

## The Role of Penta Helix Collaboration in Accelerating Bureaucratic Reform and Improving the Quality of Public Services in Papua Province

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### ABSTRACT

**Objective:** This study examines the role of Penta Helix collaboration in accelerating bureaucratic reform and improving the quality of public services in Papua Province. The Penta Helix model involving government, business, community, academia, and media is expected to create more effective synergies in addressing Papua's bureaucracy and development challenges.

**Methodology:** The research method used is a qualitative approach with data collection through in-depth interviews, observation, and documentation studies at the Papua Provincial Secretariat.

**Findings:** The findings show that despite significant challenges in terms of infrastructure and human resources, cross-sector collaboration can accelerate bureaucratic reform, create more responsive policies, and improve the quality of public services. Good cross-sector coordination and the active role of the community and media are key success factors.

**Conclusion:** This study concludes that the Penta Helix collaboration can be an effective model to accelerate bureaucratic change in Papua by considering local characteristics and strengthening the capacity of related sectors in development.

**Keywords:** Penta Helix Collaboration; Bureaucratic Reform; Public Services

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## INTRODUCTION

Bureaucratic reform is one of the critical aspects of achieving an efficient and effective government, especially in regions with complex development challenges, such as Papua Province. This province, with vast geographical characteristics and diverse socio-economic conditions, faces significant challenges in improving the quality of public services. Although Papua is rich in natural resources, underdeveloped infrastructure, low education levels, and limited access to technology and information are significant obstacles in realising good governance (Statistics Indonesia, 2023). Therefore, strategies to accelerate bureaucratic reform are urgently needed, with approaches that involve stronger and more inclusive cross-sector collaboration. One promising approach is the Penta Helix collaboration model, which involves five primary elements: government, business, community, academia, and media (Sagala et al., 2022).

Penta Helix collaboration is expected to create more effective synergies in addressing existing challenges, with each party contributing according to its expertise. This approach focuses on building a dynamic ecosystem, which enables the creation of public services that are more responsive, innovative, and adaptive to the needs of society (Cahyani et al., 2021). The importance of this research lies in identifying key elements in Penta Helix collaboration that can accelerate bureaucratic reform and improve the quality of public services in Papua. In addition, this research also seeks to provide insights into how intersectoral collaboration can overcome existing structural constraints in Papua and pave the way for more inclusive and sustainable improvements in the quality of public services.

However, while Penta Helix collaboration has been applied in various urban areas in Indonesia, limited research addresses this model's application in the Papuan context. A key gap is the lack of research that adopts an approach fully adaptive to Papua's very different social and cultural characteristics. The diverse ethnic characteristics, remote geography, and strong traditional social structures make applying the Penta Helix model in Papua much more complex than other regions in Indonesia. This research highlights the importance of designing collaboration strategies that consider the local context of Papua, local wisdom, and the social structure of indigenous communities to accelerate bureaucratic reform and improve the quality of public services.

By adding this dimension, this research focuses on developing a Penta Helix model that not only involves the five main traditional sectors but also considers the role of indigenous peoples in the decision-making process and policy implementation. This is expected to provide a more integrated solution, which not only promotes bureaucratic efficiency but also respects and accommodates local cultural values that are highly influential in the daily lives of Papuans. This new approach could improve the sustainability of bureaucratic reform in Papua, as it harnesses the power of collaboration between formal and informal institutions, which has not been adequately represented in previous research.

In addition, this research will introduce an adaptation model of Penta Helix collaboration based on a more in-depth participatory approach, where Papuan communities are given a more expansive space to be involved in planning and implementing public policies. This is a step forward in encouraging the empowerment of communities excluded from key decision-making in the public sector, especially in remote areas. This approach breaks new ground by introducing an active role for local media and academia that focuses more on public education and community capacity building, particularly in improving the transparency and accountability of local government bureaucracies.

Thus, this research not only identifies factors that influence the success of Penta Helix collaboration but also introduces an innovation in the form of an adaptive collaboration model that can be applied in Papua to overcome the region's unique bureaucratic challenges. This innovation is the main novelty of this research. It significantly contributes to developing the theory and practice of bureaucratic reform in an area with unique social conditions, such as Papua.

According to data from the Central Bureau of Statistics (2023), Papua still faces several obstacles in providing optimal public services. Limited trained human resources, uneven infrastructure, and unequal access to information are the main challenges that must be overcome. Against this background, it is essential to explore how Penta Helix collaboration can be a solution to accelerate bureaucratic reform in Papua. Several previous studies have revealed that collaboration involving various parties can improve the effectiveness of public services, as seen in research in big cities such as Jakarta and Surabaya (Handayani, 2020; Prasetyo & Astuti, 2021). However, applying the Penta Helix model in Papua, which has different social and geographical characteristics, certainly requires adjustments and a more targeted strategy.

Empirical studies on applying the Penta Helix model in Papua are limited, and most existing studies focus on urban areas with more established bureaucratic structures. This research gap includes a deeper understanding of how the elements of Penta Helix interact in areas with more complex geographical and social challenges, such as Papua. Based on previous research, it is known that the biggest obstacles in the implementation of Penta Helix are the suboptimal coordination between the sectors involved and the lack of awareness and active participation of the community (Sagala et al., 2022). Therefore, this study aims to answer the question of how the elements of Penta Helix can collaborate effectively to overcome bureaucratic challenges in Papua and improve the quality of public services in the region.

Through qualitative and quantitative approaches, this research will focus on identifying factors that influence the success of Penta Helix collaboration in the context of bureaucratic reform in Papua. The variables to be analysed include the quality of coordination between sectors, the level of community participation, and support from the academic and media sectors in creating transparency and accountability of public services (Cahyani et al., 2021). Thus, this research is expected to provide a more comprehensive picture of how Penta Helix collaboration can be effectively applied to accelerate bureaucratic reform and improve the quality of public services in Papua Province. The main objective of this research is to provide policy recommendations that can be used by local governments, the private sector, and the community to accelerate the bureaucratic reform process oriented towards improving the quality of life of the Papuan people.

## **LITERATURE REVIEW**

### **Penta Helix Collaboration**

Penta Helix collaboration involves five main parties: government, business, community, academia, and media, working together to address problems and achieve development goals, particularly in bureaucratic reform and public service improvement. The concept emphasises synergy between sectors, where each element contributes according to its strengths and roles. This collaboration enables more innovative and sustainable solutions to development challenges. Torfing et al. (2020) in their study on multi-stakeholder collaboration argue that a collaborative approach that directly involves various sectors can accelerate the resolution of complex social problems, by utilising the resources and knowledge of each party. In addition,

Albu & Jäkel (2021) also emphasise that the success of the Penta Helix model depends on strong coordination between the sectors involved. Good coordination will optimise the potential of each industry, create more responsive policies, and better accommodate the community's needs. Implementing the Penta Helix model in several major cities in Indonesia, such as Jakarta and Surabaya, has successfully accelerated bureaucratic reform. However, coordination between sectors is still a significant challenge.

### **Bureaucratic Reform**

Bureaucratic reform is a process of change in government structures and procedures to improve efficiency, transparency, accountability, and responsiveness to public needs. The World Bank (2020) states that bureaucratic reform should involve organisational and process transformation to optimise public services and ensure accountability. This is in line with the principles of good governance that emphasise the importance of transparency, public participation, and strengthening government capacity to deliver better services. Melin & Håkansson (2021) mentioned that cross-sector collaboration between the public and private sectors is important to accelerate the structural changes needed in bureaucratic reform. The application of Penta Helix as a collaboration model between the public and private sectors is expected to support the bureaucratic reform process, especially in creating a more efficient and responsive bureaucracy. Setiawan & Suprpto (2022) highlighted that despite progress in bureaucratic reform in Indonesia, regions with limited infrastructure and human resources, such as Papua, still face significant challenges that hinder the reform process.

### **Quality of Public Services**

The quality of public services indicates a government's success in meeting the community's needs. Zeithaml et al. (2021) in Service Quality (SERVQUAL) theory suggest that service quality can be measured through five dimensions: reliability, responsiveness, assurance, empathy, and physical evidence. These dimensions provide a comprehensive picture of how public services are measured and evaluated. Applying the Penta Helix model can improve the quality of public services by strengthening coordination between the sectors involved, so that the services provided become more responsive to the community's needs. Wiyono (2023) points out that limited resources, limited employee skills, and uneven access to various regions often hamper public services in Papua. In this context, the Penta Helix model can be a solution to overcome these challenges by involving more parties in the process of planning and implementing public service policies.

### **Inter-sector Coordination**

Coordination between sectors is crucial in ensuring the success of bureaucratic reform and public services. Malone & Crowston (2020) in Coordination Theory state that effective coordination between various parties will increase productivity, accelerate the achievement of common goals, and ensure the resulting policies are more holistic and practical. Good inter-sectoral coordination also enables constructive management of different interests. In the Penta Helix model, the success of collaboration between government, business, community, academia, and the media depends on the quality of coordination between sectors. Cahyani et al. (2021) revealed that in regions with complex geographical and social challenges, such as Papua, poor coordination often hinders the implementation of public policies and slows down bureaucratic reform. Therefore, strengthening inter-sectoral coordination is key to accelerating and ensuring the successful implementation of bureaucratic reforms.

## **Community Participation**

Community participation in public policy-making is essential for a responsive and accountable government. Fung (2015) in the theory of Participatory Governance emphasises that the active participation of the community in decision-making will increase the legitimacy and quality of the policies produced, and positively impact the sustainability of these policies. In the context of Penta Helix, the community acts as an actor who provides important input in the policy formulation process and plays a role in its implementation. Handayani (2020) found that despite efforts to increase community participation in Papua, geographical constraints and lack of information are still the main challenges that limit participation. Therefore, increasing the capacity of the community through political education, as well as strengthening the role of the media and academia in educating the public, is essential to strengthening community participation in bureaucratic reform.

## **HYPOTHESIS AND RESEARCH FRAMEWORK**

### **The Effect of Penta Helix Collaboration on Bureaucratic Reform in Papua Province**

Bureaucratic reform is important for an efficient, responsive, and transparent government. According to OECD (2021), collaboration between various sectors is key in encouraging effective bureaucratic reform. Applying the Penta Helix model involving the government, business world, community, academia, and media can accelerate the change process and improve the quality of public services. Emerson & Nabatchi (2020) argue that multi-stakeholder collaboration models can produce more evidence-based, transparent, and accountable policies. In Papua, despite challenges such as uneven infrastructure and limited access to resources, strengthening intersectoral collaboration will promote a more efficient governance system responsive to local needs. Through better intersectoral synergy, bureaucratic reform in Papua is expected to run faster and more effectively.

**H1:** Effective Penta Helix collaboration will positively influence the success of bureaucratic reform in Papua Province by strengthening cross-sectoral coordination and creating policies that are more transparent, accountable, and responsive to community needs.

### **The Effect of Penta Helix Collaboration on the Quality of Public Services in Papua Province**

The quality of public services is an important indicator in assessing the effectiveness of a government. Parasuraman et al. (2020) state that public service quality is measured through several dimensions: reliability, responsiveness, assurance, empathy, and physical evidence. In the Penta Helix model, collaboration between sectors enables the creation of policies that are more efficient and responsive to community needs. Bryson et al. (2019) state that good collaboration between sectors involved in public service delivery significantly affects the quality of services received by the community. In Papua, with the challenges of limited access, collaboration between government, business, community, academia, and media can accelerate the implementation of more inclusive and quality policies, which in turn will improve the quality of public services provided to the community.

**H2:** Effective Penta Helix collaboration will improve the quality of public services in Papua Province by increasing the efficiency, transparency, and responsiveness of services provided to the community, especially in hard-to-reach areas.

## The Effect of Inter-Sector Coordination on the Success of Bureaucratic Reform and the Quality of Public Services

Coordination between sectors is an important factor that can determine the success of implemented policies. The Coordination Theory developed by Malone & Crowston (2020) explains that good coordination between various actors in public policy can increase productivity and minimise redundancy, ultimately accelerating the achievement of policy objectives. In implementing the Penta Helix model, coordination between sectors significantly affects the success of bureaucratic reform and public services. O'Flynn (2020) points out that in countries with complex geographical and social challenges, such as Papua, good intersectoral coordination can minimise barriers to policy implementation and deliver better outcomes in public service delivery. Therefore, strengthening inter-sectoral coordination within Pentahelix will ensure the smooth implementation of bureaucratic reforms and improve the quality of public services provided to Papuans.

**H3:** Better intersectoral coordination in Penta Helix collaboration will accelerate the success of bureaucratic reform and improve the quality of public services in Papua Province by ensuring that policies are implemented more effectively, efficiently, and according to the community's needs.

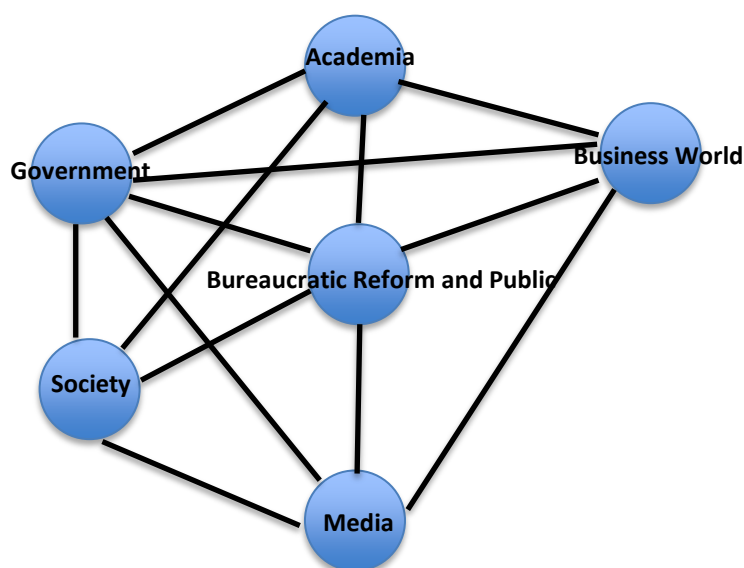


Figure 1. The Conceptual Framework

## METHODS

This research uses a qualitative approach to understand the social phenomena in the Regional Secretariat of Papua Province, related to the digitalisation of bureaucracy and the application of the Penta Helix model in bureaucratic reform. According to Creswell (2009), a qualitative approach is appropriate for studying phenomena in complex social contexts, with inductive data collection, thematic data analysis, and interpretation of the meaning of the data obtained. This research also places the researcher as the main instrument, who is directly involved in the community to explore a broader and deeper understanding of the existing dynamics.

Qualitative approaches allow researchers to identify relevant variables in natural conditions and are more flexible than quantitative approaches. This research will collect data based on the researcher's point of view and will be conducted in a naturalistic manner with a flexible design relevant to the problems in the field. This aligns with Lincoln & Guba (1985), who state that qualitative research allows researchers to capture phenomena holistically and build a deeper understanding of the social situation under study.

### **Research Location**

This research was conducted at the Regional Secretariat of Papua Province, an area affected by the formation of new autonomous regions. This area has several state civil servants (ASN) who carry out government service tasks. The Regional Secretariat of Papua Province plays an important role as the control centre and leading operator of government administration services in Papua Province. However, faced with the challenges of bureaucratic digitalisation, this research focuses on how Penta Helix collaboration can play a role in accelerating bureaucratic reform and improving public services. Considering the limited time and opportunity, the sampling scope was narrowed to the Regional Secretariat of Papua Province.

### **Research Focus**

This research focuses on Penta Helix's collaboration in accelerating bureaucratic reform and improving the quality of public services in Papua Province. In qualitative research, researchers focus on specific variables and social conditions. The research focus involves places (the government sector under study), actors (ASN and related stakeholders), and activities (bureaucratic reform processes and public services). Sugiyono (2019) explains that qualitative research focuses on a deep and broad understanding of social situations, thus providing new information relevant to field conditions. This research explores how collaboration between these sectors increases the effectiveness of bureaucracy and public services in Papua.

### **Data Source**

This research utilises three primary data sources: key informants, observed events, and relevant documents. All three were integrated to obtain a comprehensive picture of Penta Helix's collaboration in bureaucratic reform and public service quality improvement in Papua Province.

#### **1. Informant**

Primary data was collected from key informants who were selected using a purposive sampling technique based on the following criteria:

- a) Have a strategic role or direct involvement in the bureaucratic reform agenda and/or digitisation process within the Papua Provincial Secretariat;
- b) Represents one of the five main elements of the Penta Helix model: government, business, academia, media, and community.
- c) Have competence, experience, or knowledge relevant to the research topic.

Snowball sampling was used as a complementary strategy (Noy, 2008). In this technique, the initial informant recommends that other relevant interviewees enrich the depth of the data.

#### **2. Events**

Event data were obtained through direct observation, which was conducted periodically on digitisation activities and cross-sector coordination within the Papua Provincial government. These observations focused on interactions between Penta Helix actors, the implementation of digitisation policies, and the process of training and service delivery to the community.

### 3. Document

Documents analysed include:

- a) Official government documents, such as the RPJMD of Papua Province, the Renstra of Regional Apparatus Organisations (OPD), governor regulations, and minutes of coordination meetings.
- b) Public documents, including media articles, press releases, and progress reports on digitisation programmes.
- c) Internal organisational archives that provide supporting data on bureaucratic reform and intersectoral collaboration practices.

Documents are used to cross-check information from interviews and observations (Bowen, 2009).

### Data Collection

Data collection in this study used several techniques to ensure the completeness and depth of information obtained:

1. Entering the field: The researcher will start by obtaining research permits from the relevant institutions and approaching the informants to be interviewed. This initial approach is important to build rapport and gain access to more information.
2. Getting along: The researcher will establish a more intimate relationship with the subject under study to obtain objective data. This includes conducting interviews at convenient hours and organising times that allow maximum participation from informants.
3. Data Collection: Data will be collected using three main techniques:
4. In-depth Interviews: Exploratory open-ended interviews allowed informants to express their views on bureaucratic reform and the Penta Helix.
5. Observation: Conduct descriptive and focused observations of activities related to bureaucratic digitalisation.
6. Documentation Study: The collection of relevant documents, including archives and relevant reports, to provide context and complement the research data.

### Data Analysis Technique

Data were analysed using a thematic approach formulated by Braun and Clarke (2006). This approach was chosen for its ability to identify patterns and meanings from qualitative data systematically and flexibly. The analysis process was conducted in six main stages:

1. Data Familiarisation  
All data from interviews, observations, and documentation were transcribed and read repeatedly to understand the full context and content.
2. Initial Code Generation  
Meaningful pieces of data were initially labelled (coded) based on emerging topics, such as "cross-sector coordination", "infrastructure readiness", or "role of media and digital literacy".
3. Theme Identification  
Similar codes were grouped into initial themes that reflected core phenomena, such as "challenges of digitalisation," "cultural resistance," and "collaborative innovation."
4. Theme Review  
The themes formed were tested against the whole data to ensure consistency, relevance, and absence of overlapping meanings.
5. Theme Naming and Definition



The final themes were given representative names and conceptually defined, and supporting narratives were developed based on field data.

#### 6. Preparation of Analysis Report

The findings are organized in a scientific narrative that shows the relationship between empirical data and the theoretical framework. Analyses are supported by direct quotes from informants, observation results, and documents, a form of data triangulation.

The entire analysis process is iterative and reflective, allowing for ongoing adjustments to the focus and direction of interpretation, as the researcher's understanding of the phenomenon under study develops.

### Data Validity

The validity of the data in this qualitative research was tested through various triangulation techniques, which include source triangulation (different informants), method triangulation (interviews, observations, and documents), and theoretical triangulation (comparing the results of the analysis with existing theories). Denzin (1978) suggests using triangulation to verify data and ensure more valid and reliable results. Data validity was also tested through transferability and confirmability to ensure that the research results can be applied to a broader context and are supported by consistent evidence.

Using this method, this research is expected to contribute to understanding how Penta Helix collaboration can accelerate bureaucratic reform and improve the quality of public services in Papua Province.

## RESULTS AND DISCUSSION

### Research Results

#### Dynamics of Bureaucratic Reform and Opportunities for Penta Helix Collaboration

The results show that bureaucratic reform in Papua still faces challenges in implementing digitalisation, especially in technological readiness, coordination between stakeholders, and public acceptance of digital-based services. The Penta Helix model was found to have an important role in accelerating the digital transformation of the bureaucracy by involving five main elements: government, academia, private sector, media, and society.

Collaboration between these five elements is crucial in building a more effective and adaptive bureaucratic system to technological developments. The government has a significant role in creating supportive regulations, while academia contributes to research and policy innovation. The private sector plays a role in developing digital infrastructure, while the media helps disseminate information and increase public understanding of the benefits of bureaucratic digitalisation.

**Table 1** Actors in the Penta Helix Model

Actor	Role in Digitalisation of Bureaucracy
Government	Drafting digitalisation policies and regulations.
Academics	Provide research-based studies to support digitalisation policies.
Private	Provider of supporting infrastructure and technology.
Media	Disseminate information and raise public awareness.
Community	Public service users who provide feedback.

With a clear role for each element of the Penta Helix, digitalisation of the bureaucracy in Papua can be carried out in a more structured and efficient manner. However, the main challenge that needs to be overcome is to build strong synergies between these actors to avoid overlapping roles and responsibilities.

### **Human Resource Development Policies and Programmes for Civil Servants in Papua Province**

The results showed that ASN HR development is important in digital bureaucratic reform. The programmes implemented include digitally based training, performance-based evaluation, and merit-based incentive policies.

Improving the digital skills of civil servants is a key factor in supporting the success of bureaucratic reform. This training programme aims to provide a better understanding of the use of technology in daily administrative work. In addition, the performance-based evaluation system aims to encourage civil servants to be more productive and able to adjust to changes that occur.

**Table 2** Aspects of Practicality Applied

No.	Aspects	Policies Implemented
1	Training and Development	Digital-based programme to improve ASN skills.
2	Performance Management	Performance-based evaluation to improve accountability.
3	Career Development	Meritocracy-based promotion to improve ASN competence.
4	Compensation and Benefits	Incentives are adjusted according to performance and skill achievements.
5	Work-Life Balance	Work flexibility to improve employee welfare.

With this policy, ASN is expected to have better capabilities in using digital technology to improve the quality of public services. However, a challenge remains the lack of access to adequate training infrastructure in some areas in Papua.

### **Stakeholder Perspectives on Government Digitalisation in Papua Province**

Stakeholders' views on government digitalisation vary. Here are their perspectives: Digitalisation of government is considered to improve bureaucratic efficiency and speed up administrative processes. However, there are differences in the level of readiness of each actor to adopt this change. The government is challenged to draft flexible regulations, while the private sector faces investment barriers due to policy uncertainty.

**Table 3** Views on Digitisation

Parties	Views on Digitisation
Government	Digitalisation increases efficiency but still faces regulatory barriers.
Academics	Research-based policies and digital skills enhancement for civil servants are needed.
Private	Play a role in infrastructure provision but face regulations that restrict investment.
Community	Confronting the digital divide that hinders access to online services.
Media	Has a role in improving digital literacy in the community.

For digitalisation to work well, the government needs to ensure there are more supportive regulations and provide access to training for ASN and the community. The media also needs to be more active in improving digital literacy so that people can more easily access technology-based services.

### **Factors Hindering Digitalisation of the Papua Provincial Government**

One of the most significant barriers to government digitalisation in Papua is the limited technology infrastructure and lack of resources to implement digital systems. In addition, resistance to change among civil servants and communities is also a factor slowing down the adoption of digitalisation.

**Table 4** Factors Hindering Digitisation of the Papuan Government

Parties	Major Constraints
Government	Infrastructure limitations, resistance to change, lack of coordination across sectors.
Academics	Lack of involvement in the formulation of digitisation policies.
Private	Lack of investment incentives and unclear regulations.
Community	Digital divide and lack of trust in online-based services.
Media	Lack of support for digital literacy campaigns.

To overcome this obstacle, closer cooperation between the government and the private sector in building adequate digital infrastructure is needed. In addition, the socialisation and education of the public need to continue so that they can better understand the benefits of digitalisation and trust the system.

### **Discussion**

#### **Dynamics of Bureaucratic Reform and Opportunities for Penta Helix Collaboration**

Bureaucratic reform in Papua Province is integral to the national agenda to improve governance efficiency and provide more responsive and inclusive public services. Given Papua's geographical, social, and cultural complexities, the digitalisation of the bureaucracy is one of the main strategies for realising more effective and adaptive governance. Applying the Penta Helix model becomes very relevant within this framework as a cross-sector collaborative approach.

The Penta Helix model, which involves five leading actors- government, business, community, academia, and media- has been proven to accelerate bureaucratic reforms in various regions, especially in encouraging the birth of data-based, participatory public policies and expanding social inclusion (Chesbrough, 2023). The synergy between these sectors allows for a complementary division of roles, where the government acts as a policy facilitator, the private sector provides digital infrastructure, academics produce research-based innovations, the media disseminates information and builds digital literacy, and the community acts as both a recipient and controller of public services.

However, the biggest challenge in implementing this model lies in creating a balance of roles without the dominance of one particular sector. The government must provide more space for the non-government sector to contribute actively. In contrast, the coordination mechanism between sectors must be strengthened to avoid overlapping policies and roles. Academics are expected not only to be observers, but also active partners in designing evidence-based policies

(Ranga & Etzkowitz, 2022). On the other hand, community involvement must be systematically facilitated so that they are not only objects, but also subjects in the decision-making process. The application of the Penta Helix model in remote areas such as Papua has also been reinforced by various studies in similar contexts. Haryanto and Siregar (2020) emphasise that the success of cross-sector collaboration in village development depends on an approach that respects local wisdom and community social structures. Approaches sensitive to local culture can create program sustainability and increase community participation. Similarly, research by Widodo et al. (2021) in the Kalimantan border region shows that the success of collaborative governance is primarily determined by the local government's ability to embrace informal actors to bridge access, communication, and strengthen policy legitimacy at the grassroots level. Thus, implementing the Penta Helix model in Papua must be designed as contextual and participatory, considering the unique socio-cultural dynamics and the need for adaptive governance amidst the challenges of remote area development.

### **Human Resource Development Policies and Programmes for Civil Servants in Papua Province**

Improving the quality of human resources (HR) for the State Civil Apparatus (ASN) in Papua is the key to supporting digital bureaucratic transformation. According to the World Economic Forum (2023), developing ASN digital skills should be a priority to accelerate bureaucratic digitalisation. Limited access to technology and internet facilities in Papua complicates HR development efforts. Therefore, a blended learning-based training programme that combines online and face-to-face training is needed to reach ASNs in remote areas (UNDP, 2022). In addition, performance-based incentive programs that reward ASNs with high digital skills should be introduced to encourage them to be more active in digitisation. Local governments should introduce policies that support the use of technology in administrative work to make it easier for ASNs to adapt to changes and improve their work efficiency.

### **Stakeholder Perspectives on Government Digitalisation in Papua Province**

Various stakeholders have different views on government digitalisation in Papua. According to the OECD (2023), successful digitalisation depends on infrastructure readiness, supportive policies, and cross-sector collaboration. The government should serve as a facilitator, not just a regulator, in supporting inclusive digitisation initiatives. Academics can contribute by providing research-based studies and suggesting more adaptive policies. In contrast, the private sector, which provides digital infrastructure, should be incentivised to invest more in Papua. As users of public services, the public should also be given greater space to participate in the digitisation policy evaluation process. McKinsey Global Institute (2023) states that public involvement in policy evaluation can increase the effectiveness of digitisation policy implementation by up to 30%. Therefore, a clear and structured public communication strategy should be a priority in the digitisation process in Papua, to ensure that the public can understand and make optimal use of digital services.

### **Factors Hindering the Papua Provincial Government's Digitalisation**

According to the Technology Adoption Model (TAM) theory updated by Venkatesh et al. (2022), resistance to change significantly hinders technology adoption in the public sector. In Papua, in addition to limited digital infrastructure, another challenge is the lack of readiness of human resources to use digital-based systems. This is a big problem, mainly when many ASNs

are still accustomed to conventional systems and are reluctant to adapt to new technologies. Therefore, a more inclusive, education-based approach is needed to overcome this challenge. In addition, digital infrastructure challenges remain a pressing issue in Papua. Limited internet access, especially in remote areas, results in gaps in digital policy implementation. A study by the World Bank (2023) shows that investment in digital infrastructure in remote areas can increase bureaucratic efficiency by up to 40% within the first five years of implementation. To address this, solutions based on satellite technology or alternative communication networks can be implemented to connect areas that are hard to reach by wired infrastructure. On the other hand, resistance to change among ASNs must also be overcome by developing a more progressive organisational culture change strategy. Deloitte Insights (2023) emphasises that an effective change communication strategy can increase technology adoption in the public sector up to 50% faster than conventional approaches. Therefore, the government needs to develop policies encouraging ASNs to adopt technology more openly and understand the benefits of this digital transformation.

## CONCLUSIONS

This research explores the role of Penta Helix collaboration in accelerating bureaucratic reform and improving the quality of public services in Papua Province. In a region with complex geographical, social, and structural challenges like Papua, bureaucratic reform faces significant obstacles, including limited infrastructure, low human resource capacity, and uneven technological access. The findings show that the application of the Penta Helix model, which involves five leading actors, namely government, business, community, academia, and media, has excellent potential in encouraging the creation of public policies that are more responsive, inclusive, and adaptive to the needs of local communities.

Cross-sector collaboration within the Penta Helix framework is proven to accelerate the process of bureaucratic digitalisation and improve the efficiency of public services, primarily through strengthening coordination between actors, utilising resource synergies, and meaningful community participation in the policy process. However, the challenges that still stand out are the weak coordination between sectors and the lack of optimal community involvement, especially in remote areas. Therefore, there is a need to design a collaboration model that is more adaptive to Papua's local characteristics, considering local wisdom, indigenous peoples' social structure, and the informal sector's important role in the bureaucratic transformation process.

The implications of these findings emphasise the importance of increasing the capacity of the state civil apparatus through digitally-based training, increasing investment in technology infrastructure, especially in areas not yet covered by basic services, and strengthening the role of the media and academia to support digital literacy and public oversight. In addition, the private sector also needs to be encouraged to contribute more actively to the bureaucratic reform agenda through policy incentives and strategic partnership schemes with local governments.

The limitation of this study lies in its scope, which only covers one institution, namely the Regional Secretariat of Papua Province. Therefore, generalisation of the results to other institutions or provinces in Indonesia must be done with caution, given Papua's unique social, political, and administrative characteristics that are not always comparable to other regions. In addition, the qualitative approach used is exploratory and contextual, so the results of this study are not intended for statistical generalisation. Another limitation is the relatively short duration of data collection and the limited number of informants at the policy and operational levels.

Based on these results, this study recommends developing a Penta Helix collaboration model that focuses on the context of underdeveloped and outermost regions and conducting inter-regional comparison studies to assess the effectiveness of similar models outside Papua. Further research using a quantitative or mixed methods approach is also needed to measure the concrete impact of this collaboration on public service performance. In addition, a longitudinal evaluation of the sustainability of bureaucratic reforms that actively involve the non-government sector should also be conducted to gain a deeper and more sustainable understanding. Future research is expected to strengthen the theoretical and practical foundations of applying the Penta Helix model in Indonesia's bureaucratic reform context with a broader, more comprehensive approach based on more representative data.

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