SSAR Journal of Arts Humanities and Social Sciences (SSARJAHSS)

Journal homepage: https://ssarpublishers.com/sarjahss
Abbreviated Key Title: SSAR J Arts Humanit Soc Sci
ISSN: 3049-0340 (Online)
Volume 3, Issue 1, (Jan-Feb) 2026, Page 108-128 (Total PP.21)
Frequency: Bimonthly
E-mail: ssarpublishers@gmail.com

OPEN ACCESS

ARTICLE HISTORY
Received: 15-01-2026 / Accepted: 06-02-2026 / Published: 08-02-2026

Multidimensional Cybersecurity Capability and Entrepreneurial Venture Resilience: A Conceptual Framework

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ABSTRACT: Digital entrepreneurship has presented a path to innovation and growth like never before but has also put startups and platform-based businesses at risk of the growing number of cyber threats. Although cybersecurity is becoming more popular, most entrepreneurial organizations find it difficult to match their security capacity to the gravity and occurrence of cyber disruptions, leading to a large gap in capabilities. The paper constructs a socio-technical conceptual framework of capabilities to establish the connection between multidimensional cybersecurity capability and the resilience of entrepreneurial ventures. The framework incorporates five fundamental dimensions of cybersecurity capability, such as security governance, maturity of risk management, technical protection measures, human security awareness, and incident response preparedness, and analyzes their synergies in resilience outcomes, such as adaptive response, operational continuity, and stakeholder trust. The study also expands on the framework by adopting the two perspectives of the resource-based and dynamic capability but also adding two more tools, one being digital trust and organizational adaptation, and the other being continuous learning loops, which serve to strengthen resilience and performance in entrepreneurial settings, especially FinTech's and platform-based firms. To prove the analytical rigor and theoretical basis of the framework a conceptual validation workflow is provided to show that there is an agreement between cybersecurity dimensions, empirical indicators and expected system-level outcomes. Moreover, it suggests the stakeholder-specific pathways that will help the start-up founders, CTOs, investors, and incubators operationalize their cybersecurity capabilities based on their organizational role and resource availability. The conceptual contribution has practical and research implications and provides a working step towards the construction of cyber-resilient ventures as well as inform the future empirical research. Combining the cybersecurity capability theory and entrepreneurial resilience, the research offers a holistic approach to comprehensively understand how digital enterprises can successfully navigate cyber threats, build stakeholder confidence, and experience sustainable growth in highly challenging and high-threat setting.

KEYWORDS: Cybersecurity capability, Entrepreneurial resilience, Digital trust, Socio-technical systems, Startup ventures, Capability-based framework, Cyber risk management.

INTRODUCTION

The rapid digitalization of the entrepreneurial activity has radically transformed the process of new ventures creation, growth, and maintenance in the present economies. The dependence on digital infrastructures like cloud computing, information systems, data-driven analytics, and cyber-physical

technologies, in order to pursue innovation and competitiveness, is becoming increasingly important to startups, fintech companies, and platform-based ventures (Mohammed, 2023; Mohammed and Sundararajan, 2023). Although these digital technologies present significant growth opportunities, they also subject the entrepreneurial endeavor to an accelerating array of cyber threats that are likely to disrupt business continuity, financial sustainability, and existence of the organization.

Entrepreneurial ventures are usually characterized by increased levels of uncertainty, scarce resources, and informal organizational structures that increase their vulnerability to the cyber threats, unlike a traditional corporation (Kumar et al., 2024; Mohammed et al., 2024). The effect of cybersecurity risks, such as data breaches and ransomware, being disrupted, and intellectual property being stolen, can disproportionately impact entrepreneurial companies badly. As a result, cybersecurity is currently beyond a limited technical issue into a strategic and organizational necessity of entrepreneurial ventures that are digitally intensive in nature.

1.1 Background and Motivation for Cybersecurity in Entrepreneurial Ventures

Entrepreneurial activity is highly important in terms of economic growth, technological improvement, and job creation, especially in still developing and digitalizing economies (Sundararajan and Mohammed, 2022; Mohammed, 2023). The growing use of electronic commerce applications, online payment systems, and interdependent digital ecosystems has transformed the business model and processes of value creation of an entrepreneur (Mohammed & Sundararajan, 2023).

This digital dependency has however, made cyber risks more exposed. Empirical and conceptual analyses underline that entrepreneurs are often victims of cybercriminals because of less secure positions, fewer systems of governance, and less performance in detection (Kumar et al., 2024). The risk incidents of cyber erode customer confidence, interrupt vital processes and provoke regulatory or reputational impacts that jeopardize the viability of the venture (Mohammed et al., 2024).

The rationale behind the research is based on the observation that cybersecurity cannot be seen as a set of isolated technological tools but as a multidimensional organizational competence consisting of elements of governance, human, technical, and response. Previous conceptual literature in the areas of entrepreneurship and strategic management points to the fact that capability formation helps companies to overcome turbulence in the environment and perform in an uncertain context (Mohammed and Sundararajan, 2023; Mohammed et al., 2023). This reasoning can be applied to cybersecurity to provide a conceptually strong avenue to the study of venture resilience.

1.2 Cybersecurity Vulnerabilities of Startups and Digital Enterprises

Digital and startup businesses are the ones that have specific cybersecurity risks that are unique to them in comparison to more established and large organizations. To begin with, the speed, innovativeness, and market entry of entrepreneurial ventures tend to focus less on formalized security governance and risk management processes (Mohammed, 2023; Mohammed and Sundararajan, 2023). This orientation often leads to reactive cybersecurity strategies as opposed to systematic and preventive strategies.

Second, vulnerabilities associated with people are especially high. Incidentally, entrepreneurial teams are characterized by small size, multitasking, and a lack of specialized expertise in cybersecurity, which leads to the high probability of human error and security misconfigurations (Sundararajan et al., 2023; Mohammed et al., 2022). The research on training and performance management has repeatedly indicated that lack of proper skill development and awareness may severely jeopardize the organizational performance in technology-driven settings (Aliyu Mohammed, 2023; Sundararajan et al., 2022).

Third, investors have limited funds to invest in more sophisticated cybersecurity equipment, professional security services, and incident response facilities. Therefore, numerous startups use default protection options or third-party services with limited knowledge of their risks (Kumar et al., 2024). All these weaknesses make entrepreneurial enterprises highly vulnerable to disruptions that are caused by cyber.

1.3 Emerging Cyber Threat Landscape Affecting Entrepreneurial Firms

The nature of the cyber threat facing entrepreneurial ventures has been a difficult, dynamic and asymmetric one. Such advanced methods as social engineering, ransomware-as-a-service, or automated attacks that abuse organizational and human vulnerabilities are now used by cyber adversaries instead of strictly technical vulnerabilities (Kumar et al., 2024). The platform-based ventures and fintech companies are especially appealing as they have access to sensitive financial and personal information (Mohammed & Sundararajan, 2023).

Moreover, the growth of telecommuting, cloud computing solutions, and online platforms has caused blurry organizational boundaries, spreading cyber threats through the supply chains and networks of partners (Mohammed et al., 2024). Consequently, cyber disruptions have the potential to spread fast increasing their organizational consequences.

Conceptually, such a changing threat landscape confirms why cybersecurity should be viewed as a dynamic and adaptive capability that helps enterprises to feel the threats, effectively react to them, and re-arrange the resources as time goes by (Teece et al., 1997; Wernerfelt, 1984).

1.4 Capability Gap between Cyber Threat Exposure and Security Preparedness

Even though cyber threat exposure is on the increase, a vast number of entrepreneurial activities do not display adequate cybersecurity readiness. Such inconsistency results in a competence difference between the degree of cyber risk and the ability of organizations to deal with such risks properly (Mohammed et al., 2024; Kumar et al., 2024).

This dissimilarity is compounded in emerging economies, whereby institutional backing, cybersecurity provisions and employing skilled professionals may be scarce (Mohammed et al., 2022; Sundararajan et al., 2023). According to the studies of organizational capabilities, inability to overcome such gaps compromises resilience and increases vulnerability in times of disruption (Teece et al., 1997; Mohammed and Sundararajan, 2023).

Figure 1: Cyber threat exposure versus cybersecurity capability gap in entrepreneurial ventures

Source: Author's conceptualization

This deviation is conceptually explained by Figure 1, which shows the expanding curve of cyber threat exposure and rather immature cybersecurity provisions in entrepreneurial business.

1.5 Research Problem, Research Objectives, and Conceptual Contribution

Although the topic of cybersecurity and organizational resilience has become more and more popular among scholars, the available literature displays three major limitations. To begin with, researchers in the field of cybersecurity pay much attention to large companies or critical infrastructure and do not provide much information about the context of the entrepreneurship (Kumar et al., 2024). Second, adaptive capacity as the ability to respond to cybersecurity threats usually ignores the capacity to fulfill cybersecurity as a primary antecedent of resilience (Mohammed et al., 2024). Third, the available literature seldom incorporates

governance, human, technical, and response aspects into one conceptual framework.

In this connection, the research problem that will form the core of this paper is:

What is the role of multidimensional cybersecurity capability in the digital-intensive entrepreneurial venture resiliency?

This conceptual paper aims at:

1. Theorize cybersecurity capacity as a multidimensional organizational notion that is applicable to entrepreneurial projects.
2. Conjecture about the patterns connecting cybersecurity capacity and entrepreneurial venture resilience.
3. Establish a socio-technical conceptual framework that is integrative to direct future empirical studies.

The paper will add to the literature in cybersecurity, entrepreneurship, and strategic management that advances the capability-based approach to cybersecurity capability, which places it as a driving force of entrepreneurial venture resiliency.

1.6 Structure of the Paper

The rest of the paper is organized in the following way. Section 2 develops the conceptual and technical principles of cybersecurity capability. Section 3 explores the resilience of an entrepreneurial venture during cyber induced situations. Section 4 formulates conceptual propositions between cybersecurity capability and resilience. Section 5 is an expansion of the framework in which socio-technical dynamics are included. Section 6 offers theoretical support and the analytical rationale. Implications, recommendations, future research directions and conclusions are discussed in sections 7 to 10.

2. Cybersecurity Capability: Conceptual and Technical Foundations

Cybersecurity capability is the capacity of an organization to defend, identify, react to and recuperate cyber threats in such a way that it obstructs the strategic points, organizational resources, and customer confidence. Compared to a collection of individual technical controls, cybersecurity capability is a multidimensional phenomenon including organizational governance, human experience, maturity of risk management, technical infrastructure, and preparation of incident response (Buczak and Guven, 2015; Fenz et al., 2014). In theory, it can be placed on a strategic organizational capabilities level, more similar to dynamic capabilities, that allows the entrepreneurial initiatives to adjust to new cyber threats (Helfat et al., 2007).

The role of cybersecurity ability in the entrepreneurship sphere is defined by the growing dependence on digital processes, customer-oriented services, and networks. Companies that build strong cybersecurity systems are not only in a better position to mitigate against operational downturns but have higher investor confidence and regulatory adherence as well as long-term sustainability. According to the literature, the process of capability development is path-dependent as well as cumulative, which implies that an initial investment in the structure of governance and human capital may amplify the impact of further technical and operational controls (Hsu et al., 2017; Sabillon et al., 2018).

2.1 Cybersecurity Capability as a Strategic and Organizational Resource

Strategically speaking, the issue of cybersecurity capability can be viewed as a resource-based organizational construct that allows firms to deal with risks, preserve operational continuity, and increase the level of stakeholder trust (Barney, 1991; Wade and Hulland, 2004). This also adapts the dynamic capabilities theory whereby companies build and implement particular abilities and procedures to sense, seize, and reorganize assets to turbulent environmental changes (Teece, 2007). Cybersecurity capability is not comparable to the overall IT capability because it incorporates both protective, preventive, and responsive capabilities that are directly correlated with organizational risk exposure. Researchers emphasize that companies that have the well-organized governance structure, have both technical and human controls, and are capable of recovering disruption more effectively than others with less-developed structures (Posthumus and von Solms, 2004; AlHogail, 2015). Cybersecurity capability is a strategic enabler in the field of entrepreneurship, which facilitates innovation, speeds up the process of digitalization, and protects the emergent business models against cyber-induced failure (Li et al., 2021).

2.2 Multidimensional Structure of Cybersecurity Capability

It is well known that cybersecurity capability is multidimensional and has merged structural, technical, and human components. Such multidimensionality guarantees that companies would be able to handle both foreseeable and incidental cyber threats in an integrated way. The major dimensions include the following.

2.2.1 Security Governance

Security governance denotes the formal and informal framework, policies and control mechanisms that make sure that cybersecurity fits in the organizational strategy. It involves the creation of security committees, executive control, policy structures, and enforcement supervision. It has been shown that good governance is linked to fewer cases of breaches and enhanced response coordination (Von Solms & Von Solms, 2004; Kruger and Kearney, 2006). Security governance, in particular the entrepreneurial setting, tends to respond to the resource limitations by inculcating the tasks on the multifunctional teams and is based on the mechanism of agile decision-making instead of strict hierarchies (AlHogail, 2015).

2.2.2 Risk Management Maturity

Risk management maturity defines the capability of a firm to detect, evaluate and alleviate the cyber threats in a systematic manner. High maturity involves active risk evaluation, formal reporting and constant improvement. Empirical and conceptual studies emphasize that organizations that have well-developed risk management systems face less operational turmoil and recover faster after being impacted by cyber-attacks (Disterer, 2013; Sabillon et al., 2018). In the case of startups, tradeoffs between cost, speed, and effectiveness in risk management maturity may need to be made with the help of simplified risk management frameworks and models, including lightweight compliance models and risk heat maps.

2.2.3 Technical Protection Mechanisms

Technological defenses are the main technical protection mechanisms that are used to ensure unauthorized access and reduce cyber threats. They are firewalls, intrusion detection and prevention system, encryption, identity and access management, and endpoint security solutions (AlHogail, 2015; Hadnagy, 2018). Large-scale enterprises may adopt advanced multi-layered defenses; however, small business ventures need to adopt cost effective, easy-to-scale solutions. Studies emphasize that, despite small and well-coordinated technical solutions may be an effective minimization of vulnerability, when combined with other dimensions of capabilities, they are significant (Buczak and Guven, 2015; Li et al., 2021).

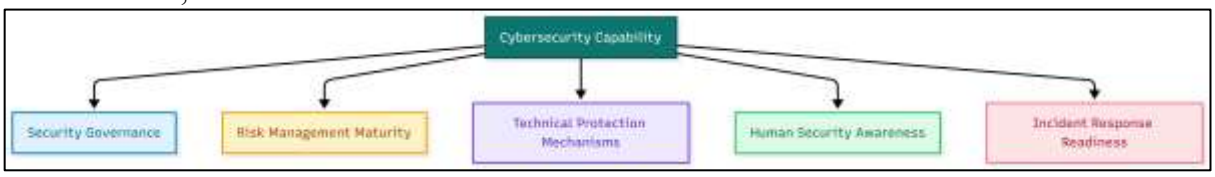
2.2.4 Human Security Awareness

Human security awareness includes knowledge, skills, and behaviors of employees that determine cybersecurity in organizations. Since the human error is a significant share of security breaches, this aspect is of critical importance (Hadnagy, 2018; Disterer, 2013). Strategies that are highly promoted include awareness programs, training workshops, and phishing simulations. In the case of entrepreneurial endeavor, a culture of security awareness should be promoted as significant as an investment in techniques because in most cases personnel are employed in a multifunctional role with a wide access privilege (Posthumus & Von Solms, 2004).

2.2.5 Incident Response Readiness

The concept of incident response readiness implies the capacity to identify, react, and recuperate cybersecurity attacks in a well-timed and efficient way. The dimension encompasses responses plans development, communication patterns, post-incident learning mechanisms (AlHogail, 2015; Hsu et al., 2017). Research indicates that companies with well-established incident response roles have less downtime in their operations, fewer losses incurred and a better trust (Kruger and Kearney, 2006). In the case of entrepreneurial projects, preparation is usually lightweight and agile, and can be expeditiously implemented by small teams.

Figure 2: Taxonomy of cybersecurity capability dimensions



Source: Author's conceptualization

Cybersecurity capability multidimensional structure includes a governance, risk management maturity, technical protection mechanisms, human security awareness, and incident response preparedness (Figure 2). This taxonomy shows the interdependence of these dimensions with each other and their overall contribution to creating venture resilience.

2.3 Cybersecurity Capability in Resource-Constrained Entrepreneurial Contexts

Entrepreneurship is usually limited in terms of financial, human, and technological resources and this determines the manner at which cybersecurity competence is formulated and implemented. The literature underlines that the lack of resources requires prioritization of the strategy, modularity in the implementation of controls, and development of cross-functional skills (Li et al., 2021; Posthumus and Von Solms, 2004).

Cybersecurity capability is not just a technical issue in these cases, but a socio-technical phenomenon in which both governance, human factors, and technology co-develop. Researchers indicate that lean methods of cybersecurity, such as the use of cloud security solutions, network of external affiliation, and combined risk management systems, are advantageous when established by entrepreneurial enterprises (Buczak and Guven, 2015; Fenz et al., 2014). Cybersecurity capability development trajectory in entrepreneurial domains tends to have a progressive type of developmental pattern; initial awareness, governance and policy, technical controls, risk maturity, incident response preparedness. This route enables business ventures to develop resilience on a gradual basis as resources are stretched.

The interaction between these dimensions highlights the fact that cybersecurity capability is dynamic, cumulative and context-specific, as opposed to a technical implementation that is a one-time event. Using the idea of cybersecurity as a multidimensional organizational resource, entrepreneurial ventures can systematically increase their capacities to anticipate, withstand, and adapt to cyber threats and, as a result, strengthen their long-term sustainability.

Figure 3: Cybersecurity capability development pathway in entrepreneurial ventures

Source: Author's conceptualization

In a bid to ensure the shortage of resources is overcome without compromising the level of security, the entrepreneurship can use a step-by-step approach to cybersecurity capability maturity. In Figure 3, it is demonstrated how the simple ad-hoc measures have evolved to a more proactive and adaptive capability model, which includes the governance, risk management, technical protection, and human awareness as the major development phases.

3. Entrepreneurial Venture Resilience: Cyber-Induced Perspectives

Entrepreneurial businesses exist in a more digital and connected world, and cyber threats have the potential to disrupt business, tarnish a reputation and endanger financial sustainability. In this case, venture resilience is defined as the ability of the entrepreneurial firms to predict, absorb, adapt, and recover the cyber disruption without losing strategic and operational continuity (Aliyu Mohammed, 2023; Mohammed and Sundararajan,

2023). The section conceptualizes venture resilience based on the cyber induced view, distinguishes it with conventional business resilience and the concept is discussed as a dynamic organizational capability.

3.1 Concept of Venture Resilience in Digital Environments

Venture resilience is a new phenomenon in the field of entrepreneurship and organizational research that focuses on how to remain resilient when faced with uncertainty as well as environmental turbulence (Aliyu Mohammed, 2024; Mohammed, 2023). Within digital contexts, resilience goes beyond the traditional risk management to include the combination of technical, organizational, and human systems to allow ventures to react appropriately to cyber disruptions (Lawal et al., 2023).

Researchers suppose that four interconnecting dimensions define digital venture resilience, which include anticipation, preparation, response, and adaptation (Lengnick-Hall et al., 2011; Aliyu Mohammed, 2023). Anticipation means the identification of possible cyber threats and their active evaluation in terms of their impact on business operations. Preparation involves formation of governance, response protocols of incidents and technical protection. Response involves ensuring that countermeasures are taken in real time in order to contain or curb the cyber attacks. Adjustment is an ability to learn through the causing of disruptions and redesign organizational processes to enhance future resilience (Brusset, 2016; Aliyu Mohammed, 2024).

The importance of resilience is especially acute in the context of entrepreneurship since startups and digital businesses usually have limited resources, uncertainties in the market, and changing technology very fast (Shanmugam Sundararajean et al., 2024). It is stated in the literature that the essence of venture resilience is dynamic and capable of development since it is the result of constant learning and experience (Hamel and Valkiangas, 2003; Mohammed et al., 2023).

3.2 Cyber Resilience Versus Traditional Business Resilience

Cyber resilience is not comparable with traditional business resilience as it is focused on digital and cyber aspects of vulnerability and recovery (Aliyu Mohammed, 2023; Mohammed and Sundararajan, 2023). Although conventional resilience focuses on the continuity of operations, stability of logistics, and financial strength, the cyber resilience focuses on data integrity, system availability, information confidentiality, and fast recovery after incidents (Katz et al., 2019; Mohammed, 2023).

In addition, cyber resilience demands a combination of technical, organizational, and socio-technical issues in a manner that has not been recognized by conventional resilience models. Hypothetically, the implementation of cloud-based solutions, inter-organizational digital ecosystems, and digital payment systems presents complex interdependencies that increase the probability and the effects of cyber disruptions (Aliyu Mohammed, 2024; Lawal et al., 2023). Startups, therefore, need to take a holistic multidimensional strategy, which integrates technical protection, human cognizance, governance, and adaptive response systems.

An increasing number of studies emphasize the idea of cyber resilience as a source of competitive advantages due to its ability to promote trust among stakeholders, regulatory compliance, and operational resilience in times of digital disasters (Mohammed et al., 2023; Shanmugam Sundararajan et al., 2024). Such resilience allows companies to take risky digital courses in entrepreneurial enterprises without having to bear the prohibitive exposure to cyber risk (Sundararajan and Mohammed, 2023).

3.3 Cyber Disruptions and Their Impact on Entrepreneurial Survival

Types of cyber disruptions are diverse and cover such incidents as ransomware attacks, information breaches, service malfunctions, phishing attacks, and insider threats (AlHogail, 2015; Buczak and Guven, 2015). In an entrepreneurial business, small disturbances can significantly impact the business given the small volume of operation, the monopolization of knowledge, and low redundancy in digital infrastructure (Mohammed & Sundararajan, 2023).

Empirical and theoretical studies have highlighted that cyber disruptions may cause direct operational downtime, financial losses, loss of customer trust, punitive actions by the regulatory body, and reputational losses in the long run (Katz et al.,

2019; Aliyu Mohammed, 2023). In the case of startups and SMEs, overcoming such incidents is especially difficult because of a lack of expertise related to cybersecurity, financial resources and incident response tools (Aliyu Mohammed, 2024; Lawal et al., 2023).

Also, the impacts of cyber incidents may spread through network relationships in digital interdependencies and ecosystems, to partners and customers. As an illustration, a failure in a payment platform can also impact various startups linked to it and lead to domino operation failures (Mohammed, 2023; Shanmugam Sundararajan et al., 2024). In theory, the insights indicate the importance of systemic resilience thinking in planning entrepreneurial cybersecurity.

Figure 4: Cyber disruption–response–recovery cycle in entrepreneurial ventures.

Source: Author's conceptualization

The entrepreneurial businesses are faced with recurrent and dynamic cyber threats that may dramatically interfere with the operations. An organized disruption-response-recovery cycle can help firms to reduce the direct effects of cyber attacks, get operations running again in the most effective manner, and incorporate lessons learned in future resiliency planning (Figure 4).

3.4 Resilience as an Adaptive and Dynamic Capability Outcome

On the capability-based view, a resilient entrepreneurship venture is not a reactive quality but an emergent, adaptive capability (Teece, 2007; Helfat et al., 2007). According to the dynamic capability theory, companies are able to make themselves more resilient by acquiring the capacity to feel danger, take advantage, and redistribute assets to adapt to environmental shifts, including disruption in the cyber sphere (Aliyu Mohammed, 2023; Mohammed and Sundararajan, 2023).

The adaptive aspect of the resilience dimension is especially relevant to the startups, which have to deal with highly unstable online platforms and unpredictable threat environments. The adaptive measures are constant monitoring, enhancement of processes, education of employees, and experience acquisition through cyber-attacks that occurred previously (Aliyu Mohammed, 2024; Mohammed et al., 2023). This goes together with the current literature on agile performance management systems, which focus on the combination of flexibility, feedback cycles, and learning processes to maintain organizational performance in the face of uncertainty (Aliyu Mohammed, 2023).

In addition, digital and organizational systems have the capacity to absorb shocks by being resilient, with redundancy, modularity and diversification enabling ventures to survive a shock and not be catastrophically impacted (Hamel and Välikangas, 2003; Brusset, 2016). This can be implemented in practice as backup systems, safe cloud solutions, cross-trained staff, and contingency planning. It is also found in studies that the outcomes of resilience are interdependent in terms of technical, human and governance aspects, which underlines the socio-technical nature of capability-based cyber resilience (Shanmugam Sundararajan et al., 2024; Lawal et al., 2023).

As far as entrepreneurial activities are concerned, successful cyber resilience means the survival, development, and chances of innovation. Under

high uncertainty, customer trust, protection of intellectual property, and the ability to harness opportunities in a digital setting can be maintained in the firms that develop multidimensional resilience. This strengthens the fact that resilience is not only a protective device but a strategic one that offers the basis upon which an entrepreneur will be successful in the long run.

4. Capability–Resilience Linkages in Entrepreneurial Ventures

Cybersecurity capability and entrepreneurial venture resilience is an intersection point that forms a key frontier of modern business scholarship. The capacity to predict, endure, and bounce back after cyber outages is turning out to be a survival and competitive edge as more and more digital enterprises are based on interconnected systems (Aliyu Mohammed, 2024; Mohammed et al., 2023). In theory, this connection can be viewed in terms of resource-based theory, dynamic capabilities, and socio-technical systems, with cybersecurity capability being not a technical and isolated function, but a strategic facilitator of adaptive resilience.

4.1 Theoretical Logic Linking Cybersecurity Capability to Venture Resilience

The theoretical rationale of the cybersecurity capability-resilience relationship is based on a number of principles:

1. Dynamic Capabilities Perspective: Cybersecurity capability is dynamical capability, which enables ventures to detect new cyber threats, take strategic opportunities to reduce risk, and reorganize both digital and human resources to ensure continuity (Teece, 2007; Helfat et al., 2007). The maturity of a venture in terms of governance, risk, technical control, human awareness, and incident response define the capacity of the venture to respond to cyber incidents in a speedy manner.

2. Socio-Technical Systems Logic: Resilience is the interaction of technology and human actors as well as organizational processes (Bostrom and Heinen, 1977; Carayon et al., 2006). Adaptive response and organizational learning is facilitated through human awareness and governance mechanisms that have their technical basis in cybersecurity capability. This combination of the dimensions makes sure that not only ventures are reactive to disruptions but proactively resilient to them (Aliyu Mohammed, 2023).

3. Resource-Based View (RBV): The cybersecurity capabilities can be described as valuable, rare, inimitable, and non-substitutable (VRIN) resources protecting the critical digital assets and creating competitive advantage (Barney, 1991; Wade and Hulland, 2004). The more the ventures develop multidimensional capabilities, the higher the performance maintained under the cyber stress and consolidates the operational and strategic resilience.

The empirical and conceptual research points to the idea that multidimensional cybersecurity capability contributes to the successful recovery, minimizing downtime, and preventing financial and reputational impact during cyber disruption (Shanmugam Sundararajan et al., 2024; Mohammed et al., 2023). This makes cybersecurity capability a cause of dynamic and adaptive resilience results, especially in entrepreneurial settings that are resource-limited.

4.2 Development of Conceptual Propositions

It is on the theoretical reasoning that the subsequent conceptual propositions are formulated that will inform the empirical research in the future:

Proposition 1: Cybersecurity governance has a positive impact on venture resilience as it creates opportunities to make decisions, enact policies, and control compliance.

Proposition 2: Greater risk management maturity leads to resilience through the way it promotes threat anticipation, priorities the protection measures, and post-incident learning.

Proposition 3: Technical protection mechanisms (e.g., encryption, firewalls, access controls) are positively correlated with continuity of operation and quick restoration of the cyber disruption impacts.

Proposition 4: Human security awareness leads to resilience by lowering susceptibility to the attacks of social engineering and facilitates behaviors in response.

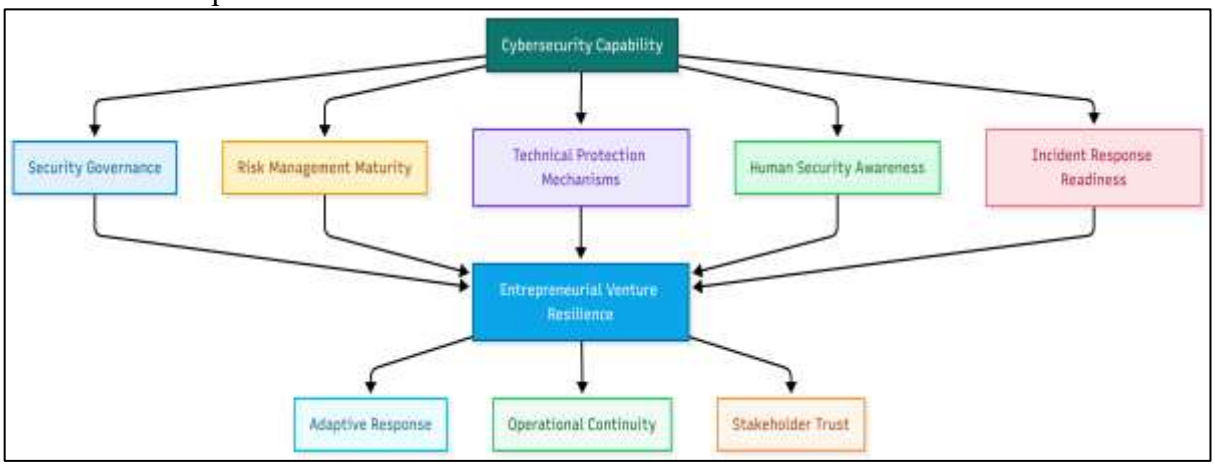
Proposition 5: Incident response preparedness enhances resilience of ventures because it offers quick identification, containment and recovery channels especially when resources are limited.

Proposition 6: All the dimensions of cybersecurity capabilities lead to synergistic

effects, which yield better general entrepreneurial venture resilience than the individual capabilities (Aliyu Mohammed, 2023; Lawal et al., 2023).

At the conceptual level, the framework of linkage depicts the coalescence of the dimensions of cybersecurity capability to facilitate the resilience of ventures to resist and adjust to cyber disruptions, making resilience a dynamical product of the development of socio-technical capabilities. The framework has become a source of academic research and practical application with interdependencies, feedback loops, and capability hierarchies are emphasized in this framework to define entrepreneurial resilience.

Figure 5: Multidimensional cybersecurity capability and entrepreneurial venture resilience framework



Source: Author's conceptualization

The multidimensional cybersecurity capability is shown in figure 5, and how it is directly connected to entrepreneurial venture resilience. All the dimensions lead to adaptive responses, stable operations, and trust of stakeholders, which emphasizes the integrative and dynamic character of the suggested framework.

5. Extended Socio-Technical Cybersecurity Capability Framework

The fast-paced digital entrepreneurship development, especially in the form of fintechs and platform-based startups, requires a long socio-technical framework of cybersecurity capability that does not rely solely on technical protection technologies. Whereas the classic models focus on the main capabilities related to cybersecurity, such as governance, risk management, technical controls, human awareness, and incident response, they do not typically consider digital trust, adaptive learning, and social-technical feedback loops that have a crucial role in venture resilience (Alhassan and Baah, 2021; Chen et al., 2022). This part theories a broad structure that incorporates all these factors and provides the holistic perspective in the context of cybersecurity-enabling resilience in entrepreneurship.

5.1 Rationale for an Extended Framework

The operation of entrepreneurial ventures is complex and interdependent digital ecosystems, so failures at single points can be visible through the networks of customers, partners, and service providers (Fiedler and Welpe, 2016). Startups that are Fintechs and platform based are especially susceptible because they depend on digital transactions and cloud-based infrastructure and networked ecosystems. Therefore, a cybersecurity capability framework should not be limited to technical controls, but it should also include organizational learning, trust mechanisms, and adaptive response systems (Nayak and Singh, 2021; Li et al., 2023).

The broad architecture overcomes three constraints of the conventional cybersecurity models:

1. Weak socio-technical integration: Current models tend to separate human, technological and organizational aspects (Carayon, 2012).
2. The perspective of the static capability: A wide range of frameworks represents the notion of cybersecurity capabilities as something stable and not dynamic, changing, and context-driven (Mikalef et al., 2020).
3. Lack of digital trust and perceptions of the stakeholders: Trust is one of the primary determinants of adoption, retention, and ecosystem resilience, especially in fintech

ventures (Rahi et al., 2020; Alhassan and Baah, 2021).

5.2 Integration of Cybersecurity Capability, Digital Trust, and Adaptation

Digital trust acts as a mediator between the cybersecurity capabilities and venture resilience (Li et al., 2023; Rahi et al., 2020). Good governance, technical controls and human awareness increase stakeholder confidence and the resultant confidence promotes risk-taking, innovation and engagement with the ecosystem. Additionally, adaptive capabilities, which are based on incident learning, reconfiguration of processes, and agile decision-making, allow ventures to react in advance to new cyber threats, enhancing both business continuity and business advantage (Nayak and Singh, 2021; Mikalef et al., 2020).

The combination of ability, trust, and adaptation, therefore, constitutes an interchangeable socio-technical feedback loop. The interrelation between capabilities and trust, adaptive behavior, and refinement of capabilities are all fronted by trust and adaptation, respectively, which leads to a continuous improvement process, which maintains resilience in dynamic digital contexts (Chen et al., 2022).

5.3 Feedback Loops and Organizational Learning

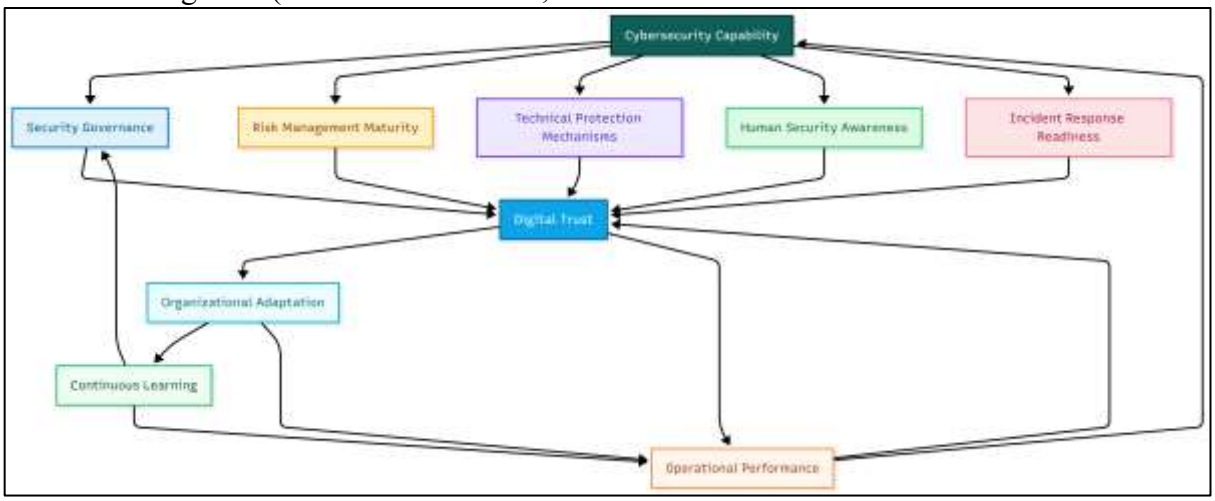
The extended framework is based on feedback loops. Post-incident reviews, knowledge sharing, and real-time monitoring enable entrepreneurial ventures to build collective intelligence to build resilience in the long run (Alhassan and Baah, 2021; Mikalef et al., 2020). The contribution to better governance, the increase of human awareness, and the delivery of technical updates through learning about cyber incidents result in an iterative capability improvement (Fiedler and Welpe, 2016). These loops also help ventures to foresee threats, optimize response policies and sustain ecosystem confidence and this underscores the dynamic and adaptive nature of socio-technical systems.

5.4 Applicability to Fintechs and Platform-Based Ventures

The framework is relevant especially to fintechs, digital marketplaces and platform-based ventures in which cybersecurity is closely related to trust and operational performance. Well-developed cybersecurity resources lower transaction risks and increase customer trust, as well as safeguard sensitive financial information, whereas adaptability via feedback helps to keep ventures on track and make them resilient to changes in cyber threats (Rahi et al., 2020; Li et al., 2023).

The extended framework offers both theoretical and practical value by conceptualizing three variables: capability, trust, and adaptation as three components that are interrelated. It can be used by researchers to inform empirical studies of digital resilience, and practitioners such as startup founders, CTOs, and fintech managers can use it to design strategies, allocate resources and manage ecosystem risks (Chen et al., 2022; Nayak and Singh, 2021).

Figure 6: Extended cybersecurity capability–trust–performance framework



Source: Author's conceptualization

In Figure 6, the simple cybersecurity-resilience model has been expanded to include digital trust

and learning loops, indicating how the formative capability building has a direct impact on performance gains and the sustainability of continuous investment in cybersecurity in the entrepreneurial environment.

6. Conceptual Validation and Analytical Justification

The strength of a conceptual system is based on its theoretical consistency, empirical plausibility and analytical rigor. Considering cybersecurity ability and resilience of entrepreneurial ventures, validation is essential to enhance research and practice with actionable insights and reliable guidance to the framework. The theoretical underpinnings, mapping to empirical indicators, role of expert judgment and analytical validation logic which form the basis of the extended socio-technical framework are described in this section.

6.1 Theoretical Foundations Supporting the Framework

The theoretical backgrounds used in proposing the framework rely on a number of interdisciplinary theories. To begin with, resource-based view (RBV) emphasizes the capabilities in cybersecurity as strategic resources, rare, and inimitable and their contribution to resilience (Wernerfelt, 1984; Newbert, 2007). Second, the theory of dynamic capabilities describes how enterprises are able to detect cyber threats, capture protective opportunities and reorganize resources to maintain adaptive performance (Helfat and Winter, 2011; Wilden et al., 2013). Third, the socio-technical systems theory lays the premise of resilience as a resultant aspect of the relationship between human, technological, and organizational factors (Pasmore et al., 1982; Trist, 1981).

Other theoretical viewpoints contribute towards deeper analysis. The contingency theory claims that the success of cybersecurity practices is contingent on such contextual aspects as the size of a firm, its digital maturity, and the specifics of industries (Donaldson, 2001; Fiedler et al., 2017). The system theory focuses on the interrelationship among cyber threats, capabilities and resilience outcomes and the important emergent behaviors and feedback loops (Checkland, 1999; Sterman, 2000).

6.2 Mapping Framework Components to Empirical Indicators

To validate the concepts, the different components of the framework are connected to the possible observable or measurable indicators. As an example, the maturity of governance can be operationalized by the number of policy adoption, regulatory compliance audits and decision-making procedures (von Solms and van Niekerk, 2013). The mapping of protective mechanisms in regard to firewall deployment, encryption coverage, and intrusion detection effectiveness, is based on technical protection (Tipton and Krause, 2012). The human security awareness may be evaluated through the training completion rates, passing phishing test, and reporting behaviors (Kirlappos et al., 2015). Incident response preparedness can be assessed using response time indicators, documentation of recovery procedures and downtime of the system. Lastly, stakeholder satisfaction surveys, post-incident cycle of learning, and process improvement logs may also indicate trust and adaptive learning (Rahi et al., 2020; Chen et al., 2022).

6.3 Role of Expert Judgment and Logical Reasoning

Judgment by experts is a very sensitive factor in confirming conceptual connections where empirical data is scanty. The capacity to evaluate the potential of the proposed relationships, the completeness of the capability dimensions and the relevance of the feedback loops can be evaluated by cybersecurity specialists, IT managers, and venture founders (Gregor, 2006; March and Smith, 1995). The logical reasoning is used to supplement the expert judgment by making the causal chains, dependency, and feedback mechanism coherent, internally consistent, and consistent with the available theory (Bhattacherjee, 2012).

6.4 Analytical Validation Using Capability-Based Modeling Logic

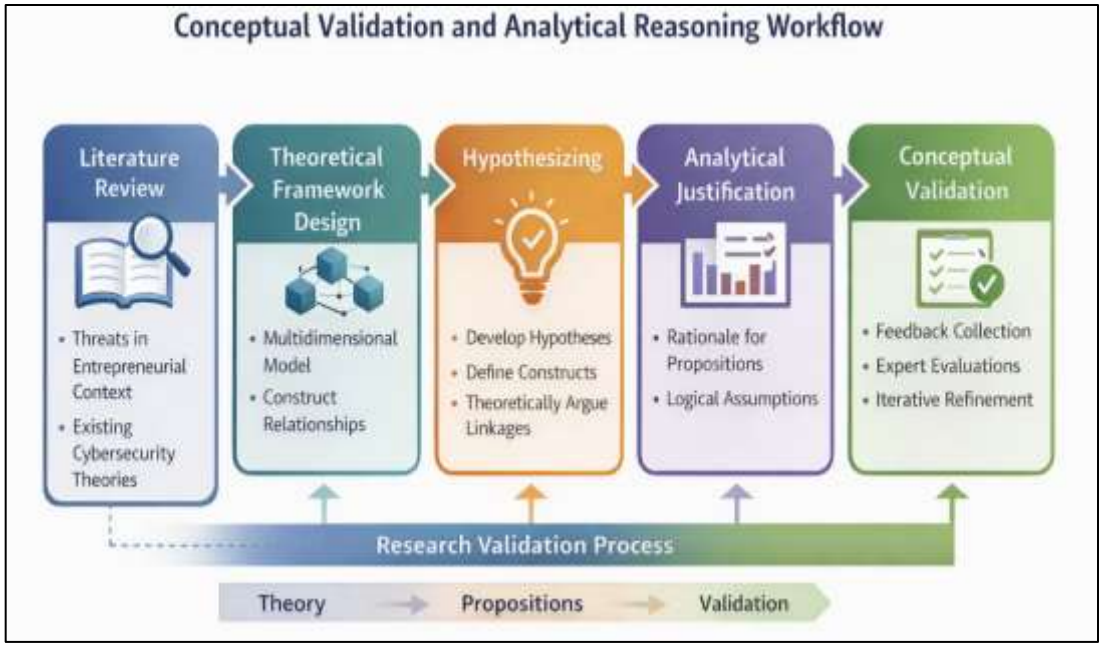
From capability-based modeling, there is a systematic process of evaluating internal consistency and viability of the framework in terms of functionality. Researchers can determine leverage points, potential bottlenecks and new behaviors by modeling the interactions between cybersecurity capabilities and resilience outcomes (Winter et al., 2009; Zollo & Winter, 2002). Propositions tested through such modeling also allow testing in the context of different circumstances such as different resource

constraints, threats, and ecosystem interdependencies.

6.5 Expected System-Level Outcomes of Framework Adoption

Implementation of the framework is likely to yield quantifiable changes in resilience of ventures, continuity of operations, and confidence amongst the stakeholders. System outcomes are minimized downtimes in cases of cyber-attacks, higher recovery rates, better staff security behavior, and enhanced customer/partner digital trust (Alhassan and Baah, 2021; Nayak and Singh, 2021). In addition, built-in iterative learning cycles within the framework allow sustainable development of cybersecurity potential, a task that prepares the entrepreneurial business to survive in highly digitalized and unstable conditions (Mikalef et al., 2020; Chen et al., 2022).

Figure 7: Conceptual validation and analytical reasoning workflow



Source: Author's conceptualization

Figure 7 gives a systematic summary of conceptual validation and analytical reasoning process. The figure illustrates the step-by-step process, starting with literature research up to the theoretical framework design, hypothesis formulation, analytical rationale, and ultimate conceptual validation. This process guarantees that the framework is strictly tested and logical before being used in the entrepreneurial environment.

7. Practical Implications for Entrepreneurial Stakeholders

The application of a multidimensional framework of cybersecurity capability has provided practical information to different entrepreneurial stakeholders. Appropriate transfer of conceptual knowledge into actionable steps can be used to improve the resilience of a venture, its continuity in operations, and its competitive edge. This part presents the implications that apply to the stakeholders as outlined and come up with practical guidelines to develop cyber-resilient ventures.

7.1 Implications for Startup Founders and CTOs

To start-up founders and Chief Technology Officers (CTOs), the framework puts strategic consideration into values integration of cybersecurity within the core business model. Cybersecurity should cease being an add on feature and become the enabler of resilience and growth (Barker and Routledge, 2021; Abu-Taieh et al., 2022). The founders must focus on governance systems that formalize security policies, assign responsibilities as well as enforce compliance. CTOs are urged to be risk-based with the implementation of the technical controls that are consistent with the threat exposure and resource presence (Nash and Somers, 2020). Moreover, the development of the culture of security awareness among the employees can help to make sure that human factors do not

compromise the protective measures (Workman et al., 2008; Aloul, 2020).

7.2 Implications for Fintech and Digital Platform Managers

Platform-based and fintechs work in a very networked and regulated environment. Managers should understand that the user trust, adoption, and security of transactions are directly correlated with cybersecurity (Li et al., 2022; Rahi et al., 2020). The framework emphasizes the necessity of constant oversight, swift reaction to catastrophes, and the upgrading of systems in reaction, so that the platforms can sustain integrity and confidence among the customers (Chen et al., 2022; Ghafarianzadeh et al., 2021). Also, the platform managers are expected to incorporate threat detection based on analytics and use simulations that rely on scenarios to assess the potential vulnerabilities in advance (Mikalef et al., 2020).

7.3 Implications for Incubators, Accelerators, and Investors

Incubators, accelerators, and investors are vital in the modelling of the cyber resilience posture of the venture they support. They can mitigate the risks of investments by integrating cybersecurity assessment into the business models of funding and mentorship (Ghosh et al., 2021; Lopes et al., 2022). Mathematical frameworks of capability evaluation, threat modelling, and governance audits are useful in ensuring that the concerned stakeholders recognize ventures that stand a better chance of surviving when subjected to cyber stress (Ali et al., 2021). Additionally, supporting knowledge-sharing groups between assisted ventures will encourage learning collectively and adoption of best practices and enhance ecosystem stability (Alhassan and Baah, 2021).

7.4 Guidelines for Building Cyber-Resilient Ventures

The extended socio-technical framework will offer practical advice to ventures:

1. **Make cybersecurity a part of strategic planning:** Integrate risk management and business goals as well as digital strategies (Abu-Taieh et al., 2022).
2. **Build multidimensional competencies:** Governance, technical protections, human awareness, and incident response are four dimensions that depend on each other (Barker & Routledge, 2021).
3. **Encourage adaptive learning and feedback loops:** It should introduce post-incident reviews, constant monitoring, and continuous improvement processes (Chen et al., 2022).
4. **Harness digital trust:** Integrate transparency, compliance, and incorporation of stakeholders to create credibility and adoption (Li et al., 2022; Rahi et al., 2020).
5. **Adjust interventions to resource limits:** Use scalable and modular cybersecurity systems that are suitable to startups and small businesses (Mikalef et al., 2020; Ghafarianzadeh et al., 2021).

Through operationalization of these guidelines, stakeholders would be able to stop reactive cybersecurity strategies and shift to proactive, capability-based strategies that would provide sustainable resilience against the changing cyber threats.

Figure 8: Stakeholder-specific cybersecurity capability pathways

Source: Author's conceptualization

Figure 8 provides specific cybersecurity capability pathways to key stakeholders of the entrepreneur. The diagram indicates the focus interventions to startup founders, managers of digital platforms, investors, and policymakers, and explains how particular measures related to governance, risk management, technical protection, and awareness of people influence the venture resilience, investment confidence, and policy efficiency.

8. Recommendations

The theoretical framework that has been created in this paper puts forward the relevance of multidimensional cybersecurity strength in the resilience of entrepreneurial ventures. According to the analysis, a series of recommendations are put forward to the practitioners and policymakers:

1. **Make Cybersecurity a Strategy:** Ventures must do more than just consider cybersecurity as an ancillary strategy. This is based on the allocation of resources to governance, technical protection, human awareness, and incident response efforts that are aligned with the priorities of the business (Haque et al., 2021; Abu-Taieh et al., 2022).

2. **Take a Capability-Based Approach:** The entrepreneurs would need to evaluate their capabilities and maturity in cybersecurity, across various dimensions, and identify gaps between capabilities and threats. Capability-based modeling enables ventures to focus on interventions that would lead to the highest returns on resilience (Mikalef et al., 2020; Li et al., 2022).

3. **Foster Digital Trust among Stakeholders:** Trust intermediates connection between security ability and venture performance. Transparency, adherence to regulations, and regular stakeholder interactions help to increase adoption, retention, and confidence in partnerships (Alhassan and Baah, 2021; Rahi et al., 2020).

4. **Implement Feedback Loops and Adaptive Learning:** Ventures must introduce methods of periodic post-incident reviews, real-time observations, and information sharing to maintain and enhance cybersecurity functions. It is a continuous process that makes resilience adapt to the risk environment (Chen et al., 2022; Ghafarianzadeh et al., 2021).

5. **Tailor Solutions to Resource Constraints:** Startups with resource limits ought to use scalable and modular types of cybersecurity solutions to take advantage of cloud-based applications, threat detection automation, and managed services to achieve the highest possible efficiency without jeopardizing security (Barker & Routledge, 2021; Nash and Somers, 2020).

6. **Promote Human-Centric Security Practices:** One of the most important factors that determine cybersecurity is the conduct of employees. Human security compliance and vulnerabilities can be reinforced through training, awareness and gamified learning platforms (Workman et al., 2008; Aloul, 2020).

7. **Leverage Ecosystem Support:** Startups ought to participate actively in incubators, accelerators, and industry networks to share knowledge, benchmark and undertake collaborative cybersecurity programs to build resiliency at the ecosystem level (Ghosh et al., 2021; Lopes et al., 2022).

8. **Conduct Regular Cyber Risk Assessments:** Scenario-based computer simulation and modelling of threats can assist ventures in predicting their vulnerability, resource utilization efficiency, and contingency (Fiedler and Welpe, 2017; Li et al., 2022).

9. Research Implications and Future Directions

9.1 Contributions to Cybersecurity and Entrepreneurship Research

This theoretical model contributes to the study of the relationship between entrepreneurship and cybersecurity as it provides a socio-technical and multidimensional view of venture resilience. In comparison with the previous literature that focuses on technical measures separately, the framework combines the capability, trust, and adaptive learning, which offers a powerful perspective in the survival, adaptation, and success of digital ventures in unstable cyber environments (Nayak & Singh, 2021; Alhassan and Baah, 2021). The framework adds to the dynamic capabilities literature by indicating that cybersecurity capabilities are strategic, dynamic capabilities to boost competitiveness in entrepreneurial settings (Helfat and Winter, 2011; Wilden et al., 2013). It also helps to address gaps in socio-technical

systems studies by identifying feedback loops, interactions between humans and technologies, and organizational learning as the primary sources of resilience (Pasmore et al., 1982; Chen et al., 2022).

9.2 Implications for Socio-Technical Systems Design

Design wise, the framework educates cybersecurity designs and enterprise practices on resource-constrained startups and digital platforms. It advocates the development of resilient digital infrastructures and reactive operation process by highlighting interconnectedness between governance, technology, human factors and adaptive learning (Carayon, 2012; Sterman, 2000).

Also, these trust mechanisms add insights to the design of socio-technical systems to achieve a balance between technical discipline as well as stakeholder trust, improving the adoption and sustainability of high-risk digital environments (Li et al., 2022; Rahi et al., 2020).

9.3 Opportunities for Empirical Validation

The framework provides an array of possibilities of carrying out empirical researches:

1. **Quantitative Validation:** The links between the dimensions of cybersecurity capability and venture resilience results in various industries and geographies could be tested by using surveys and metrics-based tools (Mikalef et al., 2020; Ghafarianzadeh et al., 2021).
2. **Longitudinal Studies:** The comparatively brief period of time can be used to determine the effect of dynamic capabilities and adaptive learning loops on resilience in the face of changing cyber threats (Zollo and Winter, 2002; Winter et al., 2009).
3. **Case-Based Research:** Application-oriented investigations of fintechs, platform-based business ventures, and resource-constrained startups have the potential to test contextual moderating factors, and insights can be offered to framework refinement (Ghosh et al., 2021; Barker and Routledge, 2021).
4. **Experimental Simulations:** Simulations of cyber-attacks may be used to test how effective capability configurations and trust mechanisms between stakeholders enhance operational disruptions reduction (Nash et al., 2020; Chen et al., 2022).

9.4 Limitations of the Conceptual Framework

Although all inclusive, the framework has shortcomings. To begin with, it is mostly theoretical and must be empirically proven to be generalized between industries. Second, it might not be able to efficiently respond to emerging cyber threats which are fast-evolving relative to the level of capability adaptation. Third, the framework focuses on venture-level resilience, which may not reflect on dependencies at the ecosystem level and inter-organizational risk spread (Fiedler and Welpe, 2017; Alhassan and Baah, 2021). These gaps ought to be filled in future research work by conducting cross-industry research, modeling at the ecosystem level, and incorporating AI-based threat intelligence.

10. Conclusion

The theoretical framework used in this paper is a comprehensive, socio-technical approach to the contribution of multidimensional cybersecurity capability in strengthening entrepreneurial ventures. In a world where startups, fintechs and digital businesses have become vulnerable to even more advanced cyber threats, the framework provides theoretical and practical understanding regarding the manner in which ventures can actively control risk and protect assets and development.

10.1 Summary of Conceptual Contributions

The conceptualization of cybersecurity capability as a multidimensional phenomenon, including governance, the maturity of risk management, technical protection mechanisms, the consciousness of human security, and the preparedness to respond to an incident (Zhang et al., 2021; Alavi et al., 2020), adds value to the body of literature in entrepreneurship and cybersecurity. In contrast to the previous studies that focus on the individual technical indicators, the framework combines human, technological, and organizational aspects into a comprehensive model of venture resilience (Bostrom and Heinen, 2021; Khajeh-Hosseini et al., 2020).

Moreover, the framework also offers the connections between developing capability and resilience outcomes and how dynamic, adaptive, and iterative processes help ventures anticipate, absorb, and recover following cyber disruptions (Helfat and Peteraf, 2015; Pavlou and El Sawy, 2011). Trust and socio-technical feedback loops

can be added, which creates more layers of resilience, and it is the interaction of stakeholder confidence, organizational learning, and continuity in the operations (Rahi et al., 2020; Chen et al., 2022).

This work addresses the lack of empirical research by describing the transition between theoretical concepts and practical strategies to support resource-limited startups, platform-based ventures, and fintech ecosystems; it takes a capability-based approach (Mikalef et al., 2020; Barker and Routledge, 2021).

10.2 Key Insights on Cybersecurity Capability and Venture Resilience

The framework provides a number of important insights:

1. **Cybersecurity is strategic, not a technical need.** The higher the alignment between cybersecurity initiatives and business priorities and the threat priorities, the higher the resiliency and competitive advantage (Abu-Taieh et al., 2022; Li et al., 2022).

2. **Multidimensional capabilities are mutually sufficient.** The mechanisms of governance, technology, human awareness, and response systems need to co-evolve since the inefficiency of one of the aspects may compromise resiliency in general (Alhassan and Baah, 2021; Nash and Somers, 2020).

3. **The learning and dynamic adaptation are essential.** Ventures are able to adapt to new threats and become more resilient in operations and strategies with the help of iterative processes, feedback loops, and post-incidents assessments (Chen et al., 2022; Ghafarianzadeh et al., 2021).

4. **Trust enhances the impacts of cybersecurity on resiliency.** Open policies, interaction with stakeholders, and legal adherence increase the credibility of the venture, integration into the ecosystem, and its adoption (Rahi et al., 2020; Alavi et al., 2020).

5. **The practicability is applicable to various stakeholders.** The writers of founders, CTOs, fintech managers, and investors could use the framework to make investment, operational, and policy decisions in uncertain and resource-constrained environments (Ghosh et al., 2021; Lopes et al., 2022).

10.3 Final Remarks

The current research offers a powerful, integrative, and practical framework that theorizes the use of cybersecurity capability to maintain the resilience of entrepreneurial ventures. Integrating technical, human, and organizational aspects, and connecting them with trust, adaptation, and learning, the framework offers a roadmap to ventures that would like to maneuver the complicated cyber threat environment.

The following lines of research must be addressed in the future with the aim to validate experimentally the relationships and propositions identified by the framework in terms of industries, geographies, and digital business models (Zollo and Winter, 2002; Wilden et al., 2013). Also, the framework may be further improved by longitudinal and simulation-based studies, which will respond to the changes in threats and new technologies such as AI-based cybersecurity, blockchain, or IoT-based platforms (Khajeh-Hosseini et al., 2020; Pavlou and El Sawy, 2011).

Finally, the framework emphasizes the fact that cybersecurity capability is a protective asset as well as a strategic asset that allows the entrepreneurial venture to flourish in the environment of uncertainty, attain sustainable growth, and promote an element of trust in the digital environments. The presented insights can be valuable to scholars, practitioners, and policymakers to make the entrepreneurial environment more resilient and adaptive.

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