

Entrepreneurial Ecosystem of Startups in Bangladesh: Mechanism of Balanced Coexistence

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Abstract

Purpose

This study has conducted exploratory research to understand who should comprise the members of a resilient supply chain for promoting an entrepreneurial ecosystem of a startup project and to determine the mechanisms for the balanced coexistence of all stakeholders. This is necessary to ensure mutual benefits for all stakeholders, each of whom has multidimensional interests. Additionally, this supply chain must be able to withstand any potential disruption risks.

Design/methodology/approach

This research has employed a mixed-design approach. In this context, the study conducted an extensive qualitative and quantitative investigation, including 30 interviews and a survey involving 180 potential stakeholders in this supply network, respectively in the capital city of Bangladesh, Dhaka. The analysis of the interviews utilized principles of matrix thinking, while structural equation modeling (SEM) through LISREL was employed to understand cause-and-effect relationships.

Findings

Network, platform, and governance—these three independent constructs have the potential to contribute to the dependent construct, a resilient supply chain, aimed at promoting an entrepreneurial ecosystem for startup projects. It has been revealed that the management of such projects depends on the rules and regulations within the ecosystem. An excellent governance mechanism is essential for this purpose. To facilitate coexistence, the establishment of a platform is crucial, where cooperation among all members is mandatory.

Practical implications

For practitioners, three distinctive but closely interdependent issues are explored and resolved in this philanthropic study. It has unfolded the elements of any startup project with essential settings.

Originality/value

The identification of the structural dynamics of potential stakeholders within the entrepreneurial ecosystem of startups is largely absent in existing literature. Therefore, there is a need to

comprehensively investigate the entire network, including their roles, responsibilities, and associations. This study makes a significant and novel contribution to the existing literature. Academics and practitioners alike have ample opportunities to learn from this new aspect of relationships across three distinct areas: the entrepreneurial ecosystem, startup projects, and the development of a resilient supply chain.

Keywords Entrepreneurial ecosystem, Startup projects, Resilient supply chain, Governance, Platform, Network, Stakeholder

Paper type Research paper

Introduction

For business innovation, entrepreneurial ecosystem can be defined as a collaborative and collective structure of different actors where a system of innovation is developed for sustainable cooperation (Audretsch and Belitski, 2021; Johnson, 2019; Theodoraki et al., 2022; Wagner, 2021). It is a serious challenge and an issue for potential development of the regional economy (Alkaabi et al., 2023; Cheah et al., 2016; Ritala et al., 2013; Wagner, 2021). In this situation, policymakers and researchers are gravely concerned with planning, establishing, and promoting different scalable startup projects by nursing young entrepreneurs with innovative ideas (Adner, 2017; Fuzi, 2015; Gutmann et al., 2020).

In the light of the pragmatic views of the recent researchers (Guijarro-García et al., 2019; Guimarães et al., 2023; Gutmann et al., 2020; Smorodinskaya et al., 2017; Yablonsky, 2018), startup projects can be defined as a brief idea with a scalable future to disrupt the future market. Shedding light on the ontological and epistemological paradigms of startup projects in comparison to regular business models, startup projects are generated, nurtured, and grown with certain basic characteristics (Adner and Kapoor, 2010; Pellinen et al., 2012; Ritala et al., 2013). For instances, i) it might have enormous scope and future, ii) it is just an idea that might not draw the attention of future investment, iii) it is risky and practically uncertain, iv) it might reflect some unconventional dreams, and, v) it might not be structured and organized from a traditional view. As a result, generally, startup projects are attempted to draw attention of academicians, venture capitalists, technology experts, innovators, and general market investors while they remain in their

preliminary planning stage; nevertheless, it has the ability to show future prospects (Cheah et al., 2016). However, for its sustainability, digital technology inclusion and transformation is an essential pillar (Acs et al., 2016; Dini et al., 2011; Richter et al., 2015; Sussan and Acs, 2017).

Recent researchers on entrepreneurial and digital ecosystems are very keen to analyze formation, execution, and success of different startup projects. For instance, Google, Uber, different social media platforms, etc. (Cheah et al., 2016; Morgan-Thomas et al., 2020; Purbasari et al., 2021; Ritala et al., 2013; Song, 2019). However, for the sustainability of ecosystem startup projects, it is essential to address, explore, and understand structural dynamics, stakeholders, and their association in the supply chain (Longva, 2021; Oppong et al., 2020; Ritala et al., 2013; Smorodinskaya et al., 2017; Yablonsky, 2018). However, this essential issue is not extensively explored by the researchers (Dutta and Hora, 2017; Gutmann et al., 2020; Schwartz, 2013; Wagner, 2021).

The supply chain of ecosystem startup projects represents the entire cycle of these innovative ideas starting from the initiation (procurement) up to the final execution (end customer). Institutionalization of ecosystem and startup projects depends on the identification of all the major stakeholders and their association, i.e., the supply chain and their structural dynamics (Alkaabi et al., 2023; Cheah et al., 2016; Hillemane et al., 2019; Guijarro-García et al., 2019; Gutmann et al., 2020; Rahman et al., 2022; Ritala et al., 2013). Researchers, Guimarães et al. (2023), affirmed this issue through an extensive investigation on the ecosystem.

Sustainability and success of startup projects does not depend only on the young innovators. At different phases, role and involvement of different members are extremely important (Chu and Yoon, 2021; La Rocca et al., 2019; Rupo et al., 2019; Yli-Renko et al., 2020). These members include, but are not limited to, academicians, venture capitalists, technology experts, innovators, and general market investors (Cheah et al., 2016; Fuzi, 2015; Thompson and Illes, 2021). It is a complete network. Researchers are keenly interested in analyzing the design, formulation, and implementation stages of startup projects (Cheah et al., 2016). To focus on the future and bring experience from past successful startup projects, researchers also explored the emerging characteristics of startup projects and the digital entrepreneurial ecosystem (Acs et al., 2016;

Audretsch and Belitski, 2021; Richter et al., 2015; Sussan and Acs, 2017; Theodoraki et al., 2022; Wagner, 2021). However, from the study of development, application, failure, success, and the redesigning of enormous startup projects, it is explicitly evident that the sustainability of startup projects substantially depends on effective and efficient integration of all the essential members of the prospective supply chain of startup projects and digital transformation (Hahn, 2020; Joglekar et al., 2017; Purbasari et al., 2021; Zaremba et al., 2017). If structural dynamics of the supply chain is not properly investigated, evaluated, and established, this successful integration is not possible and feasible for greater sustainability (Kraus et al., 2019; La Rocca et al., 2019; Yli-Renko et al., 2020).

Nevertheless, it is quite evident that updated studies did not focus on the issues related to the integration of all the members of a prospective startup project with the possible identification of the stakeholders of this supply chain (Audretsch and Belitski, 2021). Consequently, the identification of the structural dynamics of the plausible stakeholders is vastly absent in the existing literature (Chu and Yoon, 2021). Therefore, the entire network needs to be investigated with their roles, responsibilities, and associations.

Based on the aforementioned research gap and necessity of future research, the potential research questions of this exploratory research are as follows:

- What is the structural dynamics of the supply chain of entrepreneurial ecosystem of a startup project?
- How can a resilient supply chain of entrepreneurial ecosystems of startup projects be established?

This research was conducted in Dhaka, Bangladesh. Promoting startup projects, developing innovative entrepreneurial ecosystem, and initializing a resilient supply chain of startups is very crucial for those countries that are deeply engaged in boosting their economy to the upper level with a GDP of more than seven for the last couple of years (Guijarro-García et al., 2019; Gutmann et al., 2020). Considering this assumption, for a policy driven country like Bangladesh, which has come out from the status of the least developing country and turning into a rapidly growing middle-income country, effective and sustainable startup projects are very important. There are a few

significant examples of startups in Bangladesh namely bKash, Pathao, and Chaldal.com. These startups reflect the success story of the entrepreneurial ecosystem in Bangladesh. Many scholarly studies have explored the innovative ideas of these flagship projects (Ahmed et al., 2019; Ullah and Islam, 2017). However, coexistence of different stakeholders and establishment of the entrepreneurial ecosystem which is a prerequisite for a resilient supply chain of startups has not been systematically investigated so far (Gani et al., 2023).

Different ministries in Bangladesh are also aggressively attempting to promote startups and the entrepreneurial ecosystem through random institutional structure (Alexander et al., 2017; Yesmin et al., 2019). However, due to absence of proper institutionalization and structured establishment, enormous startups are being failed at different stages to show their initial potentials (Yesmin et al., 2019). Nevertheless, hardly any scholarly studies have investigated the structural dynamics and the reasons of this failure (Ahmed et al., 2019; Rahman et al., 2022; Ramadani et al., 2022). As such, for a rapidly growing country like Bangladesh, the finding of this research in the local context has enormous applications. The purpose of this exploratory research is very explicit, and it is engaged to fulfill the following:

To initialize the growth of healthy and environment-friendly startup projects in Bangladesh by successfully integrating different prospective members from the government, established and innovative startup projects, the industry, and academicians.

Therefore, for the future sustainable growth of any country, particularly developing countries, in terms of social, economic, and environmental aspects, heuristically, the objective of this essential research is:

- To explore stakeholders of the supply chain of the entrepreneurial ecosystem of startup projects and their association with resilience.

In its preliminary stage, the trend of doing research on only the success of startup projects is quite reasonable and justified; however, now after numerous years of these kinds of startup projects, it is potentially and heuristically essential to explore and understand the structural dynamics, stakeholders, and their association (Beliaeva et al., 2019; Hillemane et al., 2019; Wagner, 2021). Without knowing the supply chain members of startup projects, their association, and interactions,

a resilient supply chain of startup projects is not possible (Adner, 2017; Bonollo and Poopuu, 2019; Collin and Lorenzin, 2006; Garcia-Herrera et al., 2018). This research will help to understand the institutionalization of ecosystems and startup projects.

The current study is structured as follows. Firstly, the study discussed the literature review around start-up projects and their nodal points with their possible structural dynamics and an effective entrepreneurship ecosystem. Secondly, the study's methodological approach, research context, and theoretical framework and hypothesis development were presented. Thirdly, the study interpreted and examined the data findings while providing discussions, a conclusion, and a recommendation. Lastly and fourthly, this research presented the implications of the result, limitations of the result, and future research guidelines.

Literature Review

To understand the present investigation on startup projects and its nodal points with possible structural dynamics to create an effective entrepreneurship ecosystem, the literature review section should focus on five intertwined areas namely: i) startup projects, ii) entrepreneurial ecosystem, iii) digital entrepreneurship and ecosystem, iv) supply network and probable stakeholders with their structural dynamics and, v) disruption risk and development of a resilient supply chain.

Startup Projects

Startup projects throughout the world are gaining much attention and demand from established business organizations and institutions to provide disruptive solutions or products (Hasan, 2019). Fundamentally, researchers on startup projects (Halberstadt et al., 2021; Shankar and Shepherd, 2019; Wagner, 2021; Wouters et al., 2018) revealed and acknowledged that for the sustainable innovative ideas from startup projects and its proper commercialization for incubation, acceleration, or financing, the establishment of an entrepreneurship ecosystem is imperative. Recently many business and government organizations as well as educational institutions have been engaged in promoting startups and establishing themselves as the customers (Cheah et al., 2016; Ritala et al., 2013; Rottenburger and Kaufmann, 2020; Wagner, 2021). In this context, there are some recent examples of startup projects in Bangladesh namely bKash, Pathao, and Chaldal.com. Founded in 2010, the mobile financial service (MFS) company bKash now has 70

million verified customers (Uddin, 2022). This MFS has the potential to contribute to the development of a digital entrepreneurial ecosystem in Bangladesh for financial services as an alternative to the traditional banking service (Alexander et al., 2017; Yesmin et al., 2019). Similarly, founded in 2015 by some young innovators, Pathao is a digital platform for transportation, courier, and food service delivery in Bangladesh and some other developing countries and has integrated different business ventures under a single digital platform (Ahmed et al., 2019; Ullah and Islam, 2017). Chaldal.com is an online based grocery retailer. Started in 2013, this startup project has made significant success in disrupting traditional concept of retail grocery businesses in Bangladesh by integrating the entire supply chain of grocery retailing through a combined digital infrastructure (Gani et al., 2023).

This study can also borrow ideas from some prominent startups in developed countries. For example, German railway company Deutsche Bahn is associated with KONUX, a prominent startup engaged in providing hardware and software solutions to bring revolutionary changes in railway maintenance (Wagner, 2021). Basically, Deutsche Bahn is patronizing this startup, and KONUX is the supplier. Singapore also has taken extensive initiatives to create technological innovation by funding high-tech startup projects and set up a national entrepreneurial ecosystem program through the prime minister's office (National Framework of Innovation and Enterprise — NFIE) in 2008 (Cheah et al., 2016). However, a startup is also getting technological and product support from other established business organizations and vice versa, for instance, the relation of DHL and Amazon for innovative ideas at their startup formation (Chung and Bowie, 2018). In this context, this established corporation comes from a supplier of that startup project and from a customer to get their desired solution.

Entrepreneurial Ecosystem

It is evident that the supply network of startups is very complex and connected with different nodal points with open or closed loops (Egere et al., 2022; Ghosh et al., 2018). However, development of a supportive entrepreneurial ecosystem for innovative and disruptive products and ideas, i.e., for startup projects, is a very complex and robust issue as it is associated with several other entities who are basically the members of a complex supply chain of startup projects (Trebilcock, 2020; Yoruk et al., 2022; Zaremba et al., 2017). Thus, researchers (Bonollo and Poopuu, 2019; Cheah et

al., 2016; Garcia-Herrera et al., 2018; Ritala et al., 2013; Wagner, 2021) affirmed that a startup project needs an appropriate space, scope, and facility of an entrepreneurial ecosystem (Audretsch & Belitski, 2021; Johnson, 2019; Theodoraki et al., 2022; Vartabedian, 2020). Pragmatically, development of an entrepreneurial ecosystem is a precondition for commercialized startup projects and is closely connected with its sustainability (Ritala et al., 2013; Song et al., 2008; Wagner, 2021).

Absence of the entrepreneurial ecosystem is also evident for startups in Bangladesh (Gani et al., 2023). Patronized by several government donations, enormous startups have launched their initial steps to promote digital disruptions in Bangladesh (Ahmed et al., 2019; Ramadani et al., 2022). Unfortunately, most of these efforts have failed to show their initial potentials (Uddin, 2022). Researchers working on failure of startups in Bangladesh have figured out that mechanism of coexistence through promoting entrepreneurial ecosystem is not properly developed before launching these startups (Hasan, 2019; Ramadani et al., 2022).

Digital Entrepreneurship and Ecosystem

Researchers working on digital ecosystem (Dini et al. 2011; Li et al. 2012; Purbasari et al., 2021) have conceptualized the term as a sustainable system where different actors and processes are linked together through enduring innovative technologies to promote shared knowledge, fulfill mutual interest of multidisciplinary groups, and advance society as a whole with scalable benefits. For sustainable ecosystem and resilient supply chain of startup projects, the term digital entrepreneurship which confirms the successful integration of innovative technologies is a popular concept and has now gained an unstoppable momentum to resolve complex structural dynamics of startup projects (Purbasari et al., 2021). Popular and global entrepreneurs of digital ecosystems, for instance, Uber, AirBnB, Amazon, Facebook are extremely successful in creating hubs where members of different multidisciplinary aspects have joined together and formed an effective model of business innovation through the use of digital technology (Acs et al., 2016; Morgan-Thomas et al., 2020; Song, 2019; Sussan and Acs, 2017). Therefore, the development of a multidisciplinary platform with a set of functional rules and regulations which is the essential and core requirements of any entrepreneurial ecosystem is feasible and possible if digital infrastructure is established (Richter et al., 2015). Privacy, security, connectivity, interaction, and mutual exchange — all are

possible and can get a smooth and resilient flow of movement in any entrepreneurial ecosystem of startup projects if digital governance and digital infrastructure are integrated as an essential business process and system (Morgan-Thomas et al., 2020; Purbasari et al., 2021). Sussan and Acs (2017) suggested that the structural dynamics and mutual interactions of different actors and agents in the entrepreneurial ecosystem can be effectively and favorably managed if digital governance is incorporated in the system. Sustainable initialization and management of complex structural dynamics of the multidisciplinary stakeholders of startup projects can be effectively facilitated by the inclusion of the digital ecosystem (Richter et al., 2015; Sussan and Acs, 2017). This argument is nicely portrayed by the conceptual framework advocated by Sussan and Acs (2017).

Supply Network and Probable Stakeholders with their Structural Dynamics

Since sustainability is deeply related to conforming environmental, social, and economic issues, there is a potential concern to explore the entire supply chain of startups with the salient features of structural dynamics without which a resilient supply chain cannot be ensured (Amedofu et al., 2019; Hasan, 2019). For instance, startups providing disruptive software solutions to many private and public institutions in India and England recommended that it is an utmost and challenging concern to investigate the associations and robust relations of the upstream and downstream suppliers and customers of the entire supply networks of startup projects, i.e., structural dynamics of all the entities (Ghosh et al., 2018). There are so many inhibiting forces working inside this relation, which poses a serious challenge to establish an entrepreneurial ecosystem for startup projects with a resilient supply chain (Chung and Bowie, 2018). The most important and potential challenge is that startups with an associated entrepreneurial ecosystem are established with extremely innovative ideas and thus, can provide a social growth in employment, GDP and overall country economy; however, inherently startups are very risky and disruptive, and collapse of such projects can destabilize many other established organizations who are the active members of this supply chain (Acharya, 2019). Failure of startups can destroy the overall community-based organizations of the entrepreneurial ecosystem and can cause a devastating impact on employment (Cheng, 2018).

Disruption Risk and Development of a Resilient Supply Chain

Ecosystems are primarily embedded and rooted in biology, geography, and environment; however, for the last couple of years, this notion and its conceptual application has emerged in management,

marketing, and business models (Gomes et al., 2018; Iansiti and Levien, 2004). Heuristically, the idea of the entrepreneurial ecosystem as a business model has essentially been attributed by several multidimensional and closely interdependent entities such as, customers-suppliers-competitors (i.e. overall markets), financing institutions with venture capital, regulatory and legal bodies, high-tech organizations for digitization, and patronizing institutions with collaborative culture and policies (Dubey et al., 2021; Gawer, 2014; Geissbauer et al., 2020; Gomes et al., 2018; Gopal and Thakkar, 2016; Gunasekaran et al., 2018; Iansiti and Levien, 2004; Shareef et al., 2022; Tasnim et al., 2022). Babson's startup ecosystem framework has raised six issues: culture, markets, human capital, finance, support, and policy (Cheah et al., 2016; Isenberg, 2011).

Methodology and Research Context

This research has followed a mixed design approach. It has both qualitative and quantitative investigations. For this kind of exploratory research, this mixed design approach is quite reasonable (Bulsara, 2015; Leech et al., 2010).

Research Context

From the interview-based qualitative study, consultation with the focus group, and extensive literature review, the following issues were identified which served as the theoretical framework of the quantitative investigation. The issues are as follows:

- Stakeholders of the supply chain of startup projects.
- Association and relations of the stakeholders in establishing an entrepreneurial ecosystem for innovative startup projects.
- Development of a theoretical framework of a resilient supply chain.
- Instrument of the empirical survey.

Focus Group

Prior to the qualitative study, at first a focus group was formed in Dhaka, Bangladesh to identify primarily the stakeholders and their association for institutionalization of startup projects. This focus group was formed by: i) two university professors; ii) two startup executives; iii) two investors and; iv) two entrepreneurs.

Based on literature review conducted on the topics of i) entrepreneurial ecosystem, ii) startup projects, iii) academic research on startup projects and, iv) venture capital and investment in startup projects and three meetings with the focus group in Dhaka, Bangladesh (each meeting was around two hours long), major stakeholders of the supply chain of entrepreneurial ecosystem and startup projects were identified and established who have active participation in the structural dynamics.

First Phase Research: Qualitative Study

Stakeholders of startup projects and its institutionalization were investigated through a detailed quantitative empirical study among the stakeholders of the supply chain who have involvement in the structural dynamics. However, prior to the quantitative study, the stakeholders and their pattern of association were addressed, explored, and identified through multiple interviews of the related stakeholder of startup projects. Hence, this methodology for this type of exploratory study is justified (Groenland and Dana, 2020).

Extensive interviews were conducted among the major stakeholders of entrepreneurial ecosystem and startup projects, which included: i) young innovators of startup projects (10 numbers), ii) academic researchers and/or innovators (5 Numbers), iii) venture capitalists (5 numbers), iv) technology experts and product innovators (5 Numbers) and, v) general market investors (5 Numbers). Respondents were selected from several government databases.

The interviewees were asked to provide their ideas about startup projects, probable stakeholders of a sustainable supply chain of a startup project, development of an entrepreneurial ecosystem with plausible structural dynamics based on their associations and functions, and how a resilient supply chain can be established. The participants explored and provided in-depth knowledge about the aforementioned issues for the development of a resilient supply chain of a startup project with recommended structural dynamics. For any qualitative study, such as an interview, maintaining reliability and validity of information is extremely important. Researchers of this study having expertise in different areas confirmed the issues following the triangulation method recommended by Moon (2019): Variation in i) method, ii) information provider and, iii) context (location). Researchers used several distinct procedures to collect information such as direct question, observation, opinion, and discussion. Information was collected from different

professionals (as mentioned previously) with different contextual perspectives to validate the information (Ketokivi and Choi, 2014; Fernández Campos et al. 2019; Hughes et al., 2020).

The transcripts of the interviewees were recorded and analysed later on to reveal and organize the concepts, keywords and similarity among participants. In this context, categorizing, grouping, and restructuring were done following the principles of matrix thinking (Patton, 1981). It allows dividing any long sentences into keywords with significance so that the identified concepts can be compared with and recognised as common attributes. Specific attributes revealed from this analysis were synchronized based on commonalities to confirm reliability of information; as well as to identify the possible independent constructs and their measuring items to develop the questionnaire of an empirical study to further investigate the development of a resilient supply chain. The identified four independent and one dependent constructs and their functional definitions are depicted in Table 1.

Table 1: Independent Constructs and Concepts

| N0. | Name of Constructs | Functional Definition |
|------------|------------------------------|---|
| 1 | Stakeholder (SH) | Any essential network members who should collaboratively work with alternative resources to establish a resilient supply chain in order to promote an entrepreneurial ecosystem for startup projects. The members are: innovators of startups, academicians/researchers, venture capitalists, technology experts and facilitators, general market investors, top corporate executives, and government policymakers. |
| 2 | Network (NW) | The degree to which the stakeholders perform their interconnected and interdependent roles and responsibilities and value propositions in order to establish a resilient supply chain to promote an entrepreneurial ecosystem for startup projects. |
| 3 | Platform (PF) | The degree to which the stakeholders are associated, cooperative among them, and mutually benefited to establish a resilient supply chain to promote an entrepreneurial ecosystem for startup projects. |
| 4 | Governance (GV) | The degree to which there is a mechanism of coexistence of the network members according to their expected and specific roles so that the stakeholders impartially maintain their position to establish a resilient supply chain to promote an entrepreneurial ecosystem for startup projects. |
| 5 | Resilient supply chain (RSC) | A supply chain which has the capability to minimize risks and withstand against disruptions to promote an entrepreneurial ecosystem for startup projects. |

Theoretical Framework and Hypotheses Development

Based on the discussion of the focus group, literature review, and extensive interviews, the theoretical framework of a resilient supply chain of startup projects to establish an entrepreneurial ecosystem was proposed which served as the reference of the second phase research conducted by a quantitative study. However, to develop the framework of this study, the conceptual paradigms of the rules of the game and economic institutions proposed by North (1991) were deeply analysed to get the understanding of the probable behaviour of different actors in the entrepreneurial ecosystem. It is a powerful tool to analyse and conceptualize human behaviour where multidimensional interests are interacting to shape financial outcome in the society. According to this principle, a couple of essential characteristics can be evolved in uncertain institutional interactions, which ultimately get some formal shape reflecting the societal demand and norms of the society (McKinnon, 1993; Trussler, 1998). North (1989), in his seminal study, suggested that in an uncertain environment, based on the characteristics and requirements of any institutions, institutions set the players and rules of the game where the players and organizations play following the set rules to shape the society. This umbrella principle can provide excellent insight to identify the independent forces termed here as the constructs (Stakeholder, Network, Platform, and Governance) of an entrepreneurial ecosystem. Particularly, economic institutions can be shaped according to their players' multidimensional requirements, interests, nature of exchange, and demand of the society. However, North (1991), did not explain the general rules of the game as it depends on a particular situation.

Stakeholder (SH)

To establish an entrepreneurial ecosystem, stakeholders of the supply chain of any startup projects have an enormous potential role to play (Guijarro-García et al., 2019; Gutmann et al., 2020). Different stakeholders, who must participate to establish a balanced ecosystem for startups, are mutually responsible to form and direct a resilient supply chain to minimize all sorts of risks and to withstand possible disruptions (Smorodinskaya et al., 2017; Wagner, 2021; Yablonsky, 2018). Shedding light on the principle of rules of the game (North, 1991; Trussler, 1998), it is quite evident that in an uncertain environment where an entrepreneurial ecosystem of startup projects develops, based on the complex characteristics of the organizations, players, i.e., stakeholders, will

be selected to advance the institution. Borrowing the central concept from stakeholder theory (Baumfield, 2016; Laplume et al., 2008), any startup projects should organize and integrate different stakeholders - who have different interests to represent a comprehensive scalable venture. Several case studies conducted on startup ecosystems have revealed that stakeholders should understand the roles, authorities, and distribution of powers in their supply network and practice their functions accordingly (Cheah et al., 2016; Ritala et al., 2013; Wagner, 2021). A classic example of a recent startup project in Bangladesh is Pathao, a digital platform for transportation and food delivery. Founded in 2015, it is regarded as the fastest growing digital startup in Asia (Ahmed et al., 2019; Ullah and Islam, 2017). This company has successfully accumulated different e-commerce platforms and stakeholders to promote and establish their business ventures (Alexander et al., 2017). A case study on India's high-tech manufacturing startups has identified the essential stakeholders and demonstrated their roles to establish a sustainable supply chain (Ghosh et al., 2018; Wagner, 2021). Similarly, analysing the case study on the entrepreneurial ecosystem of the aerospace programme in Singapore, which was started in 2007, Cheah et al. (2016) recommended that existence of several stakeholders is imperative to launch a startup project. Adner (2017) has worked on stakeholder of startups and postulated different members as the essential partner of an effective supply chain of a startup project. Researchers (Adner, 2017; Bonollo and Poopuu, 2019; Collin and Lorenzin, 2006; Garcia-Herrera et al., 2018) unanimously argued that the presence and association of several stakeholders, for example, young innovators of startup projects, academic researchers, venture capitalists, technology experts and facilitators, general market investors, top corporate executives and innovators, and government policymakers are a prerequisite condition to establish a resilient supply chain of startup projects. Focus group members and interviewees also affirmed that the presence, coexistence, and association of the aforementioned stakeholder (SH) are prevalent to establish a resilient supply chain to promote an entrepreneurial ecosystem for startup projects. Thus, this study has proposed that,

H₁: Stakeholder (SH) has an impact on the development of a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects.

Network (NW)

Fundamentally, an entrepreneurial ecosystem of any startup project consists of multilateral actors with multidimensional tasks (Adner, 2017; Bonollo and Poopuu, 2019; Hagiwara and Wright, 2015;

Lock and Seele, 2017). To promote a resilient supply chain of any startup project, interactions among the network members should be such that it can effectively maintain value propositions with alternative resources so that disruptions can be avoided (Altman and Tushman, 2017; Kim, 2016). In this connection, it is imperative to define and establish structural dynamics among the network members (Ramadani et al., 2022). Looking at the core concept of social network and social ties, it is affirmed that inter-relationships, interactions and connections, and nature and pattern of interactions are substantially dependent on the relative positions of different actors and the rules of association (Borgatti and Halgin, 2011; Friedkin, 1980). Thus, economic institutions should set the rules and allocate the roles and responsibilities according to their association which is also supported by the rules of game principle (Granovetter, 2005; Przeworski, 2004). Structural dynamics depend on the rules and regulations of the associations. In this regard, researchers argued that creating digital infrastructure and ensuring digital connectivity are the two prevalent conditions for sustainability (Dini et al. 2011; Li et al. 2012; Purbasari et al., 2021). To ensure this unilateral structural dynamic among multilateral actors, roles and responsibilities of all the actively participating members should be well defined and organized (Ben-Gad, 2016; Lu et al., 2014). Researchers working on this vulnerable issue to promote national growth (Adner and Kapoor, 2016; Cooke, 2012; Hagi and Wright, 2015), have put enough stress and importance on the factor that reconciliations among the members have potential value to achieve the targeted goal. For the success and sustainability of this supply network, actors must understand their goal, mutual benefits, and act accordingly (Adner, 2017; Bonollo and Poopuu, 2019). In this regard, focus groups and all the interviewees prioritized the roles and responsibilities of the actors recommending that since performance of all the actors are entirely interconnected. Development of a resilient supply chain to promote an entrepreneurial ecosystem of startup projects substantially depends on interconnected roles and responsibilities of the stakeholders which is termed here as the network (NW). They also highlighted the digital infrastructure of two recent very successful startup projects in Bangladesh called Pathao and Chaldal.com. Chaldal.com is a digital platform for grocery retailing. A case study on Chaldal.com identified that the primary success story of this venture relied on the effective setup of connections among different potential stakeholders (Gani et al., 2023). Thus, this study has proposed that,

H₂: Network (NW) has an impact on the development of a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects.

Platform (PF)

The agents of a supply chain of startup projects have multilateral positions and their roles and responsibilities are multidimensional; however, they should be properly interconnected through digital ecosystem and mutually cooperative (Hagiu and Wright, 2015; Sussan and Acs, 2017). Their power should be balanced in such a way that their commercial and voluntary benefits and participation should develop a mutually beneficial platform (Bonollo & Poopuu, 2019). This argument is clearly supported by stakeholder theory (Baumfield, 2016). Stakeholders' mutual benefits must be confirmed in their association so that the structural dynamics among the stakeholders will be sustainable. Any startup project where different actors are interacting, an entrepreneurial ecosystem should ensure and balance the power and mutual benefits of all the stakeholders according to the social network theory (Friedkin, 1980). Otherwise, this system will fail to create a resilient supply chain (Laplume et al., 2008; McKinnon, 1993). Researchers (Cheah et al., 2016; Garcia-Herrera et al., 2018; Ritala et al., 2013; Wagner, 2021; Yablonsky, 2018) working on the entrepreneurial ecosystem, have asserted that collaborative relationships among the multilateral agents is imperative to reconcile structural dynamics among the members and promote a resilient supply chain of startup projects. Analysing case studies on several entrepreneurial ecosystems of startup projects, researchers (Bonollo and Poopuu, 2019; Lu et al., 2014) postulated that a streamlined society where all the actors should stay with mutual benefits with a unilateral mission to develop and uphold their community should be based on a common ground (Adner, 2017; Bonollo and Poopuu, 2019; Ramadani et al., 2022). This collaborative relation which is the prerequisite and precondition of a common beneficial ground is termed here as the platform (PF). Sussan and Acs (2017) have advocated for the creation of digital infrastructure in the entrepreneurial ecosystem. The focus group of this study and agents of different stakeholders suggested in interviews that mutually beneficial interconnected relations, i.e., the common platform is very important to develop a resilient supply chain to promote an entrepreneurial ecosystem of startup projects. In this context, the focus group pointed out the success story of a multi-million startup project in Bangladesh called bKash Limited. It is a mobile financial service (MFS). This startup project has created an excellent cooperative platform of different stakeholders who have essential roles to play for successful procurement, operation, and marketing (Uddin, 2022; Yesmin et al., 2019). Thus this study reiterated that,

H₃: Platform (PF) has an impact on the development of a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects.

Governance (GV)

In the pursuit of fostering the proper development of institutional governance, defined here as the entrepreneurial ecosystem of startup projects, it becomes evident that rules and regulations governing group interactions and coexistence are imperative (Mason and Brown, 2014). Thus, governance stands as a pivotal prerequisite element for effectively managing the dynamic structural aspects of this ecosystem. It is supported by the principle of rules of game. It is explicitly understandable that participating agents in an entrepreneurial ecosystem of startup projects are coming from different professions, and they have different functions, roles, and responsibilities (Kim, 2016; Lu et al., 2014). To some extent, they have different goals with multidimensional missions (Adner, 2017; Bonollo and Poopuu, 2019; Collin and Lorenzin, 2006). In that sense, it is a serious challenging issue to interconnect them with a common platform (Adner, 2017; Altman and Tushman, 2017). Researchers, working on start projects, have acknowledged these potential differences among actors of the supply networks of start projects (Bonollo and Poopuu, 2019; Garcia-Herrera et al., 2018). Nevertheless, seminal studies on the entrepreneurial ecosystem affirmed that success of startup projects largely depends on the unilateral position and relation among the members (Adner and Kapoor, 2016; Altman and Tushman, 2017). Thus, creating a common ground to promote a community with economic growth depends on the coexistence mechanism among the participating members in a startup project (Adner, 2017; Bonollo and Poopuu, 2019; Garcia-Herrera et al., 2018). This coexistence mechanism with different roles directed toward the same objective for the community is termed here as the governance (GV). Researchers of the digital entrepreneurial ecosystem (Acs et al., 2016; Beliaeva et al., 2019; Morgan-Thomas et al., 2020; Purbasari et al., 2021; Song, 2019; Sussan and Acs, 2017) have provided strong arguments that, in this connection, sustainability of startup projects largely depends on the effective digitalization of the governing system. Researchers working on successful startups in Bangladesh like bKash, Pathao, and Chaldal.com revealed that these ventures fundamentally prioritized their governance system, i.e., the mechanism of coexistence (Ahmed et al., 2019; Alexander et al., 2017; Gani et al., 2023; Ullah and Islam, 2017; Yesmin et al., 2019). These startups have effectively integrated digital governance system through a digital platform.

Interviewees and the members of the focus group have said that although it is a challenging issue to establish such governance, this is a bounded principle to develop a resilient supply chain to promote an entrepreneurial ecosystem of startup projects. In this light, this study has proposed that,

H₄: Governance (GV) has an impact on the development of a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects.

Researchers (Cooke, 2012; Dutta and Hora, 2017; Fuzi, 2015) also asserted that development of mutually beneficial relations, i.e., platform (PF), is substantially dependent on the mechanism of coexistence, i.e., governance (GV). Thus this study has proposed that,

H_{4a}: Governance (GV) has impact on the development of Platform (PF) of a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects.

Integrating all the proposed hypotheses, the following theoretical framework can be developed for further analysis through an empirical study (shown in Figure 1).

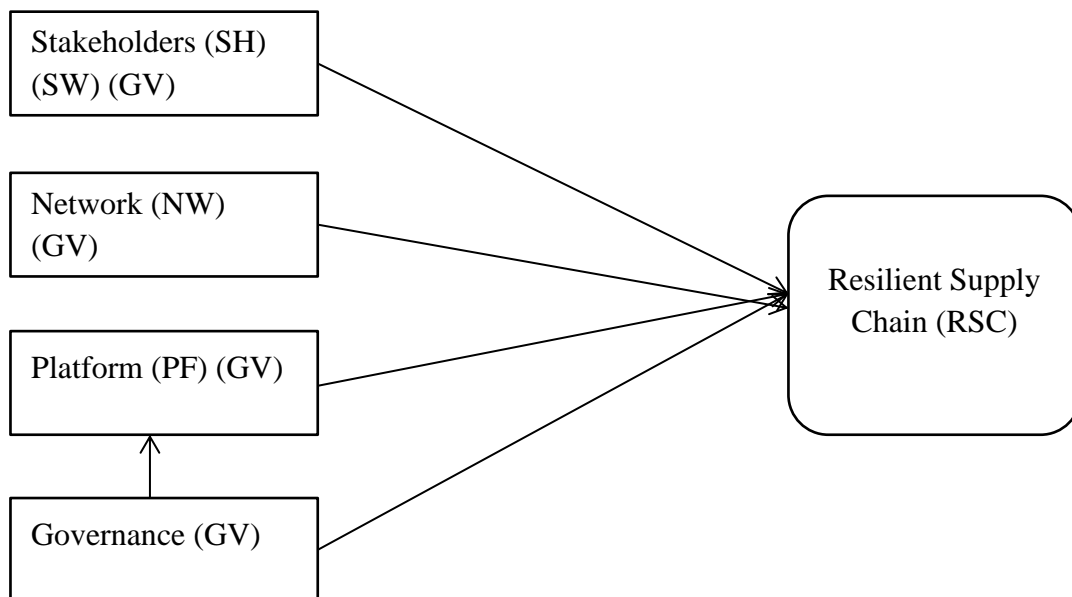


Figure 1: Formation of Resilient Supply Chain of Startups: Entrepreneurial Ecosystem
Second Phase Research: Quantitative Study

Based on the findings of the first phase qualitative study, in the second phase, a quantitative study was done. In this phase, scale items were developed, and a survey-based empirical study was conducted among the selected network members.

Scale Items for Quantitative Study

Based on the transcripts of the interviews, literature review (Adner, 2017; Bonollo and Poopuu, 2019; Cheah et al., 2016; Collin and Lorenzin, 2006; Garcia-Herrera et al., 2018; Guijarro-García et al., 2019; Gutmann et al., 2020; Ritala et al., 2013; Wagner, 2021), and discussion with the focus group, four independent constructs namely stakeholder (SH), network (NW), platform (PF), and governance (GV) were revealed with 32 scale items to predict a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects. The dependent variable resilient supply chain (RSC) is measured by 6 scale items (shown in Appendix A). The proposed independent and dependent constructs for the sustainable institutionalization of startup projects was operationalized through the brainstorming of the focus group. However, it was tested through a pilot survey of 14 people (2 participants from each stakeholder) to verify the appropriateness of the word, sentence, structure, and intended meaning. It was then revised following the comments of the pilot study, and the final questionnaire was developed (shown in Appendix A). A detailed survey was conducted among the stakeholders of an entrepreneurial ecosystem of startup projects throughout Bangladesh. The following sample and their respective number were selected based on the recommendation of the focus group:

- a) Innovators of startup projects (50 numbers)
- b) Academic researchers (50 numbers)
- c) Venture capitalists (20 numbers)
- d) Technology experts and facilitators (20 numbers)
- e) General market investors (10 numbers)
- f) Top corporate executives and innovators (20 numbers)
- g) Government policymakers (10 numbers)

Except the last stakeholder mentioned in the list (Government policymakers), all the stakeholders from each group were selected randomly from their institutions in Dhaka, Bangladesh. Government policy makers (under the condition of anonymity) were selected from two ministries in Bangladesh; namely the ICT ministry and planning ministry, considering their involvement and authority to look after and promote such startup projects with possible guidance. With the

assistance of three appointed research assistants, the questionnaires were distributed physically among the specified members. Participants were explained about the mission and objective of this study, and they were given around twenty minutes time to fill out the question. The total sample size is 180.

Results and Hypotheses Testing

Statistical analysis was conducted through structural equation modeling (SEM) to identify the cause effect relation between the dependent and independent constructs. Since this study is completely exploratory and data was collected from samples representing quite different professions, several systematic statistical analyses were conducted on the collected sample to validate the sample for reliability. At first, a demographic analysis was done to reveal general characteristics of the sample (shown in Table 2).

Table 2: Demographic Information

| Traits | Sample |
|----------------------------------|----------------------|
| Median age | More than 40 years |
| Gender | 63:37 (Male: Female) |
| Knowledge about startups (years) | 8 years |

This study examined the reliability of the measuring items and the respective latent constructs. It also investigated the cause-effect relationships between the independent and dependent variables following the suggestion of Anderson and Gerbing (1988) by a two-step approach. In the first step, this study conducted a confirmatory factor analysis (CFA) to examine the measurement model to identify the scale items which have potential contributions to reflect the respective latent constructs and verify different reliability parameters such as, convergent and discriminant validity. In the second step, a structural model was examined to study the cause-effect relationships so that the proposed hypotheses can be established.

Validity and Reliability: Measurement Model

CFA was conducted among the four independent constructs, stakeholder (SH), network (NW), platform (PF), and governance (GV) with their 32 reflective indicators and the dependent variable resilient supply chain (RSC) with its 6 scale items. The CFA results revealed over-identified models for all the constructs, which is a condition for acceptability of CFA. According to literature (Fornell and Larcker, 1981; Kline, 2011) and their recommendation, any scale items will be retained as a potential contributor to the variance of the respective latent variable, if it has loading values 0.50 or above. For the four independent constructs and their total 32 measuring items, it was identified that four scale items have loading values less than 0.50 which indicate that these four scale items namely NW9, PF2, PF5, and PF8 do not have significant contributions to the variances of their respective latent variables. Similarly, one item, RSC6 from the dependent construct, had a loading value less than 0.50. As per the recommendation, these five items were removed from the list of the respective measuring items (shown in Appendix A). It was observed that the four independent and one dependent construct had average variances extracted (AVE) higher than 0.50, thus, CFA result and their minimum cut-off values confirmed the convergent validity (Fornell and Larcker, 1981). Following the suggestion of Fornell and Larcker (1981), variance-extracted test was conducted to examine the discriminant validity among the independent and dependent constructs. Discriminant validity between any two constructs can be assured if the variances of these two constructs are greater than the squared correlations between the respective two constructs. According to this test, the lowest AVE value is 0.927 (for the construct PF), which is higher than the largest squared correlation between any pair of constructs (0.21, between independent construct GV and dependent construct RSC) (shown in Table 3). So, this test adequately confirmed discriminant and convergent validity.

Table 3: Discriminant Validity among the Latent Constructs

| | SH | NW | PF | GV | RSC |
|----|--------------|----|----|----|-----|
| SH | 0.971 | | | | |

| | | | | | |
|-----|---------|--------------|--------------|--------------|-------------|
| NW | 0.00073 | 0.979 | | | |
| PF | 0.029 | 0.0038 | 0.927 | | |
| GV | 0.043 | 0.0072 | 0.057 | 0.971 | |
| RSC | 0.023 | 0.065 | 0.139 | 0.21 | .966 |

Diagonals are the square root of AVE and others are squared correlation.

Reliability of the measuring items and their respective constructs is an essential issue to be verified. It was suggested by many researchers (Fornell and Larcker, 1981; Hair et al., 2013) that construct reliability can be verified by composite reliability scores for which the minimum acceptable score must be 0.70. Calculating based on the standardized factor loadings and the indicator's measurement error, it was revealed that for all the four independent and one dependent variable's composite reliability scores are above 0.70 (shown in Table 4). This result confirmed the reliability of all the constructs and their measuring items.

Table 4: Composite Reliability Score

| Constructs | Composite Reliability based on Standardized Loading Value |
|------------------------------|--|
| Stakeholder (SH) | 0.991 |
| Network (NW) | 0.997 |
| Platform (PF) | 0.976 |
| Governance (GV) | 0.988 |
| Resilient supply chain (RSC) | 0.986 |

Causal Relationship by Structural Model

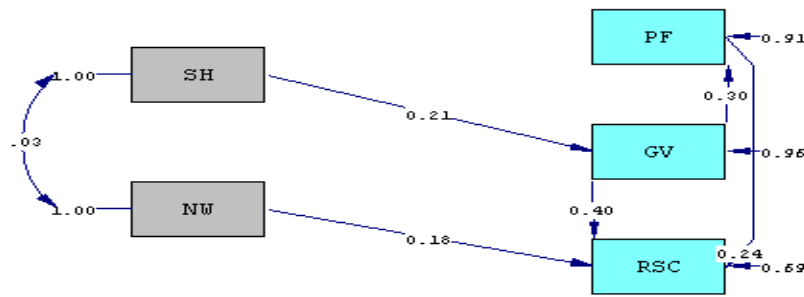
Structural equation modeling (SEM) through LISREL with maximum likelihood estimation was used to investigate and reveal the cause-effect relationships between the independent and dependent constructs. These relations were proposed through hypotheses shown in Figure 1. After several iterations, primary model fitness parameters were verified against recommended values prescribed in literature (Chau, 1997; Kline, 2011). It was observed that the root mean square error of approximation (RMSEA), Chi-Square, P-value were slightly on the higher side. Values of other model fitness indices, such as normed fit index (NFI), comparative fit index (CFI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), incremental fit index (IFI), and relative fit

index (RFI) indicated that the model did not fit well with the sample data. At this stage, all the standardized loading values of the independent constructs on the dependent construct and respective 't' values were verified. It was found that the independent constructs network (NW), platform (PF), and governance (GV) have significant effects on the dependent variable resilient supply chain (RSC) at the 0.05 level. Effect of governance (GV) to pursue the development of platform (PF) is also significant at the 0.05 level. Therefore, the hypotheses H₂, H₃, H₄, and H_{4a} were not rejected. However, the relation of stakeholder (SH) with the dependent variable resilient supply chain (RSC) was not significant. Its contribution to the variance of RSC is only 0.03 (standardized loading value) which is insignificant at the 0.05 level. It means, its contribution to form a resilient supply chain is so negligible that this hypothesis H₁ can be rejected.

Structural model analysis suggested one new important relation to decrease chi-square coefficient and increase model fitness. It proposed that although stakeholder does not have direct significant effect on the dependent variable, it has indirect impact on the development of a resilient supply chain (RSC) through governance (GV). Specifically, an independent construct stakeholder (SH) influences governance (GV) directly. In this aspect, the correlations matrix of the independent and dependent constructs was examined. It was found that correlation of stakeholder (SH) with governance (GV) is relatively high. Plausible explanations of the removal of the hypothesis H₁ and the inclusion of a new relation are given in the next section in the light of statistical data, literature review, and theories.

Thus, hypothesis H₁ was rejected through the analysis based on the opinions of the respondents which was postulated from the collected data. Hypotheses H₂, H₃, and H₄ which exhibits the relations of the three independent constructs with the dependent construct are significant. Hypothesis H_{4a} is significant.

After the inclusion of this new relation and the removal of the non-significant relation, the model was run again. This time, the model fitness indices were found quite reasonable against literature (Chau, 1997; Kline, 2011). Fitness parameters indicated that the model has fitted well with the data and thus, can be accepted. The final accepted model with standardized loading values is shown in Figure 2.



Chi-Square=5.39, df=4, P-value=0.24983, RMSEA=0.044

Figure 2: Supply Chain of Startup Projects with Standardized Loading Values

The model fitness parameters against recommended values are shown in Table 5.

Table 5: Model Parameters of Resilient Supply Chain of Startup Projects Model

| Fit Measures | Recommended Values | Validated Model |
|---------------------------------------|--------------------|-----------------|
| Chi-square (χ^2) | $P \geq 0.05$ | 5.39 (0.24983) |
| Degrees of Freedom | | 4 |
| χ^2 /Degree of freedom (df) | ≤ 3.00 | 1.3475 |
| RMSEA | < 0.06 | 0.044 |
| Normed Fit Index (NFI) | ≥ 0.90 | 0.946 |
| Goodness of Fit Index (GFI) | ≥ 0.90 | 0.988 |
| Adjusted Goodness of Fit Index (AGFI) | ≥ 0.80 | 0.957 |
| Relative Fit Index (RFI) | ≥ 0.80 | 0.865 |
| Incremental Fit Index (IFI) | ≥ 0.90 | 0.985 |
| Comparative Fit Index (CFI) | ≥ 0.90 | 0.985 |

Squared multiple correlation coefficient (R^2) derived from the analysis of the cause-effect relationships between the independent and dependent constructs is 0.305. This value indicates that the amount of variance that the three independent constructs network (NW), platform (PF), and governance (GV) contributes to pursuing the dependent construct resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects is 30.5 percent. This is slightly low; however, for an appropriate exploratory study in social science, this value is quite justified (Kline, 2011). Among the three significant independent constructs, governance (GV) has the highest contribution to form a resilient supply chain (RSC). A unit change on governance

(GV) can cause a 0.40-unit positive change on resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects when other two significant constructs, network (NW) and platform (PF), remain constant. Similarly, standardized loading values of network (NW) (0.182) and platform (PF) (0.232) can be interpreted.

Discussion

This study has conducted research to understand who should be the members of a resilient supply chain to promote an entrepreneurial ecosystem of a start-up project. The proposed theoretical framework for a resilient supply chain to promote an entrepreneurial ecosystem of startup projects was verified and theorized through SEM. All the constructs and their scale items were examined through measurement and structural models.

Network (NW), platform (PF), and governance (GV) have potential impact on a resilient supply chain (RSC) of the entrepreneurial ecosystem of a startup project. This identification indicates the structural dynamics of the supply chain of the entrepreneurial ecosystem of a startup project and thus, provides the answer of both the research questions. This finding suggests that forming a stable supply chain of startup projects which can withstand risks of disruption substantially depends on the balanced presence of the essential stakeholders. This is supported by the scholarly research studies done by Wagner (2021) and Adner (2017). Significant contributions of network (NW) and platform (PF) of the stakeholders of a startup project clearly postulate that the stakeholders should execute their appropriate roles and responsibilities to benefit them and society mutually with justified allocation of power. This is clearly absent in startup initiatives in Bangladesh (Uddin, 2022); although findings from developed countries have strong recommendations in favor of developing protocols of entrepreneurial ecosystem before launching any startup projects (Bonollo and Poopuu, 2019; Garcia-Herrera et al., 2018). However, in this context, it is widely recommended by several seminal studies (Acs et al., 2016; Morgan-Thomas et al., 2020; Richter et al., 2015; Song, 2019; Sussan & Acs, 2017) that digital infrastructure and digital entrepreneurship are important forces to facilitate the development of platform and network. This finding was also acknowledged by researchers on entrepreneurial ecosystem and startups (Audretsch, & Belitski, 2021; Ritala et al., 2013; Yablonsky, 2018). All the essential stakeholders must contribute to forming any effective startup projects according to their scope and ability, so

that it can be sustainable and a resilient supply chain can be established which will eventually lead to forming an entrepreneurial ecosystem (Guijarro-García et al., 2019; Gutmann et al., 2020; Smorodinskaya et al., 2017).

Governance (GV) has potential impact on the development of platform (PF). It indicates that if proper governance exists in a supply chain of startup projects, that means if the essential stakeholders of any startup perform their ideal roles and responsibilities with proper authority delegation, a mutually collaborative and beneficial system, i.e. a platform of an entrepreneurial ecosystem will be developed. This identification fulfills the research objective and provides the answer of the second research question. It is supported by the seminal work done by Theodoraki et al. (2022). Necessity of good policy and system, which is termed here as governance, is also recommended by several researchers on the entrepreneurial ecosystem and startups (Adner, 2017; Bonollo and Poopuu, 2019; Collin and Lorenzin, 2006; Garcia-Herrera et al., 2018). At present, several researchers (Dini et al., 2011; Li et al., 2012; Purbasari et al., 2021; Sussan & Acs, 2017) suggested that for sustainable startups, digital governance system is the most important force to ensure its effectiveness and efficiency. Governance (GV) has a significant contribution to form a platform (PF).

It is identified that the mere presence of stakeholders (SH) must not be counted as a potential contributor to the formation of a resilient supply chain to promote an entrepreneurial ecosystem of startup projects. Although, this finding is slightly contradictory to the recommendation of the study Wagner (2021), several seminal studies both in Bangladesh and other countries have asserted that presence of stakeholders in the supply chain of startups is not a considerable issue; rather, the more important concern is to settle the associations among the stakeholders through appropriate governance (Bonollo and Poopuu, 2019; Gani et al., 2023; Garcia-Herrera et al., 2018). However, this present study has revealed that formation of a resilient supply chain to promote an entrepreneurial ecosystem of startup projects can be streamlined through a network of the stakeholders, their mutual cooperative existence in a platform, and their proper delegation of roles and responsibilities reflecting good governance. This finding has strong support from the existing studies (Guijarro-García et al., 2019; Gutmann et al., 2020; Smorodinskaya et al., 2017; Wagner, 2021; Yablonsky, 2018).

Nevertheless, to form a resilient supply chain to promote an entrepreneurial ecosystem of startup projects, the presence of stakeholders is important, and it contributes to the potential of independent construct governance (GV) (Bonollo and Poopuu, 2019; Collin and Lorenzin, 2006; Garcia-Herrera et al., 2018; Ritala et al., 2013; Wagner, 2021). In any risk aversion, supply chain, which is dedicated to promote an entrepreneurial ecosystem of startup projects, presence of all the essential stakeholders is imperative to establish good governance among the network members. And thus, it is newly identified that there is an effect of stakeholders (SH) on governance (GV). Therefore, the construct 'stakeholders' (SH) has an indirect effect on the resilient supply chain (RSC) through the potential construct governance (GV) which is also supported by a seminal study done by Bonollo and Poopuu (2019).

Conclusion

This study has conducted research to understand who should be the members of a resilient supply chain to promote an entrepreneurial ecosystem of a startup project, what will be the association among them to allocate authorities and responsibilities, how will their mutual benefits be maintained, and finally, what will be the mechanism for balanced coexistence so that this supply chain can withstand against any disruption risks. In this connection, this study has conducted extensive qualitative and empirical study through interviews and a survey among the probable members of this supply network. After a detailed statistical analysis, this study has identified several potential independent constructs that can contribute to developing a resilient supply chain to promote an entrepreneurial ecosystem of a startup project.

Contribution of the Study

This study has significant contributions to the existing knowledge of promoting startups and developing an entrepreneurial ecosystem in Bangladesh, as well as in other developing countries. It has precise contributions to the literature on the entrepreneurial ecosystem of startup projects.

The first and foremost knowledge revealed from this study is, that just the initialization of startup projects and their promotion through government funding or venture capital will not be effective unless proper mechanism of coexistence, i.e., the governance system of the entrepreneurial ecosystem is well established. This finding can provide guiding paradigms to the promoters of the entrepreneurial ecosystem in Bangladesh as well as in other developing countries (Ahmed et al., 2019; Gani et al., 2023; Rahman et al., 2022; Ramadani et al., 2022; Song, 2019). It has clear support from some seminal studies like the studies done by Alkaabi et al. (2023) and Audretsch and Belitski (2021). The entrepreneurial ecosystem of startup projects basically arranges different stakeholders from multidisciplinary fields. Another important finding of this study, which has potential impacts on the present literature of the entrepreneurial ecosystem, is the requirements of setting rules and regulations for proper associations and allocating responsibilities among the conflicting members of startup projects (Theodoraki et al., 2022; Wagner, 2021).

As potential contributions, policymakers can get deep insight from the findings of this study. In this regard, this study has certain recommendations which can contribute to promoting any startup projects and establishing an entrepreneurial ecosystem in any community of a country. These are:

From the findings, it is explicitly revealed that the policymakers and promoters of startup projects should not be concerned too much about who the members to initiate the network of a startup project are. It means, the identity of the stakeholders of any startup is not the deciding factor for its resilience. Development of a supply chain of a startup project to resist any kinds of disruption risks does not have any close connections with the identity of the members. This is supported by other studies (Cheah et al., 2016; Ritala et al., 2013; Theodoraki et al., 2022).

Government agencies should try to address and evaluate the adaptability of the system by the members who are willingly participating in this robust entrepreneurial ecosystem before funding such projects (also supported by Adner, 2017; Bonollo and Poopuu, 2019). Organizing, i.e., allocating roles and responsibilities, among the members of this supply network is a real concern to promote an entrepreneurial ecosystem of a startup project (Wagner, 2021; Yablonsky, 2018). As such, researchers recommended that digital infrastructure is the essential prerequisite for its sustainability (Acs et al., 2016; Morgan-Thomas et al., 2020; Song, 2019; Sussan and Acs, 2017).

The members of this kind of supply chain of any entrepreneurial ecosystem of a startup project have multidimensional aspects, interests, wisdoms, experiences, skills, knowledge, and issues to be benefitted. And thus, promoters, coordinators, policymakers, and mentors of this kind of project should always be careful that a balanced coexistence with mutual benefits is a serious challenging issue for this supply chain, and there is always the possibility of occurrence of disputes and disagreement (Adner, 2017; Dubey et al., 2021; Ivanov et al., 2016; Shareef et al., 2019). To resolve challenges from any unwanted structural dynamics, researchers recommended for the inclusion of digital ecosystem (Purbasari et al., 2021; Sussan and Acs, 2017). Several researchers (Rahman et al., 2022; Ramadani et al., 2022) working on the entrepreneurial ecosystem in Bangladesh have acknowledged this issue in their seminal studies.

Development of a set of well-structured and well documented policies and mechanisms for mutual coexistence is the pivotal issue for the sustainability of the effort to promote an entrepreneurial ecosystem of a startup project. Several researchers have showed similar finding (Bonollo and Poopuu, 2019; Collin and Lorenzin, 2006; Garcia-Herrera et al., 2018). In this regard, researchers suggested incorporating digital governance system for greater sustainability (Morgan-Thomas et al., 2020; Richter et al., 2015; Sussan and Acs, 2017).

Implications for Policy and Practice

Implications of the study for both policy and practice have been explained under this section.

Academic Implication

Academicians have scopes to learn from this truly new issue of relations in three different areas namely the entrepreneurial ecosystem, startup projects and development of resilient supply chain for this system which is attempted to be addressed and unfolded through this exploratory study. This study has confirmed that the presence of stakeholders (SH), their performance to execute individual roles and responsibilities (NW), association for mutually beneficial cooperation (PF), and an effective system of coexistence (GV) are potentially important for the success of a startup project so that a resilient supply chain (RSC) is established to promote an entrepreneurial

ecosystem. Academicians can get deep insight from this finding. For the success of any startups, governance (GV) is the most prioritized issue to streamline and establish a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of a successful startup project. This is an important learning of the academicians of entrepreneurial ecosystem of startups. Academicians can understand that a fruitful system or policy of coexistence and a mutually beneficial cooperative body (PF) are essential issues for an effective entrepreneurial ecosystem of a startup project. For the successful operation of a startup project so that a resilient supply chain can be established to promote an entrepreneurial ecosystem, network (NW), i.e., the proper execution of roles and responsibilities is very important. Academicians can get potential knowledge from this finding. And mere presence of the network members, i.e., the stakeholder (SH), is not a direct contributor to developing a resilient supply chain. A true academician or researcher engaged in study on a startup project might be surprised by this result; however, they can get deep insight from this result when the question of developing a resilient supply chain to promote an entrepreneurial ecosystem has been raised. This is not unexpected for supply chain study or an effective effort to promote an entrepreneurial ecosystem. Now, from this finding, academicians should learn that the development of a resilient supply chain (RSC) to promote an entrepreneurial ecosystem of startup projects, the top most priority is **to establish a unique policy or mechanism (denoted here as governance) so that significantly multidimensional stakeholders by profession, having quite different interests and to some extent, almost opposing target of acquiring benefits should coexist, be cooperative and mutually benefited so that a startup project can run smoothly to form an entrepreneurial ecosystem.**

This is a really challenging, complicated, and conflicting situation where novice innovators are the initiators who are looking for being regarded as the future entrepreneurs. Academicians who are working in this ecosystem are disseminating knowledge. Venture capitalists and corporate executives are engaged in this ecosystem to invest and provide unorthodox support and they have enthusiastic eagerness to earn significant profit. Government policymakers are associated to promote overall support to the ecosystem and they have aspirations to find some disruptive technologies to increase annual gross domestic product (GDP). In this regard, academicians working on organizational behavior and supply chain of the entrepreneurial ecosystem can look at the findings and understand the conflict management issues revealed from this study. Conflict

among the stakeholders might be a potential barrier and thus, establishment of balanced mechanism is the pivotal concern.

Mutually beneficial association in the supply chain with cooperation, i.e., platform (PF) is also an overarching issue and thus, power distribution in any sustainable supply chain is a burning concern raised from this finding. Researchers working on a resilient supply chain can find interesting ideas from the findings of this study. To withstand against any disruption risks which is very common for this kind of supply chain, where stakeholders with quite multidimensional interests are working, development of a common goal with mutual understanding and cooperation is of utmost important. Researchers and academicians can gain enough insight that the formation of a resilient supply chain to promote entrepreneurial ecosystem substantially depends on studies regarding power distribution based on equity.

Organizational theorists, who are engaged in analyzing and conceptualizing group behavior where group members have versatile and opposing interests can find very constructive suggestions from this study. At any time any member can downplay this multidimensional group, and robust group dynamics can be disrupted. It is almost unavoidably precondition that there must be an excellent policy and system to control these conflicting dynamics. Rules and regulations to manage group dynamics is the pivotal issue which comes first. This is an advancement of knowledge for the researchers working on group behavior.

Managerial Implications

Practitioners and government policymakers, who are actively associated with promoting startup projects and developing an entrepreneurial ecosystem in any community, have significant scopes to learn from the findings of this research. This project has created the scope for the academicians, young entrepreneurs who wish to initiate any startup projects, venture capitalists, corporate executives, technology innovators, supply chain managers dealing with multidimensional stakeholders, and overall government policymakers to get a clear idea about starting and promoting a startup project to establish an entrepreneurial ecosystem in any community to boost up the national economy. For practitioners, three different, distinctive while closely interdependent issues are explored and resolved in this philanthropic study. It has unfolded the elements of any startup

projects with essential settings. This research has provided excellent learnings for the government policymakers who are engaged in establishing an entrepreneurial ecosystem of startup projects in any community. This type of a project integrates people from diverse interests and characteristics. Obviously and heuristically, the supply chain of this kind of stakeholders may experience tremendous conflict and confrontation which may cause the possibility of occurrence of disruption risks in the supply chain. Supply chain managers can get excellent ideas about how to manage this kind of network for its resilience.

Do not be overly concerned about the members who are forming the network of the supply chain. Rather, heuristically provide keen attention on the adaptability of the system by the members who are willingly participating in this robust entrepreneurial ecosystem. There should be a balance of authority delegation so that a uniform system of coexistence can be established.

For the policymakers, carefully articulate the memorandum of understanding so that in the association of supply networks of startup projects where all the members are devoted to form a community of coexistence, all the pivotal network members must mutually benefit from this initiative. Only then, a resilient supply chain of startup projects to promote an entrepreneurial ecosystem is feasible, justified, and moreover, possible. This is a potential learning for the practitioners.

A very constructive learning for the promoters of startup projects, policy makers that are establishing a community of an entrepreneurial ecosystem, and managers who are engaged in developing a resilient supply chain to minimize disruption risks is that managing a dynamic group of people who have distinctively conflicting interests from the outcome of the group performance is extremely difficult. And for smooth operation of this kind of high velocity turbulent project, the initial setup of policy and system which can confirm sustainable existence is the prime issue to be considered from the beginning. An effective platform where all the relevant stakeholders will interact among themselves to ensure mutual benefit is important; however, this condition will be fulfilled if there is a system or mechanism of coexistence.

Practitioners should know that a good governance system can support the formation of an effective platform. Mentors, promoters, and policymakers might accentuate this finding. To manage this kind of project, first develop rules and regulations. There must be an excellent system of governance. Digital governance systems with digital infrastructure can be key elements in this regard. Then, establish a platform where all the members will cooperate. Practitioners may have the inquisitive query, why will they cooperate? There must be positive incentives for all the stakeholders, i.e., all the stakeholders will be benefited from this project mutually. Develop organograms, allocate responsibilities, and connect them with networks. However, practitioners keep in mind, that while developing appropriate governance for this kind of project to promote an entrepreneurial ecosystem, you need to consider the stakeholders. Types and characteristics of the stakeholders can influence your governance system. Therefore, there should not be any ad-hoc system of policy or mechanism for coexistence. It should be developed after forming the group when you have a clear idea about the network members, i.e., stakeholders.

Limitation and Future Research Guideline

It is an exploratory study. It has several limitations which warrant evaluating the findings with caution. Most of the entrepreneurs who participated in this study as the respondents are at the preliminary stage of their intended projects. Future researchers can study a successful startup project. Demographic factors of the respondents such as age, level of education, gender, and income may have moderating effects on the identified independent variables; although as an exploratory study, initially this project did not consider any probable effects of any moderating variables. Future researchers may consider and identify effects of any demographic variables on the cause-effect relationships. Future researchers can explore the same research in a developed country which may capture effects of different cultures, if any (see Adner, 2017; Garcia-Herrera et al., 2018). Future researchers can also be engaged to understand the cause-effect relations comprehensively by adopting and testing some new independent variables.

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Appendix A

Questionnaire for Exploring Supply Chain Structural Dynamics of Startup: Resilience and Disruption Risks

- 1. Gender: Male
- Female
- 2. Age : 25-30
- 30-35
- 35-40
- More than 40
- 3. Knowledge about startups (years):
- 0
- 1-3
- 4-6
- 7 to higher

Please give the √ sign in the appropriate box.

| SI | Question | Loading Value from CFA |
|-------------------------|---|------------------------|
| Stakeholder (SH) | | |
| 1. | SH1: An innovative person should be an active member of the supply network of a sustainable startup project | 0.86 |

| SI | Question | Loading Value from CFA |
|---------------------|---|-------------------------------|
| 2. | SH2: An academicians should be an active member of the supply network of a sustainable startup project | 0.83 |
| 3. | SH3: A general investor should be an active member of the supply network of a sustainable startup project | 0.92 |
| 4. | SH4: A venture capitalist should be an active member of the supply network of a sustainable startup project | 0.71 |
| 5. | SH5: Corporation(s) should be an active member of the supply network of a sustainable startup project | 0.79 |
| 6. | SH6: Technology expert(s) should be an active member of the supply network of a sustainable startup project | 0.86 |
| 7. | SH7: Legal expert(s) should be an active member of the supply network of a sustainable startup project | 0.69 |
| Network (NW) | | |
| 8. | NW1: I think idea of a sustainable startup project should come from an innovative person | 0.88 |
| 9. | NW2: : I think an innovative person should be the initiator of a startup project | 0.90 |
| 10. | NW3: I think academicians have a potential role to evaluate an idea of a sustainable startup project | 0.85 |
| 11. | NW4: I think academicians have a potential role to mentor an idea of a sustainable startup project | 0.90 |
| 12. | NW5: I think investors have a potential role to evaluate the feasibility of a startup project | 0.85 |
| 13. | NW6: I think investors have a potential role to invest in a sustainable startup project | 0.86 |
| 14. | NW7: I think venture capitalists have a potential role to invest in a sustainable startup project | 0.81 |
| 15. | NW8: I think technology experts have a potential role to strengthen a startup project for sustainability. | 0.86 |

| SI | Question | Loading Value from CFA |
|------------------------|--|------------------------|
| 16 | NW9: I think technology experts have a potential role to enhance efficiency of a startup project for sustainability. (Dropped) | 0.49 |
| 17. | NW10: I think legal experts have a potential role to look after legal issues to a startup project for acceptability. | 0.70 |
| 18. | NW11: I think corporations have a potential role to bring a sustainable startup project in the market. | 0.74 |
| 19. | NW12: I think corporations should support a sustainable startup project for commercialization. | 0.76 |
| Platform (PF) | | |
| 20. | PF1: I think all the members of a sustainable startup project should cooperate each other | 0.69 |
| 21. | PF2: I think all the members of a sustainable startup project should coexist in a community mutually. (Dropped) | 0.40 |
| 22. | PF3: I think all the members of a sustainable startup project should form a mutually beneficial community. | 0.51 |
| 23. | PF4: I think all the members of a sustainable startup project should share common views to form a mutually beneficial community. | 0.72 |
| 24. | PF5: I think a well-coordinated supply chain is essential to promote a feasible startup project. (Dropped) | 0.25 |
| 25. | PF6: I think a collaborative supply chain is essential to promote a feasible startup project. | 0.77 |
| 26. | PF7: I think a well-coordinated supply chain is essential for sustainability of a startup project. | 0.69 |
| 27. | PF8: I think a collaborative supply chain is essential for sustainability of a startup project. (Dropped) | 0.09 |
| Governance (GV) | | |
| 28. | GV1: I think there should be a mechanism of coexistence in the supply chain of a sustainable startup project so that academicians can coordinate among the members to promote an entrepreneurial ecosystem | 0.83 |

| SI | Question | Loading Value from CFA |
|--|---|------------------------|
| 29. | GV2: I think there should be a mechanism of coexistence in the supply chain of a sustainable startup project so that academicians can guide students to promote an entrepreneurial ecosystem | 0.81 |
| 30. | GV3: I think there should be a mechanism of coexistence in the supply chain of a sustainable startup project so that agile innovation can be contributed by the talent volunteers in the society to promote an entrepreneurial ecosystem | 0.91 |
| 31. | GV4 I think there should be a mechanism of coexistence in the supply chain of a sustainable startup project so that government policy maker(s) can patronize the project to promote an entrepreneurial ecosystem | 0.92 |
| 32. | GV5: I think there should be a mechanism of coexistence in the supply chain of a sustainable startup project so that government regulatory bodies can provide necessary supports to the community of entrepreneurs to promote an entrepreneurial ecosystem. | 0.88 |
| Resilient Supply Chain (RSC) | | |
| 1. | RSC1: The supply chain of a startup project should have adequate alternative resources. | 0.69 |
| 2. | RSC2: The supply chain of a startup project should have alternatives in every aspect. | 0.90 |
| 3. | RSC3 The supply chain of a startup project should be sustainable | 0.91 |
| 4. | RSC4: The supply chain of a startup project should be feasible for the community. | 0.77 |
| 5. | RSC5: The supply chain of a startup project should minimize risk. | 0.79 |
| 6. | RSC6: The supply chain of a startup project should have ability to withstand against any risks. (Dropped) | 0.42 |
| Do you have any other comments or suggestions? | | |

Thank You