

Learning to Innovate: WhatsApp Groups as Grassroots Innovation Ecosystems Among Micro-Entrepreneurs in Emerging Markets

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Abstract

Scholarly and policy analyses of innovation have traditionally privileged formal, capital-based research and development systems, thereby marginalising the dynamic, grassroots innovations in the informal digital spaces of emerging markets. This theoretical paper aims to critically interrogate this prevailing paradigm by redefining the WhatsApp groups of micro-entrepreneurs as decentralised, real-time innovation systems. Based on network theory and the Communities of Innovation (CoI) framework, we argue for the recognition of these groups as informal research and development laboratories. The platform's intrinsic architectural aspects, including instant multimedia sharing and real-time dialogue, facilitate rapid cycles of peer-to-peer problem-solving, iterative prototyping, and shared learning. This process yields new forms of innovation, from incremental product variations to adaptive marketing techniques to robust crisis management strategies, all based on social capital and trust rather than formal institutional support. While the review recognises the significance of this emerging phenomenon, it also critically examines its inherent limitations, including the risks of echo chambers, the dissemination of misinformation, and the notable absence of intellectual property protections. By incorporating new empirical evidence from South Asia, we demonstrate how these digital networks serve as both spaces of significant creativity and sites of vulnerability. Through a theoretical analysis of these groups, this paper formulates a new theory of entrepreneurial resilience and outlines a future research agenda. It holds important implications for innovation theory, development policy, and digital platform design, calling for a shift in emphasis towards the identification and cultivation of the organic dynamics of grassroots innovators operating at the core of the informal economy.

Keywords: Micro-entrepreneurship, Informal Innovation, WhatsApp Communities, Social Capital, Emerging Markets.

Introduction

In the economic landscapes of emerging nations like Pakistan, India, and Indonesia, WhatsApp has evolved beyond its origins as a messaging application to become a foundational part of digital infrastructure. For a vast population of micro and small-scale entrepreneurs, artisans, gig workers, and street vendors, it is an indispensable tool for daily communication, marketing, and customer service (Ahmed et al., 2025; Riaz et al., 2024). Despite its informal nature, WhatsApp is

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increasingly central to business innovation and knowledge exchange at the grassroots level. This reality, however, stands in stark contrast to scholarly conceptualisations of innovation, which typically privilege formal R&D labs, incubators, or structured corporate units. Consequently, the vibrant, peer-driven ecosystems where micro-entrepreneurs innovate in real-time remain largely invisible.

The academic literature confirms that informal communication networks are crucial for organisational innovation, facilitating the exchange of critical information and fostering a sense of collaborative identity (Dietsch & Khemiri, 2018; Zhao, 2012). Communication technologies are a significant contributor to small business success, yet the qualitative benefits of informal digital spaces are often underestimated (Biagioli, 2017; Jorgensen et al., 2022). In developing economies, where the informal sector can be a hidden engine of innovation, these platforms are particularly significant (De Beer et al., 2016). Tools like WhatsApp Business are being increasingly adopted, enhancing community engagement and providing a conduit for collecting and interpreting organisational data (Issa & Makubi, 2024; Sayudin et al., 2024; Timcke, 2022).

This review aims to reframe these WhatsApp communities, specifically those of micro-entrepreneurs, as informal research and development laboratories or grassroots innovation ecosystems. These groups function as decentralised, peer-based systems that enable real-time feedback, collective problem-solving, and iterative prototyping across products, services, and marketing initiatives. Drawing on peer-reviewed studies from 2010 to 2025, this paper synthesises empirical evidence on social networks and technology adoption in emerging markets to illuminate how these groups facilitate business insights. We anchor our analysis in network theory and the Communities of Innovation (CoI) framework, contextualised with rich insights from Pakistan (Ahmed et al., 2025; Riaz et al., 2024) and India (De, 2025) to interrogate the benefits, constraints, and future trajectories of this phenomenon.

Theoretical Framework

This review constructs its argument by integrating three complementary theoretical frameworks: Communities of Innovation (CoI), network theory, and technology adoption models. Together, these frameworks provide a comprehensive understanding of how informal digital groups act as catalysts for grassroots innovation.

Communities of Innovation (CoI)

The CoI framework assumes that innovation can be gained through the long-term collaborative efforts of different participants, which occur through the exchange and enhancement of ideas (Fischer, 2001; West, 2010). Cycles of divergence, filtering, and convergence that are characteristic of this process do not represent exclusively formalised processes and are particularly illustrative when it comes to the operation of digital peer groups (Levine & Prietula, 2014). CoIs operate based on a degree of symmetry of ignorance, where a combination of different pools of knowledge is utilised to address complex problems; thus, the framework is notably applicable in examining the collaboration of micro-entrepreneurs with diverse skills and experiences engaging in virtual collaboration (Fischer, 2001). The model gives an analytical perspective on distributed creativity and collaborative innovation.

Network Theory & Knowledge Acquisition

The vulnerability of these communities to operate depends on the social networks on which they are supported. The literature on SMEs in emerging markets has consistently emphasised the

paramount role of social networks (whether familial, professional, or peer-based) as a knowledge conduit of practice that, in effect, triggers entrepreneurial success. As an example, Riaz et al. (2024) conducted a study in Pakistan and reported that the positive connections between social network strength, learning, and SME success were substantial. This is an empirical confirmation of the central principle of network theory, which is that external connections help to make diverse information, resources, and support accessible. More studies indicate that social capital, in its manifold dimensions, will elevate the performance and entrepreneurial orientation of SMEs, which will continually justify the excellence of networks in contributing to the market prosperity of concerned nations, such as Pakistan (Aftab et al., 2022; Khattak, 2022). Research also highlights the role of technology in facilitating social interactions and fostering knowledge exchange among entrepreneurs (Davison et al., 2013; Zamani et al., 2021).

Technology Adoption & Innovation

The capacity of these networks to utilise a medium like WhatsApp is dependent on the use of technology, which is based on factors that control technology use. Studies show that the compatibility of technology influences the adoption of digital tools among SMEs, as well as the available infrastructure, knowledge, and perceived complexity. While examining Pakistani startups using a qualitative approach (Ahmed et al., 2025), it has been discovered that digital literacy served as a significant mediator; the more entrepreneurs knew about technology, the more capable they were of adapting to and strategically engaging with tools such as social media marketing. It means that although accessibility is basic, the power to reconfigure the elements of a tool into original business operations is balanced by the user's capacity. Furthermore, Fatima & Bilal (2020) emphasise the importance of individual entrepreneurial orientation and active social networking in driving SME performance, an essential factor for adapting to and leveraging technology in informal sectors.

WhatsApp Groups as Informal Innovation Labs

WhatsApp groups can be theoretically defined as informal labs due to their affordances, which are based on the specific technological resources and the social processes they accommodate. With the platform's functions, it is possible to instantly share various media, such as product sample photographs, voice messages that describe a new sales story, collective surveys on customer preferences, and videos on a new method. This feature enables quick evaluation processes that resemble ad hoc R&D prototyping. A businessperson can prototype an idea, receive instant feedback from their coworkers, make adjustments, and disseminate the idea rapidly in an iterative cycle.

This team ethic is fostered by several social and psychological rewards that have sustained it. Based on studies of online communities, it is not only functional value (exchange of information) that members find, but also social and emotional support, which generates a sense of belonging to peers (Lakmali et al., 2021; Mattioli et al., 2012). Huang et al. (2022) argue that trust and camaraderie enhance openness to accepting emerging ideas and participating in mutual problem-solving, as well as supporting experiments, especially in a high-stakes business environment.

As a result, innovation within such groups is usually emergent and self-organised. The involved groups are formed in local trade clusters or friendship circles with no formal hierarchy. Members share marketing topics, supplier information and market information without restrictions. Innovations often emerge from the bottom up: a vendor shares a new packaging idea, others replicate or adapt it, and a collective marketing phrase spreads through the network. These

emergent practices are then refined collectively, serving as micro-scale analogues of formal innovation systems. Mupepi (2019) discusses how mobile messaging apps, such as WhatsApp, can reduce risks and increase productivity, emphasising the efficiency that such platforms bring to informal innovation processes.

Table 1: Themes and Corresponding References

No.	Themes	References (In-Text Citations)
1	WhatsApp as a tool for communication, marketing, and customer service	Ahmed et al. (2025); Riaz et al. (2024)
2	Informal communication networks and organizational innovation	Dietsch and Khemiri (2018); Zhao (2012)
3	The role of WhatsApp in business innovation and knowledge exchange	Biagioli (2017); Jorgensen et al. (2022)
4	Informal sector as an engine of innovation in developing economies	Beer et al. (2016)
5	Adoption of WhatsApp Business and community engagement	Issa and Makubi (2024); Sayudin et al. (2024); Timcke (2022)
6	Peer-based, decentralized innovation ecosystems	Ahmed et al. (2025); Riaz et al. (2024); De (2025)
7	Communities of Innovation (CoI) framework	Fischer (2001); West (2010); Levine and Prietula (2014)
8	Role of social networks in knowledge acquisition and entrepreneurship	Riaz et al. (2024); Aftab et al. (2022); Khattak (2022)
9	The role of technology adoption in SMEs' success	Davison et al. (2013); Zamani et al. (2021); Fatima and Bilal (2020)
10	Digital literacy as a mediator in the adoption of digital tools	Ahmed et al. (2025)
11	WhatsApp groups as informal innovation labs	Lakmali et al. (2021); Mattioli et al. (2012); Huang et al. (2022)
12	Emergent and self-organized innovation processes in WhatsApp groups	Mupepi (2019)

Empirical Findings

Recent empirical work provides a solid foundation for our conceptual claims, offering context-rich insights from South Asian markets where WhatsApp is deeply embedded in the micro-enterprise fabric.

Social Networks and Entrepreneurial Success in Pakistan

In a quantitative study of 311 Pakistani SMEs, Riaz et al. (2024) established a clear empirical pathway: social network strength was a significant predictor of knowledge acquisition, which in turn was a significant predictor of entrepreneurial success (measured via performance, growth, and innovation). Notably, the study found that a green entrepreneurial orientation acted as a positive moderator, meaning firms with a sustainability focus derived even greater benefits from their networks. This research firmly links the peer networks, such as those organised on WhatsApp, to tangible business outcomes.

Adoption of Social Media Marketing & Technology Infrastructure

Investigating the enablers of digital adoption, Ahmed et al. (2025) conducted in-depth qualitative research with Pakistani startups. Their findings revealed that technological compatibility and

existing infrastructure were key, but that technology knowledge was the critical mediator of success. Complexity was not a significant barrier for younger, tech-aware entrepreneurs, suggesting a readiness to experiment with digital tools like WhatsApp. Crucially, this study highlights that it is the ability to creatively utilise a platform's features, rather than just access to it, that drives innovation.

Transition to WhatsApp Business & Creative Appropriation

Providing a more critical perspective, De (2025) interviewed 14 Indian small business owners about their transition to the more formalised WhatsApp Business platform. While the platform introduced official tools, participants reported frustration with its stricter templates and reduced flexibility. As a reaction, they developed informal workarounds, including creating tailored catalogues by using images, employing voice notes to narrate product contexts, and utilising batch messaging strategies that maintained the traditional and peer-based dynamics of their groups. De (2025) introduces the term "coercive professionalisation" to describe how platform standardisation can risk stifling the very grassroots adaptation that makes these communities innovative. Entrepreneurs creatively resisted these new constraints by carving out spaces for peer innovation.

Types of Innovation Emerging

WhatsApp groups foster a collaborative environment that leads to various types of grassroots innovation, which may intersect. These outcomes illustrate the stages of collective innovation (CoI), which include ideation, peer validation, and collective implementation, all taking place informally and across the network.

Product Innovation

This will always be a readily observable innovation. Minor yet impactful modifications, such as novel variations of a food item, a stronger or longer-lasting packaging style, or a new/unique product combination, are shared through photographs or video presentations. Peer critiques trigger quick reiterations, which can be shared through the network quickly. As an example of their use, a street food store may introduce a variant of mango chutney in response to the suggestions of the respective group, test its marketability, and scale it based on actual consumer feedback among fellow consumers.

Marketing Innovation

The marketing strategies are developed through mutual efforts. Co-created and shared viral messages, referral campaigns, group-only discounts and post designs are co-created and shared. One example of this is a group of craftspeople who may develop a template phrase or special hashtag that everyone applies to their businesses, thereby achieving greater collective exposure due to the amplified network effect.

Operational Innovation

Such groups are sources of incremental innovations in processes that streamline the micro-operations and reduce their expenses. Examples of logistical tips that members provide include ordering in bulk to receive discounts, combining delivery routes to reduce fuel costs, collaborating on purchasing raw materials, and optimising scheduling to use their time more efficiently.

Crisis Innovation

In times of external shock (e.g. during pandemic lockdowns or unexpected disruptions to supply chains), WhatsApp groups have become an indispensable means of adapting on short notice. These networks enabled rapid switches, such as the joint identification of other suppliers, consolidation of orders to reach minimums, and the organisation of no-contact delivery systems. The group chat evolves into a sphere of collaborative sense-making, which helps micro-entrepreneurs navigate uncertain conditions and develop communal resilience.

WhatsApp Communities as Micro-CoINs (Communities of Innovation Networks)

Mapping CoI principles onto the dynamics of these WhatsApp groups reveals a precise alignment. These groups operate as micro-scale Communities of Innovation Networks (CoINs):

Divergence: Members suggest a diverse range of ideas, including product adjustments and promotional strategies.

Gateway Filtering: Peers serve as an informal filtering mechanism by evaluating the viability of ideas through their reactions, such as likes and replies, as well as through constructive criticism and suggestions for improvement.

Convergence: The group gathers with innovative and refined ideas, which members then adopt and implement in their businesses.

Implementation: The ideas are tested in the marketplace, with outcomes and further refinements often shared back with the group in subsequent conversational rounds.

Furthermore, these groups exhibit boundary-spanning behaviour, as participants draw on knowledge from external sources, such as suppliers, customers, and other local peers. This flow of bridging social capital enriches the community's knowledge base. While lacking formal structure, these WhatsApp communities function as effective, self-organised CoI networks with emergent leadership and shared innovation norms.

Constraints, Risks & Limitations

Despite their innovative potential, these informal ecosystems are subject to significant constraints and risks that must be acknowledged and addressed.

Platform Constraints & Coerced Professionalisation

The WhatsApp platform itself imposes technical limitations, such as member caps on groups and media compression, which can constrain scale. More importantly, as seen in De's (2025) research, moves toward standardisation via platforms like WhatsApp Business can introduce a "coercive professionalisation" that stifles the spontaneity and creative control that define grassroots innovation.

Misinformation & Echo Chambers

The peer-driven nature of these discussions can be a double-edged sword. Incorrect advice, unsubstantiated marketing myths, or outdated business practices can be propagated and reinforced within closed, high-trust groups, creating echo chambers that limit exposure to better information.

Digital Divide & Literacy Gaps

Access to the technology and the skills to use it effectively are not evenly distributed. Not all micro-entrepreneurs can easily adopt or utilise WhatsApp's more advanced features, particularly

older generations or those with lower digital literacy. The underlying digital divide in access to reliable internet and smartphones remains a persistent barrier (Ahmed et al., 2025).

Informality Limits Scale

Because these groups operate outside of formal institutions, their innovations often remain confined to local clusters. Scaling an idea beyond the immediate network requires bridging into formal structures (e.g., incubators, government programs), a transition that risks disrupting the organic group dynamics that fostered the innovation in the first place.

Lack of Intellectual Property Protection

The most significant risk is the exposure of intellectual capital. Ideas shared openly in these groups are vulnerable to appropriation by others, both inside and outside the community. Without formal IP protection, participants rely solely on trust and social norms, leaving them with little recourse if their ideas are copied without credit or compensation.

Future Research Directions

To build upon this conceptual framework and deepen our understanding, future research should pursue several key trajectories:

Longitudinal Tracking of Innovation: Move beyond cross-sectional snapshots to monitor specific WhatsApp groups over time. This would allow researchers to map the entire lifecycle of an idea from genesis and diffusion to adaptation and measurable performance outcomes.

Cross-Context Comparisons: Conduct comparative studies in different emerging markets (e.g., Nigeria, Indonesia, Brazil) to examine how varying cultural norms, regulatory environments, and infrastructural realities shape the dynamics of WhatsApp-driven innovation.

Intervention Experiments: Design and test lightweight interventions to evaluate their effectiveness. Researchers could collaborate with groups to introduce peer leader training, expert-led content prompts, or curated knowledge modules and then assess the effects on innovation quality, diffusion, and group cohesion.

Measurement Scales for Informal Innovation: Develop and validate new survey instruments designed to quantify the unique dimensions of this phenomenon, including peer engagement intensity, iteration cycles, and the specific functional, psychological, and hedonic benefits members derive.

Hybrid Ecosystem Models: Examining the Intersections between Informal and Formal Systems. Research is needed on hybrid models where NGOs or business support agencies can gently scaffold these WhatsApp communities, for instance, by providing access to funding or IP advice without coercing standardisation or destroying organic trust.

Practical Implications

The insights from this review provide actionable guidance for various stakeholder groups seeking to support micro-entrepreneurship in the digital age.

For Practitioners and NGOs: Instead of creating new platforms, recognise and support the innovation already happening in existing WhatsApp groups. This can be achieved by offering tailored digital literacy workshops, facilitating peer mentor programs that connect different groups, or providing micro-grants that validate and help scale group-developed innovations.

For Policymakers: Digital economy policies should focus on fostering an enabling environment through affordable internet access and widespread training on digital tools. Crucially, policy

should seek to facilitate these networks and reduce their risks without imposing rigid structures that would disrupt their organic, bottom-up dynamics.

For Businesses: Larger businesses and early-stage entrepreneurs can ethically leverage these networks to gain valuable local market intelligence. This could involve co-creation initiatives, where brands provide sample materials or early-stage products and gather authentic, real-time feedback from established communities.

For researchers, there is a need to adopt methodologies suited to studying these fluid, in-situ environments. Digital ethnography (netnography) and mixed-methods designs that combine the analysis of chat narratives with surveys and performance tracking are essential for capturing the richness of these interactions.

Conclusion

This review advances a conceptual reframing of informal WhatsApp communities, arguing that they should be recognised as legitimate and potent grassroots innovation ecosystems. By characterising them as decentralised R&D labs, we challenge the conventional, institution-centric view of where and how innovation occurs, particularly in emerging markets. Our central thesis is that micro-entrepreneurs are creatively appropriating the affordances of ubiquitous digital tools to overcome structural barriers, powering a mode of innovation that relies not on capital investment, but on the currency of social capital, peer-to-peer learning, and agile experimentation. The empirical evidence from Pakistan and India demonstrates that these are not merely communication channels but are active sites for the co-creation of product, marketing, operational, and crisis-response innovations.

Crucially, this paper does not present an uncritical celebration of these digital spaces. We have underscored the profound constraints and risks—platform limitations, the peril of echo chambers, digital literacy gaps, and a fundamental lack of intellectual property protection that define these informal arenas. This highlights the central tension of our argument: the very informality that makes these communities agile, accessible, and resilient also renders them inherently vulnerable. The contribution of this work is therefore twofold. First, it offers a theoretical lens that brings a largely invisible economic activity into the domain of innovation studies, advocating for a more inclusive understanding of R&D. Second, it provides a clear and actionable agenda for future research and practice. Moving forward, the goal for researchers, policymakers, and NGOs should not be to formalise these groups into rigid structures, but to find ways to support them gently—mitigating their risks while preserving the organic, trust-based dynamics that are their greatest strength. Ultimately, to understand these digital labs is to do more than study an application; it is to recognise innovation where it lives: in the conversations, collaborations, and collective resilience of those building economies from the ground up.

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