STI POLICY AND MANAGEMENT

The Implementation of the SECI Model in Knowledge Management Adoption Within Local Governments to Foster Innovation

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ARTICLE INFO	ABSTRACT
	This study aims to explore the implementation of the SECI model (Socialization, Externalization, Combination, Internalization) in knowledge management (KM) adoption within local governments as a means to foster public innovation. In the context of bureaucratic intricacies and constrained resources, the SECI model offers a systematic framework for managing both explicit and tacit knowledge, thereby facilitating sustainable innovation. This study uses qualitative approaches through semi-structured interviews and case studies on several local governments, namely Sumedang, Banyuwangi, Deli Serdang, and Aceh Jaya, as well as less innovative local government, namely South East Aceh. The findings reveal that leadership endorsement, organizational culture, budget constraints, and human resource capabilities have a significant impact on the effectiveness of KM adoption. Each stage in the SECI model enhances the organization's capacity to innovate: socialization creates teamwork, externalization organizes information, combination integrates data from different sources, and internalization reinforces learning within the organization. Nonetheless, several challenges, such as inflexible bureaucratic culture and budget constraints, present substantial impediments. This study recommends the integration of the SECI model into local KM policies as well as regulatory and funding supports from the central government to encourage the transformation of bureaucracies into innovative learning organizations.

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I. INTRODUCTION

Innovation is defined as an idea, practice, or thing considered novel. It is characterized by relative advantage and potential for further development (Singh and Aggarwal, 2022). Innovation processes may serve several purposes, such as the co-creation of knowledge and solutions to achieve societal goals (Aladwan et al., 2022; Kassa and Ning, 2023). In today's era of globalization and technological advancement, knowledge management (KM) has become a crucial element in enhancing the efficiency and effectiveness of organizations (Pratama, 2020; Sensuse et al., 2025). KM helps organize information and keep it easy to obtain, thereby improving the speed and accuracy of decisions made based on extensive resources.

Numerous studies have indicated that local governments excelling in KM adoption demonstrate better performance in delivering public services (OECD, 2024). Knowledge and experience facilitate decision-making in KM and innovation (Abubakar et al., 2019; Pangaribuan and Satrya, 2024) and knowledge has a significant impact on the innovation process (Susanty et al., 2019; Hassanzadeh, 2020). Although many studies have showed that KM facilitates innovation, local governments' efforts to adopt KM in their innovation initiatives are often hindered by several challenges, such as their organizational culture, human resource capacity, budget constraints, and the ineffective utilization of information and communication technology (ICT).

Therefore, KM frameworks, such as the SECI (Socialization, Externalization, Combination, Internalization) model formulated by Nonaka and Takeuchi, provide a comprehensive structure for understanding the processes of knowledge creation, dissemination, and application within an organization (Le and Tuamsuk, 2023). The SECI model emphasizes the interplay between tacit and explicit knowledge (Ocholla and Adesina, 2019; Duan and Jin, 2022). This model enables local governments to recognize and leverage existing knowledge to develop improved solutions via knowledge integration (Howard and Okan, 2024).

In certain instances, unsuccessful innovations stem from KM being difficult to be internalized (Coccia, 2023). According to the 2024 Regional Innovation Index issued by the Ministry of Home Affairs of the Republic of Indonesia, among 415 districts and cities evaluated, 17% were classified as highly innovative, 56% as innovative, 23% as less innovative, and 4% were not assessed. The 2024 Global Innovation Index reported a rising trend in Indonesia's innovation despite persistent challenges, notably in the form of insufficient government investment in knowledge and research (WIPO, 2025). The OECD's 2024 Global Trends in Government Innovation report stated that digitalization and innovation are the foundation of efficient public services. Furthermore, the report emphasized that governments should collaborate with users and stakeholders to co-design solutions and anticipate future needs by creating flexible and responsive public services through long-term knowledge (OECD, 2024).

The implementation of the SECI model, while has been extensive in business and manufacturing domains (Nonaka and Takeuchi, 1995; Ocholla and Adesina, 2019), is often constrained in the public sector, particularly by local governments in developing countries. Numerous studies, such as those by Mc Evoy et al. (2019) and Pepple et al. (2022), argued that KM adoption in the public sector is crucial for enhancing bureaucratic efficiency, promoting policy innovation, and improving public services. Nonetheless, the majority of these studies focused on technology and documentation aspects rather than on the dynamics of knowledge translation as articulated in the SECI model. Likewise, a systematic literature study by Aryanti and Prasojo (2021) concerning KM adoption within Indonesia's public sector from 2010 to 2021 identified methodological deficiencies and specific under-researched domains, particularly the dynamics of tacit and explicit knowledge conversion as highlighted in the SECI model.

The SECI model distinctly delineates the knowledge generation process through the interplay of tacit and explicit knowledge. This approach is especially relevant for local governments, since substantial tacit knowledge resides in staffs' experience, local practices, and organizational culture. While alternative models, such as the Data-Information-Knowledge-Wisdom (DIKW) framework, outline the levels of knowledge, they do not explain how knowledge transitions from one level to another (Baskarada and Koronios, 2013). Consequently, local governments must evolve into learning organizations to enhance their capacity and adaptiveness in dealing with changes (Lima, 2021). In this sense, SECI promotes organizational learning by integrating new knowledge into day-to-day practices through internalization process, such as training, policy simulations, or the documentation of best

practices. This is contrasts with Wiig's KM model, which prioritizes individual KM and cognitive processes and places less emphasis on collective organizational learning (Dalkir, 2017).

This study aims to investigate the implementation of the SECI model in KM adoption within local governments and its potential to foster innovation. This model facilitates innovation within local government settings by offering a systematic framework for efficient KM adoption. In the realm of governmental bureaucracy characterized by its hierarchical and inflexible nature, the SECI model facilitates the dynamic exchange of knowledge across individuals, units, and organizations. This study examines specific instances of local governments that have effectively adopted KM to foster successful innovation. Therefore, the following research questions are formulated: RQ1: How does the implementation of the SECI model in KM adoption influence the innovation development within local government? RQ2: What is the impact of KM adoption on the innovation advancement within local government? Through such approach, this study would contribute significantly to the domains of KM in the public sector, public administration, and innovation within local government.

II. ANALYTICAL FRAMEWORK

A. Resource-Based Theory (RBT)

The SECI model, created by Nonaka and Takeuchi, is often used to explain how tacit and explicit knowledge are created and shared. However, this model is widely viewed as too rigid and fail to wholly take the complex social, cultural, and structural environments into account (Howard and Okan, 2024). Therefore, a careful and detailed approach is necessary to assess how well this model captures the knowledge interactions observed in various types of organizations and work environments. A primary critique to the SECI model is the one concerning its propensity to oversimplify the link between tacit and explicit knowledge (Kahrens and Früauff, 2018), whereas the knowledge transfer process often occurs in a non-linear way and is not always be discernible in practice (Gourlay, 2006). This makes an analytical approach necessary to evaluate how structural constraints, such as organizational hierarchy, culture, or power imbalances, may hinder the crucial processes in knowledge transfer, such as externalization and combination.

Moreover, the SECI model is often regarded as neglecting the significance of conflict, divergent viewpoints, and power dynamics within organizations (Kahrens and Früauff, 2018; Farnese et al., 2019). A critical perspective might prompt inquiries regarding the authority over knowledge, the designation of the "legitimate owner" of knowledge, and the impact of social systems on the validation and legitimacy of the knowledge generated. An interdisciplinary approach that integrates critical theory, organizational sociology, and behavioral theory can enhance our comprehension of knowledge generation and dissemination in contemporary organizations. While classical public administration philosophy underscores the significance of efficiency, effectiveness, and accountability in public organizations (Laihonen et al., 2024), current advancements in public administration have increasingly embraced a more flexible, interactive, and knowledge-driven practices.

The SECI model is essential as a KM framework that helps expedite bureaucratic innovation processes. Integrating the SECI model into public administration procedures enables local governments to enhance their institutional capacity and strengthen their commitment to organizational learning and improvement. It is especially relevant in an era of governance that prioritizes the values of transparency, responsiveness, and public involvement. Nowadays, innovation is perceived not as an individual endeavor, but as the outcome of collective social processes within a learning bureaucracy. Moreover, Rogers' (2003) diffusion of innovation theory elucidates the temporal dissemination of innovation within a social system. Innovation is assimilated by individuals or organizations incrementally. This theory explains the dissemination of new policies, technologies, or service models among agencies or regions within a governmental setting.

Thus, local governments must engage with four fundamental aspects in the SECI model (Socialization, Externalization, Combination, Internalization) and tailor each one of them to enhance its relevance to the innovation ecosystem specific to the local government, as described below:

1. Contextual socialization aims to foster community practices within bureaucratic units and engage the community in collaborative discussions. Tacit knowledge is elicited from employees and the community via discussion forums, development planning meetings *(musrenbang)*, and co-creation laboratories.

2. Adaptive externalization occurs when informal knowledge is made clear via storytelling, the creation of policy examples, and the arrangement of narratives to help people understand and replicate it in local policy situations.

3. Systematic digital integration involves utilizing localized information systems, such as e-government platforms or regional knowledge portals, to manage, consolidate, and disseminate explicit knowledge across various agencies, both locally and between central and regional governments.

4. Practice-oriented internalization emphasizes experiential learning via pilot projects, policy experiments, and innovation incubation. Knowledge is acquired through experiential practice and reflective learning, then reinforced using an innovative performance evaluation system that upholds the ideals of effective governance.

The SECI model thereby offers a more dynamic and relevant methodology for promoting innovation within local government. This approach enhances the creative capacities of local officials to address community development issues by incorporating teamwork, technology, flexible management, and ongoing evaluation. The implementation of this model is fundamentally influenced by information management, organizational culture, human resource capabilities, and institutional backing.

III. METHODOLOGY

A. Data Collection
To achieve this study's objectives, a qualitative approach through semi-structured interviews and case studies was performed to collect data. The data obtained were analyzed to identify all four aspects in the SECI model related to KM and innovation within local government. Semi-structured interviews were conducted with regional officials from South East Aceh and Sumedang local governments at a comparative study event and the signing of the Electronic-Based Government System (*SPBE*) MoU held in September 2024. Interviews were conducted with 33 predetermined informants, comprising regional leaders, *SPBE* managers, and employees involved in planning, implementing, and evaluating innovations in these two regions. When conducting interviews, researchers adapted their approach to understand the informants' characters in order to achieve this study's objectives.

Researchers also complied with the priorly established theoretical concepts and interview guidelines, maintaining the focus of interviews to address the research questions. Interviews were conducted in the form of face-to-face interviews and focus group discussions, both of which were designed to elicit arguments from informants. In addition, this study also conducted case studies on several local governments (Banyuwangi, Deli Serdang, and Aceh Jaya) to review the implementation of innovation and how KM has been adopted in replicating and generating innovation. The local governments chosen in the case studies were those who won the award in the 2023 and 2024 Government Innovation Award (GIA) for innovative goods.

B. Data Analysis
Prior to conducting semi-structured interviews, an interview protocol was established to provide focus on key themes, thereby providing a basic framework (Creswell, 2014). Alongside conventional qualitative data analysis protocols, namely data organization and preparation, comprehensive reading and verification, coding, thematic description, qualitative narrative construction, and findings interpretation, the interview results were further analyzed using NVivo 12 software to enhance the outputs and mitigate certain biases regarding this study's topic. Additionally, various papers and pertinent studies were examined to formulate substantiated arguments.

IV. RESULTS

This study examines the implementation of the SECI model in KM adoption to foster organizational innovation. Within local government, failures in KM adoption often occur due to multiple causes, such as insufficient leadership commitment, organizational culture, budget constraints, and a lack of competent human resources to effectively integrate the SECI model into regional innovation initiatives. Consequently, local governments struggle to effectively identify the prevailing issues, recognize emerging opportunities, or devise innovative solutions. Without a dependable KM system, innovation processes are likely to be erratic, unscalable, or ineffective.

A. Contribution of the SECI Model to the Innovation Development within Local Government

1) Socialization aspect

This study's findings reveal that adequate socialization can foster trust among government personnel and cultivate a cooperative work environment. Within local government, socialization occurs in various settings, such as meetings, seminars, and group discussions. In an interview, the head of the Regional Planning Agency (South East Aceh local government) indicated that budgetary limitations pose a significant obstacle for innovation creation within the local administration. He remarked, "We aim to regularly conduct knowledge-sharing forums and comparative analyses among regions." However, insufficient budget allocations often constrain these activities and fail to emphasize them in annual planning. Budgetary concerns further highlight the disparity within local governments' perceptions of human resource investment compared to that of expenditure on infrastructure or other standard operational needs. This suggests that innovation is not solely reliant on extensive undertakings. Instead, it often materializes owing to insights and inspiration derived from cross-regional encounters. Without the ongoing facilitation of such forums, the organization's capacity to adapt itself, adopt new practices, and replicate breakthroughs would be significantly hampered.

Discussions with various officials and personnel from the local innovation department (Sumedang local government) revealed that informal exchanges of tacit knowledge often serve as the primary catalyst of innovative concepts. A leader of an innovation department remarked, "Novel concepts often arise from informal conversations outside structured settings." This phenomenon illustrates that informal interaction among staffs is an essential domain for giving rise to the exchange of experiences and insights that are unofficially recorded. The socialization process transpires through collaborative development initiatives among agencies, cross-region comparative analyses, and regional innovation community forums.

This study's findings concerning Aceh Jaya local government exemplify an organizational culture aiming to foster employees' creativity and innovation. An *SPBE* manager from Aceh Jaya local government asserted, "Cultural elements are structured to enhance trust and collaboration." This implies that political, social, and economic forces might affect the capacity of creativity to foster innovation. The local government enhanced public trust so that individuals are willing to participate and share their experiences via task forces. Simultaneously, to enhance KM adoption, the local government collaborated with other entities, such as universities and educational and training institutes, to promote knowledge sharing. Likewise, in several regions, such as Banyuwangi and Deli Serdang, organizational culture was able to enhance individuals' creativity and competitiveness. These measures taken by government institutions mainly aim to improve their services and achieve institutional, regional, and national goals.

The socialization process can be divided into several steps. Initially, individuals must participate in social interactions, either official or casual. These contacts may manifest in diverse formats, such as in-person gatherings, virtual chats, or alternative social engagements. Subsequently, individuals must be willing to disseminate knowledge and obtain insights from others. Yeboah (2023) argued that the willingness to disseminate knowledge is often influenced by corporate culture and social environment. The process requires reflection and understanding of the learned information. In this setting, organizations need to cultivate a climate that facilitates learning and knowledge exchange, such as by allocating time and space for dialogue and promoting inter-team collaboration. A conducive culture for collaboration and knowledge exchange would certainly expedite the socialization process.

2) Externalization aspect

Numerous *SPBE* managers from Banyuwangi, Deli Serdang, and Aceh Jaya local governments articulated, "The handbook functions as a framework for knowledge documentation to be utilized in innovation endeavors, ensuring that employees possess a collective comprehension and accountability." Discussions within these entities facilitated mutual consensus to ensure that all related parties implement this initiative. Moreover, to externalize information, leaders advocated for individuals to document the knowledge they obtained by arranging it in the form of scientific articles, enabling external experts to assess the degree of originality and innovation generation presented in the work.

An official from the Department of Communication and Information, Statistics, and Cryptography (Sumedang local government) confirmed that his organization encourage the staffs to document the ideas and solutions they

identify in the field. "We instruct each team to generate monthly innovation reports, rather than mere activity reports." The report presents information regarding challenges, solutions, and developmental concepts. The strategy aims to institutionalize innovations within the system. However, interviews with regional leaders of South East Aceh local government revealed that the scarcity of proficient human resources results in data analyses and the outputs lacking scientific rigor. Local governments can improve this drawback by partnering with institutions and colleges to perform high-quality, reliable data analysis. While bureaucratic challenges often hinder the establishment of an agile, flexible, and seamless procedures, the merit system provides a structure for allocating officials based on their expertise and qualifications, yet certain domains still undervalue human resource competency. In this case, individuals qualified to perform technical and analytical tasks should be willing to undertake these duties.

Deli Serdang local government engaged in several activities to process information and analyze data for generating new ideas, which include collecting knowledge by identifying pertinent sources, both internal and external, to the organization. The accumulated knowledge must be properly processed and examined to ascertain its context and significance. Then, the processed knowledge must be disseminated to those in need to facilitate successful decision-making and plan formulation. This study's findings also reveal that several regions, namely Sumedang, Banyuwangi, Deli Serdang, and Aceh Jaya, established cross-sectoral teams to create innovation programs encompassing diverse disciplines. These teams integrated data and information from diverse sources to generate more thorough responses to the prevailing issues. The interview results as a whole demonstrate that the externalization process within local governments is essential for enhancing the innovation capacity of individuals at the institutional level.

The externalization process encompasses both persons and social interactions within the organizational framework. Krogh et al. (2000) suggested that a social climate facilitating collaboration and open communication can enhance the efficacy of externalization. For this reason, it is essential for an organizational culture to promotes information sharing and individual contributions. This study's findings highlight the significance of leaders in fostering an environment that facilitates the externalization process. Nonetheless, the process may encounter numerous hurdles. A significant obstacle is the difficulty in conveying intricate tacit knowledge. According to Howard and Okan (2024), the nature of tacit knowledge might impede the knowledge transfer process. Moreover, externalized knowledge may be at risk of forfeiting its essential context or complexity, thereby reducing its values. Therefore, it is essential to formulate effective measures to enhance the efficacy of externalization, such as by utilizing ICTs that promote collaboration, suggesting that the ramifications of externalization for KM are substantial.

3) Combination aspect

The combination stage in the SECI model is crucial for promoting innovation within local government, since it synthesizes various types of existing explicit knowledge to generate new insights. An interview with an *SPBE* manager from Sumedang local government revealed that a strategic measure undertaken was by compiling diverse policy documents, evaluation reports, and public service survey data. "We consolidate data from different regional government organizations (*Organisasi Perangkat Daerah/OPD*) into a singular analytical framework to identify patterns that inform the development of novel programs." This measure exemplifies a planned and data-informed approach to promote innovation within municipal government. Bringing together data from different *OPDs* into a single analytical system demonstrates how the SECI model combines clear information from various sources to generate new insights. This initiative is crucial, since it enables policymakers to recognize the interrelations among various issues, thoroughly identify the problems, and devise creative initiatives that are more focused and impactful.

It is essential to guarantee that the aforementioned analytical system is equipped with high quality data, interoperability among different systems, and personnel proficient in accurately interpreting the analysis outputs. Without these system, data integration may devolve into a mere formality, failing to yield genuinely valuable insights. In this case, the success of the combination stage depends on the collaboration between *OPDs* and leaders' dedication in utilizing the analysis results to make informed decisions. The process involves creating an idea repository and an innovation catalog. A staff member from the Regional Planning Agency (Sumedang local government) disclosed that they consistently gather exemplary methods from other *OPDs* and regions that have demonstrated efficacy in generating new insights from various types of

source. "We analyze data from multiple sources, including innovation reports." The local leadership from Sumedang local government has strategically integrated diverse data and information sources that were formerly dispersed throughout several *OPDs*. Regarding this practice, the local government secretary revealed, "We provide an integrated digital infrastructure to ensure that documented knowledge is accessible to all stakeholders." This suggests that they facilitates the expeditious data-driven decision-making process and promotes intersectoral collaboration. In today's era of digital transformation, the accessibility of meticulously documented data and information is vital for crafting responsive and relevant public policies.

A staff member from the Regional Planning Agency (South East Aceh local government) stated, "We possess diverse data from multiple sectors; nevertheless, consolidating it into a unified digital platform necessitates substantial expenses for system development and personnel training." Despite the leadership's dedication, the allocation of budgetary resources for digital innovation has not been prioritized over other physical or routine initiatives. As a solution, local governments must regard data integration as a long-term strategic investment rather than merely an information technology (IT) initiative. Another solution advised to obtain alternative financial aids is by enhancing engagement with the central government, corporate sectors, and donor organizations. The interview results as a whole indicate that the combination stage is essential throughout the local government's innovation process, since it involves analyzing, categorizing, and integrating explicit knowledge from many sources into new, more structured insights.

Combination is a stage where distinct explicit knowledge is amalgamated to generate new insights. This process involves organizing, systematizing, and integrating the existing knowledge. Nonaka and Takeuchi (1995) asserted that diverse methods, such as information processing, data analysis, and the synthesis of novel concepts, can be combined. Applying current knowledge to foster creativity and improve solutions is a crucial technique for enhancing organizational value. Within the realm of KM, the combination stage acts as a conduit between pre-existing knowledge and the new insights to be generated. The amalgamation of knowledge enables organizations to develop a more extensive knowledge repository, thereby augmenting their innovation potential and competitiveness. Moreover, the combination stage contributes to enhance collaboration among teams and departments, facilitating the effective integration of fragmented knowledge (Migdadi, 2022).

4) Internalization aspect

This study's findings reveal that continuous training is essential in the internalization process. Municipal administrations that provide consistent training for their personnel generally exhibit elevated levels of innovation. Internalization necessitates an extensive learning process to convert personal tacit knowledge into explicit knowledge. For instances, ICT training has enhanced employees' proficiency in utilizing digital tools to optimize public services. Interviews with several department heads from South East Aceh and Sumedang local governments indicated that "local training for employees is an essential stage in fostering innovations aligned with standards set by national policy". Training is not simply an everyday task; it is a strategic endeavor to enhance individuals' competency, deepen comprehension of national policy directives, and ensure that innovations created correspond with society's needs and relevant policies.

Local leaders emphasized the significance of ongoing education. A local secretary from Sumedang local government stated, "We urge every employee to assimilate the effective practices developed through training, comparative studies, and the provision of incentives for successfully executed innovations." This implies that innovation should be an integral part of organization's core values rather than merely a temporary initiative. Local legislation embodied this commitment by mandating that each *OPD* create at least one public service innovation annually. Nonetheless, financial limitations impede the long-term training and development of innovation. A public sector employee from South East Aceh local government stated, "We frequently engage in innovation training, either independently or via invitations from the ministry." However, from a regional perspective, training or incentives for the internalization of innovation are currently unavailable. This indicates that insufficient budgetary support can significantly hinders the efficacy of organizational learning process.

All regions examined in this study indicated that the trainings provided were able to equip employees with experience and expertise. However, the success of mentorship and training depends not only on the material provided, but also on the integration of knowledge with personal

experiences. An interview with a department head from Sumedang local government revealed that they often provide innovation training containing real-life case studies from their region. "We offer theoretical knowledge and examine innovation documents implemented by *OPDs*, utilizing them as educational resources." This approach creates a constructive assessment process, enhances experiential learning, and facilitates continuous progress. In addition to reducing unnecessary duplication, this approach accelerates the development of original, relevant, and valuable ideas. However, a staff member from South East Aceh local government indicated that assimilating current ideas has not yet become a standard practice. "While we acknowledge the existence of innovative programs from other *OPDs*, there is a lack of a platform or learning mechanism that facilitates our comprehension and replication of these initiatives." This implies that internalization process to realize innovation would stagnate without adequate facilitation on mentorship and skill enhancement.

In particular, Sensuse et al. (2025) and Alvarenga et al. (2020) suggested that IT plays a crucial role in facilitating the internalization process, since technology is a highly useful medium for disseminating information, enhancing interpersonal communication, and providing access to essential learning resources. Moreover, internalization is closely linked to the concept of organizational learning. Ineffective human resources may face difficulties in internalizing knowledge due to contextual and psychological factors. Additional impediments include constrained financial resources and resistance to change, two widely-regarded causes of organizational failure (Chundakkadan and Sasidharan, 2020). Consequently, organizations must recognize and mitigate these obstacles to guarantee the efficacy of the internalization process.

In this study, local governments implementing the SECI model in innovation initiatives show distinct characteristics from each other, as illustrated in Table 1.

Table 1. Integration of the SECI model in innovation initiatives.

SECI Model Integration
Socialization
1. Banyuwangi is prominent for building a collaborative culture via a community-oriented methodology and the utilization of social media. The *"Kanggo Riko"* invention emerged from an awareness of the needs of the impoverished, bolstered by interactions between staffs and community members.
2. Deli Serdang launched the outreach initiative involved both the school community and parents using a participatory method to create an inclusive and hygienic educational environment. Interdisciplinary personnel engaged in dialogues and practical endeavors.
3. Aceh Jaya highlighted the establishment of task teams, interagency cooperation, and collaborations. An interpersonal strategy was being formulated to foster creativity, despite ongoing political and socioeconomic difficulties that affect the sustainability of innovation.
Externalization
1. Banyuwangi and Aceh Jaya developed a guidebook to document innovative practices that will serve as a reference for policy formulation and implementation. Banyuwangi also incorporated academics into this measure.
2. Deli Serdang has become more organized by incorporating three principal programs and using standard operating procedures from educational practices to foster explicit knowledge within communities.
Combination
1. Banyuwangi and Deli Serdang effectively consolidated data from multiple sectors into a unified digital system. Deli Serdang pointed out the importance of gathering data from educational programs to delineate enhancements.
2. Aceh Jaya engaged in the development of digital platforms for public services, despite problems in infrastructure and interoperability.
Internalization
1. Banyuwangi integrated innovation into practical training and fieldwork to ensure ideas extend beyond mere documentation.
2. Deli Serdang implemented an evaluation and reflection system to embed learning outcomes as part of an innovative work culture.
3. Aceh Jaya adopted mentoring and case studies as learning methods, but was constrained by limited training budgets and the need for cross-sectoral internalization.

Source: Research data (2024)

The following three regencies exhibited the use of the SECI model, each with distinct characteristics: Deli Serdang excelled in cross-program integration and ongoing assessment; Banyuwangi excelled in community involvement and technological application; and Aceh Jaya excelled in establishing external networks, but encountered structural and budget constraints. The latter suggests that the obstacles posed a significant impediment, since they directly impacted the availability of knowledge-sharing forums, innovation training, and comparative study initiatives within the region. The head of South East Aceh Regional Planning Agency asserted that initiatives to establish an innovation ecosystem are often obstructed due to funding for this aim not being prioritized in annual planning. On the whole, the lack of innovation in South East Aceh local government is attributed to a combination of structural issues, such as budget and staffing problems, as well as cultural issues, such as poor teamwork and resistance to knowledge sharing among different units. Hence, it is essential for institutional reforms to ensure that KM adoption go hand in hand with strategic investments in training, IT, and intersectoral collaboration.

B. Impact of Knowledge Management Adoption within Local Government

This study's findings also demonstrate that KM adoption has a significant impact on the development of organizational capacity. The investigation indicates that local governments that consistently implement KM practices observe enhancements in employees' competency.

Nevertheless, not all local governments examined possess the financial resources for knowledge investment. One region, namely South East Aceh local government, was classified as less innovative according to the 2024 Regional Innovation Index issued by the Ministry of Home Affairs of the Republic of Indonesia. Therefore, the central government can encourages this region to allocate budgets, even in a limited amount, to initiate innovation planning, particularly by investing in human resource knowledge through training and mentoring. This initiative can be facilitated via collaboration with government institutions, such as the Innovation Center of the State Administration Institute and the National Research and Innovation Agency as well as private sector innovation centers and universities. Furthermore, the latest technology can also be utilized, since it provides supporting facilities to enhance employee training outcomes.

However, this study's findings indicate that these obstacles can be tackled using the proper technique. The local governments of Sumedang, Banyuwangi, Deli Serdang, and Aceh Jaya implemented training and outreach initiatives emphasizing the significance of KM and fostered a collaborative work atmosphere. In fact, it is essential to engage all stakeholders in the design and execution of KM to guarantee a sense of ownership and accountability for the initiative's success. This is because the efficacy of KM adoption relies not only on IT systems, but also on intangible factors, such as workplace culture, corporate values, and leadership support. Without such robust elements, knowledge would remain fragmented and underutilized for supporting decision-making or local innovation advancement.

Additionally, KM adoption enhances organizations' capacity to adapt themselves and innovate sustainably (Ashok et al., 2021). When knowledge is maintained using a transparent and readily accessible system, organizations can enhance their capacity to adapt themselves to regulatory changes, social dynamics, and technological advancements. In advance, individual (tacit) knowledge can be shared to foster cross-unit collaboration, expedite internal learning processes, and enhance participation in innovation development. Moreover, KM creates responsibility and transparency in the innovation process. Each phase in the innovation process can be tracked via accessible documentation and knowledge repositories, enabling the objective assessment of policies and ideas as well as facilitating the replication of successful innovations in various settings. The enduring effect from these measures is the establishment of more transparent, data-informed, and adaptive local governance.

V. RESULTS AND DISCUSSION

The SECI model significantly contributes to foster innovation within local governments through its processes that promote collaborative learning and knowledge-driven decision-making. During the socialization stage, local participants exchange experiences and insights informally, enabling the elicitation of tacit knowledge. Then, in the externalization stage, this experience is transformed into explicit knowledge, such as policy documents, procedures, or local innovation plans. Next, in the combination stage, this knowledge is integrated with additional sources, generating new solutions to local issues. Finally, the internalization stage ensures the integration of new insights into practice, thereby sustainably enhancing the local innovative capacities.

Moreover, the SECI model offers a structure for establishing knowledge-creating groups at the local level. Previous studies by Jotabá et al. (2022) and Yeboah (2023) have expanded the comprehension concerning the KM adoption within organizations. This paradigm creates an ongoing cycle of knowledge conversion, thereby augmenting local capacity to generate and administer innovation, whether in products, public services, or policy. The SECI model can help improve competitiveness and self-sufficiency by creating local policies based on knowledge that aligns with the unique social, cultural, and economic characteristics of each locality. The model offers both a conceptual framework for KM and a practical methodology for promoting innovation through collaboration and organizational learning. Integrating this paradigm into local governance can foster an inclusive and adaptable innovation ecosystem in response to regulatory, structural, and cultural dynamics.

Moreover, the SECI model enhances local governments' innovation by fostering knowledge-

based capabilities, such as the ones for continuous learning, adaptation, and the development of contextual solutions to diverse public issues. Effective KM adoption provides local governments with a unique competitive advantage over other regions that rely solely on conventional administrative methods. This advantage is durable, since it develops during learning and innovation processes that are continuously revised and tailored to meet the desired conditions (Meyer & Waldorff, 2022). Therefore, the implementation of the SECI model within local government bureaucracy can facilitate innovation as long as the enforcement is grounded in local knowledge, collaborative efforts, and sustainable practices over time. Such approach establishes a competitive advantage stemming from the organization's internal dynamics and the distinctive collective learning capabilities, thereby making it difficult for others to duplicate.

However, a contributing factor to the "lack of innovation" is the use of the SECI model, which is normative and procedural without a comprehensive grasp regarding the fundamental nature of each stage. The socialization stage is sometimes considered a typical routine coordination meeting, lacking any endeavor to elicit tacit information from seasoned staffs. Furthermore, many local governments operate on budget constraints (Chundakkadan and Sasidharan, 2020), making it difficult to allocate sufficient resources for realizing KM programs. Consequently, KM as one of initiatives considered "intangible" or long-term is more likely to be disregarded. Whereas, without a robust KM system, local governments will continue to struggle to maintain policy consistency, document best practices, and support ongoing innovation. In this regard, one solution advised is to utilize simple yet effective ITs, such as cloud-based platforms, internal wikis, or online employee discussion forums, all of which are relatively low-cost. Additionally, local governments can promote a culture of documenting and knowledge dissemination within their operational framework, such as in the form of weekly reports, inter-departmental conversations, or post-project "lessons learned" initiatives.

In today's era of digital transformation and decentralization, a region's capacity to generate and implement new knowledge is crucial for fostering contextual and sustainable innovation. Moreover, the implementation of the SECI model creates cross-sector engagement among government, academia, commercial entities, and civil society (four pillars of the Quadruple Helix framework), thereby serving as a crucial foundation for developing a local innovation ecosystem. All four stages in the SECI model can enhance knowledge transfer among all related entities and promote the integration of ideas and resources, providing new solutions grounded in local potentials.

VI. CONCLUSION

This study confirms that using the SECI model (Socialization, Externalization, Combination, Internalization) in KM adoption can significantly enhance creativity within local government. The SECI model facilitates the systematic conversion of both tacit and explicit knowledge, yielding new insights that addresses local issues and enhances public services. Case studies' findings conducted on Sumedang, Banyuwangi, Deli Serdang, Aceh Jaya, and South East Aceh demonstrate that regions implementing the SECI model were significantly more innovative than those that did not fully adopt it.

Each stage in the SECI model has strategic implications. The socialization stage encourages the interaction and exchange of experiences among individuals, fostering a collaborative culture. The externalization stage enables the knowledge documentation in the form of standard operating procedures (SOPs), policy briefs, or handbook, serving as the basis for informed decision-making and policy development. Next, the combination stage integrates data and information from various sources into more comprehensive knowledge as a foundation for formulating policies or solutions. Finally, the internalization stage ensures that the formalized knowledge is truly adopted and applied in work practices through training, case studies, and mentoring. All of these stages create a learning organization, allowing the establishment of a bureaucracy that is sustainable and adaptive to any given changes and dynamics.

Nonetheless, substantial obstacles in this regard need to be addressed. This study's findings reveal that the primary impediments for implementing the SECI model are rigid organizational culture, individuals' reluctance to change, insufficient leadership support, budgetary limitations, and inconsistent human resource competency. One region, namely South East Aceh local government, illustrates how structural and cultural impediments can hinder the KM adoption and diminish creativity.

Local governments should incorporate the SECI model into local innovation and knowledge governance strategy frameworks. This can be conducted via local head regulations or bylaws that oversee the KM cycle, encompassing collection, documentation, and dissemination of best practices. Furthermore, the central government is advised to provide supporting regulations and inter-regional collaboration platforms to strengthen national knowledge-sharing capacity. Regional innovation portals and inter-regional knowledge hubs would enhance the integration process and promote cross-regional synergies. Additionally, the central government must also provide proactive budgetary support for knowledge investment, particularly to budget-constrained regions, through innovation-driven regional incentive fund programs or partnerships with research institutions and universities.

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