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Penta-Helix Collaborative Governance Model for Youth Innovation Centers: A Design to Accelerate the Entrepreneurship and Creative Economy Ecosystem in Tangerang Regency

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ABSTRACT

This study analyzes the Penta Helix governance model design for the Tangerang Regency Youth Innovation Center (PIP), which is planned to be established based on academic studies in 2025. The background is a development paradox: the largest industrial area in Banten with 3.3 million residents and 70.09% of productive age, but facing a mismatch of workforce competencies and low youth competitiveness in the digital creative economy. Using a qualitative approach based on document analysis and policy studies, the study concludes that the Penta Helix model that integrates Government, Academic, Business, Community, and Media actors is most relevant to the Tangerang PIP context. Its uniqueness lies in the dominance of business/manufacturing industry actors as the main enablers, different from generic models in non-industrial areas. A hybrid institutional model between UPTD and third-party collaboration is considered optimal to balance innovation flexibility with public accountability. Theoretically, this study contributes the Business-Anchored Penta Helix concept as a contextual variant of the standard Helix theory, while formulating institutional recommendations for the establishment of the Tangerang Regency PIP.

INTRODUCTION

Tangerang Regency holds a development paradox that is academically interesting to study in depth. On the one hand, this region is widely known as the 'City of a Thousand Industries' a nickname that is not merely rhetoric, but reflects the empirical reality that this area is one of the largest manufacturing industry clusters in Indonesia, with the presence of hundreds of multinational and domestic companies spread from

the Balaraja corridor to Pasar Kemis. On the other hand, the population of Tangerang Regency in 2023 reached 3,309,365 people with a concentration of productive age population (15–64 years) reaching 70.09% (BPS Tangerang Regency, 2024) actually faces serious challenges in the form of competency mismatch, low youth competitiveness in the digital creative economy, and the unoptimized demographic bonus as development capital.

Employment data shows that Vocational High School (SMK) graduates in Tangerang Regency, who are curricularly prepared to enter the industrial workforce, often face a significant competency gap with the actual demands of Industry 4.0. Meanwhile, the School Participation Rate for the 19–24 age group in Tangerang Regency has only reached 23.40%, far below South Tangerang City (38.06%) and Tangerang City (32.46%) (BPS Banten, 2024) . This condition indicates a large segment of productive youth who are not in the formal higher education pathway and at the same time require alternative capacity development pathways.

The Industrial Revolution 4.0, characterized by automation, artificial intelligence (AI), and the digitalization of production processes, has fundamentally changed the employment landscape. Conventional, labor-intensive jobs that have traditionally been the primary source of employment for young workers are increasingly being replaced by machines and algorithms, while demand for digital competencies, high-level creativity, and an entrepreneurial spirit continues to grow rapidly. This is where the strategic urgency of establishing a Youth Innovation Center (PIP) in Tangerang Regency lies.

The Tangerang Regency Government, which plans to establish a Youth Entrepreneurship Program (PIP) based on the mandate of the Regional Government (2014) and the Minister of Youth and Sports Regulation Number 1 of 2023 concerning Increasing the Competitiveness of Youth Entrepreneurship in the Regions, has assigned a team of academics to conduct an in depth study of the fundamental aspects of establishing a PIP. The study, completed in February 2025, identified its functions, potential economic impacts, design concepts, and the most appropriate institutional model (PIP Study Compilation Team, 2025). This study served as the primary data source for this research.

The Penta Helix model, as a theoretical extension of the Triple Helix (Mensah & Enu-Kwesi, 2018) and Quadruple Helix (Carayannis & Campbell, 2018), offers a collaborative governance framework that integrates five key actors of the innovation ecosystem: Government , Academia , Business, Community , and Media. This model is considered the most comprehensive in responding to the complexity of the modern innovation ecosystem that can no longer be driven effectively by just one or two actors. Its relevance to the context of the PIP Tangerang Regency as a region with industrial density, demographic bonus, and large creative economic potential is the main analytical focus of this study.

There is a conceptual gap that has not been fully answered in the *collaborative governance literature* , namely how the Penta Helix model should be operationalized contextually in the environment of industrial satellite regions that have distinctive demographic, economic, and institutional characteristics. The follow-up question is what determinants should function as *anchor* points in the formation of an innovation ecosystem in such a context. This study seeks to fill this gap by using the planning process of the Tangerang Regency Youth Innovation Center (PIP) as its case analysis unit, as well as an empirical arena to test the relevance and applicability limits of existing theoretical frameworks.

Based on the above background, this study formulates three research questions as follows:

1. How is the Penta Helix collaborative governance model designed to be implemented in the Youth Innovation Center (PIP) that will be established in Tangerang Regency to accelerate the regional entrepreneurship and creative economy ecosystem?
2. What factors have the potential to be determinants of the effectiveness of collaboration between Penta Helix actors in PIP, with particular emphasis on the dominant role of business/manufacturing industry actors in the context of industrial satellite regions?
3. What is the most optimal institutional model for the Tangerang Regency PIP from a hybrid governance perspective that ensures innovation flexibility and public accountability?

This research has three main objectives. First, to analyze the operational framework of the Penta Helix model recommended for the Tangerang Regency Youth Innovation Program (PIP) based on previous academic studies. Second, to identify critical variables that could potentially determine the success or failure of cross-actor collaboration within the planned youth innovation ecosystem. Third, to formulate recommendations for an institutional model that can serve as an operational guide for the establishment and management of the PIP.

Theoretically, this research contributes to the development of *collaborative governance literature* in the context of developing countries characterized by industrial dense satellite regions. This research also proposes the original concept of *the 'Business-Anchored Penta Helix'* as a contextual variant of the standard Penta Helix theory, which currently assumes equal roles among the five actors. Practically, the results of this research are expected to serve as a policy reference for the Tangerang Regency Government in the process of establishing the PIP, as well as for other ministries and local governments designing similar youth innovation centers.

LITERATURE REVIEW

Literature Review and Theoretical Framework

1. Collaborative Governance Theory

According to Himam & Sugiyanto (2025) , collaborative governance is a form of governance in which non-state stakeholders are directly involved in a formal, consensus-oriented, and deliberative collective decision-making process by one or more public institutions. This definition emphasizes three essential elements: formality, consensus, and deliberation, all of which require a structured facilitation platform. Himam & Sugiyanto, (2025)collaborative governance model explains that starting conditions , such as power imbalances between actors, a history of collaboration, and incentives to participate, significantly influence the process and output of collaboration.

In their article entitled " *Evaluating the Productivity of Collaborative Governance Regimes: A Performance Matrix, "* Emerson & Nabatchi (2015) developed an evaluation framework that allows for systematic measurement of the productivity *of Collaborative Governance Regimes (CGRs). They constructed a nine-dimensional performance matrix that combines three levels of performance: actions* , *outcomes* , and *adaptation* , with three units of analysis: participating organizations, the CGR itself, and target goals. This framework emphasizes that effective collaborative capacity requires communication, conflict management, trust-building, and social capital as fundamental prerequisites.

The relevance of Emerson & Nabatchi's (2015) framework to this research is very strong: in the context of PIP which is still in the planning stage, this CGR productivity evaluation framework can be used as a prospective guide to design a comprehensive monitoring and evaluation system from the start of operations, so that accountability and adaptability of PIP governance can be guaranteed from day one.

2. Evolution of the Helix Model in the Innovation Ecosystem

The Helix model evolved gradually in the study of regional innovation, reflecting the ever growing complexity of the innovation ecosystem. The Triple Helix integrates three fundamental actors: universities (knowledge sources), industry (commercialization), and government (regulation). This model was later developed into the Quadruple Helix with the addition of civil society as a fourth actor, recognizing that sustainable innovation requires social legitimacy.

The latest development is the Penta Helix model, which adds media as a fifth actor (Grundel & Dahlström, 2016). In the digital economy era, the addition of media, including conventional mass media and digital platforms, has strong justification, given the central role of social media, content platforms, and digital ecosystems in shaping public opinion, building startup ecosystems, and amplifying innovation narratives.

Carayannis & Campbell (2018) argue that in the modern innovation ecosystem, the five Helix actors do not interact linearly but rather in a dynamic and mutually reinforcing spiral pattern which they call the ' *quintuple helix of innovation* '. Each actor has a unique but complementary role. The government acts as a facilitator of regulation and public infrastructure; academia as the guardian of research-based knowledge and innovation standards; business as the motor of commercialization and absorber of innovation output; communities as a source of grassroots creativity and social validation; and the media as an amplifier that expands the reach of the ecosystem exponentially (Bouncken & Reuschl, 2018).

3. Creative Economy, Public Sector Innovation, and Youth Entrepreneurship

John Howkins (2001) popularized the concept of *the creative economy* as an economy that generates value from individual creativity, skills, and talents. In Indonesia, the Ministry of Tourism and Creative Economy identifies applications and games, architecture, interior design, visual communication design, product design, fashion, film/animation/video, photography, crafts, music, publishing, advertising, performing arts, fine arts, television and radio, and online television/radio among the 17 subsectors of the creative economy. This framework serves as the foundation for the planned PIP programs that will support youth in developing capacity across the spectrum of these subsectors.

In the context of public sector innovation, Hilmi et al., (2026) explains that government organizational innovation is a transformation of core functions and permanent changes in organizational structure. Meanwhile, Suhindarno et al., (2024) emphasizes that public sector innovation is a new idea that is implemented and must provide tangible benefits. The establishment of PIP as a policy response to the challenge of workforce mismatch thus represents a form of impact-oriented public sector innovation.

Joseph Schumpeter (1934), in his theory of entrepreneurship, emphasized entrepreneurs as agents of change who engage in creative destruction. Drucker (1986) added that entrepreneurship is a learned practice, not simply an innate talent, which serves as the philosophical foundation for the existence of incubators and innovation centers. In the context of youth, UNESCO (2017) emphasized that youth innovation centers need to provide facilitation, training, access to technology, and mentoring oriented towards developing the capacity of youth as agents of change.

4. Research Framework

This research adopts a system-based thinking framework Input–Process–Output–Outcome that integrates Collaborative Governance theory with the empirical conditions of Tangerang Regency. At the input level, there are three initial conditions that are the driving force for the establishment of PIP: (1) the industrial paradox of being a 'City of a Thousand Industries' accompanied by the challenge of workforce *mismatch* ; (2) the demographic bonus of a concentration of 70.09% of the productive age population that requires a structured development platform; and (3) the digital skills gap amidst the acceleration of the Industrial Revolution 4.0.

At the process level, the Penta Helix model is positioned as a governance mechanism that synergistically integrates the five actors. PIP, as the institution to be established, acts as an intervening variable that carries out four main functions: (1) developing youth creativity, (2) competency-based non-formal education and training, (3) strengthening professional networks across actors, and (4) social empowerment for youth from marginalized groups. The targeted output is digitally skilled and entrepreneurial youth, while the long-term outcome is the growth of a startup ecosystem and local creative economy that contributes to regional economic independence within the framework of the Golden Indonesia 2045 vision.

RESEARCH METHODS

1. Research Approach and Design

This study adopts an interpretivist paradigm, which rests on the ontological assumption that reality is socially constructed and the epistemological assumption that knowledge is gained by interpreting the meanings embedded in texts, documents, and their contexts (Lincoln & Guba, 1985). Rather than measuring reality objectively, the researcher interprets how governance purposes, meanings, and logics are constructed in policy documents. The interpretivist paradigm aligns naturally with qualitative methods, as both emphasize depth of meaning, contextuality, and non-numerical analysis. Accordingly, this study employs a descriptive analytical qualitative approach, using a policy document analysis design supported by a thematic literature review. This approach was chosen because the object of study is an institution that is not yet operational (pre-operational stage), so no experience based empirical data are available. Policy planning documents, regional contextual data and governance theory literature are therefore the most valid and reliable data sources (Lim, 2025).

The qualitative approach was chosen because the research questions are *'how'* and ' *what'* how the governance model is designed, and what factors are potentially determinants that are epistemologically more appropriate to be answered through in-depth interpretation rather than statistical measurement (Creswell & Poth, 2017). Robert K. Yin (2018) emphasized that policy document analysis is a legitimate and often crucial method in governance studies, especially when the phenomenon being studied is still in the planning phase or has just been initiated.

2. Data Sources

This study uses two categories of data sources. First, primary policy data sources, which include: (a) Final Report of the Study on the Establishment of the Youth Innovation Center in Tangerang Regency in 2025 (Tim Penyusunan Kajian PIP, 2025) a document of more than 100 pages produced by a team of academics assigned by the Tangerang Regency Government; (b) Tangerang Regency Regional Regulation Number 10 of 2014 concerning Youth; (c) Initial Draft of the Tangerang Regency RPJMD for 2025–2029; and (d) Regulation of the Minister of Youth and Sports Number 1 of 2023 concerning Increasing the Competitiveness of Youth Entrepreneurship in the Regions.

Second, contextual secondary data sources, which include: (a) BPS Tangerang Regency data in Figures 2024 as a source of demographic and education data; (b) BPS Banten Province data on School Participation Rates; (c) reports from *the World Economic Forum, ILO,* World Bank , *McKinsey Global Institute,* and other international institutions cited in the PIP study; and (d) scientific articles from indexed journals on collaborative governance, Penta Helix, and youth innovation centers.

The document selection criteria were determined *purposively* based on three considerations: (1) direct relevance to the object of study (Tangerang Regency Youth Innovation Center); (2) authority and validity of sources (official government documents, international institutions, or indexed journals); and (3) data recency (prioritization of documents from 2020–2025 except for regulations that are still in effect). The principle of *purposive sampling* in document selection is in accordance with (Morgan, 2022) argument that qualitative document analysis requires deliberative selectivity, not exhaustive completeness.

3. Data Analysis Techniques

Data were analyzed manually using a descriptive qualitative technique, consistent with the interpretivisit paradigm and the policy document analysis design. The analysis proceeded in three sequential stages. First, a content analysis of the 2025 PIP Study Report was conducted through repeated readings and manual thematic coding to consolidate key policy propositions related to collaborative governance. Second, these propositions were systematically mapped against the elements of the Peta Helix model and the *collaborative governance framework assess* their theoretical consistency and to identify strengths, gaps, and contradictions. Third, a comparative institutional

analysis evaluated the two recommended models (the UPTD scheme and the third-party collaboration scheme) against criteria from the new public governance literature. The findings were then synthesized descriptively and narratively to explain how the governance model was designed and which factors determine its effectiveness (Muslikun et al., 2025).

To meet the standards of validity of qualitative research according to Lincoln & Guba (1985), this study applies four criteria: (1) Credibility : achieved through triangulation of sources between three data categories (policy documents, BPS statistical data, and international academic literature *)* **;** (2) Transferability : the description of the context of Tangerang Regency is presented in bold (*thick description)* so that readers can assess the relevance of the findings for similar contexts; (3) Dependability (*dependability*): the analysis process is documented in an audit trail through coding notes and analytical memos; (4) Confirmability (*confirmability*): when there are inconsistencies between sources, this study transparently documents these uncertainties, rather than hiding them for the sake of narrative consistency.

RESULT AND DISCUSSION

1. Context and Urgency of Establishing PIP Tangerang Regency

1.1 Demographic Conditions and Employment Challenges

Based on data from the Tangerang Regency Statistics Agency (BPS) (2024), the population of Tangerang Regency in 2023 reached 3,309,365 people, an increase from 3,245,619 people based on the 2020 Population Census. With a concentration of the productive age population (15–64 years) of 70.09%, Tangerang Regency actually holds the potential for an extraordinary demographic bonus. The districts with the highest population densities are Pasar Kemis, Cikupa, and Curug, all located in the main industrial corridor of Tangerang Regency.

However, this demographic potential does not automatically translate into development capital. Tangerang Regency's 2023 School Participation Rate (APS) data for the 19–24 age group only reached 23.40%, although this figure is above the Banten Province average (24.85%), but remains far below South Tangerang City's 38.06% (BPS Banten Province, 2024). This condition indicates that the majority of college-age youth are not enrolled in formal education, and therefore require accessible alternative capacity-building pathways.

The challenge of competency mismatch between educational output, especially vocational high school graduates, whose numbers continue to increase along with the growth in the number of high schools/vocational high schools by 71 new units in 2023, with the actual needs of industry that are increasingly shifting towards digitalization and automation, is the main context behind the urgency of establishing PIP.

1.2 Creative Economy Potential and Innovation Opportunities

Tangerang Regency has significant potential in the creative and technology industries, which can be boosted through the establishment of a Creative Economy Initiative (PIP). The PIP study report (PIP Study Team, 2025) identified that with the advancement of digital technology and Industry 4.0, young people trained in these fields can create new products and services that strengthen Tangerang Regency's competitiveness in national and international markets. Furthermore, focusing on the creative industry has the potential to increase the sector's contribution to Tangerang Regency's Gross Regional Domestic Product (GRDP).

A report from UNDP & UNCTAD (2022) , cited in the PIP study, states that the creative economy sector has significant potential to increase income and create value added jobs. In the context of Tangerang Regency, this sector can thrive through collaboration between youth, the private sector, and local government, with PIP serving as a hub for innovation development that drives local economic growth (PIP Study Compilation Team, 2025).

The PIP study explicitly identifies four key economic opportunities that can be realized through the existence of PIP: (1) increasing workforce capacity that will strengthen the competitiveness of local human resources; (2) developing an entrepreneurial ecosystem through innovation-based startup incubation; (3) accelerating creative and technology industries that are

relevant to market trends; and (4) increasing access to funding and investors for young entrepreneurs (PIP Study Compilation Team, 2025).

2. Penta Helix Model Designs for PIP Tangerang Regency

The PIP (2025) study explicitly recommends a multi-actor partnership model encompassing government, educational institutions, the private sector, and non-governmental organizations as the foundation of PIP governance. While the study does not literally use the terminology "Penta Helix," the recommended collaborative framework reflects all the essential elements of the model. The following is a mapping of the roles of each actor based on the study's findings:

3. Government Actors (Regulators and Facilitators)

The Tangerang Regency Government plays a dual, complementary role within the PIP ecosystem. As a regulator, this role is realized through the establishment of the PIP's operational legal framework through Regional Regulation No. 10 of 2014 and various derivative regulations. The PIP study (2025) recommends that the Tangerang Regency Government issue a regional regulation or regent's decree specifically governing the establishment, governance, and funding of the PIP, including institutional legality, funding mechanisms, and protection of Intellectual Property Rights (IPR) for youth innovations.

As a facilitator, the government plays a role in providing PIP's physical infrastructure, allocating an annual operational budget through the regional budget (APBD), and facilitating PIP's access to national programs. The PIP study (2025) also recommends comprehensive synergy between regional government agencies (SKPD): the Tangerang Regency Development Planning Agency (Bappeda) in integrating PIP targets into the 2025–2029 RPJMD, the Education Office in a link and match program with vocational schools (SMK), and the DPMPTSP in facilitating licensing for PIP alumni startups.

Specifically, the PIP (2025) study identified two institutional models that the government should consider: (1) a UPTD scheme such as the Bandung Creative Hub, which is under the UPTD Padepokan Seni, Kreativitas, and Budaya Kota Bandung; and (2) a collaborative scheme with third parties such as the Hetero Space model in Central Java, a collaboration between the Central Java Provincial Cooperatives and SMEs Office and the Impala Network. The study recommends a hybrid model that combines the advantages of both schemes.

4.Academic Actors (Conceptors and Standardizers)

Academics within the designed PIP ecosystem act as conceptualizers, providing the scientific foundation for innovation programs and as standardizers, ensuring the quality of training curricula. The PIP (2025) study emphasized that collaboration with universities and colleges is a critical aspect of PIP development, given the significant role educational institutions play in producing skilled human resources prepared to face industry challenges.

Projected academic contributions include: first, the development of an industry-based competency-based training curriculum that is regularly updated according to market needs, encompassing skills in graphic design, digital content creation, animation, mobile application development, artificial intelligence (AI), *the Internet of Things* (IoT), and cloud-based application development. Second, facilitating collaborative research and development (R&D) involving youth as active research partners. Third, an academic mentoring program that connects lecturers and researchers with PIP startups.

The PIP (2025) study also recommends that internship programs directed towards PIP can bring students directly into contact with industry, creating a learning cycle that integrates theory and practice, an approach that Bozeman, Rimes & Youtie (2014, in the PIP Study Team, 2025) have shown can increase technology transfer and accelerate the commercialization of research results.

5.Business Actors (Strategic Enablers)

The role of business actors in the PIP ecosystem is the most complex and strategic, particularly in the context of Tangerang Regency, a densely industrialized region. The PIP (2025) study identified that the private sector, particularly large and medium-sized companies, has in-depth insight into the skills needed by the labor market. Collaboration between the private sector and PIP can create training programs tailored to these needs.

The study recommends four concrete forms of business involvement in PIP: (1) industry-based training and certification programs where companies in the information technology, manufacturing, and creative economy sectors collaborate with PIP to provide intensive training; (2) quality internship programs that provide youth with hands-on experience in the field, apply learned skills, and develop soft skills; (3) business incubators and accelerators where private companies provide seed funding, business guidance, and access to marketing networks; and (4) global market access through e-commerce platforms and distribution networks to expand the reach of innovative youth products (PIP Study Drafting Team, 2025).

The PIP (2025) study specifically emphasized that corporate sponsorship, based on a study , can strengthen the innovation ecosystem by providing financial support while opening up opportunities for further collaboration (Dahlander et al., 2021). Furthermore, research by Sal & Raja (2016) shows that companies actively involved in workforce training and development significantly contribute to skills and productivity improvement, an argument that is increasingly relevant in the context of the need for reskilling due to industrial automation.

6.Community Actors (Grassroots Creativity Accelerator)

Communities within the PIP ecosystem are designed to act as accelerators of grassroots creativity and drivers of organic youth participation. The PIP (2025) study identified numerous positive youth communities in Indonesia with diverse focuses on leadership, the environment, technology, and mental health. These communities can be strategic partners for PIP in mobilizing youth and creating an informal learning ecosystem.

The PIP (2025) study recommends that PIP partner with various communities and organizations, with the expectation that these partners will implement activities and events at PIP. These activities will cover various areas supporting 17 sub-sectors of the creative economy, with a focus on improving the soft and hard skills of youth in Tangerang Regency. Community and youth organization activities are also recommended for implementation at PIP as part of an inclusive ecosystem.

7. *Media Actors (Ecosystem Expanders)*

The media within the PIP ecosystem is designed to function as an expander, expanding the reach and visibility of youth innovation beyond the geographic boundaries of Tangerang Regency. The PIP (2025) study implicitly recognizes the importance of digital platforms, including online forums, webinars, and digital collaboration spaces, in expanding the reach and accessibility of PIP. These virtual platforms serve not only as a means of communication but also as an ecosystem that enables youth from diverse backgrounds to interact, share experiences, and learn from one another.

8. Main Functions of PIP Designed

The PIP (2025) study defines four main functions of PIP which directly reflect the theoretical framework of collaborative governance in its operationalization:

Table 1. *Main Functions of PIP and Dominant Penta Helix Actors (Elaborated by the PIP Study Compilation Team, 2025)*

Main Functions of PIP	Operational Description	Dominant Penta Helix Actor
Development of Creativity	A platform for exploring ideas in technology, art, and entrepreneurship based on 17 sub-sectors of the creative economy	Community + Business
Education & Training	Non-formal education facilities: coding, design, AI, IoT, digital marketing, soft skills, entrepreneurship	Academics + Business
Network Strengthening	Cross-actor connector for professional collaboration, investor access, and mentoring programs	All actors (Government as facilitator)
Social Empowerment	Reducing economic disparities through access to facilities for marginalized youth and women	Government + Community

9. Hybrid Institutional Models: Critical Findings from the PIP Study

One of the most significant findings of the PIP (2025) study is the recommendation for a hybrid institutional model. The study identified two extreme schemes, each with its own advantages and disadvantages:

A pure UPTD scheme, as implemented in the Bandung Creative Hub, offers strengths in terms of: integration with local government bureaucracy, easier access to regional budget resources, cross-agency coordination, and guaranteed public accountability through the DPRD and BPK oversight mechanisms. However, this scheme faces inherent weaknesses in the form of bureaucratic procedural rigidity that can hamper responsiveness to the dynamics of the startup ecosystem, limitations in recruiting creative industry professionals, and the risk of the 'bureaucratization of creativity.'

In contrast, a purely third-party collaboration scheme, such as the Hetero Space model managed by Impala Network in collaboration with the Central Java Provincial Government, offers advantages in terms of operational flexibility, speed of program adaptation, the ability to recruit professional human resources from the creative industry, and a more *market-responsive approach* . However, this scheme faces risks such as dependence on the capacity of the third-party operator, potential misalignment between the operator's commercial interests and PIP's public mission, and accountability complexity.

The PIP (2025) study recommends a hybrid model that combines the advantages of both schemes: the UPTD functions as a regulator that ensures accountability and policy continuity, while a professional third party acts as an operator that ensures program flexibility and relevance. This model is in line with the concept of *'New Public Governance* ' which emphasizes that the government does not have to be the direct implementer of public services, but rather ensures that these services are delivered effectively, efficiently, and accountably by the most competent party.

DISCUSSION

1. Relevance and Theoretical Contribution: Proposing a Business-Anchored Penta Helix

The findings of this study provide significant theoretical contributions to the literature *on collaborative governance* and regional innovation. In the standard Penta Helix model, the five actors are assumed to participate with relatively equal intensity in a mutually reinforcing spiral pattern. However, analysis of the context of Tangerang Regency, an industrial satellite region with an exceptionally high manufacturing density, indicates that this assumption of equality needs to be modified.

The PIP (2025) study consistently positions the private sector and its collaboration with PIP as the most critical factor in the success of the innovation ecosystem. This argument is supported by several empirical mechanisms. First, *demand-pull innovation* : the manufacturing industry, exposed to global competitive pressures, creates real demand for innovative solutions that local PIP startups can meet. Second, *resource provision* : only the business sector has the financial capacity to provide capital, sophisticated equipment, market access, and professional mentoring on a meaningful scale. Third, *talent absorption* : the prospect of product commercialization and employment by large industries is the most powerful incentive attracting talented young people to the PIP ecosystem.

Based on these findings, this study proposes the concept of the 'Business-Anchored Penta Helix', a contextual variant of the standard Helix theory in which business/industry actors are not simply one of five equal elements, but rather become anchors that determine the direction and speed of the entire ecosystem. This concept is particularly relevant for regions with similar characteristics to Tangerang Regency: high industrial density, geographic proximity between industrial areas and innovation institutions, and a surplus of young labor in need of productive distribution.

This concept does not negate the importance of the other four actors. The government remains essential as the provider of the legal framework and public infrastructure; academics as the guarantor of scientific quality standards; communities as a source of grassroots creativity that cannot be replicated by formal structures; and the media as an amplifier that provides visibility and social

legitimacy to the ecosystem. What has changed is the understanding of who the prime mover is, and in the Tangerang context, the answer is industry.

2. Comparative Advantage Analysis: Industrial Proximity Advantage

This research identifies a concept we call *'industrial proximity advantage* ,' which is the competitive advantage possessed by innovation ecosystems in industrial satellite regions due to their geographic and structural proximity to manufacturing clusters. In the context of the Tangerang Regency PIP, this advantage operates through several mechanisms:

First, *proximity to pain points* : startups born in the Tangerang ecosystem have a much more intimate understanding of the operational challenges of the local industry than startups from outside the region. They live in the same ecosystem, speak the same language, and experience the problems they are trying to solve firsthanda comparative advantage that is difficult to replicate.

Second, *low transaction costs of collaboration* : The physical proximity of PIP to industrial clusters significantly reduces collaboration transaction costs. Meetings, field visits, internships, and joint projects can be conducted with minimal coordination costs, in contrast to cross-city or cross-regional collaborations, which require significantly greater time and expense.

Third, *talent pipeline proximity* : industries in Tangerang Regency have a large and constant need for talent. The presence of PIP in the same area creates an efficient talent pipeline, allowing industries to access, evaluate, and recruit talented young people early on, even before they complete the incubation program.

Fourth, *legitimacy spillover:* the success of multinational manufacturing industries in Tangerang Regency in embracing the PIP innovation ecosystem will automatically provide reputational legitimacy for the ecosystem, attracting more investors, mentors, and talent from outside the region. Conversely, the industry's reluctance to engage substantially will create stigma that will slow the ecosystem's growth.

3. Critiques and Evaluations of Model Design: Gaps That Need to be Addressed

Although the PIP (2025) study presents a comprehensive design, a critical analysis of this study identified several gaps that need to be addressed in the implementation process:

The first gap is the ambiguity of inter-actor coordination mechanisms. The PIP (2025) study recommends the involvement of all stakeholders but does not specifically define the coordination mechanisms that bind the actors. Referring to Himam & Sugiyanto (2025), the effectiveness of *collaborative governance* depends heavily on the existence of facilitative leadership and structured deliberation forums. Without concrete coordination mechanisms, such as a multi-sectoral Steering Committee with clear authority or a scheduled inter-actor meeting schedule, collaboration risks being ad-hoc and unsustainable.

The second gap is the unclear impact-based monitoring and evaluation system. The PIP (2025) study does identify several performance indicators, such as the number of programs implemented, the number of youth accessing training, and the number of new businesses formed. However, these indicators are output-centric and do not address deeper outcomes and impact. Adopting the framework of Emerson & Nabatchi (2015), the PIP M&E system should measure not only actions (programs implemented), but also outcomes (changes in youth capacity, the commercialization value of innovations) and adaptation (the ecosystem's ability to learn and respond to change).

The third gap is the gap in inclusion of marginalized groups. The PIP (2025) study does indeed mention the importance of empowering youth from low-income families and areas with limited access to education. However, concrete affirmative action mechanisms, such as access quotas for youth from poor families, training scholarship programs, or active outreach to marginalized communities, have not been operationally formulated. Without specific and measurable affirmative action mechanisms, PIP risks only reaching youth from already relatively privileged groups.

The fourth gap is long-term financial sustainability. The financing model proposed by the PIP (2025) study relies heavily on regional budgets (APBD) and CSR/industry sponsorship. This model

is vulnerable to budgetary political cycles and shifting corporate priorities. This study recommends diversifying revenue sources, including revenue sharing with alumni startups, tiered membership fees from the community, and retainer fees from corporate training programs, to create a more resilient financial ecosystem.

4. Comparative Validation: Learning from Hetero Space and Bandung Creative Hub

The PIP (2025) study informatively presents two relevant institutional case studies as comparative references. The Bandung Creative Hub, managed through the UPTD scheme by the Bandung City Government, has proven successful as one of the most active creative economy ecosystems in Indonesia, supported by the strong political commitment of local leaders and integration within Bandung's ecosystem as a 'creative city.' The advantages of the UPTD Bandung Creative Hub scheme lie in its institutional stability and consistent budget support from the regional budget.

Meanwhile, Hetero Space in Central Java, managed by Impala Network in collaboration with the Central Java Provincial Cooperatives and SMEs Office, offers a more agile and market-responsive model. As a third-party operator, Impala Network has an extensive network within the national startup ecosystem and the ability to attract qualified mentors and investors from outside the region. This model is particularly effective in creating programs that are responsive to the actual needs of startups. This study argues that the context of Tangerang Regency, with its industrial proximity advantage and unique manufacturing industry dynamics, requires a model closer to the Heterospace scheme for operational flexibility, but with strengthened accountability through the UPTD oversight mechanism. The success of this hybrid model will depend heavily on: (a) the quality of third-party operator selection; (b) the clarity of the performance contract between the UPTD and the operator; and (c) a transparent periodic evaluation mechanism.

5. PIPs as Policy Laboratories for Regional Economic Transformation

In the context of national macro policy, the Tangerang Regency PIP can be understood as a policy laboratory testing regional innovation governance models with the potential for national replication. The Golden Indonesia 2045 vision envisions Indonesia's transformation into a developed nation with a significant digital and creative economy contribution to national GDP.

The PIP model's contribution to this vision can be seen in at least three dimensions. First, PIP contributes to the development of young entrepreneurs based on technological innovation, who in the long term will become pillars of Indonesia's digital economy. Second, PIP serves as a catalyst for the transformation of regional economic structures from dependence on labor-intensive industries to industries based on knowledge, creativity, and innovation. Third, PIP creates a lifelong learning ecosystem that addresses the need for reskilling and upskilling due to the disruption of automation and AI a challenge that will become increasingly acute in the coming decades.

Within the framework of regional autonomy, the success of the Tangerang Regency PIP model also demonstrates that local governments don't need to wait for central government direction to innovate in youth development governance. Local initiatives that respond to specific regional conditions, such as Tangerang's industrial characteristics, actually produce models that are more contextually valid, sustainable, and have a more measurable impact than *one-size-fits-all national programs* .

The World Economic Forum (2020, in the PIP 2025 Study Team) stated that improving skills in digital technology plays a key role in increasing the competitiveness of young workers globally. Bughin et al. (2018) emphasized that soft skills have a significant impact on productivity and professional success. The combination of these two dimensions hard technological skills and soft entrepreneurial skills forms the foundation of the PIP program design, which is designed to produce young people who are both technically competent and socially adaptive.

CONCLUSIONS

This study has analyzed in depth the design of the Penta Helix collaborative governance model for the Tangerang Regency Youth Innovation Center (PIP), an institution currently in the process of being established based on the 2025 PIP Establishment Study. From a comprehensive analysis of study documents, BPS demographic data, and governance theory literature, this study produces five main conclusions:

First, the context of Tangerang Regency, with a total population of 3.3 million, a productive-age population of 70.09%, and its position as the "City of a Thousand Industries," creates a strong strategic urgency and unique opportunity for the establishment of PIP. The paradox between industrial density and the challenge of labor mismatch can only be addressed through institutional interventions that effectively bridge youth potential, industrial capacity, and market needs.

Second, the Penta Helix model, which integrates government, academia, business, community, and media, is the most relevant and comprehensive governance framework for the Tangerang PIP context. Each actor has a distinctive yet complementary role, and synergy among them is a prerequisite for a successful innovation ecosystem.

Third, in the context of an industrial satellite region like Tangerang Regency, business/manufacturing industry actors have the potential to be the most dominant enablers, differing from the assumption of equality in standard Penta Helix theory. The *'Business-Anchored Penta Helix* ' concept proposed by this study offers a more contextual and accurate framework for understanding the dynamics of innovation ecosystems in dense industrial areas.

Fourth, a hybrid institutional model using the UPTD as an accountability regulator and a professional third party as a flexible operator is the most optimal recommendation based on a comparative analysis of the Bandung Creative Hub (UPTD scheme) and Hetero Space Central Java (third-party collaboration scheme). The success of this model depends heavily on the quality of operator selection, clarity of performance contracts, and transparent evaluation mechanisms.

Fifth, the long-term effectiveness of the PIP will be largely determined by the extent to which the monitoring and evaluation system is able to measure not only outputs (number of programs and participants), but also outcomes (changes in capacity and economic value creation) and adaptations (the ecosystem's ability to learn and develop). Adoption of the performance matrix framework by Emerson & Nabatchi (2015) is recommended as the foundation of the PIP M&E system.

Based on the research conclusions, five policy recommendations were formulated to support the process of establishing and operationalizing the Tangerang Regency PIP:

The first recommendation is directed to the Tangerang Regency Government: immediately finalize the operational regulatory framework for PIP through a Regent's Regulation that specifically regulates the hybrid mechanism for third-party UPTD operators, including operator selection criteria, a performance contract structure, and a clear oversight mechanism. Without a robust regulatory framework, the hybrid model risks ambiguity of authority, which could hamper operational effectiveness.

The second recommendation: develop a structured incentive framework to encourage the manufacturing industry to expand its involvement beyond CSR/sponsorship to strategic engagement in the form of joint *innovation projects, co-investment* in startups, and technology transfer. This framework could include fiscal incentives (local tax reduction awards), reputational incentives (the 'Industry Champion of Innovation' PIP Award), and accessibility incentives (priority access to government programs).

The third recommendation: formulate a concrete and measurable affirmative program to ensure inclusive access for youth from marginalized groups, including access quotas for youth from poor families, a training scholarship program funded by CSR funds from partner industries, and an active outreach program to sub-districts with the highest poverty rates in Tangerang Regency.

The fourth recommendation: establish an impact-based monitoring and evaluation (M&E) system from the operational planning phase by adopting the Emerson & Nabatchi (2015) performance matrix framework that measures actions, outcomes, and adaptation across three units of analysis: individual PIP participants, the overall PIP ecosystem, and regional development targets. Collaboration with partner universities to develop and operate this M&E system should be prioritized.

The fifth recommendation is addressed to the Ministry of Youth and Sports and the Ministry of Tourism and Creative Economy: use the Tangerang Regency PIP planning process as a reference model for developing a national implementation guide for youth innovation centers, identifying universal elements (the four pillars, the Penta Helix framework) and elements that need to be adapted to local contexts (institutional models, anchor actor selection). Replication without careful contextual adaptation risks producing institutions that formally exist but are substantively ineffective.

This study opens up several important follow-up research agendas. First, a longitudinal study that follows the establishment and initial operations of PIP during its first 3–5 years to empirically test the theoretical propositions proposed by this study, particularly regarding the 'Business-Anchored Penta Helix.' Second, a comparative study between PIP Tangerang Regency (when operational) and youth innovation centers in non-industrial areas to more precisely quantify *'industrial proximity advantage* .' Third, research on the factors influencing the manufacturing industry's decision to increase their level of engagement from CSR to strategic engagement in the innovation ecosystem. Fourth, a study on a hybrid financing model that can strengthen PIP's financial sustainability beyond dependence on the regional budget.

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