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Architecting Sustainable Digital Startups: A Qualitative Synthesis of Dynamic Capabilities, Digital Platforms, and Green Business Model Innovation

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Abstract

The convergence of digital transformation and environmental sustainability—termed the "Twin Transition"—presents both strategic opportunities and paradoxes for early-stage technology ventures. While digital startups possess structural agility, they often struggle to reconcile rapid economic scaling with ecological stewardship under severe resource constraints. This study addresses this tension by examining how digital startups architect green business model innovation through specialized organizational capabilities and platform ecosystems. Employing a qualitative literature synthesis based on 26 peer-reviewed articles, this research integrates Dynamic Capabilities Theory (DCT) with digital platform governance perspectives. The findings reveal that successful sustainable startups develop "Green-Digital Dynamic Capabilities" across three micro-foundations: green sensing, green seizing, and green transforming. Furthermore, digital platform architectures act as core enablers by driving dematerialization, eco-optimized delivery, and outcome-based value capture. These synthesized dimensions are unified into a novel conceptual model: the *Sustainable Digital Startup Architecture (SDSA)* framework. Ultimately, this study offers startup founders an actionable roadmap for building born-green digital ventures and provides impact investors with qualitative frameworks to evaluate sustainable tech ventures.

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1. INTRODUCTION

The global business landscape is currently undergoing a unprecedented structural shift characterized by the intersection of digital transformation and environmental sustainability—a phenomenon increasingly referred to as the "Twin Transition" (El-Kassar & Singh, 2019; George et al., 2021). Within this paradigm, digital startups have emerged as pivotal engines of economic dynamicism, agile innovation, and disruptive market solutions. Unlike traditional enterprises bound by legacy systems, technology-driven ventures possess the structural flexibility to leverage cutting-edge technologies—such as Artificial Intelligence (AI), Cloud Computing, and Big Data Analytics—to build scalable value propositions rapidly (Nambisan, 2017; Upadhyay et al., 2023). However, the traditional growth model of digital startups, historically driven by the single-minded pursuit of

exponential scaling and financial valuation, faces severe criticism due to its neglect of environmental and social externalities. Consequently, integrating ecological governance into digital business models has evolved from an optional corporate social responsibility (CSR) exercise into a strategic necessity for long-term venture viability and competitive advantage (Bocken et al., 2014; Kraus et al., 2022).

Despite the growing imperative for sustainable operations, digital startups face unique organizational paradoxes. On one hand, the hyper-scalable nature of platform-based business models allows startups to optimize resource allocation and democratize green solutions. On the other hand, the intense pressure for rapid market penetration, resource constraints, and dynamic market turbulence often compel startup founders to prioritize short-term survival over long-term sustainability initiatives (Gregori & Holzmann, 2020). Extant literature on corporate sustainability has predominantly focused on established incumbent firms, examining how large corporations implement green supply chain management or incremental environmental strategies (Eisenhardt & Martin, 2000; Teece, 2007). Conversely, scholarly inquiry into how nascent digital startups systematically architect green business model innovation (Green BMI) from inception remains fragmented and theoretically underdeveloped.

To address this organizational ambiguity, the Dynamic Capabilities Theory (DCT) provides a vital analytical lens (Teece, 2007, 2014). Dynamic capabilities—specifically the organizational micro-foundations of *sensing* market opportunities, *seizing* resources, and *transforming* organizational structures—are essential for ventures operating in high-velocity digital environments. While prior studies have applied DCT to digital transformation (Warner & Wäger, 2019) or eco-innovation in isolation (Kattirtzi et al., 2021), a critical knowledge gap persists regarding how digital dynamic capabilities explicitly interact with digital platform ecosystems to catalyze Green BMI within young ventures. Current research often treats digital technologies merely as operational tools rather than strategic enablers of sustainable value co-creation, failing to explain the mechanisms through which platform architectures enable startups to scale environmental impact without compromising economic resilience.

This research addresses these gaps by offering a qualitative synthesis of the intersection between dynamic capabilities, digital platform ecosystems, and green business model innovation in startups. The overarching objective of this study is threefold:

1. To examine how digital startups configure and deploy dynamic capabilities (*sensing, seizing, transforming*) to embed environmental sustainability into their core value creation, delivery, and capture mechanisms.
2. To synthesize the structural mechanisms through which digital platform ecosystems facilitate or hinder green business model innovation in technology ventures.
3. To develop a novel, integrated conceptual framework—the *Sustainable Digital Startup Architecture (SDSA)*—that maps the alignment between digital capabilities, platform dynamics, and sustainable outcomes.

This study makes several distinct theoretical and practical contributions to the field of digital business and innovation. Theoretically, it advances the Dynamic Capabilities Theory by contextualizing its micro-foundations within the dual imperatives of digitalization and sustainability (the Twin Transition), offering a fine-grained understanding of "green-digital dynamic capabilities." Furthermore, it enriches the business model innovation literature by clarifying the platform-enabled mechanisms that bridge digital scalability with ecological responsibility. Practically, the synthesized

conceptual framework provides startup founders, digital entrepreneurs, and venture capitalists with an actionable roadmap for architecting resilient, eco-friendly digital ventures from the ground up, while equipping policy-makers with insights to design supportive digital innovation ecosystems.

2. LITERATURE REVIEW

2.1 The Twin Transition Paradigm: Intersection of Digitalization and Sustainability

In contemporary organizational studies, the convergence of digital transformation and environmental sustainability—known as the "Twin Transition"—represents a fundamental paradigm shift in value creation (El-Kassar & Singh, 2019; George et al., 2021). Historically, digital technology adoption and environmental management developed as parallel, distinct organizational trajectories. Digitalization primarily aimed at driving operational efficiency, market expansion, and structural agility (Nambisan, 2017), whereas corporate sustainability focused on resource conservation, carbon footprint reduction, and regulatory compliance (Bocken et al., 2014). However, recent scholarly discourse posits that digital technologies are not merely neutral tools for growth, but active enablers of sustainable systemic change (Kraus et al., 2022; Upadhyay et al., 2023).

For entrepreneurial ventures, the Twin Transition introduces both strategic opportunities and complex paradoxes. Digital startups possess the unique structural advantage of being "born-digital," meaning they operate without the burden of heavy legacy infrastructure or entrenched corporate inertia (Upadhyay et al., 2023). This flexibility allows them to leverage advanced digital solutions—such as Artificial Intelligence (AI), Internet of Things (IoT), Cloud Computing, and Big Data Analytics—to build transparent, energy-efficient, and dematerialized business models from inception (Geissdoerfer et al., 2018). Conversely, the startup lifecycle is inherently constrained by extreme resource scarcity, high market liability of newness, and intense pressure from venture capitalists for hyper-scaling and immediate financial returns (Gregori & Holzmann, 2020). Consequently, balancing environmental stewardship with economic viability remains a significant strategic challenge that necessitates sophisticated organizational capabilities.

2.2 Dynamic Capabilities Theory (DCT) in High-Velocity Digital Environments

To understand how new ventures navigate environmental volatility while pursuing sustainable innovation, the Dynamic Capabilities Theory (DCT) provides a robust theoretical foundation (Teece et al., 1997; Teece, 2007, 2014). Distinct from the static Resource-Based View (RBV), which emphasizes the ownership of valuable, rare, inimitable, and non-substitutable (VRIN) assets, DCT focuses on an enterprise's capacity to continuously integrate, build, and reconfigure internal and external competencies to address rapidly shifting business environments (Eisenhardt & Martin, 2000). Teece (2007) categorizes dynamic capabilities into three core micro-foundations:

1. ***Sensing Capabilities*:** Analytical processes, identification routines, and exploratory activities dedicated to scanning, filtering, and interpreting technological shifts, market trends, and emerging customer requirements.
2. ***Seizing Capabilities*:** Organizational structures, decision-making protocols, and business model architectures designed to mobilize resources, capture identified opportunities, and execute value propositions effectively.

3. ***Transforming (or Reconfiguring) Capabilities*:** The continuous realignment of tangible and intangible assets, culture, organizational design, and ecosystem partnerships to maintain strategic fit as market conditions evolve.

In the context of the digital economy, researchers have conceptualized "digital dynamic capabilities" to explain how firms leverage digital assets and software infrastructures to accelerate sensing, seizing, and transforming activities (Warner & Wäger, 2019; Yeow et al., 2018). For instance, digital sensing utilizes real-time data analytics and machine learning algorithms to detect micro-trends in consumer behavior. Digital seizing involves rapid prototyping, agile software deployment, and platform integration. Digital transforming relies on cloud-based modular architectures that allow ventures to pivot operations with minimal friction.

However, traditional literature on digital dynamic capabilities has predominantly focused on economic outcomes, such as market share and financial agility (Warner & Wäger, 2019). As ecological pressures mount, scholars advocate for expanding this concept into "green-digital dynamic capabilities" (El-Kassar & Singh, 2019; Kattirtzi et al., 2021). Green-digital dynamic capabilities represent a startup's ability to deploy digital tools specifically to sense environmental risks, seize sustainable market opportunities, and reconfigure business operations toward low-carbon and circular value networks.

2.3 Digital Platform Ecosystems and Co-Creation Mechanisms

Digital platforms have redefined industrial structures by shifting economic activity from firm-centric pipelines to multi-sided platform ecosystems (Nambisan, 2017). A digital platform acts as a shared technological infrastructure that facilitates interactions, transaction matching, and collaborative value co-creation among a diverse network of external actors, including complementors, suppliers, consumers, and regulatory entities (Upadhyay et al., 2023).

Within the sustainability domain, platform ecosystems serve as critical orchestrators of green innovation (Bocken et al., 2014; Kraus et al., 2022). By utilizing platform architectures, digital startups can achieve three distinct sustainability mechanisms:

1. **Resource Optimization & Dematerialization:** Platforms facilitate sharing economy models and asset optimization (e.g., peer-to-peer equipment sharing, smart logistics platforms), significantly reducing physical waste and resource consumption.
2. **Ecosystem-Wide Transparency:** Blockchain technology and distributed ledgers embedded within platforms enable end-to-end supply chain traceability, allowing consumers to verify environmental metrics and ethical sourcing in real time.
3. **Network-Driven Scale:** Platform network effects allow green value propositions to achieve scale rapidly, democratizing sustainable choices for broader user bases that would otherwise be unreachable via traditional distribution channels.

Despite these advantages, platform governance presents significant operational challenges for startups. Open platform models can lead to opportunistic behavior, data privacy concerns, or "greenwashing"—where environmental claims lack empirical verification (Gregori & Holzmann, 2020). Therefore, startup founders must design platform governance mechanisms that enforce environmental accountability across ecosystem partners without stifling participant innovation and network growth.

2.4 Green Business Model Innovation (Green BMI) in Startups

A business model defines the overarching logic of how an organization creates, delivers, and captures value (Teece, 2010). Business Model Innovation (BMI) occurs when a firm fundamentally redefines one or more of these core dimensions to establish a competitive advantage. Extending this theoretical foundation, Green Business Model Innovation (Green BMI)—often aligned with Sustainable Business Model Innovation (S-BMI)—incorporates ecological and social value alongside economic metrics into the core architecture of the firm (Bocken et al., 2014; Geissdoerfer et al., 2018).

The structural components of Green BMI within digital startups are conceptualized as follows:

1. **Sustainable Value Proposition:** The product-service system offers explicit ecological benefits, such as carbon offset tracking, circular product lifecycles, energy reduction, or zero-waste delivery models.
2. **Sustainable Value Delivery:** The operational infrastructure utilizes energy-efficient server hosting (green cloud computing), paperless workflows, decentralized digital networks, and eco-optimized supply chain logistics.
3. **Sustainable Value Capture:** Monetization strategies are structured around sustainable metrics, including product-as-a-service (PaaS) subscriptions, carbon credit trading, pay-per-use circular access, or premium pricing for verified eco-friendly solutions.

While extensive research exists on Green BMI within established corporations undergoing incremental change (Eisenhardt & Martin, 2000; Teece, 2007), nascent digital startups operate under fundamentally different organizational dynamics. Startups do not need to unlearn obsolete legacy processes; instead, they face the challenge of building organizational capabilities and platform ecosystems from scratch in environments of extreme uncertainty.

2.5 Synthesis and Literature Gap

A systematic evaluation of current literature reveals three significant research gaps that justify this study:

1. **Theoretical Fragmentation:** The literature on digital transformation, dynamic capabilities, and sustainable business models largely exists in silos. Few studies systematically integrate DCT with Green BMI specifically within the context of early-stage digital startups.
2. **Mechanistic Ambiguity:** While existing studies highlight the importance of digital platforms, there is a lack of qualitative synthesis regarding the exact mechanisms through which platform governance and ecosystem dynamics enable or impede green innovation in technology ventures.
3. **Lack of Integrated Architectural Frameworks:** Startup founders and investors lack an integrative, actionable conceptual framework that illustrates how green-digital dynamic capabilities align with platform structures to drive sustainable value creation, delivery, and capture.

To bridge these literature gaps, this study provides a qualitative synthesis that intersects dynamic capabilities, digital platforms, and Green BMI, laying the foundation for the proposed *Sustainable Digital Startup Architecture (SDSA)* framework.

3. METHOD

3.1 Research Design

This study adopts a qualitative synthesis research design centered on a Systematic Literature Review (SLR) and conceptual framework development (Page et al., 2021; Snyder, 2019). A qualitative synthesis methodology is particularly suited for this inquiry as it enables the integration, critical evaluation, and thematic aggregation of findings from distinct theoretical domains—namely Dynamic Capabilities Theory (DCT), digital platform ecosystems, and green business model innovation (Green BMI). Rather than providing a descriptive summary of existing literature, this method allows for conceptual building to formulate an overarching architecture—the *Sustainable Digital Startup Architecture (SDSA)*—that addresses theoretical gaps in the "Twin Transition" literature.

3.2 Protocol and Search Strategy

To ensure rigorous, reproducible, and transparent data collection, the literature identification process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021). Comprehensive electronic searches were conducted across four premier academic indexing databases: **Scopus**, **Web of Science (WoS)**, **IEEE Xplore**, and **Google Scholar**.

The search strings were engineered using Boolean operators (AND, OR) combining three primary conceptual clusters: (1) Sustainable Digital Startups, (2) Dynamic Capabilities, and (3) Platform & Business Model Innovation.

3.3 Inclusion and Exclusion Criteria

Studies retrieved from the initial database searches were subjected to systematic screening based on pre-defined eligibility criteria:

1. **Inclusion Criteria (IC):**
    a. Peer-reviewed journal articles, high-impact conference proceedings, and foundational book chapters published in English.
    b. Literature focusing explicitly on early-stage technology ventures, digital startups, digital platform ecosystems, or green business model innovation.
    c. Empirical (qualitative, quantitative, or mixed-methods) and conceptual papers that provide theoretical insights into dynamic capabilities or sustainable innovation.
    d. Publication timeframe prioritizing recent scholarly works (2018–2026) to reflect contemporary advancements in digital technologies and sustainability dynamics.
2. **Exclusion Criteria (EC):**
    a. Non-peer-reviewed works, editorials, conference abstracts, white papers, book reviews, and trade magazine publications.
    b. Studies focusing purely on non-digital traditional manufacturing, heavy industries, or large state-owned enterprises without digital platform considerations.
    c. Duplicate entries across multiple databases.

3.4 Selection Process and Quality Assessment

The primary search yielded an initial pool of literature. The selection proceeded through four sequential phases:

1. **Identification:** Duplicates were identified and removed.
2. **Screening:** Titles and abstracts were screened against the inclusion and exclusion criteria to discard irrelevant studies.
3. **Eligibility:** Full-text manuscripts were thoroughly evaluated to ensure theoretical relevance and methodological quality.
4. **Included:** Final studies meeting all parameters were selected for thematic qualitative synthesis.

3.5 Data Extraction and Qualitative Synthesis Technique

Data analysis was conducted using a thematic synthesis approach (Braun & Clarke, 2006; Snyder, 2019). Qualitative software tools (such as NVivo/ATLAS.ti) were utilized to manage and code the text fragments extracted from the final literature sample. The analytical coding process followed three iterative stages:

1. **First-Order Open Coding:** Initial extraction and labeling of granular concepts related to startup capability micro-foundations (e.g., data-driven sensing, modular software development, agile pivoting) and platform mechanisms (e.g., open API integration, resource sharing, ecosystem governance).
2. **Second-Order Theoretical Categorization:** Grouping first-order codes into higher-level theoretical themes corresponding to Teece's dynamic capability dimensions (*Sensing, Seizing, Transforming*) and Richardson's business model components (*Value Proposition, Value Delivery, Value Capture*).
3. **Conceptual Framework Synthesis:** Mapping the interrelationships between green-digital dynamic capabilities, digital platform mechanisms, and Green BMI dimensions to formulate the synthesized *Sustainable Digital Startup Architecture (SDSA)* framework.

4. RESULTS AND DISCUSSION

4.1 Synthesis of Green-Digital Dynamic Capabilities in Startups

The qualitative synthesis reveals that digital startups successfully architecting sustainable business models do not merely apply generic dynamic capabilities; rather, they develop specialized "Green-Digital Dynamic Capabilities." These capabilities represent the fusion of digital tools with ecological governance across Teece's (2007) triad: *Sensing*, *Seizing*, and *Transforming*.

4.1.1 Green Digital Sensing Capabilities

Digital startups utilize advanced data analytics, Internet of Things (IoT) sensors, and Artificial Intelligence (AI) algorithms to identify environmental inefficiencies and emerging green market demands in real time. Unlike incumbents that rely on periodic market research, sustainable startups deploy continuous data-filtering mechanisms:

1. **Algorithmic Environmental Footprinting:** Leveraging machine learning to detect carbon intensity across supply chains and customer usage patterns.

2. **Stakeholder Sentiment Analytics:** Utilizing natural language processing (NLP) to monitor shifting consumer expectations regarding sustainability and greenwashing sensitivities.

4.1.2 Green Digital Seizing Capabilities

Once sustainable opportunities are identified, startups must rapidly mobilize digital infrastructure to capture value. Seizing capabilities in green digital ventures center on modularity and agile execution:

1. **Rapid Eco-Prototyping:** Deploying cloud-native microservices to test and launch low-carbon digital features or circular product-service configurations with minimal capital expenditure.
2. **Agile Sustainable Value Proposition Design:** Aligning software algorithms to incentivize eco-friendly user behaviors (e.g., carbon-neutral shipping options, energy-saving app modes).

4.1.3 Green Digital Transforming (Reconfiguring) Capabilities

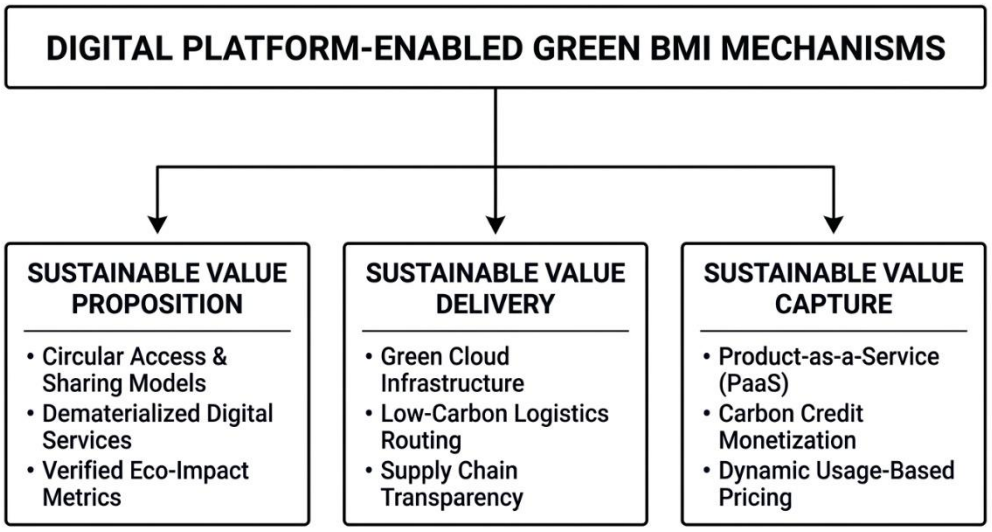
To maintain strategic fit over time, startups reconfigure their digital assets and ecosystem relationships without generating physical path-dependency:

1. **Dynamic Platform Orchestration:** Continuously reallocating platform resources and updating Application Programming Interfaces (APIs) to integrate new green complementors (e.g., eco-logistics providers, renewable energy suppliers).
2. **Decentralized Resource Alignment:** Utilizing distributed ledger technologies (e.g., blockchain) to ensure transparent, automated environmental compliance across network partners.

4.2 Digital Platform Mechanisms for Green Business Model Innovation (Green BMI)

The synthesis identifies three core mechanisms through which digital platforms enable Green Business Model Innovation across value creation, delivery, and capture:

Figure 1. Digital Platform-Enabled Green BMI Mechanisms

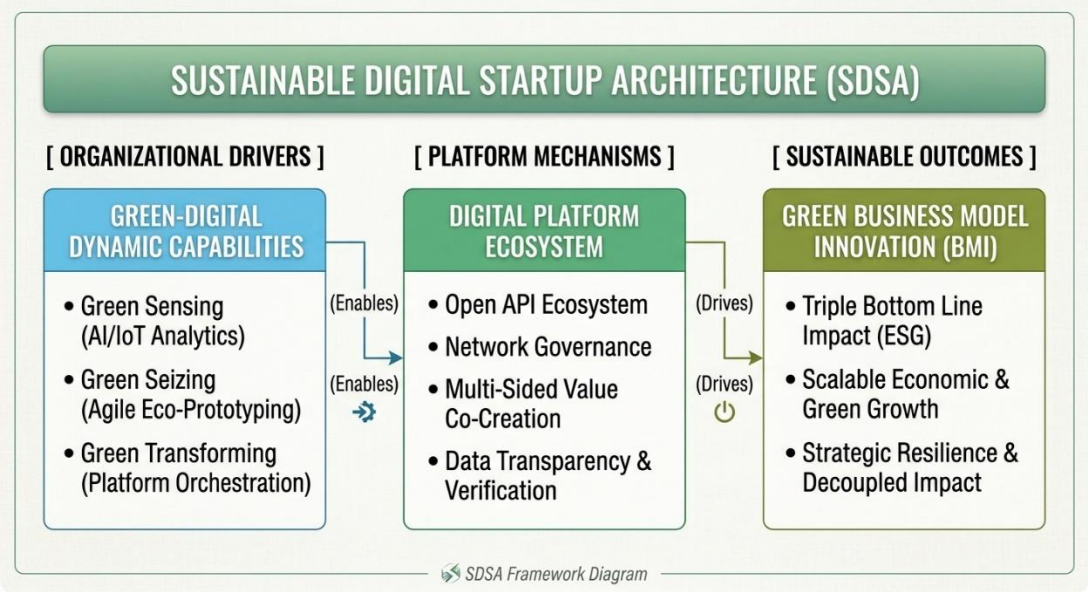


1. **Dematerialization and Circular Value Propositions:** Platforms allow startups to convert physical products into digital services (Product-Service Systems / PSS). Through sharing platforms and peer-to-peer (P2P) networks, startups optimize asset utilization, reducing physical production needs while offering high-utility value to users.
2. **Eco-Optimized Value Delivery:** Digital platform architectures minimize operational carbon footprints by leveraging energy-efficient cloud hosting (green servers), algorithmic routing for urban delivery, and paperless digital workflows. Furthermore, platform transparency ensures that environmental impacts are verifiable across the entire delivery chain.
3. **Flexible and Outcome-Based Value Capture:** Sustainable digital platforms transition away from traditional transactional sales toward recurring, performance-based monetization models. This includes subscription-based access, carbon offset integration at checkout, and dynamic pricing models tied to verified resource savings.

4.3 Proposed Conceptual Framework: Sustainable Digital Startup Architecture (SDSA)

To unify these synthesized dimensions, this study proposes the **Sustainable Digital Startup Architecture (SDSA)** framework. The SDSA illustrates how Green-Digital Dynamic Capabilities act as organizational drivers that leverage Digital Platform Mechanisms to transform early-stage startups into sustainable, high-growth ventures.

Figure 2. Sustainable Digital Startup Architecture (SDSA) Framework



4.4 Discussion: Theoretical Alignment and Synthesis Implications

The findings of this study significantly extend the current understanding of the "Twin Transition" within digital entrepreneurship literature. Prior research has frequently examined digital capabilities and corporate environmental management in isolation (Eisenhardt & Martin, 2000; Teece, 2007, 2014). By synthesizing these domains, the SDSA framework demonstrates that digital technologies and sustainability are mutually reinforcing rather than trade-offs.

1. **Advancing Dynamic Capabilities Theory:** Traditional formulations of DCT (Teece, 2007; Warner & Wäger, 2019) emphasize speed, market growth, and competitive agility. This study proves that when micro-foundations are infused with ecological goals (*green sensing, seizing, transforming*), dynamic capabilities allow startups to overcome resource constraints and avoid early-stage liabilities of sustainability investments.
2. **Reinterpreting Platform Governance:** While literature on digital platform ecosystems (Nambisan, 2017; Upadhyay et al., 2023) primarily focuses on platform architecture and network effects, our synthesis underscores platform governance as a central catalyst for trust and sustainability verification. Open platform architectures enable startups to scale green value propositions rapidly without acquiring heavy physical assets.
3. **Resolving the Startup Paradox:** Early-stage technology ventures often struggle with the paradox of pursuing rapid exponential growth versus long-term environmental stewardship (Gregori & Holzmann, 2020). The SDSA framework resolves this paradox by illustrating how platform-based Green BMI allows startups to achieve "decoupled growth"—where economic scale increases linearly or exponentially while environmental impact decreases.

5. CONCLUSION

5.1 Summary of Main Findings

This study addressed the imperative of the "Twin Transition"—the systematic intersection of digital transformation and environmental sustainability—within early-stage technology ventures.

Through a qualitative synthesis of literature across Dynamic Capabilities Theory (DCT), digital platform ecosystems, and Green Business Model Innovation (Green BMI), this research demonstrates how digital startups can achieve scalable growth without compromising environmental stewardship. The primary synthesis finding is that sustainable digital startups do not rely on traditional, static resource allocations; instead, they develop specialized *Green-Digital Dynamic Capabilities* (*sensing, seizing, transforming*). Furthermore, digital platform architectures serve as structural orchestrators that enable dematerialized value propositions, eco-optimized value delivery, and outcome-based value capture. These synthesized dimensions were unified into a novel framework: the *Sustainable Digital Startup Architecture (SDSA)*.

5.2 Theoretical Implications

This research offers three prominent theoretical contributions to the fields of digital business, innovation management, and sustainability:

1. **Contextualizing Dynamic Capabilities for the Twin Transition:** It extends Teece's (2007) Dynamic Capabilities Theory by defining the micro-foundations of "green-digital dynamic capabilities," proving that digital analytics and agile practices can be explicitly oriented toward ecological goals.
2. **Bridging Platform Governance with Sustainability:** It advances digital platform literature (Nambisan, 2017) by demonstrating how multi-sided platform governance mechanisms facilitate transparency, trust, and multi-actor co-creation for environmental value.
3. **Resolving the Startup Growth-Sustainability Paradox:** It enriches the business model innovation literature by illustrating how platform-enabled Green BMI enables "decoupled growth," allowing startups to expand economic value while reducing physical resource footprints.

5.3 Practical and Managerial Implications

For practitioners, the SDSA framework serves as an actionable strategic roadmap:

1. **For Startup Founders and Digital Entrepreneurs:** It provides a blueprint for architecting "born-green digital business models" from inception, guiding decisions on green cloud infrastructure, open API integration, and circular product-service systems.
2. **For Venture Capitalists and Impact Investors:** It establishes clear qualitative criteria to evaluate early-stage startups' green-digital readiness beyond traditional short-term financial metrics.
3. **For Ecosystem Policy-Makers:** It emphasizes the need to fund and support open digital platform infrastructures and green tech incubators that foster collaborative, multi-stakeholder innovation networks.

5.4 Limitations and Future Research Directions

While this study offers comprehensive theoretical insights through qualitative synthesis, several limitations warrant future investigation. First, as a qualitative library research synthesis, the proposed SDSA framework remains conceptual and requires empirical validation across diverse regional startup ecosystems. Second, sector-specific dynamics (e.g., FinTech vs. AgTech vs. E-Commerce) may influence the prioritization of specific green-digital capabilities. Future research

should apply quantitative structural equation modeling (SEM) or multiple case-study methodologies to empirically test the relationships within the SDSA framework across varying geographic and industry contexts.

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7. CONFLICT OF INTEREST

The authors declare that there are no financial, institutional, professional, or personal conflicts of interest regarding the publication of this paper.

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