

Developing Singhasari Special Economic Zone as a Creative and Digital Innovation Hub**Vicky Arief Herinadharma¹, Eli Jamilah Mihardja²**^{1,2} Department of Communication Science, Universitas Bakrie, Indonesia**Article History**

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Abstract: Special Economic Zones (SEZs) are increasingly expected to move beyond investment-oriented development toward innovation ecosystems that integrate talent, technology, creative production, markets, and collaborative governance. This study aims to analyze the development strategy of the Singhasari Special Economic Zone (SEZ) as a creative and digital innovation hub through a collaborative ecosystem approach. A qualitative instrumental case study was employed using document analysis covering the period from 2019 to July 2026. Data were obtained from government regulations, official government reports, publications of the Singhasari SEZ management entity, policy documents, and relevant scholarly literature. Data were analyzed using the interactive model of data condensation, data display, and conclusion drawing, supported by source triangulation. The findings indicate that the Singhasari SEZ possesses strategic foundations derived from its technology and tourism mandates, Greater Malang's talent and educational ecosystem, creative production activities, digital technology capabilities, and national and international partnerships. However, several gaps remain in ecosystem specialization, talent-to-market integration, anchor demand, financing and intellectual property services, collaborative governance, performance measurement, and regional linkages. The study proposes seven strategic pillars: specialization-based positioning, an integrated talent pipeline, AI-native production and experimentation, market-driven cluster development, financing and intellectual property, collaborative governance and data, and place-based and global connectivity. The study concludes that the Singhasari SEZ should strengthen its role as an ecosystem orchestrator that connects policy, talent, technology, creative production, investment, markets, and regional-global networks to generate sustainable innovation and economic value.

Keywords: Special Economic Zone; Singhasari SEZ; digital innovation hub; innovation ecosystem; collaborative governance

INTRODUCTION

Special Economic Zones (SEZs) are place-based policy instruments designed to accelerate economic growth, attract investment, create employment, and establish new centers of economic development. Over time, the role of SEZs has expanded beyond the provision of land, fiscal incentives, infrastructure, and investment facilitation toward the development of specialized areas capable of fostering innovation, strengthening linkages with local economies, and facilitating knowledge and technology transfer. This transformation has become increasingly important with the emergence of knowledge-, creativity-, and digitally driven economies. SEZs that rely primarily on physical infrastructure and fiscal incentives may lose competitiveness if they fail to develop talent, technological capabilities, market connections, networks, and collaboration among stakeholders. International experience indicates that successful SEZ development is strongly influenced by governance quality, specialization, connectivity, linkages with surrounding economies, and the ability to adapt to technological and market changes (United Nations Conference on Trade and Development [UNCTAD], 2019; Zeng, 2015).

The Singhasari SEZ has distinctive characteristics compared with SEZs primarily oriented toward manufacturing, natural resources, or logistics. Established through Government Regulation of the Republic of Indonesia Number 68 of 2019, the zone consists of two principal areas: a Tourism Zone and a Technology Development Zone. Its location within Greater Malang provides strategic advantages through the presence of educational institutions, young talent, creative communities, tourism activities, and cultural heritage that can support the development of digital and creative industries. Activities associated with the zone include software development, artificial intelligence (AI), information technology infrastructure, cybersecurity, animation, film, games, content production, education, and digital talent development. The establishment of the Animation and Film Factory, partnerships with educational institutions, and national and international collaboration networks demonstrate efforts to position Singhasari not merely as an investment

location but as a platform for learning, production, innovation, and collaboration. Nevertheless, the presence of facilities, programs, and partnerships does not automatically constitute an integrated innovation ecosystem without effective connections among talent, technology, creative production, investment, markets, and governance.

Previous studies have examined the development of the Singhasari SEZ and Indonesian SEZs from several perspectives. Sentanu, Prabowo, and Haryono (2023) demonstrated that the integration of investment, tourism, and creative industries is an important component of the Singhasari SEZ development strategy. Anisah et al. (2024) examined the capacity of the Singhasari SEZ to respond to changes in the global economy and identified challenges related to institutions, markets, and stakeholder participation. In the broader Indonesian context, Taufiqurrahman and Khoirunurrofik (2023) found that SEZ establishment does not necessarily lead to equitable development or poverty reduction when linkages with local economies remain weak. From an innovation ecosystem perspective, innovation performance also depends on the alignment of multiple actors and their capacity to collectively deliver a shared value proposition (Adner, 2006). Furthermore, collaborative governance emphasizes the importance of collective decision-making involving public institutions and non-state stakeholders in addressing complex development issues (Ansell & Gash, 2008). These studies indicate that the development of digitally oriented SEZs requires more than infrastructure and investment incentives; it also requires effective mechanisms for connecting actors, resources, knowledge, services, and markets.

Despite these contributions, previous studies have predominantly focused on investment, tourism, creative industries, sustainability, and the broader socioeconomic impacts of SEZ development. Research that specifically conceptualizes the Singhasari SEZ as a creative and digital innovation hub through a collaborative ecosystem perspective remains limited. This gap is important because a creative and digital innovation hub should not be understood merely as a physical location or a collection of facilities. Rather, it functions as an integrated platform connecting knowledge creation, talent development, technological experimentation, creative production, business incubation, financing, and market access through collaborative networks. The novelty of this study therefore lies in integrating three analytical dimensions: the foundations of the zone, ecosystem architecture, and collaborative orchestration. Within this framework, the SEZ management entity is positioned not only as an estate and infrastructure manager but also as an ecosystem orchestrator that connects government, educational institutions, industries, creative communities, technology providers, investors, and markets.

Accordingly, this study aims to analyze the development strategy of the Singhasari SEZ as a creative and digital innovation hub through a collaborative ecosystem approach. Specifically, the study examines the institutional, spatial, and sectoral foundations supporting the development of the innovation hub; maps the actors, resources, and activities that have emerged within the ecosystem; identifies strategic gaps that constrain ecosystem integration; and formulates development strategies capable of strengthening the connections among talent, technology, creative production, investment, markets, and global networks. Conceptually, the study contributes by integrating the literature on special economic zones, innovation ecosystems, digital innovation hubs, and collaborative governance within a place-based analytical framework. Practically, it seeks to provide strategic directions for strengthening the Singhasari SEZ as a competitive creative and digital innovation hub while enhancing its linkages with the broader Greater Malang ecosystem.

RESEARCH METHOD

This study employed a qualitative approach with an instrumental case study design to examine the development strategy of the Singhasari Special Economic Zone (SEZ) as a creative and digital innovation hub. A qualitative case study was considered appropriate because the research focuses on understanding a contemporary phenomenon within its institutional, economic, and regional context rather than statistically testing causal relationships. The Singhasari SEZ was selected as the case because of its distinctive integration of tourism, technology development, education, and creative industries within a single special economic zone. The unit of analysis was the strategy and process of innovation ecosystem development within the Singhasari SEZ, particularly the relationships among institutional foundations, actors, resources, activities, and ecosystem orchestration. The case study approach enables an in-depth investigation of complex phenomena by incorporating multiple forms of documentary evidence and examining their contextual relationships (Creswell & Poth, 2018; Yin, 2018).

The study relied on documentary data published between 2019 and July 2026, corresponding to the period beginning with the formal establishment of the Singhasari SEZ and extending to the most recent documents included in the study. Primary documentary sources consisted of Law of the Republic of Indonesia Number 39 of 2009 concerning Special Economic Zones, Government Regulation Number 68 of 2019 concerning the Singhasari Special Economic Zone, Government Regulation Number 40 of 2021 concerning the Administration of Special Economic Zones, reports and official releases issued by the Coordinating Ministry for Economic Affairs and the National Council for Special Economic Zones, as well as official publications from the Singhasari SEZ management entity. Secondary sources included scholarly publications addressing the Singhasari SEZ, special economic zones, innovation ecosystems, digital innovation hubs, creative industries, regional development, and collaborative governance.

Document selection was conducted purposively based on four criteria: relevance to the research objectives, authority of the issuing institution or publisher, clarity of publication year, and direct connection with the development of the Singhasari SEZ or the analytical concepts employed in this study. Regulatory documents were selected to establish the legal mandate, geographical boundaries, designated zones, and institutional objectives of the SEZ. Government and official SEZ publications were used to identify policies, programs, facilities, partnerships, and development activities, while scholarly literature was employed to establish analytical categories and interpret the empirical evidence. Documents that did not directly address the research focus or did not provide sufficient information regarding their institutional or publication context were excluded from the analysis. This selection procedure was intended to ensure that the evidence used in the study remained relevant and traceable to identifiable documentary sources.

Data collection was conducted through four stages. First, regulatory documents were identified and examined to determine the institutional mandate, spatial configuration, development zones, and strategic objectives of the Singhasari SEZ. Second, government reports, official publications, and program-related documents were examined to map sectors, facilities, partnerships, actors, and forms of ecosystem services. Third, relevant scholarly literature was reviewed to establish the conceptual basis for evaluating SEZ transformation, innovation ecosystems, digital innovation hubs, creative industries, and collaborative governance. Fourth, the collected evidence was organized into an evidence matrix linking strategic statements, identified activities, participating actors, available resources, and implementation gaps. This procedure enabled the study to systematically compare the formal positioning of the zone with the ecosystem functions reflected in the documentary evidence.

Data were analyzed using the interactive qualitative analysis framework proposed by Miles, Huberman, and Saldaña (2014), consisting of data condensation, data display, and conclusion drawing/verification. During data condensation, documentary evidence was organized and coded into major analytical categories, including institutional foundations, locational advantages, talent development, technology, creative production, investment and markets, partnerships, governance, and development outcomes. The data-display stage involved organizing the findings into actor-resource relationships, strategic matrices, and patterns of ecosystem development. Conclusions were subsequently developed by identifying recurring patterns, inconsistencies across documentary sources, and gaps between the positioning of the Singhasari SEZ and the functions required of an integrated creative and digital innovation ecosystem. The resulting strategic formulation was therefore derived from the relationship between documented conditions, identified ecosystem gaps, and the conceptual framework employed in the study.

The credibility of the analysis was strengthened through source triangulation. Information concerning the legal status, area, and designated zones of the Singhasari SEZ was cross-checked against government regulations; evidence concerning policies and institutional partnerships was examined through government documents; and information regarding operational programs and activities was derived from official publications of the zone management entity and interpreted in relation to relevant scholarly literature. Nevertheless, this study is limited by its reliance on documentary evidence and does not include interviews, surveys, direct observations, or stakeholder quotations. Consequently, the findings should be interpreted as a document-based strategic analysis rather than a definitive evaluation of stakeholder experiences or perceptions. Future research should therefore incorporate primary data from SEZ management, government institutions, tenants, educational institutions, creative communities, investors, and surrounding communities to validate and further develop the proposed ecosystem strategy.

RESULT AND DISCUSSION

Institutional Foundation and the Transition from an Economic Zone to an Innovation Ecosystem

The institutional foundation of the Singhasari Special Economic Zone (SEZ) provides considerable flexibility for its development beyond the conventional model of a tourism- or investment-oriented economic zone. Government Regulation of the Republic of Indonesia Number 68 of 2019 established the Singhasari SEZ across an area of approximately 120.3 hectares and designated two principal zones: the Tourism Zone and the Technology Development Zone. The regulatory framework explicitly accommodates activities related to research and technology, engineering, applied technology, software development, and information technology services. This institutional configuration enables the convergence of tourism, digital technology, education, and creative industries within a single development area.

The findings indicate that this sectoral diversity constitutes both an advantage and a strategic challenge. On the one hand, the combination of tourism, digital technology, education, creative production, and commercial activities creates opportunities for cross-sector innovation. On the other hand, excessive diversification may weaken the zone's strategic positioning if the relationship among these sectors is not clearly defined. Tourism tends to emphasize visitor experience and expenditure, educational institutions focus on learning and certification, technology firms emphasize innovation and efficiency, while creative industries depend on project continuity, intellectual property, distribution, and market access. Consequently, the competitiveness of the Singhasari SEZ depends not merely on the coexistence of these sectors but on the extent to which they can be integrated into a coherent value-creation system.

The development trajectory identified from the documentary evidence can be interpreted through three stages. The first is the establishment stage, characterized by regulatory designation, institutional formation, development of basic infrastructure, and sectoral positioning. The second is the ecosystem formation stage, reflected in the emergence of animation and film initiatives, digital technology activities, vocational education networks, and international partnerships. The third stage is ecosystem scaling, in which programs and facilities are expected to generate recurring commercial projects, business growth, employment, intellectual property, investment, and market expansion. The current strategic challenge therefore lies in moving from the formation of ecosystem components toward sustained ecosystem productivity.

This transition is consistent with the broader literature on SEZ development. Zeng (2015) argued that successful economic zones depend on strong governance, market orientation, connectivity, and linkages with surrounding economies rather than fiscal incentives alone. Similarly, UNCTAD (2019) emphasized that SEZ performance should be assessed not only through investment attraction but also through knowledge transfer, local linkages, capability development, and broader economic impacts. These perspectives support the interpretation that the future competitiveness of the Singhasari SEZ should be measured through ecosystem outcomes rather than merely through physical development or investment commitments.

Greater Malang as a Talent and Creative Catchment Area

A major competitive advantage of the Singhasari SEZ derives from its location within the Greater Malang region. The documentary analysis identifies the surrounding concentration of universities, vocational schools, creative communities, tourism destinations, technology-related activities, and cultural heritage as strategic resources for the development of creative and digital industries. These external assets extend the functional boundaries of the SEZ beyond its formal administrative area and position the zone within a broader regional innovation system.

The relationship between place, culture, and digital production is particularly significant. The cultural and historical identity associated with Singhasari can potentially support the development of stories, animation, games, film, immersive media, and other intellectual-property-based products. Tourism destinations can simultaneously serve as application environments for augmented reality, virtual experiences, digital ticketing, visitor analytics, interactive content, and destination marketing technologies. In this configuration, tourism is not treated as an isolated sector but as a potential living laboratory and market application for creative and digital innovation.

However, regional integration cannot be assumed to emerge automatically. Administrative boundaries among Malang Regency, Malang City, and Batu City, as well as the distinct priorities of universities, firms, communities, and public institutions, may create fragmentation. For the Singhasari SEZ to function as a regional innovation hub, actors outside the zone must receive concrete benefits from participation, such as access to projects, laboratories, certification, financing, technology, markets, and international networks.

The evidence therefore suggests that the zone should position itself not as a competitor to the Greater Malang ecosystem but as a platform that consolidates and scales existing regional capabilities.

Existing Architecture of the Creative and Digital Ecosystem

The documentary analysis identified five major components that currently form the initial architecture of the Singhasari SEZ innovation ecosystem. The first component is talent development. Collaboration with vocational schools, university students, teachers, and educational institutions demonstrates an effort to connect creative and digital industries with human-resource development. This is strategically important because industries such as animation, software development, artificial intelligence, and digital content production depend heavily on a continuous supply of skilled talent.

The second component is creative production. The Animation and Film Factory, Content Garage, Game Factory, and related initiatives demonstrate that the ecosystem is not limited to training activities but includes production-oriented functions. This distinction is important because training generates economic value only when participants are connected with commercial projects, production standards, distribution channels, and intellectual property opportunities.

The third component is digital technology capability, including software development, artificial intelligence, IT infrastructure, big data, cloud technology, the Internet of Things, advanced robotics, and cybersecurity. These capabilities create opportunities for the Singhasari SEZ to serve not only creative industries but also organizations requiring digital transformation. Nevertheless, the findings suggest that these technological capabilities need to be transformed from broad capability statements into clearly defined service portfolios specifying users, problems addressed, technological readiness, delivery mechanisms, and measurable outcomes.

The fourth component is physical and digital infrastructure. Basic infrastructure such as electricity, internet access, water, waste management, and road connectivity provides an essential foundation for investment. However, a creative and digital innovation hub requires additional shared infrastructure, including production facilities, high-performance computing, cybersecurity laboratories, prototyping facilities, collaborative workspaces, and digital project-management systems. Such facilities should be developed in response to market requirements rather than as symbolic infrastructure.

The fifth component is the partnership network. Collaboration with companies, schools, higher education institutions, and international organizations broadens the knowledge and market base of the ecosystem. Partnerships with international institutions can strengthen legitimacy and knowledge exchange; however, their strategic value depends on whether they generate recurring outputs such as joint curricula, applied research, professional education, internships, co-production, venture development, or market access.

The findings therefore indicate that essential ecosystem components are already present, but they have not yet formed a fully integrated value chain. An ideal creative and digital innovation value chain should connect talent attraction and selection, learning and certification, experimentation and prototyping, commercial production, intellectual property development, financing and business scaling, distribution and market access, and reinvestment. Fragmentation at any stage may reduce the productivity of the entire ecosystem. Training without projects, technology without use cases, production without distribution, or international partnerships without local implementation may create activity without sustained economic value.

The Role of the SEZ Management Entity as an Ecosystem Orchestrator

The findings suggest that the management entity of the Singhasari SEZ must perform a broader function than conventional estate management. Traditional estate management focuses on land, buildings, utilities, licensing, tenant services, and infrastructure. In contrast, ecosystem management focuses on relationships, knowledge flows, collaborative projects, talent development, financing, business growth, and market access. The transformation of the Singhasari SEZ into a creative and digital innovation hub therefore requires the integration of both functions.

This role can be conceptualized as ecosystem orchestration. An ecosystem orchestrator does not directly control all participating actors but creates the architecture through which they collaborate, exchange resources, and generate shared value. In the Singhasari context, the zone management entity is strategically

positioned to perform this role because it connects physical infrastructure, investors, government institutions, educational organizations, companies, and other ecosystem actors.

The findings indicate that effective orchestration requires institutional mechanisms rather than informal networking alone. Potential mechanisms identified in the strategic analysis include an ecosystem council, sector-specific working groups, a program management office, and an ecosystem data observatory. These mechanisms would provide different levels of governance: strategic direction, sectoral coordination, project execution, and evidence-based monitoring.

This interpretation is consistent with collaborative governance theory. Ansell and Gash (2008) emphasized the importance of institutional design, facilitative leadership, dialogue, trust, and shared commitment, while Emerson, Nabatchi, and Balogh (2012) highlighted principled engagement, shared motivation, and capacity for joint action. In the context of the Singhasari SEZ, these principles imply that collaboration should be built around concrete projects and shared outcomes rather than ceremonial partnerships or memoranda of understanding alone.

Strategic Gaps in Ecosystem Development

The analysis identifies seven interrelated strategic gaps that may constrain the transition of the Singhasari SEZ toward a mature creative and digital innovation hub. First, the zone's positioning remains relatively broad because it simultaneously incorporates tourism, technology, education, and creative industries. Although diversification offers flexibility, it may weaken market differentiation. The zone therefore requires a more focused innovation proposition grounded in the capabilities already emerging from the ecosystem.

Second, the relationship between talent-development programs and market demand needs to be strengthened. Training programs are more likely to generate economic value when curricula are directly linked to commercial projects, industry standards, apprenticeships, employment, and entrepreneurial opportunities. A demand-led talent pipeline is therefore more appropriate than a training model based primarily on course participation.

Third, the ecosystem requires stronger anchor industries and anchor markets. Creative and digital production depends on recurring demand. Anchor companies, broadcasters, game publishers, telecommunications firms, technology companies, government agencies, tourism operators, and other large organizations may provide the stable project pipeline required to sustain studios, startups, and skilled workers.

Fourth, financing and intellectual property management remain underdeveloped components. Digital and creative businesses often depend on intangible assets that cannot easily be financed through conventional collateral-based mechanisms. Services related to intellectual property registration, valuation, licensing, legal support, investment readiness, and project financing are therefore necessary to transform creative outputs into commercially sustainable assets.

Fifth, innovation-related services have not yet been consolidated into a clear one-stop service portfolio. Potential investors or clients should be able to access a structured pathway from assessment and technology testing to talent sourcing, production support, financing, regulatory facilitation, and market connection.

Sixth, ecosystem performance measurement needs to extend beyond conventional SEZ indicators such as investment value, land occupancy, tenant numbers, and employment. Indicators should also measure collaborative projects, technology adoption, talent placement, creative production value, intellectual property creation, digital exports, startup financing, and local business participation.

Seventh, stronger mechanisms are required to ensure linkages with surrounding communities and the local economy. Without such mechanisms, a digital innovation hub could become a new form of economic enclave. Scholarships, vocational-school programs, teacher development, SME access, community commissioning, open laboratories, and culturally grounded creative production can strengthen both economic inclusion and the legitimacy of the zone.

Seven Strategic Pillars for the Development of the Singhasari SEZ

Based on the identified foundations and strategic gaps, this study formulates seven mutually reinforcing pillars for the development of the Singhasari SEZ as a creative and digital innovation hub.

The first pillar is specialization-based positioning. The zone should develop a more focused identity around its strongest combinations of assets. The analysis suggests three interconnected areas: AI-enabled creative production, digital talent development, and cultural-tourism technology. Such positioning integrates existing tourism, education, technology, and creative-industry assets without attempting to compete across all areas of the digital economy.

The second pillar is an integrated talent pipeline. Talent development should progress from awareness and foundational learning to specialization, certification, apprenticeship, paid projects, employment or entrepreneurship, and continuous upskilling. Educational institutions and industries should share competency frameworks, while graduate and participant outcomes should be tracked to determine whether programs generate employment and commercial capability.

The third pillar is AI-native production and experimentation. Existing creative-production and technology facilities can be developed into integrated platforms combining generative AI, animation, film, game engines, virtual production, immersive media, cloud infrastructure, and digital experimentation. The strategic purpose is not merely technology adoption but the creation of services that allow companies and public institutions to test technologies before making large-scale investments.

The fourth pillar is market-driven cluster development. Cluster development should begin with demand rather than supply. A dedicated market function could identify digital and creative needs in tourism, education, government, media, telecommunications, financial services, and consumer industries, then translate these needs into project briefs that can be delivered by tenant consortia, startups, studios, and trained talent.

The fifth pillar is financing and intellectual property. The ecosystem requires services for investment readiness, legal support, copyright and trademark management, licensing, valuation, production contracts, and alternative financing. This pillar is particularly important because long-term value in creative industries may derive not only from production services but also from ownership and commercialization of intellectual property.

The sixth pillar is collaborative governance and data. Ecosystem decisions should be supported by systematic information regarding talent, firms, projects, investment, technology adoption, and outcomes. Governance can be organized at three levels: a strategic council for direction and performance indicators, cluster working groups for sectoral programs, and project teams for implementation.

The seventh pillar is place-based and global connectivity. The Singhasari SEZ should connect its physical assets with the wider Greater Malang ecosystem and international networks. A hub-and-spoke model would allow the SEZ to function as a coordinating and market-access platform while universities, vocational schools, communities, creative spaces, and tourism destinations across the region participate as distributed ecosystem nodes. International partnerships should be evaluated through tangible outputs such as co-production, applied research, student mobility, investment, and market access rather than merely through the number of institutional agreements.

Table 1. Development Strategy Matrix for the Singhasari SEZ as a Creative and Digital Innovation Hub

DIMENSION	IDENTIFIED FOUNDATION	STRATEGIC GAP	RECOMMENDED DIRECTION
Specialization and positioning	Digital SEZ narrative integrating technology, education, creative industries, and tourism	Value proposition remains too broad	Focus on AI-enabled creative production, digital talent, and cultural-tourism technology
Talent pipeline	Collaboration with vocational schools, students, teachers, and educational partners	Training is not consistently linked to projects and employment	Demand-led curriculum, apprenticeship, paid projects, placement, and alumni tracking

Production and experimentation	Animation and Film Factory, software, AI, cloud, and cybersecurity capabilities	Services have not been consolidated as an integrated testing and production platform	Shared facilities, try-before-invest services, AI production laboratories, and project management
Markets and tenants	Existing partnership network and potential sectoral markets	Limited anchor demand and anchor industries	Market desk, anchor projects, co-production, and project-based tenant acquisition
Financing and intellectual property	Creative production, startup, and IP potential	Financing and rights management are not yet integrated ecosystem services	Financing desk, IP clinic, legal support, licensing, and commercialization
Governance and data	Interaction among government, management, education, industry, and communities	Fragmented coordination and dependence on personal relationships	Ecosystem council, cluster working groups, PMO, and ecosystem observatory
Regional and global connectivity	Strategic location within Greater Malang and international partnerships	External ecosystem linkages remain insufficiently integrated and measured	Hub-and-spoke model, regional gateway, co-production, applied research, and market access

Proposed Creative and Digital Innovation Hub Model

Based on the seven strategic pillars, the study proposes a four-layer development model consisting of foundation, capability, value creation, and outcomes. The foundation layer includes regulation, infrastructure, place, identity, and connectivity. The capability layer consists of talent, technology, research, production facilities, and business services. The value-creation layer includes collaborative projects, products, intellectual property, startups, digital transformation, and tourism experiences. The outcome layer consists of investment, skilled employment, digital-service exports, innovation, local business development, regional reputation, and broader development impacts.

Within this model, ecosystem orchestration connects all four layers through governance, data, financing, partnerships, and market access. Investment functions both as an input and an outcome. Initial investment develops capabilities; capabilities generate production and projects; successful projects create market evidence; market evidence attracts additional investment; and new investment further expands ecosystem capability. This creates a reinforcing cycle rather than a linear development process.

Implementation can be organized into three horizons. The short-term horizon, approximately one to two years, should focus on consolidating positioning, defining service portfolios, mapping talent and market demand, establishing governance mechanisms, and implementing anchor projects. The medium-term horizon, approximately three to five years, should emphasize anchor tenants, export-oriented projects, stronger AI and production infrastructure, financing mechanisms, and intellectual property commercialization. The long-term horizon, approximately five to ten years, should seek regional and international recognition, cross-border production networks, applied research capabilities, and the emergence of a mature innovation district.

Theoretical and Practical Implications

Theoretically, the findings extend the analysis of SEZ development from place-based incentives toward place-based ecosystem orchestration. Infrastructure, regulatory privileges, and investment incentives remain necessary, but they are insufficient to create a sustainable innovation hub. Competitive value emerges when the zone reduces the costs and risks associated with finding partners, developing skills, testing technologies, obtaining financing, and reaching markets. This finding reinforces the ecosystem perspective proposed by Adner (2006), in which innovation performance depends on the alignment and interdependence of multiple actors rather than the capability of a single organization.

The findings also demonstrate that a creative and digital innovation hub must combine industrial and cultural logics. Industrial development requires productivity, standards, contracts, financing, market access, and scalability, while creative development depends on identity, cultural expression, participation, diversity, and intellectual property. The Singhasari SEZ has the potential to bridge these logics because its

institutional mandate already combines technology development and tourism within a region characterized by educational and cultural assets.

Practically, the results imply that the management entity should market the Singhasari SEZ through an ecosystem value proposition rather than predominantly through land, infrastructure, and incentives. Digital and creative investors are also concerned with talent availability, experimentation costs, access to technology, market connections, collaborative communities, and quality of place. Educational institutions can benefit from closer relationships with industry through joint curricula, applied research, apprenticeships, and commercial projects, while industries can gain access to talent and testing infrastructure. Creative communities and local businesses can participate through commissioning, production, commercialization, and regional value chains. In this configuration, the strategic contribution of the Singhasari SEZ lies in its ability to function as an ecosystem orchestrator that connects policy, place, talent, technology, creative production, investment, markets, and global networks rather than simply as a geographically bounded investment zone.

CONCLUSION

This study concludes that the Singhasari Special Economic Zone (SEZ) has a strong foundation to be developed as a creative and digital innovation hub due to its institutional mandate, strategic location within Greater Malang, access to educational institutions and young talent, cultural and tourism assets, digital technology activities, creative production facilities, and national and international partnerships. However, the presence of these elements has not yet automatically created a fully integrated innovation ecosystem. The main challenge lies in strengthening the connections among talent development, technology, creative production, financing, market access, governance, and regional linkages so that the zone can generate sustainable economic and innovation outcomes.

The study identifies seven strategic pillars required to strengthen this transformation: specialization-based positioning, an integrated talent pipeline, AI-native production and experimentation, market-driven cluster development, financing and intellectual property, collaborative governance and data, and place-based and global connectivity. These pillars position the SEZ management entity not merely as an estate manager but as an ecosystem orchestrator that connects government, educational institutions, industries, creative communities, technology providers, investors, and markets. Through this role, the management entity is expected to transform fragmented programs and facilities into an integrated system of value creation.

The proposed development model consists of four interconnected layers: foundation, capability, value creation, and outcomes. Regulatory support, infrastructure, place identity, and connectivity form the foundation; talent, technology, production facilities, research, and business services build ecosystem capability; collaborative projects, products, intellectual property, startups, and digital transformation generate value; while investment, skilled employment, service exports, innovation, local business growth, and regional development represent the expected outcomes. This model emphasizes that the competitiveness of the Singhasari SEZ should be measured not only by investment value, tenant numbers, or physical development, but also by its ability to generate recurring projects, commercialized intellectual property, skilled employment, technology adoption, and broader spillover effects for the Greater Malang economy.

This study is limited by its reliance on documentary evidence and therefore does not fully capture the experiences, perceptions, and interests of all stakeholders involved in the Singhasari SEZ ecosystem. Future research should incorporate interviews, surveys, and direct observations involving SEZ management, government institutions, tenants, educational institutions, creative communities, investors, and surrounding communities. Further studies may also test ecosystem performance indicators, financing mechanisms, talent-readiness models, and comparative development patterns between the Singhasari SEZ and other creative or digital innovation hubs in Indonesia and Southeast Asia.

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