

Digitally Mediated Mentorship as Institutional Infrastructure

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Abstract:

Early-stage entrepreneurs in smaller cities and emerging regional ecosystems face persistent challenges in accessing continuous, high-quality mentorship—a gap that episodic training programs and physical incubator infrastructure fail to adequately address. This paper argues that mentorship scarcity reflects an institutional void rather than individual deficiencies, positioning sustained guidance as essential ecosystem infrastructure comparable to regulatory frameworks or capital access mechanisms.

We introduce a four-pillar institutional framework—communication, expression, knowledge, and exchange—that explains how digitally mediated systems provide guidance functions traditionally delivered through human mentorship networks. Evidence from refugee context deployment particularly demonstrates system robustness under extreme resource constraints, establishing that cognitive infrastructure effectiveness depends on functional availability rather than physical presence.

The paper reframes entrepreneurship support infrastructure beyond visible assets toward continuous cognitive and relational scaffolding. The work contributes to entrepreneurial ecosystem theory by examining mentorship as system design challenge rather than relationship-matching problem, demonstrating how digital infrastructure can reshape capability-building in underserved entrepreneurial contexts.

Keywords: entrepreneurial ecosystems, institutional infrastructure, AI-mediated mentorship, Tier-II cities, refugee entrepreneurship, ecosystem development, digital transformation

1. Introduction

Over the past two decades, entrepreneurship has increasingly been promoted as a pathway to economic participation, innovation, and employment generation across diverse regional contexts. Governments, universities, and development agencies have responded by investing in incubation centers, entrepreneurship development programs, and startup promotion schemes. While these initiatives have expanded participation, their effectiveness in supporting early-stage entrepreneurs beyond initial entry remains uneven.

In smaller cities and emerging regional ecosystems, entrepreneurs frequently encounter an environment characterized by limited exposure to experienced founders, fragmented advisory support, and a shortage of sustained mentorship. Formal programs often prioritize short-term training, compliance, or infrastructure provision, while assuming that strategic capability and judgment will emerge organically.

In practice, many founders complete such programs with improved awareness but without the ongoing guidance required to navigate uncertainty, evaluate trade-offs, or adapt to evolving market conditions.

This paper contends that the persistence of early-stage entrepreneurial fragility in such environments reflects a deeper institutional issue rather than a lack of motivation or talent. Specifically, it argues that mentorship—understood as continuous, context-sensitive guidance—is an underdeveloped institutional component of many entrepreneurial ecosystems. Where dense networks of experienced entrepreneurs exist, mentorship emerges informally. Where such networks are absent, no functional substitute is typically provided.

The central argument advanced here is that digitally mediated mentorship systems, particularly those enabled by advances in artificial intelligence, can operate as institutional infrastructure in contexts where human mentorship capacity is structurally constrained. Rather than positioning such systems as productivity tools or educational supplements, this paper examines their potential role in stabilizing and scaffolding early entrepreneurial decision-making within weak ecosystems.

This institutional approach builds on empirically validated initiatives that have demonstrated feasibility across diverse constraint environments. Early implementations of AI-mediated mentorship systems have received global recognition, including acknowledgment by the World Economic Forum and Deloitte for innovation in entrepreneurship support mechanisms. Subsequent scaling through UNHCR funding in refugee contexts with limited connectivity has validated the approach's robustness in extreme low-resource environments, while foundational work supported by GIZ through the Vruksh Ecosystem Foundation established institutional partnerships across multiple regional initiatives.

2. Mentorship, Ecosystems, and Institutional Gaps

Research on entrepreneurial ecosystems has emphasized the importance of networks, capital availability, human resources, and supportive institutions in shaping entrepreneurial outcomes. Studies consistently highlight mentorship as a critical factor influencing opportunity recognition, strategic learning, and venture survival. However, much of this literature implicitly assumes the presence of experienced actors willing and able to mentor emerging founders.

In practice, mentorship availability varies significantly across regions. In smaller cities and peripheral ecosystems, experienced entrepreneurs are few, time-constrained, or socially distant from first-time founders. As a result, mentorship is often delivered through time-bound workshops, generalized training sessions, or sporadic advisory meetings. While these interventions may increase awareness, they rarely provide the iterative, context-aware guidance necessary for navigating ambiguity and complex decision-making.

Incubators and entrepreneurship development programs are frequently expected to fill this gap. Yet evidence from multiple contexts suggests that physical infrastructure and programmatic activity alone do not translate into sustained mentoring relationships. In such settings, incubators risk becoming symbolic institutions—visible markers of entrepreneurial intent without the embedded cognitive support required for venture development.

Prior work on institutional frameworks for innovation ecosystems has argued that effective entrepreneurial environments depend on coordinated mechanisms for communication, expression, knowledge creation, and exchange. When any of these pillars remain underdeveloped, entrepreneurs experience fragmentation, isolation, and reduced learning capacity. Mentorship failures, therefore, should be understood not as isolated program shortcomings but as systemic institutional omissions.

This perspective shifts attention away from founder-centric explanations of entrepreneurial failure toward the structural conditions under which learning and judgment are cultivated. It positions mentorship not as a discretionary program feature but as essential institutional infrastructure, comparable to regulatory frameworks or capital access mechanisms in its impact on entrepreneurial outcomes.

3. Illustrating the Institutional Void in Tier-II Contexts

The institutional nature of mentorship gaps becomes visible when examining entrepreneurship development initiatives in smaller urban and semi-urban environments. Case studies from structured entrepreneurship development programs reveal a recurring pattern: motivated participants gain initial confidence and technical exposure but struggle to sustain momentum once formal training concludes.

Case narratives from entrepreneurship programs supporting early-stage founders such as Arti Ubale and Gaurav Devtare illustrate common post-program challenges. Both cases reflect strong individual intent and engagement with available institutional mechanisms. However, following program completion, founders faced difficulties in refining business models, prioritizing strategic decisions, and accessing experienced feedback. Advisory interactions were episodic, dependent on personal networks, and largely disconnected from real-time decision needs.

These cases are not exceptional; rather, they exemplify a broader structural pattern observed across similar contexts. The absence of continuous mentorship creates a reliance on informal advice, trial-and-error learning, and prolonged periods of uncertainty. Over time, this increases cognitive load on founders and contributes to stagnation or premature exit, even in the presence of supportive policies and infrastructure. Importantly, these challenges persist despite the presence of incubators and formal programs, underscoring the distinction between activity-driven support and system-level capability building. The gap is not one of intention but of institutional design: mechanisms for sustained guidance are not embedded into the entrepreneurial environment.

This institutional void provides the analytical foundation for considering alternative forms of mentorship delivery that do not depend solely on local human availability. It suggests that effective entrepreneurial support in resource-constrained contexts requires infrastructure solutions rather than programmatic expansions.

4. Empirical Foundations: From Policy Pilot to Global Validation

The theoretical framework proposed in this paper emerges from sustained empirical engagement with entrepreneurship development across multiple contexts and institutional settings. This section traces the development pathway of AI-mediated mentorship systems from initial policy implementation through global recognition and crisis-context deployment.

Policy Implementation Foundation (2019-2022)

Initial validation occurred through pilot implementation under the Pradhan Mantri Yuva Yojana (PMYY) in Maharashtra between 2019 and 2022. This government-supported initiative provided a structured testing environment for AI-enabled mentorship systems within an established entrepreneurship development framework. The pilot demonstrated that digitally mediated guidance could complement traditional training programs while addressing post-program sustainability challenges identified in earlier cohorts.

The PMYY context offered three critical advantages for system development: access to diverse founder profiles across sectors, integration with existing institutional mechanisms, and longitudinal observation of entrepreneurial progression beyond initial training phases. Evidence from this implementation informed subsequent design iterations and established proof of concept for institutional stakeholders.

Global Recognition and Institutional Validation

Recognition by the World Economic Forum and Deloitte validated the institutional significance of AI-mediated mentorship as an innovation in entrepreneurship support mechanisms. This acknowledgment positioned the work within broader conversations about entrepreneurial ecosystem development and digital transformation of business support services. The recognition reflected assessment not merely of technological capability but of the approach's potential to address structural gaps in emerging entrepreneurial contexts.

This validation proved instrumental in subsequent scaling efforts, providing credibility signals to institutional funders and enabling partnerships with international development organizations operating in diverse geographic and constraint environments.

Crisis Context Deployment and Extreme Environment Testing

Funding support from the United Nations High Commissioner for Refugees (UNHCR) enabled deployment of AI-mediated mentorship systems in refugee settlement contexts characterized by severe resource constraints, limited internet connectivity, and disrupted social networks. This represented a critical test of the institutional infrastructure thesis: could digitally mediated systems function effectively in environments where not only mentorship networks but most conventional support mechanisms were absent or severely compromised?

Refugee contexts provided extreme conditions for validation. Entrepreneurs operating in such settings face compounded challenges including legal uncertainty, restricted mobility, limited access to formal financial systems, and social isolation from established business communities. The successful deployment of AI-enabled mentorship under these conditions demonstrated system robustness and confirmed the approach's applicability beyond conventional small-city or peripheral ecosystem contexts.

Technical adaptations for low-connectivity environments—including offline functionality, asynchronous interaction modes, and optimized data transmission—proved essential and informed subsequent system design. The UNHCR deployment established that AI-mediated mentorship could function as institutional infrastructure even in the absence of reliable digital connectivity, traditionally considered a prerequisite for such systems.

Ecosystem Building Support Through Multi-Initiative Funding

Parallel funding from GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) through the Vruksh Ecosystem Foundation supported multiple initiatives focused on entrepreneurship ecosystem development across South Asian contexts. This support enabled sustained engagement with institutional partners, development of training materials, and integration of mentorship into broader ecosystem-building efforts. The GIZ partnership facilitated cross-context learning and enabled comparative analysis across different entrepreneurial environments. It also supported development of complementary institutional mechanisms—including peer networks, knowledge-sharing platforms, and collaborative learning structures—that interact with mentorship systems.

Synthesis: From Validation to Institutional Model

The progression from policy pilot through global recognition to crisis-context deployment establishes a validation trajectory that moves beyond proof of concept toward demonstration of institutional viability. Each implementation context tested different dimensions of the institutional infrastructure thesis:

- PMYY pilot: Integration with existing policy mechanisms
- WEF-Deloitte recognition: Global relevance and innovation significance
- UNHCR deployment: Extreme constraint resilience
- GIZ support: Multi-context ecosystem integration

Collectively, these validations demonstrate that AI-mediated mentorship can function as institutional infrastructure across diverse entrepreneurial environments, from structured government programs to humanitarian crisis contexts. This empirical foundation grounds the theoretical framework developed in subsequent sections.

5. The Four-Pillar Framework: Communication, Expression, Knowledge, Exchange

Effective entrepreneurial ecosystems require coordinated institutional mechanisms that enable continuous learning, decision support, and strategic adaptation. Drawing on prior institutional framework analysis and empirical observations from the implementations described above, this paper proposes a four-pillar model for understanding how AI-mediated mentorship systems can function as institutional infrastructure.

Each pillar represents a distinct but interconnected dimension of entrepreneurial support that traditional mentorship provides informally through human networks. In contexts where such networks are weak or absent, digitally mediated systems can replicate these functions through structured interaction design.

Communication: Enabling Continuous Dialogue

Traditional mentorship operates through ongoing conversation between experienced advisors and emerging founders. This continuous dialogue allows for iterative refinement of ideas, real-time problem-solving, and contextual guidance adapted to evolving circumstances. In weak ecosystems, this communication infrastructure is typically absent beyond formal program boundaries.

AI-mediated systems can provide communication infrastructure through conversational interfaces that remain accessible beyond workshop timelines and geographic constraints. The ekatra platform, for instance, enables founders to engage in structured dialogue about strategic decisions, business model challenges, and operational priorities on an ongoing basis. Unlike episodic advisory sessions, this creates a persistent communication channel that founders can access when decision needs arise.

Evidence from refugee context deployment demonstrates the criticality of communication infrastructure even in extreme environments. Entrepreneurs operating in isolation from established business communities reported that conversational access to strategic guidance reduced perceived uncertainty and enabled more systematic decision-making processes.

Expression: Articulating Strategic Intent

Entrepreneurial learning frequently occurs through the process of articulating business logic, explaining strategic choices, and defending assumptions to experienced interlocutors. This expression function of mentorship forces founders to clarify thinking, identify gaps in reasoning, and develop coherent narratives about their ventures.

In environments where experienced mentors are scarce, founders often lack structured opportunities to articulate and refine their strategic thinking. AI-mediated systems can provide expression infrastructure by prompting founders to explain decisions, document reasoning processes, and structure business logic in formats that surface inconsistencies or gaps.

The PMYY pilot implementation revealed that structured prompting for business model articulation helped founders identify unstated assumptions and clarify value propositions. This expression function proved particularly valuable for founders without prior business education, who lacked frameworks for organizing strategic thinking.

Knowledge: Accessing Contextual Information

Mentors typically provide access to relevant knowledge drawn from experience, industry familiarity, and accumulated pattern recognition. This knowledge function reduces information search costs and helps founders navigate unfamiliar domains. In peripheral ecosystems, founders often lack efficient access to contextually relevant information.

AI-mediated systems can serve as knowledge infrastructure by providing curated information retrieval, contextual case examples, and domain-specific guidance calibrated to founder queries. Rather than replacing human expertise, this function reduces dependence on local knowledge availability by enabling access to broader information resources.

GIZ-supported implementations across multiple South Asian contexts demonstrated that knowledge infrastructure becomes particularly critical when founders operate outside established industry clusters. Access to relevant examples, regulatory information, and market context through AI-mediated systems reduced reliance on episodic training sessions that could not address specific, timely information needs.

Exchange: Facilitating Network Access

Mentorship networks provide exchange infrastructure by connecting founders to potential collaborators, customers, suppliers, and advisors. These network effects are often cited as primary benefits of incubator participation, yet they depend on the presence of active, engaged mentor networks.

While AI-mediated systems cannot directly replicate human network effects, they can facilitate exchange by identifying potential connection points, suggesting collaboration opportunities, and structuring information in ways that enable subsequent human interaction. The UNHCR deployment illustrated how

digital systems could map founder capabilities and needs even in fragmented populations, creating foundations for subsequent exchange.

Integration of AI-mediated mentorship with existing ecosystem-building initiatives supported through GIZ funding demonstrated complementarity between digital infrastructure and human network development. Rather than substituting for human exchange, AI systems can scaffold network formation by reducing information asymmetries and identifying match opportunities that founders might otherwise miss.

Framework Integration and Institutional Function

The four pillars operate interdependently rather than as discrete components. Communication enables expression; knowledge access informs communication; exchange possibilities emerge from articulated capabilities. When traditional mentorship networks exist, these functions emerge organically through human interaction. When such networks are weak, institutional substitutes must provide coordinated support across all four dimensions.

AI-mediated mentorship systems represent one approach to providing such substitutes. Their effectiveness as institutional infrastructure depends not on technological sophistication alone but on intentional design that addresses all four pillar functions in contextually appropriate ways. The empirical implementations described in Section 4 suggest that such design is feasible across diverse constraint environments, from government-supported programs to humanitarian crisis contexts.

6. Discussion: Implications for Ecosystem Development Theory and Practice

The empirical evidence and theoretical framework presented in this paper carry several implications for how entrepreneurial ecosystem development is understood and pursued, particularly in resource-constrained regional contexts.

Reframing Infrastructure Beyond Physical Assets

Entrepreneurship policy has traditionally emphasized physical infrastructure—incubation facilities, coworking spaces, fabrication labs—as visible markers of ecosystem commitment. While such assets may provide symbolic legitimacy and operational convenience, the evidence presented here suggests that cognitive and relational infrastructure may be more critical for early-stage venture development.

AI-mediated mentorship systems represent a form of cognitive infrastructure that can be deployed rapidly, scaled efficiently, and adapted contextually in ways that physical assets cannot. The refugee context deployment particularly demonstrates that infrastructure effectiveness is not primarily about physical presence but about functional availability when founders face decision points.

This reframing suggests that ecosystem investment priorities should shift toward mechanisms that provide continuous guidance and learning support rather than episodic training or facility access. Infrastructure should be evaluated not by visibility but by its capacity to reduce founder isolation and improve decision quality over extended periods.

Mentorship as System Design Rather Than Relationship Matching

Traditional approaches to mentorship development focus on matching entrepreneurs with experienced advisors, assuming that relationship formation will organically produce guidance benefits. The institutional void illustrated in Section 3 reveals limitations of this approach in contexts where experienced advisors are simply unavailable in sufficient numbers.

Treating mentorship as a system design challenge rather than a matching problem opens alternative pathways. AI-mediated systems suggest that guidance functions can be partially disaggregated and delivered through designed interactions rather than solely through interpersonal relationships. This does not eliminate the value of human mentorship but reduces complete dependence on local mentor availability.

The WEF-Deloitte recognition validates this systems perspective on mentorship as an innovation in support mechanism design. It suggests that entrepreneurship research should attend more closely to how guidance functions are institutionally provided rather than assuming that human mentorship networks will self-organize given sufficient ecosystem activity.

Scalability and Equity Implications

A recurring challenge in entrepreneurship support is the tension between program quality and access. High-touch mentorship programs serve small cohorts intensively but cannot scale to meet broader demand. Mass training programs reach larger populations but provide limited individualized guidance.

AI-mediated mentorship systems present a potential pathway toward scaling individualized support. Evidence from PMYY implementation and subsequent deployments indicates that such systems can maintain interaction quality while expanding access beyond what human-dependent models enable. This has equity implications for founders operating in peripheral locations or underserved populations who currently experience mentorship scarcity.

However, scalability benefits depend on thoughtful implementation. The UNHCR deployment required significant technical adaptation for low-connectivity contexts, demonstrating that accessibility requires intentional design rather than assuming universal digital access. Equity gains from AI-mediated systems materialize only when deployment accounts for infrastructure constraints in target environments.

Complementarity with Human Networks

The framework presented here positions AI-mediated mentorship as institutional infrastructure rather than human mentor replacement. Evidence from GIZ-supported multi-initiative implementations demonstrates that digital systems function most effectively when integrated with broader ecosystem-building efforts that include human relationship development.

This complementarity operates in both directions. AI systems can scaffold initial learning and decision-making, reducing demands on scarce human mentor time and enabling more focused, high-value interactions when human guidance is accessed. Conversely, human networks provide context, motivation, and social legitimacy that purely digital systems cannot replicate.

Ecosystem development strategies should therefore treat AI-mediated mentorship and human network development as complementary infrastructure components rather than alternative approaches. Investment frameworks that fund only one dimension risk reproducing institutional gaps through different mechanisms.

Limitations and Future Research Directions

This paper's argument rests on case evidence from specific implementations and contexts. Several limitations warrant acknowledgment. First, longitudinal outcome data comparing venture survival and growth across different mentorship infrastructure models remains limited. While the empirical implementations demonstrate feasibility and validation by institutional stakeholders, systematic outcome evaluation across diverse contexts represents an important research frontier.

Second, the paper does not deeply examine entrepreneur preferences regarding guidance modalities. Some founders may strongly prefer human interaction even when AI-mediated systems are functionally adequate. Understanding these preferences and their variation across contexts would inform implementation design.

Third, the institutional framework proposed here emphasizes guidance infrastructure but does not address other ecosystem components such as capital access, regulatory environment, or market connectivity. While mentorship is argued to be a critical institutional gap, it is not suggested to be the only determinant of entrepreneurial outcomes.

Future research should pursue comparative studies across ecosystems with varying configurations of human and AI-mediated mentorship infrastructure, examining how these interact with other institutional components. Additionally, detailed process studies examining how founders actually use AI-mediated guidance systems in decision-making would deepen understanding of micro-level mechanisms through which such systems influence entrepreneurial capacity.

7. Conclusion

This paper has argued that early-stage entrepreneurial fragility in smaller cities and emerging regional ecosystems reflects an institutional gap rather than primarily individual deficiencies. Specifically, the absence of continuous, high-quality mentorship represents a structural feature of weak entrepreneurial environments that episodic training programs and physical incubator infrastructure do not adequately address.

Drawing on empirical implementations spanning government policy programs, refugee contexts, and multi-context ecosystem initiatives, the paper demonstrates that AI-mediated mentorship systems can function as institutional infrastructure providing communication, expression, knowledge, and exchange support to founders operating in resource-constrained environments. Validation through WEF-Deloitte recognition, UNHCR scaling, and GIZ partnership establishes credibility across diverse institutional and constraint contexts.

The four-pillar framework presented here offers an analytical lens for understanding how digitally mediated systems can provide guidance functions traditionally delivered through human mentorship

networks. This reframes entrepreneurship support infrastructure beyond physical assets and programmatic activities toward continuous cognitive and relational scaffolding.

For policy and practice, the implications suggest prioritizing investment in scalable guidance infrastructure over symbolic institutional markers. For research, the work contributes to entrepreneurial ecosystem theory by examining mentorship as institutional infrastructure and by demonstrating how digital systems can reshape capability-building mechanisms in underserved entrepreneurial contexts.

As entrepreneurship continues expanding into diverse regional settings, the question is not whether to support emerging founders but how to provide that support effectively when traditional ecosystem components remain underdeveloped. This paper suggests that treating mentorship as an infrastructure design challenge rather than relationship-matching problem opens pathways toward more equitable and scalable entrepreneurial support.

AI Use Disclosure

The authors used the following Generative AI tools during the preparation of this manuscript. ChatGPT (version 5.2) and Claude (version 4.5) were used to support language refinement, structural organization, and clarity of expression. WhisperFlow was used solely for audio dictation and transcription during early drafting stages.

All conceptual framing, analytical reasoning, interpretations, and conclusions presented in this manuscript are the authors' own. The authors take full responsibility for the content, accuracy, and integrity of the work.