

Generative AI-Driven Technological Entrepreneurship: Theoretical Analysis of Opportunity, Recognition, Resource Allocation and New Venture Growth Logic

Liyan Han

INTI International University, Nilai, Negeri Sembilan, Malaysia

Abstract: Generative artificial intelligence (GenAI) is transforming how we access information, create knowledge, and organize resources in the field of technology entrepreneurship. Based on a review of the related literature and theoretical analysis, this study constructs an analytical framework covering three key aspects: opportunity identification, resource allocation, and venture growth. Our analysis suggests that GenAI broadens the opportunity space for technology entrepreneurs by combining heterogeneous information across various sources and recombination of scattered knowledge; improves the efficiency of resource allocation via AI-enabled decision support, resource orchestration, and network connectivity; and promotes new venture growth by accelerating opportunity conversion, fostering dynamic capabilities, and enabling iterative business model adaptation. Instead of simply replacing human labor, the entrepreneurial value of GenAI stems primarily from its ability to reconfigure entrepreneurial capabilities via human-AI collaboration.

Keywords: Generative artificial intelligence, technology entrepreneurship, opportunity identification, resource allocation.

1. Introduction

The generative artificial intelligence has evolved far beyond being just a content generator into one that becomes a fundamental capability for innovation and entrepreneurship, opening up new avenues for technology entrepreneurs to explore opportunities, resource organization and value creation. The Cyberspace Administration of China together with six other government authorities jointly promulgated the Interim Measures for the Management of Generative Artificial Intelligence Services in July 2023. In August 2025, the State Council issued the Opinions on Deepening the Implementation of the "Artificial Intelligence Plus" Initiative, advocating the cultivation of new AI-native models and forms of business. Under such circumstances where both rapid technological diffusion and mature institutions coexist, it is important from both theory and practice perspectives to understand what are the mechanisms through which GenAI influences technology entrepreneurship.

2. Theoretical Foundations and Mechanisms Through Which Generative AI Drives Technology Entrepreneurship

2.1. Technological Attributes of Generative AI and Research on Entrepreneurial Enablement

Driven largely by large language models (LLMs), GenAI exhibits unique abilities for generating knowledge, integrating information, and supporting interactional decisions. Applications of GenAI have been moving away from its general purpose content production towards entrepreneurial opportunity development, resource acquisition, and managerial decision-making. From the lens of organizational capability reconfiguration, Boustani and Magnaghi (2026) explore how artificial intelligence is applied

across different areas including business management, finance, and entrepreneurship. They contend that AI is reshaping organizational capability structures and speeding up the transformation of entrepreneurial activities into more intelligent and technologically augmented ones but realizing this value requires an appropriate alignment among organizational capabilities and technological tools [1]. Based on information behavior theory, Li et al. (2025) use LLMs and prompt engineering to study the entrepreneurial enabling effect of GenAI. Findings show that GenAI provides contextually relevant information, identifies potential viable opportunities, supports entrepreneurial decision making, and mitigates information asymmetries at the early stage of venture creation. However, these benefits depend on certain conditions: task complexity, domain-specific knowledge, and entrepreneurs' proficiency in prompt engineering [2]. A systematic synthesis of 39 studies related to technology adoption, skill development, innovation, and performance enhancement leads Dwivedi (2025) to propose the GAIN framework arguing that GenAI lowers barriers to entrepreneurial resource acquisition, stimulates creativity, and improves decision quality [3].

2.2. Boundary Conditions of Generative AI Embedded in Technology Entrepreneurship

GenAI's impact on technology entrepreneurship cannot be unconditional nor entirely substituting but is constrained by technological, cognitive, organizational, and institutional factors. First, via knowledge generation, information aggregation, and scenario-based solution simulation, GenAI has a substantial potential to lower entrepreneurs' information search cost and enhance the efficiency of evaluating entrepreneurial opportunities and making resource-related decisions [4]. Second, however, GenAI's output relies on training data and algorithmic inference. In cases where entrepreneurial tasks are highly specialized, strongly context dependent, or involve profound uncertainty, generated

information might be incomplete, biased, or insensitive to contextual nuance. Technology entrepreneurship involves aspects resistant to complete algorithmic codification such as experiential judgment, relational embeddedness, tacit knowledge, social interaction, and responsibility for consequential decisions. Rather than being an autonomous substitute for entrepreneurial agency, GenAI acts as an augmentative tool extending entrepreneurs' cognitive and decision-making abilities [5].

2.3. Theoretical Logic of Generative AI–Driven Technology Entrepreneurship

The basic mechanism driving GenAI-driven technology entrepreneurship involves a progressive transformation from technological capabilities to entrepreneurial action capabilities, then to venture growth capabilities. Firstly, the knowledge-generation and information-integration capabilities of GenAI expand the range of entrepreneurs' information search. Through providing deeper insight on market demand and recombining previously scattered or

disparate knowledge, GenAI makes it possible to recognize, interpret, and articulate latent entrepreneurial opportunities. Secondly, AI-powered analytics and solution generation lower the cost of identifying, evaluating, and matching resources. Consequently, scarce entrepreneurial resources such as human capital, financial capital, technological assets, and knowledge can be configured and dynamically reconfigured around emerging opportunities faster and more precisely. Thirdly, opportunity development and resource allocation feed off each other producing synergies conducive to product iteration, business model adaptation, and cumulatively developing organizational capabilities [6]. Such processes further drive the growth and evolution of new ventures. Hence, the mechanisms through which GenAI drives technology entrepreneurship can be described as a progressive causal logic: GenAI-enabled technological empowerment → opportunity identification → resource allocation → new venture growth. we develop a theoretical framework depicting the sequential mechanisms through which GenAI drives technology entrepreneurship (presented in Figure 1).

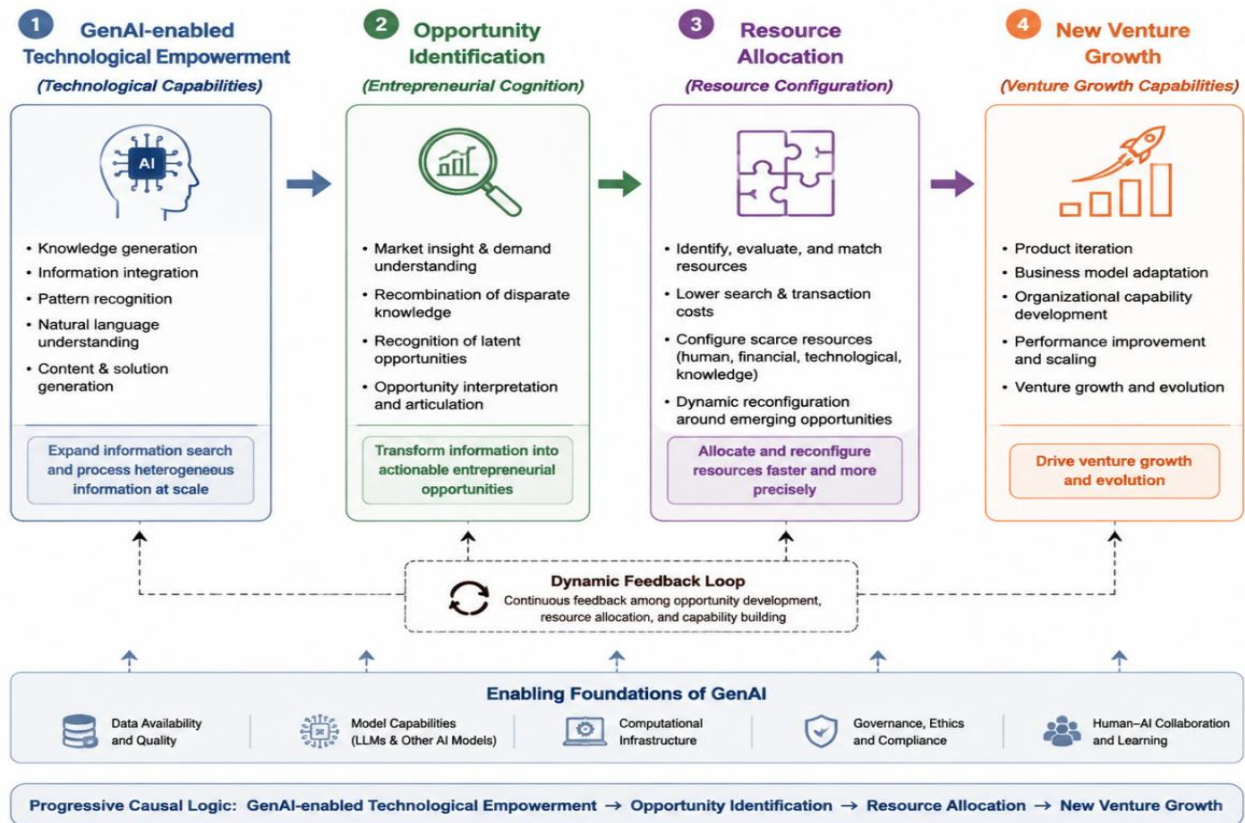


Figure 1. Progressive Mechanisms Through Which Generative AI Drives Technology Entrepreneurship

3. Mechanisms Through Which Generative AI Facilitates Opportunity Identification in Technology Entrepreneurship

3.1. Multi-Source Information Integration and the Discovery of Latent Market Demand

Identifying technology entrepreneurship opportunities starts with the entrepreneurs' timely detection of changes in market demands. However, these pieces of information are typically scattered throughout diverse data streams (e.g., user feedback, industry reports, technological literature, and

competitive intelligence) whose volume, fragmentation, and structural variation often surpass the processing power of traditional human analysis [7].

By leveraging its strengths in natural language processing, semantic association, and content generation, GenAI helps entrepreneurs synthesize heterogeneous information and extract demand-related characteristics hidden within various sources. Specifically, it enables entrepreneurs to uncover latent connections between user pain points, consumption preferences, and potential application scenarios; translating vast amounts of unstructured information into actionable signals of market demand. This integration does not imply that GenAI alone can ascertain if a certain demand is real and commercially consequential. Instead, it augments this

capability through expanding the scope for information search and lowering the cost of processing fragmented data, thereby increasing entrepreneurs' ability to capture weak signals and latent demand. The opportunity identification process thus moves away from being experience-based and relatively bounded information search towards systematic market sensing enabled by data-intensive analysis.

3.2. Knowledge Recombination and the Formation of Technology Entrepreneurship Opportunities

Latent market demand is not an actionable entrepreneurial opportunity; only if a demand can be linked to a technically feasible solution will it develop as a technology entrepreneurship opportunity capable of further development. Entrepreneurs need to connect different knowledge domains (technological principles, market needs, product functionalities, application contexts) and create new correspondence between elements that were previously conceptually or organizationally disconnected. Drawing from existing knowledge, GenAI supports cross-domain semantic association and combinatorial knowledge processing helping entrepreneurs rematch technological principles with market demand, product functionalities, and prospective application scenarios. Using GenAI for idea generation, alternative comparison, and scenario simulation allows entrepreneurs to discover latent connections scattered over disparate knowledge domains, enabling them to generate novel product concepts and value propositions based thereon.

However, knowledge recombination cannot be equated with creating reliable knowledge ex nihilo: Validity and practical usefulness of AI-assisted recombination depends on the quality of underlying data, the relevance of available knowledge inputs – critically, the entrepreneur's domain-specific expertise and ability to assess generated outputs. Therefore, the core role of GenAI during this stage consists

not of "creating" entrepreneurial opportunities per se, but rather expanding the opportunity conception space.

3.3. Human–AI Collaborative Judgment and the Validation of Entrepreneurial Opportunity Value

After a preliminary technological concept emerges, identifying opportunity transitions from finding what could be to finding what will work and have value. Here, GenAI quickly produces analytical insights on target customers, competition, products, costs, and business models, comparing different options while simulating potential results—offering entrepreneurs broader analytics upon which they can screen, adjust, or discard candidate opportunities. The output generated by AI is susceptible to time-limited training data, factual inaccuracies or bias, and inherent limits of model reasoning—it cannot replace direct market evidence nor the context-sensitive judgment of entrepreneurs. Thus, opportunity validation must rely on a human–AI collaborative mechanism combining AI-assisted analysis, entrepreneurial expertise, and empirical market verification.

Specifically, entrepreneurs can empirically scrutinize AI-generated assessments via customer interviews, prototype tests, and market experiments, adjusting their opportunity assumptions based on observations. Through these iterations between machine-generated analysis and market-based validation, we create a feedback loop where initial opportunity hypotheses get iteratively refined. To further convert human–AI collaborative judgment into an operational opportunity screening process, we establish a closed-loop validation framework built around four complementary dimensions: demand authenticity, technological feasibility, commercial sustainability, and market acceptance. Each dimension in Table 1 connects a critical validation question to observable evidence, a particular type of AI-assisted analysis, and an explicit basis for adjusting the opportunity next.

Table 1. GenAI-Assisted Framework for Validating the Value of Technology Entrepreneurship Opportunities

Validation Dimension	Key Validation Question	Primary Sources of Evidence	GenAI-Assisted Approach	Basis for Opportunity Adjustment
Demand authenticity	Is the user pain point genuine and sufficiently salient?	Customer interviews, search behavior, user feedback	Synthesizing demand characteristics and extracting frequently recurring pain points	If demand is weak, redefine the target customer segment or application scenario
Technological feasibility	Can the proposed technological solution reliably address the target problem?	Prototype testing, technological experiments, expert evaluation	Comparing alternative technological pathways and assisting in the formulation of testing protocols	If technological risk is excessive, reduce functional scope or adopt an alternative technological pathway
Commercial sustainability	Can expected revenues adequately cover customer acquisition, development, and operating costs?	Willingness-to-pay tests, cost data, order information	Simulating pricing alternatives and cost–benefit scenarios	If unit economics are unsustainable, revise the pricing strategy or delivery model
Market acceptance	Are users willing to adopt the product and continue using it over time?	MVP testing, retention feedback, actual transaction data	Synthesizing user feedback and identifying barriers to adoption	If market acceptance is insufficient, refine the value proposition and optimize the product experience

4. Reconfiguration Mechanisms Through Which Generative AI Reshapes Resource Allocation in Technology Entrepreneurship

4.1. AI-Enabled Decision Support and Precise Matching of Entrepreneurial Resources

Entrepreneurs are often faced with extreme resource scarcities (e.g., limited financial capital, lack of specialized talent, uncertain length or outcome of technological development). The key issue here becomes how to match scarce resources to the particular needs of an entrepreneurial opportunity as opposed to merely expanding input quantities into a new venture.

By leveraging its ability at information processing, content generation, and interactive analysis, GenAI enables entrepreneurs to integrate heterogeneous information regarding market demand, technological alternatives, cost structure, workforce capabilities, and operational feedback. It also helps comparing different configurations of resource allocations and evaluating their possible consequences which reduces overreliance on experience-based judgment when making resource decisions common in early-stage ventures. For instance, during product development, entrepreneurs may use GenAI to analyze user requirements and prioritize product functionalities so that development resources focus on those with higher likelihoods of market validation.

Outputs generated by GenAI do not offer necessarily definitive solutions to resource-allocation problems because they are vulnerable to deficiencies in data quality, model bias, and missing contextually salient information. A precise resource matching requires a process of mutual verification between entrepreneurial judgment, actual operational data, and AI-generated analysis. Consequently, scarce resources – capital, talent, technology, time– will be matched better towards the actual developmental requirements of entrepreneurial opportunities.

4.2. Resource Orchestration Optimization and the Synergistic Integration of Entrepreneurial Factors

The value of entrepreneurial resources depends not just on their quality/quantity but crucially also on being able to combine and coordinate them towards evolving entrepreneurial goals; incorporating GenAI enables shifting resource allocations away from static input arrangements toward an adaptive and continually-adjusting process of resource orchestration. Technology ventures could leverage GenAI to help process information about R&D progress, market feedback, customer requirements, and operational performance to detect possible mismatch between technological, human, knowledge-based, and financial resources. When these misalignments emerge, resource portfolios can then be recalibrated according to changes in the venture's developmental stage and strategic priorities. In the proof-of-concept stage, for example, resources should be disproportionately allocated to technological experimentation and acquiring user feedback. By reducing the amount of time needed to aggregate information and compare alternatives, GenAI increases managerial ability for cross-functional coordination and facilitates faster adjustment to resource combinations. But resource orchestration involves making strategic trade-offs, prioritizations, and decisions regarding responsibility and risk – aspects that cannot be fully delegated to algorithms. The real power of GenAI does not lie in substituting one type of entrepreneurial resource over another, rather it strengthens the venture's ability to identify resource gaps, sequencing investments, and coordinating interdependencies among heterogeneous resource elements. To make this transition more intuitive (especially moving from static resource allocation toward dynamic orchestration along with changes in resource priorities and interdependencies at different stages of the entrepreneurial process), we develop a mechanism of GenAI-enabled resource orchestration and entrepreneurial factor synergy, illustrated in Figure 2.

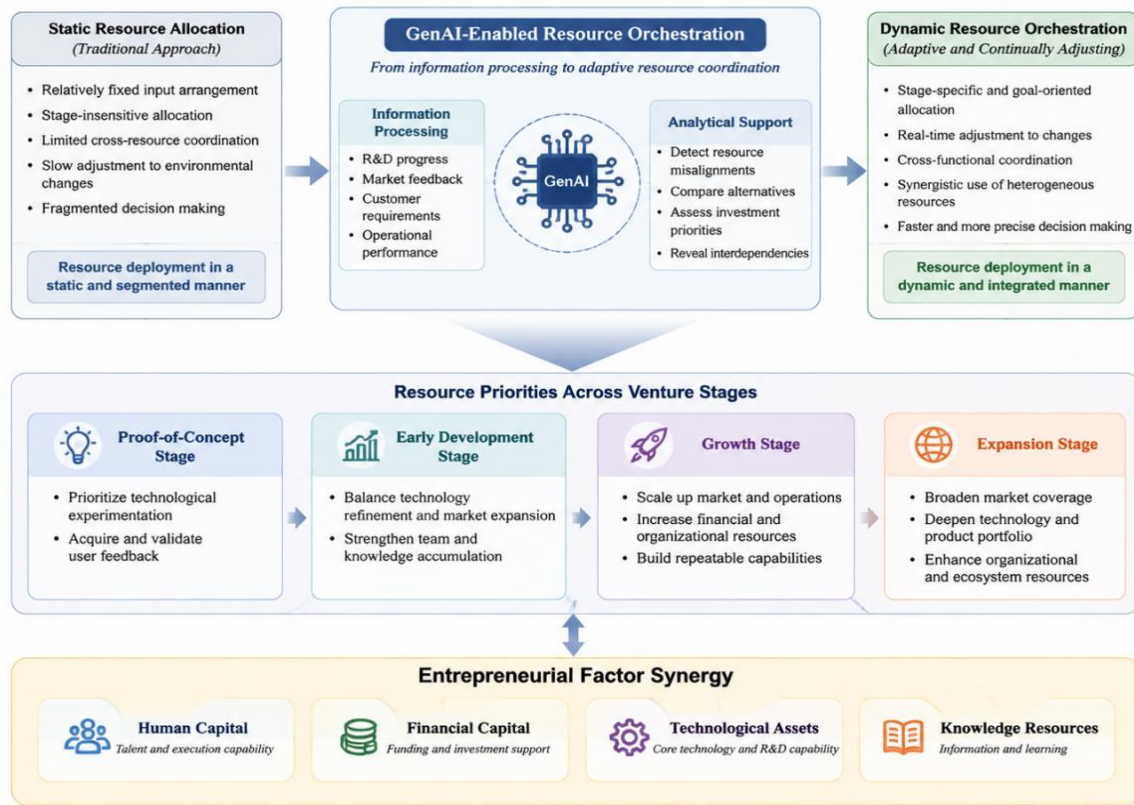


Figure 2. GenAI-Enabled Resource Orchestration and Entrepreneurial Factor Synergy in Technology Entrepreneurship

4.3. Organizational Boundary Expansion and Connectivity to External Resource Networks

Since most new ventures have limited stocks of internally controlled resources, relying solely upon their own capital, talent, technological capabilities, and knowledge will rarely suffice for long-term technological development and market growth. Having access to external resource networks is thus essential for continuing technological entrepreneurship. Herein lies how GenAI serves as an enabling infrastructure for external resource connectivity; it reduces the cost of searching for information, communicating knowledge, and formulating collaborative proposals.

Specifically, entrepreneurs can use GenAI to articulate collaboration requirements, characterize potential partners' features, draft project documentation, and communicate across specialized knowledge domains. Together, these activities reduce the informational and communicative costs of finding external resources and beginning preliminary contact.

These effects go further than simply identifying individual partners. Through the ability to quickly absorb public technological knowledge, industry intelligence, and user feedback, GenAI allows ventures to expand the breadth of knowledge acquisition beyond the confines of the internal entrepreneurial team. This results in a resource architecture that becomes potentially more open, distributed, and network-based—knowledge and other complementary resources can now be acquired outside the organization's boundaries instead of being confined therein[8].

However, expanding organizational boundaries does not imply replacing social relationships with technology. Forming trust, protecting intellectual property, negotiating commercially, and making credible commitments to collaborate still requires ongoing interaction between actual

organizational actors.

Through increasing the efficiency of resource discovery, information exchange, and collaborative preparation, GenAI lowers the initial barriers to accessing external resources while allowing entrepreneurial ventures to leverage a wider array of complementary assets. Technology entrepreneurship could thereby gradually move away from a relative closed model of resource allocation based on internally controlled resources towards a networked configuration whereby internal and external resources are dynamically coordinated.

5. Mechanisms Through Which Generative AI Enables New Venture Growth

5.1. Opportunity Conversion and Value Creation in New Ventures

The first crucial way in which GenAI drives new venture growth consists in transforming identified market opportunities into products worth paying for instead of being restricted only to idea generation. Although opportunity recognition may be highly sophisticated, it does not necessarily generate economic value; what counts is how well an identified opportunity has been transformed into a viable offering, validated via interactions with the markets, and integrated into a sustainable mechanism of value capture. First, new ventures should build minimum viable products (MVPs), focused on recurrent and salient customer pain points. With GenAI's help, they can speed up prototype designs, code developments, and content productions so as to validate demand at relatively low experimentation cost. Second, ventures should set up a rapid validation loop based on generation–testing–feedback–revision. During this iterative process, GenAI speeds up the generation/modification of alternative product options whereas user behavior and direct market feedback serve as

empirical grounds for deciding which features to retain, redesign, or abandon. By continuously adjusting product functionalities according to actual usage patterns, technological capabilities gradually align themselves with particular application contexts. Third, new ventures must find sustainable mechanisms for value capture. The differentiated functionalities made possible by AI must be embedded into viable revenue architectures such as subscription models, value-added services, or enterprise solutions, so that technological value eventually translates into commercial value.

5.2. Dynamic Capability Development and Business Model Iteration

Competitive advantages from GenAI are fluid: what was once unique will quickly standardize as models spread, competitors copy successful uses, and customers' needs shift. New ventures need to go beyond episodic use of AI tools toward making technological applications part of their organizational capabilities so they can sense environmental changes, adjust strategically fast, and reconfigure business activities.

First, we suggest establishing systematic market-sensing mechanisms. GenAI helps synthesize customer feedbacks, product usage data, and competitive intelligence so that

entrepreneurial teams discover emerging mismatches between current value propositions and shifting market demands. However, how these signals are interpreted strategically still requires entrepreneurs; sensing matters if information can be converted into decisions on what (should) and what (should not) change.

Second, new ventures should develop an incremental experimentation mechanism for adapting business models. Different product functionalities, target customer segments, pricing structure, and service configuration can be broken down into testable hypotheses and deployed on a small scale. Based on subsequent user response and market evidence, some parts might be kept, altered, or dropped. Relative to large-scale one-off business model transformation, this method lowers the risk of strategic errors while enabling ventures to adapt via a series of controlled experiments.

Third, we advocate strengthening human–AI collaborative learning. The analytical outputs from GenAI require combination with team experiences and customer-based validation before practices proven effective can be codified and accumulated as organizational knowledge. That is, temporary technological assistance can turn into an enduring organizational capability when learning produced through AI-supported experimentation gets systemically retained and redeployed.

Table 2. GenAI-Enabled Strategies for Business Model Iteration in New Ventures

Business Model Component	Key Observational Signals	Iteration Trigger	Adjustment Strategy	Expected Outcome
Value proposition	Feature utilization, customer evaluations	Core features exhibit low utilization or fail to resolve salient customer pain points	Eliminate or reduce low-value functionalities while strengthening high-frequency application scenarios	Improve product–market fit
Customer structure	Retention rate, conversion rate, differences across customer segments	Customer segments exhibit substantial differences in their value contribution	Prioritize high-value segments and refine target customer positioning	Improve the quality of customer acquisition
Revenue model	Payment conversion rate, average revenue per customer, renewal performance	Growth in product usage fails to generate corresponding revenue growth	Reconfigure the boundary between free and paid functionalities and optimize pricing	Strengthen value-capture capability
Delivery model	Response time, service costs	User growth generates increasing marginal service pressure	Introduce AI-enabled self-service and standardized service processes	Enhance delivery efficiency
Partner ecosystem	Collaboration efficiency, utilization of complementary resources	Internal capabilities are insufficient to address emerging application scenarios	Integrate partners from model, data, or application ecosystems	Expand the boundaries of value creation

5.3. Scaling and the Formation of Sustainable Competitive Advantage

As a new venture moves through its evolution from initial validation towards the growth stage, so too does the strategic importance of GenAI shift. While localized gains in efficiency are useful during early experimentation, they will not suffice when seeking growth at scale. What matters most is how to convert AI-enabling practices into replicable and scalable organizational capabilities—and eventually, deepen them such that they help form sustainable competitive advantage [9].

First, we propose standardizing high-frequency operational processes (customer service, marketing, knowledge retrieval, internal collaboration) gradually. Then, GenAI can take up a larger portion of repetitive information processing work, enabling the venture to handle increased transaction and service volume without proportional increases in human labor.

Secondly, build proprietary systems of data, knowledge, and organization workflows. By accumulating customer feedback, transaction information, operational experience, and context-specific knowledge, firms can incrementally improve the fit between AI applications and unique business environments. Rather, competitive advantage will increasingly rest upon complementary, firm-specific assets—proprietary data, accumulated organizational knowledge, embedded workflows, and ability to integrate these with effective use of AI technologies [10].

Finally, seek greater automation alongside human review, risk control procedures, and customer appeal mechanisms. Without proper governance, scaling AI-enabled operations could lead to efficient gains but also amplify errors, compromise data security, or undermine customer trust. Sustainable scaling calls for balancing automation and accountability—the repetitive and information-intensive processes can be increasingly delegated to AI systems, yet

consequential judgment, exception handling, risk oversight, and responsibility for outcomes should still involve appropriate human intervention.

6. Conclusion

GenAI's impact on technology entrepreneurship unfolds progressively—from cognitive augmentation to resource reconfiguration and finally growth enablement. In opportunity identification, GenAI augments entrepreneurial cognition by combining diverse information across various sources, promoting knowledge recombination, and supporting human–AI collaborative validation. In resource allocation, it facilitates better alignment and use of scarce entrepreneurial resources using AI-based decision support, dynamic resource orchestration, and access to external resource networks. These then form the basis for venture growth: acceleration of opportunity conversion and value creation, facilitation of developing dynamic capabilities and iterative business model adaptation, and transitioning from localized efficiency gains towards scalable organizational capabilities. However, we do not interpret the entrepreneurial value of GenAI as an indication that technological systems will ever replace entrepreneurial agency or professional judgment. Effectiveness of GenAI depends on the quality and relevance of available data, the complexity and contextual specificity of entrepreneurial tasks, and organizational capabilities used to interpret and translate AI-generated outputs into action. New ventures need to establish a complementary human–AI collaboration mechanism whereby technological applications complement (rather than substitute) human decision making. It is only through effective integration of these complementary capabilities that the temporary advantage of AI adoption can become persistent organizational capabilities—and eventually, a sustainable foundation for new venture growth.

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