operations and discontinue activities that no longer create value.

Reconfiguration requires managerial discipline because old routines can persist after conditions change. Performance reviews should identify which products, channels, or processes deserve more resources and which should be reduced or redesigned.

Dynamic capability is visible when the enterprise can repeatedly adapt rather than rely on one successful innovation. The objective is not constant disruption but the ability to change when evidence indicates that change is necessary.

Learning retention is important. Simple documentation of decisions, experiments, customer insights, and operating changes can prevent the loss of knowledge when employees leave or when attention shifts to other priorities.

OPEN INNOVATION AND ECOSYSTEM RELATIONSHIPS

Open innovation emphasizes purposeful inflows and outflows of knowledge across organizational boundaries. Chesbrough (2003) challenged the assumption that firms should rely only on internal research and development. For MSMEs, openness is often a practical necessity because specialized resources are limited.

Customers can act as co-developers by identifying unmet needs and evaluating prototypes. Suppliers can suggest material, packaging, or process alternatives. Universities can provide research, student projects, testing, and technical expertise. Associations and communities can facilitate peer learning and market connections.

Openness also creates governance questions. Firms need to decide what information can be shared, how contributions are recognized, and how commercial interests are protected. Informal collaboration may be sufficient for early exploration, while more significant projects may require written agreements.

Entrepreneurial ecosystems influence the quality of external connections. Spigel (2017) emphasizes relational, cultural, and material attributes, while Stam (2015) argues for systemic conditions that support productive entrepreneurship. Innovation policy should therefore strengthen connections as well as individual firm capability.

ENTREPRENEURIAL ORIENTATION AND INNOVATION DISCIPLINE

Entrepreneurial orientation commonly includes innovativeness, proactiveness, and risk taking. Lumpkin and Dess (1996) argue that these dimensions can vary independently and may have different relationships with performance depending on context.

For MSMEs, entrepreneurial orientation should be balanced with resource discipline. Proactiveness can help firms move before competitors, but premature investment can strain cash. Risk taking can support experimentation, but unmanaged exposure can threaten continuity.

Innovation discipline combines entrepreneurial initiative with staged commitment. Managers can begin with low-cost tests, gather evidence, and expand investment as uncertainty declines. This approach preserves strategic flexibility.

Leadership also shapes innovation climate. Employees and family members may possess useful operational knowledge but hesitate to propose changes if mistakes are punished. Constructive discussion and clear boundaries for experimentation can improve participation.

INNOVATION CAPABILITY CYCLE

The proposed cycle begins with opportunity sensing and problem recognition. External and internal signals are interpreted to identify areas where change may create value.

The second stage is knowledge acquisition and assimilation. The firm seeks relevant external and internal knowledge and connects it with existing capabilities. The third stage is resource recombination, in which the enterprise assembles feasible combinations of assets, skills, partners, and technologies.

The fourth stage is experimentation. Assumptions are tested at manageable scale. The fifth stage is commercialization or operational application, where the innovation is connected with customers, costs, delivery, and value capture.

The sixth stage is learning-based reconfiguration. Results are reviewed and successful changes are incorporated into routines. Lessons feed back into sensing, making innovation capability cyclical rather than linear.

Table 1. MSME Innovation Capability Cycle

Capability	Key Question	Illustrative Practice	Expected Value
Opportunity Sensing	What is changing?	Review customer, supplier, competitor, and process signals	Better opportunity and problem recognition
Knowledge Absorption	What do we need to learn?	Acquire, assimilate, transform, and apply external knowledge	Improved solution quality

Resource Recombination	What can be combined?	Use internal assets, partnerships, and accessible technologies	Resource-efficient innovation
Experimentation	What assumption should be tested?	Pilot products, processes, channels, or service changes	Lower uncertainty and learning cost
Commercialization	Does the innovation create and capture value?	Assess adoption, margins, delivery, and customer response	Sustainable economic value
Reconfiguration	What should become routine or be changed?	Scale, redesign, discontinue, and retain lessons	Adaptive competitiveness

CAPABILITY MATURITY AND STAGED DEVELOPMENT

Innovation capability develops gradually. A basic-stage MSME may rely on owner intuition and informal customer feedback. An intermediate enterprise may use more systematic records, supplier discussions, structured experiments, and employee input. A more advanced enterprise may maintain formal product-development routines, external partnerships, and portfolio reviews.

Maturity should not be equated with organizational size. A small enterprise can demonstrate strong innovation discipline through clear problem definition, rapid learning, accurate records, and careful resource allocation. Conversely, a larger enterprise can remain rigid if information is not used effectively.

Staged capability development helps prevent over-complexity. Firms can first strengthen sensing and records, then improve experimentation and external learning, and later develop more formal portfolio and partnership practices.

Development programs should therefore diagnose capability gaps rather than deliver identical innovation training to every enterprise.

FINANCING INNOVATION UNDER RESOURCE CONSTRAINTS

Innovation requires resources, but financing needs differ by stage. Early exploration may require mainly managerial time, customer access, and small prototype costs. Later commercialization can require working capital, equipment, certification, inventory, marketing, or distribution investment.

MSMEs should match financing structure with the uncertainty and cash-flow profile of the innovation. Short-term debt may be inappropriate for an experiment with uncertain or delayed returns. Internal funds, staged investment, partnerships, grants, or suitable longer-term financing can reduce mismatch.

Financial evaluation should include downside scenarios. Managers can estimate the maximum affordable loss, break-even volume, working-capital requirement, and effect on existing operations. These calculations do not eliminate uncertainty but make risk more explicit.

External funders can improve innovation outcomes by combining finance with capability support where appropriate. However, financing should not encourage projects that lack credible customer value or operating feasibility.

INNOVATION METRICS FOR MSMES

Innovation measurement should extend beyond the number of new products. Useful indicators include the proportion of ideas tested, time from problem identification to experiment, customer adoption, contribution margin, process time reduction, defect reduction, repeat purchases, and learning captured from discontinued initiatives.

Input measures such as training hours or technology expenditure are informative but incomplete. They show resource commitment rather than value creation. Process and outcome measures provide a stronger basis for managerial decisions.

Metrics should remain simple enough to be used consistently. A small set of indicators linked to the purpose of each innovation is preferable to a large dashboard that managers do not review.

Qualitative evidence also matters. Customer explanations, employee observations, supplier feedback, and reasons for failed experiments can reveal mechanisms that numerical indicators miss.

MANAGERIAL IMPLICATIONS

MSME managers should treat innovation as a repeatable management process rather than an occasional creative event. Regular review of customer, financial, operational, and market signals can create a pipeline of clearly defined problems and opportunities.

Managers should separate idea generation from investment commitment. Many ideas can be explored, but only a smaller number should receive significant resources after evidence improves. This portfolio logic protects scarce capital.

External relationships should be developed before urgent needs arise. Trusted suppliers, universities, associations, mentors, and peer entrepreneurs can accelerate access to knowledge when new problems emerge.

Managers should also create simple mechanisms for employee participation. Frontline employees often observe customer and process problems early. Clear channels for suggestions and feedback can strengthen sensing.

Finally, innovation decisions should be reviewed after implementation. The firm should ask what changed, whether the expected value appeared, what unintended effects emerged, and what knowledge should be retained.

POLICY AND ECOSYSTEM IMPLICATIONS

MSME innovation policy should move beyond one-time training and technology distribution. Programs should help enterprises diagnose problems, access knowledge, test solutions, evaluate economics, and build repeatable learning routines.

Universities can support applied research, prototyping, student consulting, laboratory access, and evidence-based evaluation. Business associations can organize peer learning and identify common constraints. Financial institutions can develop products appropriate to different innovation stages.

Local governments can improve the innovation environment by reducing administrative friction, coordinating support services, and facilitating connections with markets and knowledge institutions. Public procurement and supplier-development programs can also create demand-side opportunities when implemented transparently.

Evaluation of innovation programs should include capability development and business outcomes rather than participation counts alone. Programs should learn which interventions work for which types of enterprises and under what conditions.

RISKS AND BOUNDARY CONDITIONS

Innovation is not automatically beneficial. Excessive experimentation can distract management and consume cash. Firms should protect essential operations while testing new possibilities.

Imitation risk can reduce returns when innovations are easy to copy. MSMEs can respond through speed, customer relationships, service quality, brand, local knowledge, or continuous improvement rather than relying only on formal protection.

Organizational resistance can also limit innovation. Family ownership, established routines, and fear of failure may discourage change. Leadership needs to distinguish constructive caution from rigidity.

External partnerships can create dependence or conflicts over objectives. Clear expectations, contribution boundaries, and communication reduce these risks.

Finally, market conditions determine whether an innovation creates value. Capability improves the quality of adaptation, but it cannot guarantee success when demand, regulation, infrastructure, or macroeconomic conditions are unfavorable.

RESEARCH PROPOSITIONS AND FUTURE RESEARCH

P1. Opportunity-sensing capability is positively associated with the relevance of MSME innovation initiatives.

P2. Absorptive capacity strengthens the relationship between external knowledge access and innovation outcomes.

P3. Resource recombination mediates the relationship between resource constraints and feasible experimentation.

P4. Experimentation capability reduces the cost of uncertainty in MSME innovation decisions.

P5. Commercialization capability strengthens the relationship between innovation novelty and economic value capture.

P6. Learning-based reconfiguration mediates the relationship between innovation experience and adaptive competitiveness.

P7. Ecosystem connectivity strengthens the relationship between internal innovation capability and access to complementary resources.

Future studies can test these propositions across sectors, regions, and stages of enterprise development. Longitudinal designs are particularly useful because innovation capability accumulates through repeated cycles of action and learning.

Researchers should distinguish innovation inputs, processes, outputs, and outcomes. They should also examine unsuccessful experiments because failure can reveal capability weaknesses that are invisible in studies focused only on successful innovations.

CUSTOMER KNOWLEDGE AND MARKET-BASED INNOVATION

Customer knowledge is one of the most accessible innovation resources available to MSMEs. Small firms often interact directly with buyers and can observe questions, complaints, usage patterns, and purchasing decisions without complex market-research systems. The challenge is to organize these observations so that they inform decisions rather than remain anecdotal.

Managers can distinguish expressed needs from latent needs. Customers can clearly request changes in price, packaging, delivery, or service, but they may not articulate opportunities for entirely new solutions. Observation of customer behavior and recurring workarounds can reveal needs that direct questioning does not capture.

Market-based innovation should also consider noncustomers. A firm that listens only to existing buyers may optimize an offer for a narrow segment while missing larger opportunities. Lost inquiries, inactive customers, distributor feedback, and competitor offerings can provide information about barriers to adoption.

Customer participation can be incorporated into low-cost experimentation. Prototypes, samples, pre-orders, demonstrations, and limited releases allow enterprises to observe real behavior before scaling. Behavioral evidence is particularly valuable because stated preferences do not always translate into purchasing decisions.

Customer knowledge must be connected with economics. A requested feature may increase satisfaction but also raise production cost, complexity, or delivery time. Innovation decisions should consider willingness to pay, contribution margin, operational feasibility, and strategic fit.

Over time, disciplined customer learning can become a distinctive capability. Firms that systematically capture and interpret market feedback can adjust earlier than competitors and reduce the risk of investing in innovations with weak demand.

SUPPLIER, UNIVERSITY, AND COMMUNITY KNOWLEDGE LINKAGES

Suppliers are often underused sources of innovation knowledge. They may understand new materials, equipment, packaging, production methods, and industry standards. Regular technical dialogue with suppliers can reveal alternatives that reduce cost, improve quality, or enable product changes.

Universities and vocational institutions can contribute analytical and technical resources that small firms cannot maintain internally. Applied student projects, laboratory testing, design support, process analysis, and market studies can be valuable when projects begin with clearly defined business problems and realistic implementation expectations.

Community and business networks contribute contextual knowledge. Peer entrepreneurs can share information about customer trends, regulation, logistics, technology providers, and implementation problems. Such knowledge is especially useful when formal information is incomplete or difficult to interpret.

External knowledge relationships require absorptive capacity inside the firm. Advice creates little value if no one is responsible for evaluating and applying it. MSMEs should designate a person to capture recommendations, compare them with existing practices, and coordinate follow-up.

Knowledge linkages should be reciprocal where possible. Firms that contribute experience to associations, universities, and peer networks help improve the quality of shared knowledge. Reciprocity also strengthens trust and increases the likelihood that partners remain engaged.

These relationships form part of the enterprise's innovation infrastructure. Their value becomes most visible when a new challenge emerges and the firm can quickly reach credible sources of expertise rather than beginning the search from zero.

FROM INCREMENTAL IMPROVEMENT TO BUSINESS MODEL INNOVATION

Most MSME innovation is incremental, and this should not be treated as a weakness. Repeated improvements in quality, delivery, packaging, workflow, customer communication, or purchasing can generate substantial cumulative value. Incremental innovation is often easier to finance and integrate than large transformation projects.

However, environmental change can eventually require more fundamental adaptation. Business model innovation changes how the firm creates, delivers, or captures value. Examples include moving from one-time transactions to recurring services, adding direct-to-consumer channels,

changing target segments, forming new distribution partnerships, or combining physical and digital delivery.

Business model changes create interdependencies. A new sales channel can require different inventory, customer service, payment, logistics, and marketing routines. Managers should therefore assess the whole operating system rather than evaluate the visible customer-facing change alone.

Staged experimentation remains useful for more substantial innovation. A firm can test one customer segment, one location, or one product line before redesigning the entire business. This creates evidence about demand and operating implications.

Business model innovation should preserve financial visibility. Rapid growth in a new channel can conceal weak margins or high working-capital requirements. Managers should compare unit economics and cash conversion across old and new models.

The ability to move between incremental improvement and more substantial reconfiguration is an important element of adaptive competitiveness. Firms should not pursue radical change for prestige, but neither should they allow successful historical routines to become permanent constraints.

HUMAN CAPITAL AND INNOVATION CULTURE

Innovation capability depends on people. Owner-managers may initiate change, but employees often possess detailed knowledge of customer interactions, production problems, service failures, and process bottlenecks. Enterprises can improve sensing by creating simple and credible channels for employee input.

An innovation-supportive culture does not require unlimited freedom. Employees need clarity about which decisions they can make, what resources are available for experiments, and which quality or safety requirements cannot be compromised. Boundaries make experimentation more disciplined.

Learning from mistakes is important, but accountability remains necessary. A failed experiment conducted within agreed limits and documented carefully is different from negligence. Managers can encourage responsible experimentation by reviewing assumptions and lessons rather than judging outcomes alone.

Skill development should follow innovation needs. Training is most useful when employees can apply it to an active business problem. Learning-by-doing, mentoring, peer observation, and short practical assignments can complement formal courses.

Retention of key knowledge is another concern. Small enterprises can become dependent on one employee who understands a digital system, production technique, or customer relationship. Cross-training and basic documentation reduce this vulnerability.

Leadership behavior signals whether innovation is genuinely valued. When managers ask for ideas but never respond, participation declines. Feedback about why suggestions are accepted, modified, or rejected helps maintain credibility and improves the quality of future proposals.

INNOVATION PORTFOLIO GOVERNANCE AND PRIORITIZATION

MSMEs frequently have more improvement ideas than they have time or capital to implement. Innovation capability therefore includes prioritization. Managers need a simple way to compare initiatives according to customer value, strategic relevance, expected economic benefit, resource requirement, uncertainty, and implementation difficulty.

A portfolio perspective prevents one attractive idea from consuming all available attention. Enterprises can maintain a small set of initiatives at different stages: some being explored, some tested, and a smaller number being scaled. This structure makes innovation visible and reduces the tendency to start many projects without completing them.

Prioritization criteria should be explicit. A practical screening process can ask whether the problem is important, whether customers care about the solution, whether the firm has or can access the required capability, whether the downside is affordable, and whether the initiative supports the firm's strategic direction. Ideas that fail several criteria can be postponed without being permanently rejected.

Resource allocation should increase as evidence improves. Early-stage ideas can receive small budgets and limited managerial time. Successful experiments can receive additional resources for refinement and commercialization. This staged commitment resembles an option logic: the firm preserves the right to invest further without committing the full amount at the beginning.

Portfolio review also creates a mechanism for stopping projects. Entrepreneurs can become emotionally attached to ideas because they have already invested time or money. Regular review based on current evidence helps reduce escalation of commitment. Discontinuing a weak project can be a sign of learning rather than failure.

Strategic balance is another consideration. An enterprise may need some initiatives that improve current efficiency, others that strengthen existing products, and a smaller number that explore future opportunities. The appropriate balance depends on cash position, competitive pressure, and managerial capacity.

Governance does not need to be bureaucratic. A one-page innovation register can record the problem, hypothesis, owner, next test, budget limit, evidence, and decision date. For small firms, consistency matters more than sophisticated software.

Over time, portfolio governance improves organizational memory. Managers can compare patterns across initiatives and identify recurring causes of success or failure. This knowledge strengthens future sensing, experimentation, and resource allocation, completing the learning cycle proposed in this article.

LIMITATIONS

This article is conceptual and does not estimate the causal effect of innovation capability on MSME performance. Empirical testing is required before the proposed relationships can be generalized.

Second, MSMEs are heterogeneous. Sector, age, ownership, technology intensity, market orientation, and regional conditions can influence which capabilities are most important.

Third, the framework emphasizes firm-level capability while recognizing ecosystem relationships. Broader institutional factors such as regulation, infrastructure, macroeconomic conditions, and national innovation systems require additional analysis.

Fourth, innovation may generate social and environmental consequences that are not fully captured by firm-level competitiveness. Future research can integrate sustainability and inclusive-development outcomes.

CONCLUSION

Innovation capability provides a practical explanation for how MSMEs can adapt under resource constraints. The framework developed in this article integrates dynamic capabilities, absorptive capacity, organizational learning, resource recombination, open innovation, and ecosystem relationships.

The proposed Innovation Capability Cycle consists of opportunity sensing, knowledge acquisition and assimilation, resource recombination, experimentation, commercialization, and learning-based reconfiguration. These capabilities convert information and limited resources into disciplined adaptation.

For managers, the central implication is to build repeatable learning routines and stage investment according to evidence. For policymakers and ecosystem actors, the implication is to support the full innovation process rather than isolated inputs. For researchers, the framework offers testable propositions and practical measurement dimensions.

Sustainable competitiveness does not require every MSME to become a technology-intensive innovator. It requires the ability to recognize meaningful change, learn from relevant knowledge, test feasible responses, create customer value, and reconfigure the enterprise when conditions demand it.

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