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Innovation through Constraint: A Conceptual Framework of Entrepreneurial Bricolage and Knowledge Flows

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ABSTRACT

This conceptual paper provides a behavioral explanation of the way startups in resource constrained economies pursue open innovation. Based on the bricolage perspective and the Knowledge Based View, the paper argues that entrepreneurial bricolage influences how entrepreneurs create knowledge, perceive constraints and keep relations with external partners. The framework suggests that inbound and outbound open innovation is enhanced by bricolage which makes entrepreneurs gain, adapt, and share knowledge through flexible and improvisational behavior. In the paper, the concept of knowledge bricolage is proposed as the integrative process that connects internal and external ideas with the help of the continuous recombination process. This view makes innovation under constraints as a learning and a behavioral based process and not the result of institutional frameworks or resource richness. The paper helps to develop the theory as it connects behavioral ingenuity to open innovation, provides practical advice to managers and policymakers, and provides research directions in the future to understand how innovation develops in the setting where scarcity is a standard of operation.

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1.0 Introduction

Startups in emerging and resource constrained economies are prone to a constant challenge. Their operations are limited in terms of financial resources, institutional structures, and technology resources, and yet are expected to grow and be innovative in their products and services. The entrepreneurs in the developing countries need to improvise and rely on the local network in order to survive and compete, unlike companies in mature markets, which can afford the structured research and development programs, formal partnerships, or state-supported innovation mechanisms (Hossain, 2022, Li et al., 2024). This fact leaves a new way of innovation, the one which is created in the form of creativity, flexibility, and using whatever resources are at hand. In this light, entrepreneurial bricolage is now a significant behavioral lens that can be used to understand the way that entrepreneurs reconfigure and reuse resources to find solutions and expand their opportunities (Baker and Nelson, 2005, Mateus, 2024).

Meanwhile, the concept of open innovation has become popular in businesses and across the regions. Open innovation supports the companies to obtain the knowledge of other partners and provide external companies with their ideas to use them further (Chesbrough, 2003, Bogers et al., 2018). Although that strategy is well-researched in large companies, most of the evidence persists in environments that are institutionally strong, stable research networks, and have formal cooperation channels available to them (Obradovic et al., 2021, Yao et al., 2024). Consequently, there is considerably less information on the formation of open innovation in the conditions when resource constraints are not the exception but the rule (Sabando Vera et al., 2022). In the case of startups in emerging economies, there is not only the difficulty of seeking external knowledge but also adapting and incorporating the knowledge with little resources.

Both of these streams of work entrepreneurial bricolage and open innovation are frequently discussed independently, but actually in the real field of entrepreneurship, they overlap one another. Bricolage describes how entrepreneurs go about it on the inside via improvisation and recombination of resources. Open innovation describes the process of knowledge movement through the firm boundaries. Taken collectively, these views imply that bricolage can be taken as a behavioral base that can equip the entrepreneur with the ability to evolve into an inbound and outbound knowledge exchange. Learning to be resourceful will often lead entrepreneurs to flexibly think, build a trust relationship, and learn dynamically, which is fundamental to open innovation (Aaouid et al., 2024, Liu et al., 2024).

These dynamics can be particularly observed in such emerging economies as Pakistan, India or Indonesia. Entrepreneurs are able to move between institutional voids, infrastructural gaps, and environmental uncertainty, but create locally relevant and socially significant innovations. The ingenuity manifested by their dependence on local knowledge, their informal social connection, and low-cost experimentation is associated with similar logic of bricolage (Desa, 2012, Shahid et al., 2023). Frugal innovation literature emphasizes what the results of this creativity are but bricolage emphasizes the behavioral process by which the result of such a process can be produced. This process is significant in understanding how innovation persists even in the conditions of a weak formal support system.

In this paper, the author suggests that entrepreneurial bricolage is a behavioral and cognitive antecedent of open innovation. Improvise-repurpose-creatively recombine through this process startups gain the flexibility necessary to absorb outside knowledge and extract internally developed ideas to their partners. Knowledge is viewed as the main strategic resource through Knowledge Based View, particularly in cases where the financial and technological resources are limited (Grant, 1996, Zahra and George, 2002). Bricolage reinforces the capacity to produce and consume knowledge at the local level whereas open innovation allows sharing that knowledge in the external setting. A combination of these behaviors can aid startups to continue being innovative when resources are scarce.

This conceptual paper has a triple objective. First, it formulates a theoretical framework of the way entrepreneurial bricolage promotes inbound and outbound open innovation within resource constrained settings. Second, it combines the bricolage behavioral approach with Knowledge Based View to elucidate the reasons why knowledge recombination and improvisation are critical in the process of innovation during constraint. Third, it brings implications on managers, policy makers and entrepreneurs who facilitate entrepreneurship in emerging markets.

This paper redefines innovation as a process that is influenced by adaptability as opposed to access to capital by refocusing on the behavioral creativity instead of the abundance of resources. Emerging economies do not have less innovative entrepreneurs. Different in that they are innovative driven by necessity, learning through the process of doing and supported by community-based streams of knowledge. Identifying entrepreneurial bricolage as a micro source of open innovation provides a more realistic and inclusive view of the actual process of innovation in the environment that is characterized by scarcity.

2.0 Literature Review

2.1 Entrepreneurial Bricolage: Innovation with what Is at Hand

Entrepreneurial bricolage has emerged as a significant perspective through which entrepreneurs are viewed to create value when they are in a setting characterized by scarcity, risk and poor institutional support. This is based on the theory of Levi Strauss who defined the bricoleur as the individual who manages to fix his problems with the available resources (Levi Strauss, 1966). This concept was later utilized by Baker and Nelson (2005) in the context of entrepreneurship and defined bricolage as the act of doing something with what is available to it by recombining it to meet new challenges. Their article demonstrates that innovation is not necessarily initiated by acquisition of resources. It is frequently initiated by innovative activity, experiment, and recycling.

Bricolage has over the years grown to be a wider behavioral ability that encompasses improvisation, recombining of resources, and toleration of limitations (Mateus, 2024). Bricoleurs do not follow any premeditated plans or official investments, but instead, they tackle issues flexibly and inquisitively. They recycle materials, reuse relationships and create solutions that are workable based on experience. Such an attitude can be seen as an indication of a mentality where entrepreneurs cherish action, learning and adjusting. It is also consistent with the results that entrepreneurs in uncertain markets are prone to innovate by utilizing available resources in ways

they can, instead of waiting until an optimal situation arises (Aaouid et al., 2024, Li et al., 2024).

Bric-a-brac is sometimes not a matter of choice but a must in economies that are limited in resources. Businessmen in some countries like Pakistan or India do not have access to official capital, qualified workforce, or organized support systems. They rely on informal connections, relationships within the community, and under-exploited resources locally to sustain their businesses (Desa, 2012, Hossain, 2022). In this strategy, there is a lack of distinction between economic and social capital since knowledge, trust, and reciprocity are the key elements of the resource pool. Such relationships in most instances replace formal market mechanisms and allow entrepreneurs to experiment in low cost and flexible manner.

According to the recent reports, bricolage is also a key feature of digital and sustainability-oriented ventures. Liu et al. (2024) demonstrate that digital ecosystem entrepreneurs regularly use the available technological tools, customer insights, and digital platforms to develop new business models. Their results imply that low tech or informal sectors are not the only ones practicing bricolage. It also determines innovation in which digital limits, speedy changes, and unpredictable market indications need constant adjustments. The same evidence has been reported by Li et al. (2024), who indicate that bricolage facilitates growth of new ventures through promotion of experimentation, opportunity exploration, and solving problems on the spot.

Collectively, these studies allow concluding that bricolage is not merely an effort to accommodate scarcity. It is a different way of innovating. It focuses attention on the utilization of what the entrepreneur possesses instead of what he/she does not possess. It encourages action learning, develops resilience, and aids in developing solutions that are locally relevant and economically viable. Formal R and D is rare in contexts where bricolage becomes a strategic ability enabling entrepreneurs to proceed and experiment with new ideas and unleash innovation by means of resourceful use.

2.2 Bricolage Theory: The Behavioral Foundations of Constrained Innovation

Bricolage approach can be used to understand why innovation can even come about at times when entrepreneurs are the target of severe resource constraints. It highlights that business beginners do not necessarily adopt optimal circumstances or a fresh input, before making a move. Rather, they make use of the available and through creativity, experimentation and flexibility of thought, they resolve problems. According to Baker and Nelson (2005), it is a process where one works with what he or she has to hand and puts them in a different combination, and grabs opportunities as they come. This is contrary to classic theory of innovation where firms are supposed to obtain resources before innovating. The bricolage approach takes this argument in inversion by proposing the idea that innovation is usually preceded by action, which is then succeeded by learning and the gathering of resources.

The bricolage view has also been associated with effectuation in the entrepreneurship literature, which concerns using the means one has to begin with and creating opportunities together with stakeholders (Sarasvathy, 2001). But more emphasis is laid on resource transformation with the bricolage perspective. Bric-a-brac entrepreneurs do not merely make use of what they have. They change and reorganize these materials, connections and thoughts and do

so in the process of trial and error. According to Mateus (2024), this process is a micro basis of innovation since it bridges entrepreneurial cognition and the adaptive action. Entrepreneurs learn through trial and error and make new adjustments to their strategies and acquire new operational abilities over time.

More constraint acceptance is also emphasized by the bricolage viewpoint. Instead of viewing scarcity as a situation that prevents innovation, entrepreneurs view constraints as a message that can be creatively addressed. This tendency can be observed frequently in the new economies where instability and uncertainty prevail. Entrepreneurs use makeshift resources, local knowledge or informal networks to respond swiftly to external operations that do not have the necessary support. Hossain (2022) and Desa (2012) demonstrate that this improvisational behavior enables the flexibility of entrepreneurs and reduces costs and the ability to develop locally applicable solutions that would otherwise not have appeared with more formal processes.

A similar idea is frugal innovation, which addresses basic and low-cost solutions that address critical needs (Hindocha et al., 2021, Shahid et al., 2023). Although frugal innovation is used to refer to the result, the bricolage lens is used to refer to the process of behavior that results in the results. Entrepreneurs test and use materials more than once and fail until they come to solutions that work. This renders bricolage a process and an evolving one instead of an improvisation.

In general, the bricolage approach presents a good behavioral account of constrained entrepreneurial value creation. It does not focus on the resources that the entrepreneurs have but the manner in which they think and behave. It demonstrates how creativity and combination can create innovation through the rapid exploration and experimentation and practical adjustment instead of the availability of formal finance or sophisticated facilities. With such an understanding of bricolage, scholars are able to explain better why resource constrained economy entrepreneurs still innovate despite the existing constraints.

2.3 Knowledge-Based View Knowledge as the Strategic Resource

The Knowledge Based View (KBV) proposes the view that knowledge is the most important strategic factor that a firm can foster since it determines learning and adaptation as well as long-term competitiveness (Grant, 1996, Nonaka and Takeuchi, 1995). Knowledge is not bought or duplicated as is the case with financial or physical assets; knowledge is entrenched in routines, experience, and social interactions. This renders it a rare and hard to replicate asset, especially when it comes to startups that do not have long term access to external capital or institutional resources. In new ventures, when it comes to the creation and recombination of knowledge, this becomes a facility of strategic advantage (Deeds et al., 2000, Zahra and Nielsen, 2002).

In this sense, entrepreneurial bricolage serves as a focal point in production of knowledge. The tacit and explicit knowledge is created when entrepreneurs convert accessible materials, borrow concepts in other fields, or explore improvised solutions. Every improvisational act can teach them something about processes, markets or product design. This is the learning through doing and enhances the knowledge base within the venture. As Senyard et al. (2014) show,

bricolage enhances the experiential knowledge of a firm and its constraint-based innovativeness. In this process, the entrepreneurs not only overcome the current challenges but also develop future problem-solving capabilities.

KBV is also a good place to know why bricolage facilitates open innovation. The firms that rely on the external ideas, partnerships, or common learning spaces need knowledge creation and knowledge integration (Bogers et al., 2018). In resource limited economies, startups might not be able to depend on formal research and development arrangements. They seek advice and consultations with customers, suppliers, universities, or informal networks of people in the community. Companies engaged in bricolage pay more attention to weak signals in such relations, as their work on the daily basis involves improvisation and responsiveness. This sensitivity makes them internalize, assimilate and externalize knowledge in a better manner. West and Bogers (2014) reiterate the fact that open innovation is essentially a system of flowing knowledge and ventures that have good internal knowledge processes are more qualified to engage in the knowledge flows.

The use of KBV is also very applicable in the emerging economies where business owners focus on informal partnerships instead of formal networks. This is usually caused by the lack of resources and thus, the social network becomes thick in terms of knowledge being shared freely based on trust. According to Anderson and Eshima (2013), knowledge capabilities come in very handy in uncertain and dynamic settings due to their ability to facilitate quick adaptation and identify opportunities. In conjunction with bricolage, such knowledge agility allows firms to switch to internal experimentation and external learning with little time lag.

Combined, these insights demonstrate that KBV offers a robust theoretical framework on the concept of bricolage and open innovation. It makes knowledge the key asset that entrepreneurs generate in the process of improvisation and expand in the process of interaction. Companies that view knowledge as their main asset are in a better position to integrate internal experimentation with external learning that are considered as the basis behind the open innovation processes that will be later addressed in this paper.

2.4 Open Innovation: Inbound and Outbound Knowledge Flows

Open innovation refers to the process involving firms developing and sharing knowledge through external interactions with partners as opposed to the use of internal research and development. Chesbrough (2003) came up with this concept to indicate that good ideas are available both within the company and without and innovation is enhanced when knowledge cuts across organizational borders. Bogers et al. (2018) also elaborate by stating that open innovation is not merely a collection of activities but a way of thinking that stimulates firms to look external to acquire new knowledge and to promote their ideas to other people.

There are two complementary dimensions that are used to describe open innovation. The first dimension is an inbound open innovation, which entails the sourcing and incorporation of external knowledge of customers, suppliers, universities, competitors, or digital communities. The second dimension is outbound open innovation; the exchange of internal ideas or technology with the outside partners via licensing, alliances, or joint ventures. Collectively, these knowledge streams enable companies to gain more access to ideas and share their experience with greater

innovation networks (West and Bogers, 2014).

Majority of the available literature on open innovation is centered around big companies with formal processes, dedicated research and development units and established structures of partnership (Obradovic et al., 2021, Yao et al., 2024). Nonetheless, open innovation is also critical to small firms and startups since their external partnerships can aim to offset their internal resources, which are limited. According to Sabando Vera et al. (2022), open innovation within small and medium enterprises is usually informal and follows social relationships or personal networks or common space instead of a written agreement. Such informal relations are significant in emergent economies whereby the institutional support is poor and where managers rely on relational trust as a source of knowledge.

The studies of open innovation have also begun to change its structural perspective to a behavioral perspective. Rather than looking at open innovation as a strict strategy, recent research views it as an orientation that is created by experimentation, flexibility, and readiness to share ideas (Bertello et al., 2023, Bigliardi et al., 2021). This way of action is very consistent with bricolage view. The more entrepreneurs improvise and reuse resources on a regular basis, the more they are open to experimenting with external ideas, manipulating incomplete information, and having two-way exchange. The learning and collaboration necessitating open innovation is inherently reflected in how they work.

Open innovation in resource limited settings relies not so much on the formal structures but rather on the behavioral preparedness. The entrepreneurs should be in a position to locate helpful external ideas even in the absence of a substantial amount of information. They should also be able to share their knowledge but not expecting to get returns immediately. Bricolage is useful in facilitating these behaviors since it fosters confidence in experimenting and enhances the skills of dealing with incomplete or flawed knowledge. Bricolage entrepreneurs tend to be more collaborative, less protective of prototypes or initial ideas and better able to absorb external insights by learning through doing.

In general, the open innovation literature emphasizes the significance of the knowledge flows, collaborative learning, and external involvement. Through the perspectives of the emerging economies, these processes are based on the ability to behave and not the formality. This renders the connection between open innovation and entrepreneurial bricolage of particular significance and preconditions the integrative perspective of the following section.

2.5 Integrating Bricolage Perspective and KBV with Open Innovation

The combination of the bricolage approach and the Knowledge Based View would make a deeper account of the way in which open innovation takes place in resource limited settings. All the theories will provide a different fragment of the puzzle. The bricolage approach describes the way in which business people use what they have to be creative by improvising, recombining resources and making peace with the constraints. To justify the importance of these actions, the Knowledge Based View demonstrates that knowledge, but not physical resources, is the main source of advantage of startups. When put together, these theories provide a behavioral and knowledge-based explanation of open innovation.

According to the bricolage school of thought, businesspeople acquire knowledge through trial and error, recycling and modifying. Such recurring behaviors create new tacit and explicit knowledge and widen what the company is able to do with a limited set of means (Baker and Nelson, 2005, Senyard et al., 2014). According to the Knowledge Based View, companies that possess more capabilities of knowledge creation and integration can realize more effectively the beneficial external ideas and integrate them with their experiences (Grant, 1996, Zahra and George, 2002). When considered as a group bricolage provides the engine that drives these knowledge processes. The mindset of flexibility, reflection, and constant learning is gained by entrepreneurs who practice bricolage on a regular basis. The qualities are critical to inbound and outbound open innovation.

This assimilation also justifies the reason as to why the concept of open innovation might appear differently in emerging economies than in mature markets. The study of open innovation usually emphasizes the formal research relationships, systems of intellectual property, or structured partnerships (West and Bogers, 2014, Yao et al., 2024). Nevertheless, at least in the settings where resources are limited, these systems can be weak or non-existent. Rather, knowledge circulates over informal networks, social connections and learning areas within a community (Desa, 2012, Sabando Vera et al., 2022). The attitude of behavior encompassed by these interactions is captured by the bricolage perspective. The entrepreneurial interactions are directed by trust, reciprocity, and hands on working schemes as opposed to contracts. According to Knowledge Based View, such interactions generate and spread knowledge that is added to the larger ecosystem.

Open innovation is also a logical extension of bricolage and not independent strategic option when both theories are used in combination. The entrepreneurs who operate with what they have available to them learn to operate with partial information, experiment with partial solutions, and want to explore external knowledge. Simultaneously, KBV demonstrates that the behaviors reinforce the capacity of the firm to assimilate and share knowledge. It is the combination of this that constitutes the foundation of knowledge bricolage, a constant process of mixing and re-mixing internal and external ideas, a redistribution of ideas.

Open innovation does not only occur in formal knowledge partnerships in this integrated approach. It is transformed into a behavioral orientation where the entrepreneurs rely on the external ideas and exchange their personal knowledge by providing daily communication. This renders open innovation viable despite the limited resources and underdeveloped institutional structures. The aggregate strength of bricolage and KBV thus forms a good rationale to propositions and conceptual model that is formulated in the following section.

3. Conceptual Framework and Propositions

Resource constrained economies mean that startups are dependent on situations where uncertainty, weak institutions and under-resource are the norm. Still, even in these startups, there are numerous innovations and value generation. This paradox is explained using the conceptual framework presented in this paper, where entrepreneurial bricolage is the locus of behavior that facilitates the inbound and outbound open innovation. With the help of improvisation, creative

recombination, and learning through doing, the entrepreneur builds cognitive and relational orientation required in the exchange of knowledge. When such behaviors are added to the knowledge-based logic of the Knowledge Based View, they cause the circumstances of emerging open innovation despite the absence of formal structures.

The framework is based on the concept that bricolage influences the manner in which entrepreneurs perceive challenges, tackle constraints, and engage their networks. Such behaviors develop flexibility, openness and curiosity, which is fundamental in uncovering external ideas and exchanging internal knowledge. Through the lens of the KBV, the effects of these actions are beneficial to the development of useful experiential knowledge, bolster informal absorptive capacity, and promote the venture in the capacity to assimilate external insights. Consequently, companies that practice bricolage are better placed to contribute to open innovation systems, even though they do not have the conventional research and development base.

This section explains the three main propositions that explain these relationships.

3.1 Entrepreneurial Bricolage as a Behavioral Foundation

Entrepreneurial bricolage is a tendency describing a type of behavior in which entrepreneurs use what they have, reuse currently existing things, and create on-the-fly. Such acts create a problem-solving mentality that is influenced by trial and error. Historical studies indicate that bricolage stimulates entrepreneurs to experiment, connect with non-formal arrangements, and develop opportunities that would not otherwise be available to them using planned and resource intensive methods (Baker and Nelson, 2005, Mateus, 2024).

This behavioral base is very much compatible with demands of open innovation. Practicing bricolage, entrepreneurs are more likely to notice new information, more prone to collaborate with external partners, as well as operating with incomplete knowledge. These are the qualities that predispose them to outward learning and mutual knowledge sharing.

Proposition 1 (P1): *Entrepreneurial bricolage reinforces inbound open innovation where the entrepreneurs in resource limited settings are able to detect, acquire and assimilate external knowledge via adaptive learning and informal networks.*

3.2 Bricolage and Inbound Open Innovation of an Entrepreneur

Inbound open innovation is the development of external knowledge by acquiring and combining external knowledge acquired by customers, suppliers, universities, competitors or community networks. These interactions in emerging economies tend to be informal as formal partnership organizations are poorly developed (Obradovic et al., 2021, Sabando Vera et al., 2022).

Bricolage facilitates inbound open innovation by increasing the sensitivity of an entrepreneur to new ideas and by giving the flexibility required to explore external knowledge and modify it. Bric-a-brac entrepreneurs are used to operating on incomplete information, making do, and finding out by trial and error. Such practices create the culture of perceiving outside concepts as something that can be reinvented and implemented in a novel manner.

Proposition 2 (P2): *Inbound open innovation enforced by entrepreneurial bricolage facilitates the enhancement of the capacity of entrepreneurs to recognize, interpret and exploit external knowledge in the conditions of scarcity.*

3.3 Bricolage and Outbound Open Innovation as an entrepreneur

Outbound open innovation entails transfer of internal knowledge, technologies or ideas to external partners. These involve licensing, joint development, communities of knowledge sharing and informal technical interactions. In various emerging economies, outward flow of knowledge takes place in terms of social relations, workshops, peer learning circles or local incubation programs.

Bricolage fosters outbound openness since it fosters faith in the experiment, and diminishes the fear of sharing half-baked and half-developed ideas. The process of learning is also associated with the feedback provided by other people in entrepreneurs using bricolage. They build relational trust and cooperation habits that promote the external flow of knowledge.

Proposition 3 (P3): *Informal entrepreneurial ecosystems Outbound open innovation can be promoted through entrepreneurial bricolage, which fosters the collaborative behavior through trust-based knowledge flow and joint problem solving.*

3.4 Knowledge Bricolage: The Integrative Mechanism

The concept of knowledge bricolage describes the way in which entrepreneurs combine both internal and external knowledge by constantly recombining, adapting and experimenting. It describes the constant process of formulating, adjusting and refining ideas in resource deprived settings. This is consistent with the recent studies that indicate that the scope of bricolage is not only in resource reuse but also in creative knowledge recombination. Liu et al. (2024) define the way in which digital entrepreneurs apply the concept of knowledge bricolage, i.e., combining internal knowledge with external information to come up with new and context-appropriate solutions. Senyard et al. (2014) also indicate that bricolage promotes experiential learning as it makes entrepreneurs recombine and repurpose what is already in their knowledge base.

This reasoning is supported by the Knowledge Based View according to which knowledge is produced during an ongoing process of interaction and recombination and not in solitude (Grant, 1996, Nonaka and Takeuchi, 1995). Entrepreneurs are able to create new tacit and explicit knowledge through bricolage, experimenting, adapting, and collaborating. Such activities are informal absorptive capacity ones and improve the capacity to work with the emerging or incomplete ideas. West and Bogers (2014) highlight that open innovation relies on the combination of external and internal knowledge, which is why the concept of knowledge bricolage is suitable to explain how these combinations take place in reality.

The aspect of knowledge bricolage also augers well with the realities of innovation in the emerging economies. The circulations of ideas in these situations are usually done informally in groups, working environments, and community-based work (Desa, 2012). Entrepreneurs also share solutions collectively, give feedback and share prototypes. These exchanges mirror the improvisational and relationship nature of bricolage and exemplifies the reinforcement of inbound and outbound streams of knowledge by each other. In this respect, knowledge bricolage is the centerpiece of your model because the innovation connects behavioral creativity and collaborative innovation.

In this perspective, inbound open innovation brings new ideas and external feedback

whereas outbound open innovation enables entrepreneurs to express their personal ideas and perfect them by interacting. Knowledge bricolage combines all these processes by allowing entrepreneurs to combine internal and external knowledge into solutions that are workable and by making them contextually appropriate. This combination makes certain that open innovation is not divided into individual processes but is a cyclical process of learning and recombination.

Proposition 4 (P4): *Entrepreneurial bricolage creates knowledge bricolage, which combines inbound and outbound open innovation and allows them to continue recombining and adapting external and internal knowledge in resource constrained entrepreneurial ecosystems.*

3.5 Conceptual Model

The hypotheses presented in this paper are captured in the conceptual model presented in Figure 1. The model makes entrepreneurial bricolage the greatest behavioral capacity, which aids start-ups in both inbound and outbound open innovation in the state of resource limitation. It is then through these two forms of openness that interact in knowledge bricolage, which is the integrative mechanism that would fuse both internal and external forms of knowledge by recombining them continuously and enabling them to learn. The diagram provides a visual representation of the theoretical rationale that has been formulated in Section 3.1 to 3.4 in that it shows how behavioral creativity, knowledge flows, and iterative learning work together to facilitate innovation in the context of the emerging economy.

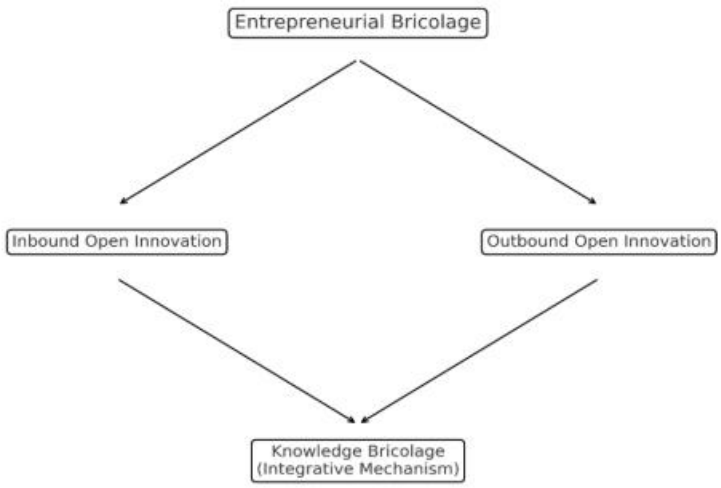

Figure 1. Theoretical framework of network between entrepreneurial bricolage, open innovation and knowledge bricolage.

3.6 Conceptual Logic Synopsis

The picture created in this paper unites bricolage perspective and the Knowledge Based View to understand how startups operating in resource strained environments involve themselves in open innovation. Entrepreneurial bricolage supplies the behavioral basis through promoting improvisation, being creative with resources and learning by doing. Such actions enhance the willingness of a startup to tap into the external knowledge, and to exchange internal ideas with partners, both of which underlie inbound and outbound open innovation. It is knowledge bricolage that subsequently links these two paths to openness and integrates the internal and external knowledge via recombination (that is constant). This integrative process demonstrates that constrained innovation does not emerge through formal systems but rather adaptive behaviour and learning fueled by knowledge. The combination of these relations not only imprisons the reasoning of the conceptual model, but provides a consistent reason as to the way open innovation is occurring in the context of the emergent economies.

4. Discussion and Implications

The paper also aimed to elaborate the mechanism through which startups in resource constrained economies open innovation through bricolage perspective and Knowledge Based View. The specified model puts an emphasis on entrepreneurial bricolage as the behavioral core, as a result of which the inbound and outbound knowledge flows become feasible. It also brings in the concept of knowledge bricolage as the integrative process that incorporates both internal and external knowledge into it with continuous recombination. By so doing, the framework redefines innovation under constraint as a behavioral and knowledge-based process as opposed to a process that relies on the presence of resources. The theoretical, managerial, policy, and societal implications of this integration are given in the following subsections.

4.1 Theoretical Implications

4.1.1 Repositioning as a behavioral engine of innovation

Resource rich environments have dominated much of the literature about innovation, whereby innovation comes out of organized processes, special research units, or institutional joint ventures. The framework at hand criticizes this assumption in that it places entrepreneurial bricolage as the behavioral generator that drives innovation under constraint. Bricolage promotes improvisation, experimentation and recombining of resources, early mode of knowledge generation as well as solving problems. This makes bricolage not merely a survival strategy but a behavioral capacity and core that mobilizes innovation in times of scarcity of conventional means.

4.1.2 The need of knowledge bricolage in this model

One of the key theoretical contributions of the paper is the clear introduction of knowledge bricolage. The emerging research (Liu et al., 2024, Senyard et al., 2014) is not the only one to support the concept, and it is also required to explain the interaction between inbound and outbound open innovation. In the absence of this mechanism the model would consider the two directions of openness to be independent outcomes of bricolage. Nevertheless, constrained innovation does not often occur in closed paths. Entrepreneurs combine the wisdom of partners, customers, suppliers and their experience with recombination. This conglomeration is what knowledge bricolage captures and how external and internal knowledge is constantly being

reconfigured through action.

The reason why knowledge bricolage should be included is threefold. First, it is in direct correlation with Knowledge Based View, which underlines that the benefit lies in the capability to integrate and recombine knowledge rather than in the capacity to obtain it. Second, it represents the reality of the emerging economy ecosystems, in which learning exists in informal networks, peer exchange, and community-based collaboration as opposed to organized systems of knowledge. Third, it enhances the conceptual consistency of the model by providing a clear working mechanism upon which bricolage results in dynamic knowledge streams. This renders the framework more justifiable and theory-oriented.

4.1.3 Knowledge Based View and Open Innovation in resource constrained situations

The knowledge creation process through improvisation and experimentation instead of formal processes are also part of the Knowledge Based View that is demonstrated in this paper. It also generalizes KBV to emergent economy setting by showing how knowledge-based advantage nevertheless can be accumulated in situations where the firms are deprived of capital, technology or even institutional backing. Likewise, it builds on open innovation theory by changing the focus on the systematic collaboration towards the behavioral aspects that enable openness. The model shows that open innovation is not necessarily formal alliances or research infrastructures. It may arise naturally when entrepreneurs are ready to learn, share and recompose constrained knowledge.

4.2 Managerial Implications

The framework formulated in this paper provides some insights to entrepreneurs and managers operating in an environment that is resource constrained. First, it emphasizes the need to develop behavioral capabilities and not just to use structural or financial resources. Practicing bricolage, entrepreneurs show that innovation can be created by improvisation, experimentation and creative recombination of resources that the entrepreneur already has. Managers can build this capacity through the promotion of a culture of problem solving in which teams can test faster, recycle materials and learn through initial stage experimentation. Such a strategy minimizes the reliance on external capital and assists companies to be adaptable in unpredictable circumstances.

Second, open innovation, according to the model, is more effective in situations where routine is developed by firms to facilitate sustained knowledge transfer. The managers can help inbound open innovation by establishing easy and open systems of scanning external ideas, involving customers in feedback loops, and ensuring close relationships with suppliers, universities and local communities. Such interactions are not based on formal partnerships. Even unofficial meetings, observation of customers, or mini-pilot projects can yield even valuable pieces of knowledge, which can be rewritten by an entrepreneur with the help of bricolage.

Third, outbound open innovation entails that managers should have an open and learning attitude. Incubators, community networks and peers can help startups to share prototypes, process insights or lessons learned about operations. This external sharing does not only increase the visibility of the venture, but also brings in comments that improves internal knowledge base of the venture. Knowledge sharing should be considered by the managers as long term relational capital investment and not as a loss of competitive advantage. Trust and collaboration that are not formal

protection of intellectual property tends to be important in resource constrained environments.

Lastly, the concept of knowledge bricolage provides a useful checkpoint of reminding all that managerial decision making must be geared towards the integration of various sources of knowledge as opposed to seeking flawless answers. Managers are able to establish areas in which teams reflect on what they have learned in the past, new ideas that they have against that of the past and to combine experiences of other collaborators. These reflexivity practices aid in changing disintegrated knowledge into practical innovations that are localized. This blended learning process is an important managerial skill in situations where there is a scarcity of resources and uncertainty is eminent.

4.3 Policy Implications

The formulated framework also has significant implications to the policymakers and development agencies who seek to empower entrepreneurial activity in the economies that are resource constrained. The implication on the first one is that the policy on innovation should cease to be narrowly focused on funding and infrastructure. Although, grants, subsidies and technology centers are good, they cannot produce long-term cultures of innovation. These efforts can be supplemented with programs that develop behavioral skills of creative problem solving, improvisation, rapid experimentation, and collaborative learning. The bricolage ability training would enable business owners to overcome unpredictability and come up with viable solutions without necessarily waiting to get optimal resources.

The second implication is with regard to innovation ecosystem organization. The informal networks determine knowledge flows in most emerging economies instead of institutions. Policymakers can enhance these already existing strengths by establishing easy access knowledge sharing spaces including open community laboratories, shared working spaces, peer learning groups, and local centers of innovation. Such platforms will be able to encourage the constant communication between entrepreneurs, universities, technical specialists, and the representatives of civil societies. Learning in a limited setting depends on the creation of knowledge bricolage which is facilitated by allowing the exchange of practical insights.

Third, policy makers are able to come up with policies that promote openness, trust and collaborative learning among various components of the entrepreneurial ecosystem. Minimized rules of collaboration agreements, facilitation of micro level network innovation and guidelines that foster equitable sharing of knowledge can help lessen the obstacles that face entrepreneurs when it comes to open innovation. The administration of these policies should not be too heavy particularly to small and informal businesses. Rather, they must promote flexible and low-cost types of collaboration that match the conditions of the local markets.

Lastly, the framework recommends that the policy of innovation ought to identify and authenticate frugal and community-based innovation practices. A lot of effective solutions are developed in non-formal environments where business people make use of what is locally available, recycle available tools, and even use local knowledge. These practices can be introduced into the formal innovation system by policymakers through the provision of publicity, certification programs or membership of national innovation platforms. This does not only confirm the efforts

of resource deprived entrepreneurs but also provides the national innovation agenda with a wide range of contextual insights.

4.4 Societal Implications

The paradigm identified in this paper has practical implications to society, especially in situations that have a large number of individuals who do not have formal economic structures. Bricolage innovation and innovation that is based on open sharing of knowledge is more inclusive than innovation based on capital intensive structure. Since bricolage depends on materials available in the locality, informal learning, and working with the community, it reduces entry barriers to participation to people who might lack access to funds or technical education. This involves women entrepreneur, micro entrepreneurs, informal sector, and rural innovators who in most cases have systemic limitations when it comes to formal support networks.

Knowledge bricolage enhances community resilience as well since it allows individuals to find their own solutions whenever problems are brought together through knowledge that they already have. By repurposing, modifying tools or even sharing knowledge with fellow entrepreneurs, entrepreneurs will create a culture of support and not competition. Such practices are useful in diffusion of practical know how amongst communities and creation of a more democratic type of innovation. In most of the developing economies, these community level learning networks are important in resolving the local issues like health care provision, water management or the provision of cheap energy solutions.

Moreover, the innovation that is bricolage-oriented encourages sustainability. Focusing on the reuse, adjustment, efficient use of resources, the entrepreneurs automatically minimize the waste levels and promote the environmentally friendly attitude. This would be in line with global sustainability objectives and would present an avenue through which people communities can come up with solutions that are geared towards their ecological and socio-economic background. In this regard, the given model does emphasize the fact that innovation within constrained settings is not only feasible, but also capable of supporting both social wellbeing, environmental stewardship, and inclusive economic growth.

4.5 Towards a Behavioral Theory of Innovation under Constraint

Collectively, the discussion in this paper suggests that a behavioral theory of innovation under constraint is to be developed. The combination of bricolage approach and Knowledge Based View and open innovation brings to the fore the fact that innovation in resource limited economies is less influenced by the availability of financial or technological resources but rather by the actions that entrepreneurs pursue in their daily activities. The fundamental processes in which innovation is realized in such environments are improvisation, creative recombination, knowledge sharing and adaptive learning. These actions are indicative of another kind of logic of innovation, one that arises naturally out of necessity and out of engagement with community and not a structured research framework.

The framework shows how the processes of innovation become cyclical and continuous by introducing knowledge bricolage as the integrative mechanism between the inbound and outbound knowledge flows. Entrepreneurs gain through the experience of outside partners and refract this

experience and reinvest it into the ecosystem. The cycle enhances collective learning and it slowly hardens the entrepreneurial environment at large. It also breaks down the belief that innovation should have ordered forms. Rather, it demonstrates the fact that innovation can be achieved in a manner that is flexible, informal, and locally based.

The viewpoint prompts scholars to look at the other side of the conventional constructs and to examine the micro level behavior that allows the firms to be innovative in cases when they have limited resources. It creates room to new questions on how behavior, community organization, and experiential learning generate the conditions of open innovation in conditions that mainstream theory might ignore. By so doing, it facilitates a more inclusive perspective of innovation and preconditions the future empirical research that explores the way in which people become innovative when they are not able to count on the plentiful resources.

5. Future Research Direction and Conclusion

This paper outlines the use of open innovation by startups in resource-constrained economies. In our theory, entrepreneurial bricolage is taken as the most important behavior that promotes inbound and outbound knowledge flows. The model reveals that innovation occurs due to the fact that firms are flexible in terms of adapting rather than abundance of resources. Integrating bricolage and the Knowledge -Based View reveals that these companies generate knowledge, improvise and learn simultaneously. Despite the fact that the model provides a novel perspective on constrained innovation, a lot of research questions exist.

The initial study of the future research should be conducted regarding the variations of the intensity and quality of bricolage with the expansion of the ventures. Young companies are highly reliant on improvisation and more established companies can combine bricolage with drills. Longitudinal studies can show how bricolage is acquired and how it relates with other capabilities with increasing scale of the firm. It will be made clear in this work on whether bricolage will remain useful in the future or it will be replaced by more organized innovation practices.

The other potential research line is the team dynamics and leadership. The majority of work on bricolage is dedicated to individual entrepreneurs whereas innovation is typically a group activity. One of the ways in which researchers can explore the impact of team diversity, shared thinking, or psychological safety on the extent to which a group undertakes bricolage is by examining these two factors. Bricolage and open innovation have a potential connection that could be enhanced by leadership that invites experimentation, tolerates ambiguity and is open to sharing knowledge. The relationships are not well studied and present fertile grounds on theory and evidence.

The comparison of cultures is also a good opportunity. The cultural norms of uncertainty, collaboration and sharing of knowledge define innovation behaviors. The practice of bricolage can be informal in the case of the collectivist societies, whereby community learning, trust and shared resources can lead to the emergence of bricolage. Such interactions may be curtailed in individualistic settings by competition or intellectual property issues. A comparison of the emerging and mature economies can help us to understand how the culture can moderate derivation processes of innovation based on bricolage.

The role of digital technologies in influencing bricolage and open innovation should also be investigated in the future. With the growing accessibility of digital tools, entrepreneurs are relying more and more on digital bricolage to find solutions, repurposing online platforms, open-source software or remote knowledge communities. By allowing rapid feedback and access to a more global experience and knowledge, digital environments can accelerate knowledge bricolage. The next step is to investigate the differences between digital bricolage and traditional ones and assess the reinforcement or undermining of informal interactions within limited environments.

Lastly, researchers need to look at the ethical and social aspects of innovation of bricolage. Poverty or inequality solutions based on entrepreneurs of this kind tend to lead to solutions that make a considerable impact on society, but they have difficulties in scaling. The behavioral theory of constrained innovation can be further understood by understanding how they move through social expectations, community obligations, and equitable exchange of knowledge. This question is consistent with the arguments on responsible innovation and inclusive development.

To conclude, this paper has demonstrated that behavioral ingenuity is a basis of innovation in resource-constrained economies as opposed to resources. Learning and collaboration create value by improving, combining, and sharing knowledge by entrepreneurs that improvise. The framework brings together the bricolage view and the Knowledge-Based View and open innovation, a more inclusive, context-sensitive concept of innovation in which constraints are widespread. To the practitioners, the model emphasizes the need to develop creativity, trust, and openness. To policy makers, it indicates that resilient innovation ecosystems can be developed by having environments that allow knowledge sharing and resource reuse. As a scholar, it provides new avenues of research that look at how humans become innovative without the need to be Abundant. Finally, the behavioral approach taken in this case, redefines scarcity not as a limitation, but as a source of innovation, mutual education and exploration.

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