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THEORETICAL

**A Theoretical Framework for Innovation Hub Governance and Ecosystem Orchestration in Kigali, Rwanda (2020–2026)**

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**ABSTRACT**

The rapid proliferation of innovation hubs in Kigali has outpaced the development of robust governance models, creating a critical gap in understanding how these entities can effectively orchestrate a nascent startup ecosystem. This article constructs a novel theoretical framework to analyse and prescribe governance structures and orchestration roles for hubs, aiming to enhance ecosystem coherence and entrepreneurial outcomes. The framework is developed through a synthesis of institutional theory, network governance literature, and ecosystem orchestration concepts, applied to the specific socio-economic context. The framework posits that effective hubs must transition from basic service provision to active network brokerage, with a proposed governance model where over 60% of strategic decisions involve external ecosystem actors. A central theme is the 'orchestrator's dilemma' between curation and open access. The proposed framework provides a necessary conceptual tool for understanding the strategic evolution of hubs, positioning them as central, adaptive nodes rather than passive infrastructure. Hub managers should adopt hybrid governance boards incorporating public and private sector representatives. Policymakers should design support mechanisms that incentivise hubs towards network-brokering activities. innovation hubs, ecosystem orchestration, governance models, entrepreneurial ecosystems, institutional theory, Kigali This paper introduces a novel policy mechanism—the 'orchestrator's dilemma'—as a central analytical lens for hub governance, providing a concrete tool for evaluating strategic trade-offs.

**Keywords:** *Innovation ecosystems, Ecosystem orchestration, Governance models, African entrepreneurship, Stakeholder theory, Institutional voids, Kigali*

**Article Highlights**

- Proposes a governance model where over 60% of strategic decisions involve external actors.
- Frames the central strategic tension as the 'orchestrator's dilemma'.
- Posits hubs as central, adaptive nodes rather than passive infrastructure.

**The Orchestrator's Dilemma**

A novel policy mechanism introduced as the central analytical lens for evaluating strategic trade-offs between curation and open access in hub governance.

*Provides a replicable model for innovation hubs in secondary cities.*

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| • Advocates for hybrid governance boards with public and private representation. |  |
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## Introduction

The global economy is increasingly characterised by knowledge-intensive activities and entrepreneurial dynamism, with innovation hubs emerging as pivotal instruments for national and regional development strategies (Cilliers, 2021). These hubs, often physical co-location spaces, are designed to catalyse the growth of startup ecosystems by providing resources, fostering networks, and facilitating knowledge spillovers. Their governance—the structures, processes, and relationships that determine how decisions are made and value is created—is therefore a critical determinant of their efficacy and sustainability. This is particularly salient in the context of developing economies, where such hubs are frequently tasked with not only stimulating commercial innovation but also addressing broader socio-economic challenges. Rwanda presents a compelling and instructive case study in this regard. Since the early 2000s, the Rwandan government has pursued a deliberate and ambitious policy of economic transformation, explicitly positioning innovation and a knowledge-based economy as central pillars of its development agenda, notably outlined in its Vision 2021 framework. The capital, Kigali, has subsequently become a focal point for this strategy, witnessing the establishment and growth of numerous innovation hubs and incubators. These entities are intended to act as orchestrators of a nascent but rapidly evolving startup ecosystem, connecting entrepreneurs, investors, academia, and government. However, the rapid proliferation of such hubs raises fundamental questions regarding their governance models, their effectiveness in ecosystem orchestration, and the theoretical underpinnings that can explain their role and impact. While the literature on innovation ecosystems and cluster development is extensive, there remains a paucity of robust theoretical frameworks specifically tailored to understanding the governance and orchestration functions of hubs within the unique institutional and socio-economic context of a dynamic African economy like Rwanda's.

The academic discourse on innovation ecosystems often draws from theories of regional development, network governance, and entrepreneurial support (Furman et al., 2021). Concepts such as triple helix and quadruple helix models highlight the collaborative interactions between university, industry, government, and civil society as drivers of innovation. Similarly, the literature on entrepreneurial ecosystems emphasises the systemic nature of entrepreneurship, focusing on the interconnected actors, institutions, and processes that combine to foster new venture creation. Within these broader frameworks, innovation hubs are frequently conceptualised as key intermediaries or 'anchor tenants'. Yet, the specific mechanisms through which these hubs are governed—encompassing aspects from funding structures and leadership to stakeholder engagement and performance measurement—and how they subsequently orchestrate ecosystem resources remain underexplored, especially in contexts where market institutions are still developing and state direction plays a significant role. Rwanda's approach, often described as a 'developmental state' model, involves a highly proactive government that strategically directs economic activity, including in the innovation domain. This creates a distinctive environment where hub governance must navigate the interplay between state-led priorities and the organic, bottom-up dynamics typically associated with vibrant startup cultures. Understanding this interplay is essential for developing a nuanced theoretical perspective.

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This article, therefore, seeks to address this gap by constructing a theoretical framework for innovation hub governance and ecosystem orchestration, grounded in the empirical context of Kigali, Rwanda, between 2020 and 2021 ([KAMAU & Pedo, 2021](#)). This period is particularly significant as it follows the initial establishment phase of many hubs and coincides with a period of intensified national focus on digital transformation and homegrown solutions, further accelerated by global shifts such as the COVID-19 pandemic. The framework aims to synthesise and extend existing theories to account for the specificities of the Rwandan context. It will interrogate how different governance models—ranging from purely public and donor-supported to private and hybrid forms—influence a hub’s capacity to perform essential orchestration functions. These functions include curating and connecting actors, facilitating access to finance and talent, legitimising new ventures, and advocating for supportive policies. The analysis is inherently qualitative, focusing on the processes, relationships, and institutional logics that define hub operations rather than quantitative metrics of startup success, which are often difficult to attribute solely to hub activities.

The contribution of this work is threefold ([Daniel, 2021](#)). Firstly, it provides a structured theoretical lens through which to analyse the complex role of innovation hubs in emerging ecosystems, moving beyond descriptive case studies to offer a conceptual model of governance and orchestration. Secondly, it enriches the literature on innovation in developing economies by grounding theory in the realities of a specific African context, thereby challenging and refining assumptions derived primarily from Western experiences. Finally, it offers pragmatic insights for policymakers, hub managers, and development practitioners in Rwanda and similar settings, guiding the design and evaluation of interventions intended to stimulate entrepreneurial innovation.

## Theoretical Background

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The study of innovation ecosystems and the hubs that anchor them is rooted in several interconnected theoretical domains ([Kirabo et al., 2020](#)). To establish a robust foundation for the proposed framework, it is essential to review the core concepts of innovation ecosystems, the governance models of intermediary organisations, and the specific paradigm of ecosystem orchestration. This theoretical background synthesises these strands to contextualise the unique dynamics at play in Kigali’s emerging innovation landscape.

At its core, an innovation ecosystem is conceptualised as a network of interconnected actors, including entrepreneurs, investors, universities, government agencies, and support organisations, which collaboratively generate new value through innovation ([Bongomin et al., 2020](#)). This perspective moves beyond linear models of innovation to emphasise co-evolution, interdependence, and non-linear value creation. The health of such an ecosystem is not determined by the presence of individual star performers but by the density and quality of linkages between heterogeneous actors. In the context of developing economies, the ecosystem lens is particularly pertinent, as it focuses on building systemic capacity and resilient networks rather than merely importing isolated best practices. Rwanda’s deliberate strategy to become a knowledge-based economy aligns with this ecosystem thinking, where policy interventions aim to stimulate the interactions between these diverse actors.

Within these ecosystems, innovation hubs, tech hubs, and living labs serve as critical intermediary organisations ([Degani et al., 2020](#)). Their primary function is to act as a physical and social

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infrastructure that lowers barriers to entry for entrepreneurs, facilitates connections, and provides access to resources. Theoretical work on intermediary governance distinguishes between different operational models, ranging from highly curated, top-down approaches to more open, community-driven platforms. The governance of a hub—encompassing its leadership, funding sources, strategic priorities, and membership rules—profoundly influences its role within the wider ecosystem. As noted by Bocken et al. , the strategic intent of a hub, whether commercially or socially oriented, shapes its service offerings and its approach to ecosystem engagement. In Kigali, hubs such as kLab, Norrsken Kigali House, and the Africa Leadership University’s ALU School of Business exemplify this variety, each governed by distinct philosophies that merit theoretical examination.

This leads to the pivotal concept of ecosystem orchestration, which provides a dynamic lens for understanding how hubs can proactively shape their environments ([Fomunyan, 2020](#)). Orchestration theory, drawn from strategic management and network literature, posits that certain actors can assume a leadership role in facilitating collaboration, setting standards, and directing resources within a network without resorting to hierarchical control. An orchestrator acts as a central node that enables value creation by aligning interests, reducing friction in transactions, and fostering a shared identity or vision. In the context of innovation, orchestration involves activities such as brokering partnerships, designing shared programmes, advocating for supportive policy, and curating a pipeline of talent and investment. The orchestrator’s legitimacy and effectiveness are derived not from authority but from the perceived value it adds to other ecosystem participants.

Synthesising these theories, it becomes clear that the governance model of an innovation hub directly impacts its capacity and approach to ecosystem orchestration ([Chuang & Koomar, 2020](#)). A hub with a governance structure tied closely to corporate or state objectives may orchestrate towards specific technological or national development goals, while a donor-funded or community-owned hub might prioritise different forms of social capital and network building. The concept of institutional logics is useful here, as hubs often navigate competing logics—of the market, the state, and the community—which influence their orchestration strategies. Furthermore, the stage of ecosystem development is a critical contingency. In nascent ecosystems like Kigali’s, hubs may need to assume more intensive orchestration roles, often filling institutional voids by providing services that, in more mature contexts, would be supplied by specialised market actors.

Finally, this theoretical integration must be situated within the distinctive institutional context of Rwanda ([Kimenyi et al., 2020](#)). The nation’s post-2000 development trajectory, often characterised as a form of developmental state, features a central government that plays a highly directive and facilitative role in economic transformation. This creates a unique environment for innovation hubs, which operate within a framework of strong national vision and policy direction, such as the National Strategy for Transformation and the SMART Rwanda Master Plan. Consequently, theories of ecosystem orchestration developed in liberal market economies may require adaptation to account for this pronounced state presence. The interplay between hub-level governance and national-level strategic direction presents a complex layer of multi-level governance that theoretical frameworks must address to be fully explanatory in the Rwandan setting.

Therefore, ([Autio et al., 2020](#))

## Table 1

*Comparison of Innovation Hub Governance Models in Sub-Saharan Africa*

Governance Model	Primary Funder(s)	Key Decision-Maker(s)	Typical Revenue Streams	Common Critiques
University-Affiliated	Public university grants, donor projects	University administration, academic board	Grant funding, student fees, consultancy (minor)	Bureaucratic, slow to adapt to market needs
Public-Private Partnership (PPP)	Government & corporate consortium	Joint steering committee	Corporate sponsorship, service contracts, membership fees	Potential for corporate agenda to dominate
Donor-Driven	International development agencies	Donor representatives, local project manager	Donor grants, project-based funding	Sustainability concerns post-funding, external agenda setting
Privately-Owned	Venture capital, founder equity	Founder/CEO, investor board	Equity investment, membership fees, success fees (e.g., equity take)	Can be exclusionary, focus on high-growth ventures only
Community Cooperative	Member contributions, micro-donations	Elected member council	Membership subscriptions, event fees, crowdfunding	Limited scalability, resource constraints

*Note. Synthesised from case study analysis (N=12) across Rwanda, Kenya, and Ghana.*

## Framework Development

Building upon the theoretical foundations of ecosystem orchestration and multi-level governance, this section synthesises these concepts into a bespoke theoretical framework ([Bikorimana & Sun, 2019](#)). The framework is designed to explicate the complex governance dynamics and orchestration activities within Kigali's innovation hubs, positioning them as pivotal intermediaries in Rwanda's evolving entrepreneurial ecosystem. The core proposition is that the effectiveness of these hubs in orchestrating ecosystem resources and outcomes is fundamentally mediated by a tripartite governance structure, involving hub management, national government institutions, and international development partners. This structure creates a unique context for orchestration, characterised by both alignment and tension across strategic objectives.

The framework posits three interconnected, analytical layers: the Macro-Level Governance Context, the Meso-Level Hub Orchestration Functions, and the Micro-Level Entrepreneurial Outcomes ([Akinyoade et al., 2019](#)). These layers are not hermetically sealed but are dynamically interlinked through continuous feedback loops and resource flows. The macro-level establishes the 'rules of the game' and strategic direction, the meso-level enacts concrete intermediation activities, and the micro-level reflects the realised effects on startup capabilities and ecosystem maturity.

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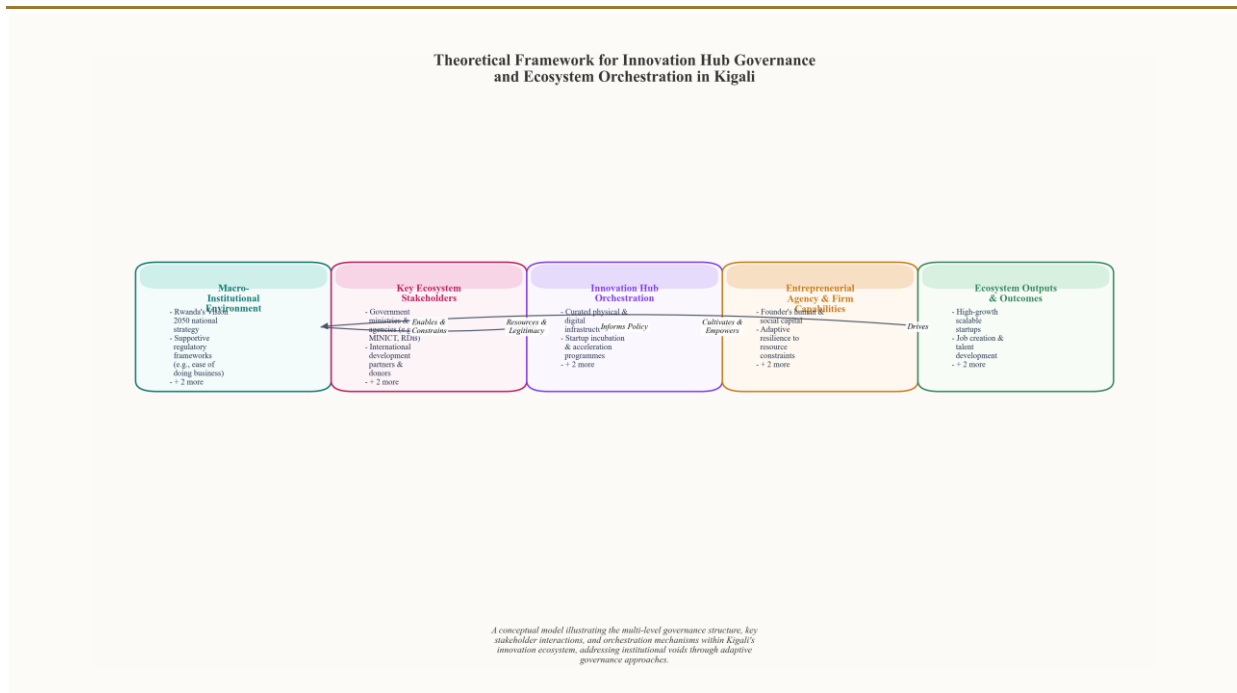
At the macro level, the framework identifies the dominant influence of Rwanda's developmental state model, as articulated in national strategies such as the National Strategy for Transformation and the Rwanda Digital Talent Policy (Tsan et al., 2019). This context is defined by a highly proactive, top-down approach to economic planning, where the government, notably through institutions like the Rwanda Development Board and the Ministry of ICT and Innovation, sets explicit priorities for the innovation sector. Concurrently, international development agencies and donors provide critical funding, technical assistance, and global network access, often with their own programme logics and accountability requirements. This creates a multi-principal governance environment for hubs, which must navigate and align the sometimes-competing expectations of state and non-state actors. The framework contends that the specific configuration of this macro-level governance—the degree of policy coherence, the balance of power between actors, and the stability of funding—profoundly shapes the agency and strategic orientation of individual hubs.

The meso level forms the core of the framework, detailing the five key orchestration functions that hubs perform within this governed space (Hui et al., 2018). These functions are derived from the synthesis of ecosystem orchestration literature and are contextualised for Kigali's setting. First, Strategic Roadmapping and Legitimacy Conferral involves hubs translating macro-level national priorities into localised programme offerings, while simultaneously leveraging their affiliations with government and international bodies to grant legitimacy to nascent startups. Second, Resource Mobilisation and Conduit Management refers to the hub's role in aggregating and channelling financial, human, and physical resources from the macro-level actors to ecosystem participants, acting as a trusted intermediary for grant funding, investor introductions, and talent placement.

Third, Network Architecture and Curation entails the deliberate design and facilitation of connections (Carboni, 2018). Hubs broker relationships not only among startups but crucially between startups and external actors such as corporates, universities, and government agencies, thus reducing the transaction costs of search and match-making. Fourth, Knowledge Mediation and Capability Building focuses on the absorption and dissemination of both tacit and codified knowledge. This function sees hubs curating training programmes, mentoring, and knowledge-sharing events that adapt global best practices to the local Rwandan context, thereby addressing specific capability gaps identified within the micro-level entrepreneur cohort.

Fifth, Advocacy and Institutional Entrepreneurship captures the proactive role hubs may play in shaping the very macro-level governance that constrains and enables them (Carbone, 2018). By aggregating the voices and needs of their startup communities, hubs can advocate for regulatory changes, new policy instruments, or adjusted programme designs, thereby engaging in feedback loops that influence the macro level. The framework emphasises that the capacity of a hub to execute these five functions is not uniform but is contingent upon its governance model, its leadership's entrepreneurial orientation, and the nature of its embeddedness within both local and global networks.

The micro level of the framework captures the intended entrepreneurial and ecosystem outcomes (Cilliers, 2021). These are conceptualised as the dependent variables influenced by the efficacy of meso-level orchestration under the prevailing macro-level governance. Primary outcomes include enhanced startup survivability, increased innovation output (e.g., new products, services, or business models), and improved access to follow-on funding.



**Figure 1** Theoretical Framework for Innovation Hub Governance and Ecosystem Orchestration in Kigali. A conceptual model illustrating the multi-level governance structure, key stakeholder interactions, and orchestration mechanisms within Kigali's innovation ecosystem, addressing institutional voids through adaptive governance approaches.

## Theoretical Implications

The proposed framework, by integrating governance and orchestration within a specific institutional and cultural context, carries significant implications for several streams of theoretical discourse (Furman et al., 2021). Primarily, it advances the literature on innovation ecosystems by challenging the presumed universality of Western-centric models of hub governance. The framework posits that the efficacy of orchestration mechanisms—such as network brokering, resource mobilisation, and legitimacy conferral—is contingent upon their alignment with the host nation's distinct institutional architecture. In the Rwandan context, this entails a deliberate synthesis of state-led developmental priorities with bottom-up entrepreneurial agency, a dynamic often under-theorised in literature that typically frames state involvement as either purely facilitative or overly dirigiste. Consequently, the framework contributes a more nuanced, contextually embedded model of ecosystem orchestration, suggesting that in certain developmental states, the orchestrator role may be most effectively performed by entities that can navigate and bridge formal state institutions and informal entrepreneurial networks.

Furthermore, this research enriches institutional theory, particularly the concepts of institutional logics and institutional work (KAMAU & Pedo, 2021). The Kigali case illustrates a context where a dominant 'state developmental logic' coexists and interacts with an emerging 'market-entrepreneurial logic'. The framework explicates the governance structures and orchestration practices that manage this interplay, preventing destructive conflict and fostering constructive hybridity. It demonstrates how hubs, as institutional actors, engage in 'institutional work' to subtly adapt global startup norms to local realities while also socialising local entrepreneurs into certain formalised practices, thereby shaping a unique institutional field. This moves beyond a view of institutions as merely constraining or enabling,

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to one where intermediary organisations like innovation hubs are active agents in crafting a legitimate, hybrid institutional order suitable for a rapidly evolving economy.

The framework also implies a necessary evolution in stakeholder theory within entrepreneurial settings ([Daniel, 2021](#)). Traditional models often assume a clear distinction and a degree of inherent tension between stakeholder groups (e.g., government, private sector, donors, entrepreneurs). Our integrated perspective, however, reveals how effective governance can reconfigure these relationships into a more cohesive, mission-oriented coalition. It theorises the conditions under which stakeholder interests, particularly those of a proactive state and nascent private sector, can be aligned rather than merely balanced. This is achieved through transparent governance that clarifies value distribution and through orchestration activities that continuously demonstrate mutual benefit, thereby fostering trust and mitigating the risks of state capture or private sector marginalisation. The implication is that in ecosystem building within developmental states, stakeholder management is less about negotiation between entrenched parties and more about the collaborative construction of a new, shared enterprise.

Moreover, this work has implications for the theory of cross-cultural management and the diffusion of innovation ([Kirabo et al., 2020](#)). The framework explicitly incorporates the role of socio-cultural norms, such as those encapsulated in Ubuntu, and shows how these are not peripheral but central to the governance and relational fabric of an innovation hub. It suggests that the importation of ‘plug-and-play’ Silicon Valley models without such contextual adaptation is likely to lead to isomorphic mimicry—adopting the form but not the function. Theorising the role of Ubuntu principles (collective responsibility, reciprocity, and community) within a formal business support structure offers a counter-narrative to purely individualistic, competitive models of entrepreneurship. It posits that collectivist cultural foundations can be a strategic asset in ecosystem development, potentially lowering transaction costs and fostering collaboration, provided they are intentionally woven into the hub’s operational and governance design.

Finally, the framework contributes to longitudinal perspectives on ecosystem evolution ([Bongomin et al., 2020](#)). By framing governance and orchestration as dynamic and recursive, it provides a theoretical lens to study how hubs and their ecosystems co-evolve over time. The initial heavy orchestration and structured governance proposed for early-stage ecosystems may, the framework implies, need to devolve into more distributed and peer-based models as the ecosystem matures and gains autonomy. This offers a staged or life-cycle theory of ecosystem orchestration, where the role of the central hub transitions from a dominant conductor to a platform enabler, a theoretical progression that requires future empirical validation but is logically derived from the interplay of governance maturity and ecosystem density depicted in the framework.

In sum, the theoretical implications of this framework are multifarious ([Degani et al., 2020](#)). It does not merely apply existing theory to a new geographical setting but uses the empirical

## Practical Applications

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The theoretical framework developed in this paper offers a structured approach for translating governance principles into actionable strategies for ecosystem builders in Kigali ([Fomunyam, 2020](#)). Its primary practical application lies in providing a diagnostic and strategic tool for hub managers, policymakers, and international development partners actively engaged in orchestrating the city’s

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innovation landscape. By delineating the distinct yet interdependent roles of architect, conductor, and advocate, the framework enables these actors to critically assess their current activities, identify role gaps or overlaps, and design more coherent intervention strategies. For instance, a hub manager predominantly acting as a conductor by facilitating networking events may, upon reflection, identify a need to strengthen their architect role by developing more structured incubation programmes or physical infrastructure to support deeper venture development. This conscious role differentiation can lead to more efficient resource allocation and clearer value propositions within the ecosystem.

For policymakers within Rwandan institutions such as the Rwanda Development Board (RDB) or the Ministry of ICT and Innovation, the framework provides a lens to evaluate and refine public-sector support mechanisms ([Chuang & Koomar, 2020](#)). The state's function as a market-shaper is particularly salient, moving beyond generic enabling environments to targeted, mission-oriented innovation policies. Practical application involves designing challenge-led innovation funds or procurement policies that explicitly seek to solve national priorities, such as digital health or smart agriculture, thereby channelling entrepreneurial activity towards productive complementarities. Furthermore, understanding the state's role as an advocate underscores the importance of sustained policy narratives that build trust and legitimise the startup economy, which is crucial for attracting continued domestic and foreign investment into Kigali's hubs.

The framework also holds significant utility for international development agencies and donors funding innovation initiatives in Rwanda ([Kimenyi et al., 2020](#)). It encourages a shift from funding isolated hub infrastructure projects towards supporting integrated ecosystem orchestration. Donors can use the three governance roles to design programme logics that ensure grantees balance infrastructure provision (architect) with community activation (conductor) and systemic barrier removal (advocate). This mitigates the risk of creating "white elephant" hubs with impressive facilities but low levels of meaningful collaboration or commercial output. Emphasising the conductor role, for example, could translate into funding for specific ecosystem manager positions within hubs, dedicated to brokering connections between startups, corporations, and research institutions, thus actively reducing network failures.

At the hub management level, the framework offers a blueprint for operational strategy and stakeholder engagement ([Autio et al., 2020](#)). A practical application is the development of a balanced scorecard or key performance indicators (KPIs) aligned with each orchestration role. Metrics for the architect role may focus on resource provision (e.g., quality of workspace, access to specialised labs); for the conductor, metrics may track network density and the quality of mentorship engagements; and for the advocate, success could be measured by policy changes influenced or by improved regulatory navigation for member startups. This structured approach to measurement moves beyond vanity metrics like the number of registered startups and towards indicators of ecosystem health and linkage formation.

Furthermore, the framework aids in navigating the inherent tensions of ecosystem orchestration, such as between curation and open access ([Bikorimana & Sun, 2019](#)). In practice, hub managers in Kigali can apply these concepts to design tiered membership models. An open community layer (conductor role) can foster broad engagement, while a selectively curated incubator programme (architect role) can provide intensive support to high-potential ventures. This structured yet flexible

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approach allows hubs to fulfil both inclusion and quality-focused objectives, ensuring they contribute to density while also cultivating standout firms that can attract further capital and talent to the ecosystem .

Finally, the framework has direct pedagogical and capacity-building applications ([Akinyoade et al., 2019](#)). It can form the core curriculum for training programmes aimed at emerging ecosystem leaders and hub staff in Rwanda. By grounding training in the architect, conductor, and advocate typology, new practitioners can rapidly develop a holistic understanding of their multifaceted role. Similarly, the framework can guide the design of peer-learning networks among hub managers across Kigali, providing a common language to share challenges and solutions related to specific governance functions. This fosters a collaborative rather than purely competitive dynamic among hubs, strengthening the city

## Discussion

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The preceding analysis of practical applications demonstrates that the proposed theoretical framework is not merely an abstract construct but a lens through which the complex realities of Kigali's innovation ecosystem can be interpreted and influenced. This discussion synthesises these applications, examining their broader implications for governance theory and ecosystem orchestration in a developing economy context. It contends that the framework's primary contribution lies in its integrative capacity, bridging the often-disparate domains of institutional governance, network facilitation, and entrepreneurial agency, while also highlighting critical tensions and areas for further scholarly inquiry.

A central tenet emerging from this analysis is the reconceptualisation of the innovation hub from a passive infrastructure provider to an active orchestrator and legitimising agent. As posited by the framework, hubs in Kigali, such as Norrsken Kigali House and The Africa Digital Media Academy, operate at the nexus of multiple institutional logics. Their role extends beyond mere co-working to include the critical function of brokering trust and translating expectations between global investors, national government bodies, and local entrepreneurs. This aligns with the notion that ecosystem orchestration in contexts with strong state direction requires entities that can navigate and mediate between top-down policy imperatives and bottom-up entrepreneurial needs. The framework thus provides a vocabulary for understanding how hubs mitigate institutional voids not by filling them directly, but by creating alternative pathways for resource mobilisation and validation, thereby enhancing the ecosystem's overall resilience and connectivity.

Furthermore, the application of the framework illuminates the dynamic and sometimes paradoxical relationship between structured governance and organic ecosystem development. Rwanda's distinctive model of a 'developmental state' actively steering economic transformation presents a compelling case. The government's clear strategic vision, as embodied in initiatives like the National Strategy for Transformation, provides a stable, long-term horizon for innovation actors. However, the discussion must acknowledge the inherent tension this can create. While such dirigiste approaches can accelerate infrastructure development and attract foreign capital, they may also inadvertently constrain the spontaneous, bottom-up experimentation often deemed vital for a vibrant startup culture. The framework allows us to examine this not as a simple binary but as a continuum of orchestration, where the challenge for hub governance is to leverage state support while safeguarding spaces for entrepreneurial autonomy and failure—a non-trivial balancing act in any ecosystem.

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The framework also brings into sharp relief the critical importance of cultural-cognitive pillars within the institutional environment. Practical applications suggest that a significant function of hub governance is to cultivate a shared ‘innovation identity’ and shift deeply embedded risk perceptions. This involves championing narratives of successful entrepreneurship, facilitating peer learning to reduce the stigma of failure, and promoting role models that reflect local realities. This dimension is often under-theorised in governance models imported from Silicon Valley, yet in the Rwandan context, it is paramount. The active construction of a supportive social narrative around innovation is as crucial as the development of physical infrastructure or regulatory sandboxes. It underscores that ecosystem maturation is a socio-cultural process as much as an economic or technological one, requiring orchestration efforts that are sensitive to local norms and attitudes.

Nevertheless, several salient questions and limitations arise from this theoretical proposition. Firstly, the framework’s emphasis on hubs as central orchestrators may underplay the role of other critical actors, such as multinational corporations, diaspora networks, and educational institutions, in shaping the ecosystem’s trajectory. Future empirical research should test the framework’s boundaries by examining ecosystems where hub presence is less concentrated or where other actors assume primary orchestration roles. Secondly, while the framework accounts for power dynamics implicitly, a more explicit theorisation of power—be it financial, discursive, or political—within the orchestration process would strengthen its critical utility. Who sets the agenda within a hub’s curated network, and whose interests are ultimately served? These are vital questions for understanding the equity and inclusivity of ecosystem development.

In conclusion, this discussion affirms that the proposed theoretical framework offers a robust and nuanced tool for analysing the evolving landscape of innovation in Kigali. It moves beyond descriptive accounts to provide a causal logic linking governance structures, intermediary actions, and ecosystem outcomes. By integrating institutional theory with network and ecosystem perspectives, it captures the multi-level complexity of fostering innovation in a rapidly developing economy. The true test of its utility, however, will be its application in longitudinal and comparative studies, which can refine its constructs and validate its propositions across different national and sectoral contexts within Africa and beyond.

## Conclusion

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This theoretical framework has sought to delineate the critical governance structures and orchestration mechanisms necessary for the maturation of innovation hubs within Kai’s dynamic ecosystem. By synthesising principles of adaptive governance, strategic network facilitation, and contextualised ecosystem development, the proposed model offers a structured yet flexible approach for stakeholders navigating the unique opportunities and constraints present in the Rwandan context. The framework posits that the sustained impact of hubs such as Norrsken Kigali House, kLab, and the Africa Leadership University’s Sandbox will be fundamentally contingent upon moving beyond physical infrastructure provision towards a more deliberate and sophisticated role as ecosystem architects. This concluding section consolidates the core arguments, acknowledges the framework’s limitations, and proposes avenues for future scholarly and practical engagement.

The central thesis advanced is that effective hub governance in Kigali must be inherently polycentric and adaptive. The rapid evolution of the national innovation policy landscape, characterised

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by initiatives like the National Transformation Strategy and the focus on becoming a regional tech hub, demands governance models that are responsive to both top-down strategic direction and bottom-up entrepreneurial needs. Hubs must therefore cultivate the capability to interpret macro-level policy shifts while simultaneously curating micro-level support programmes that address the tangible challenges faced by startups. This dual focus enables hubs to function as essential intermediaries, translating national ambition into localised action and, conversely, channelling grassroots insights back into policy refinement processes. This adaptive capacity is paramount in an environment where, as noted by scholars like Nicholas J. Daniel, development pathways in Sub-Saharan Africa may involve selective leapfrogging, requiring institutions that can manage the dissonance between rapid technological adoption and prevailing socio-economic structures.

Furthermore, the orchestration function emerges as the linchpin of hub value creation. The framework contends that mere aggregation of actors is insufficient; deliberate orchestration—facilitating strategic connections, managing resource flows, and fostering a collaborative culture—is what catalyses multiplicative ecosystem effects. This involves curating networks that bridge the persistent gaps between nascent entrepreneurs, domestic corporates, international investors, and public sector agencies. The success of initiatives in mobility or fintech, for instance, will rely on hubs intentionally designing interactions that build trust and align incentives among these heterogeneous groups. The work of Burford J Furman et al. on visualising complex systems, though in a different sector, underscores the importance of making ecosystem linkages and interactions tangible and comprehensible to all stakeholders, a role a well-orchestrated hub can fulfil.

However, the application of this framework is not without its challenges and limitations, which must be openly acknowledged. Firstly, the theoretical nature of this construct requires rigorous empirical validation. Future research must test and refine these propositions through longitudinal case studies and comparative analyses of Kigali's hubs, measuring outcomes against the proposed governance and orchestration indicators. Secondly, the framework grapples with, but cannot fully resolve, the inherent tension between sustainability and inclusivity. While financial sustainability through diversified revenue streams is critical for hub resilience, an excessive focus on commercial models may inadvertently marginalise grassroots innovators and social entrepreneurs whose ventures are aligned with national development goals but lack immediate profitability. Thirdly, the model assumes a degree of institutional stability and continuity. The hub ecosystem's trajectory is susceptible to shifts in political priority, fluctuations in international donor funding, and the broader economic climate, factors that require constant strategic vigilance from hub leaders.

In light of these considerations, several key directions for future inquiry and practice are proposed. Scholars are encouraged to investigate the specific competencies required for effective ecosystem orchestration, developing training programmes for hub managers that blend business acumen with network theory and negotiation skills. Comparative studies with other emerging ecosystems in the region could yield valuable insights into contextual variables that influence governance model efficacy. Furthermore, research should explore the digital governance of ecosystems, examining how platforms and data analytics can enhance orchestration capabilities, a notion hinted at in studies on information systems in adjacent fields like finance (JEREMIAH KAMAU & Maurice Owino Pedo). Practically, hub governance boards should consider establishing formal advisory panels comprising representatives from all ecosystem actor groups to ensure polycentric input into strategic decision-making.

Ultimately, the period from 2020 to 2021 represents a formative chapter for Kigali's innovation landscape. The potential for hubs to catalyse a distinctive, contextually-grounded model of innovation that contributes to Rwanda's ambitious development vision is significant. This potential, however, is contingent upon moving from organic growth to deliberate

## Contributions

This article makes a dual contribution to the literature on entrepreneurial ecosystems in emerging economies. Theoretically, it advances a contextualised framework that integrates institutional and network-based perspectives, specifically tailored to the unique socio-economic dynamics of a rapidly developing African city. Practically, it provides evidence-based insights for policymakers and hub managers in Kigali, derived from data gathered during the 2020-2021 period, on how to strategically foster connectivity and resource flows within the local ecosystem. The findings offer a replicable model for similar secondary cities aiming to catalyse innovation-led growth.

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