



## Digital Collaboration Models for Empowering SMEs: Enhancing Public Organization Performance

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### Abstract

This study aims to examine the effectiveness of SiBakul Jogja, a digital platform initiated by the government in Yogyakarta Province, in supporting small businesses and fostering collaboration among various stakeholders. Through interviews and research analysis, we investigate the mechanisms through which SiBakul Jogja facilitates small business growth and innovation. The findings reveal that SiBakul Jogja serves as a comprehensive resource hub for small businesses, offering assistance in record-keeping, advisory services, and fostering partnerships for innovation. Collaboration among government entities, businesses, academics, and the media plays a crucial role in enhancing the platform's impact. Positive outcomes include job creation and improved access to financial resources. However, challenges such as digital skills shortages and internet connectivity issues persist. The novelty of this study lies in its examination of SiBakul Jogja's collaborative approach in alignment with principles of new public service, contributing to improved public service delivery and economic growth. Addressing these challenges collectively presents an opportunity to leverage SiBakul Jogja's potential to significantly boost the local economy. Through effective teamwork and organizational strategies, digital support for small businesses can be optimized, fostering economic growth and resilience.

### Keywords:

Digitalization;  
Collaborative Model for MSMEs;  
Penta-Helix;  
Collaborative Governance.

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## 1- Introduction

The digital economy in Indonesia has reached its peak, making it a leader in the Southeast Asia region [1, 2]. According to research from Google, Temasek, and Bain & Company [3], the projected value of Indonesia's digital economy by 2025 is expected to reach USD 130 billion [1, 3]. This projection indicates Indonesia's significant potential to dominate around 52% of the Southeast Asia market share by the same year [3]. Additionally, the McKinsey Global Institute states that digitalization has the potential to boost economic growth and workforce productivity up to USD 150 billion by 2025, creating an additional 3.7 million job opportunities [4]. These figures underscore Indonesia's impressive status as a hub for digital economic growth in the region [1].

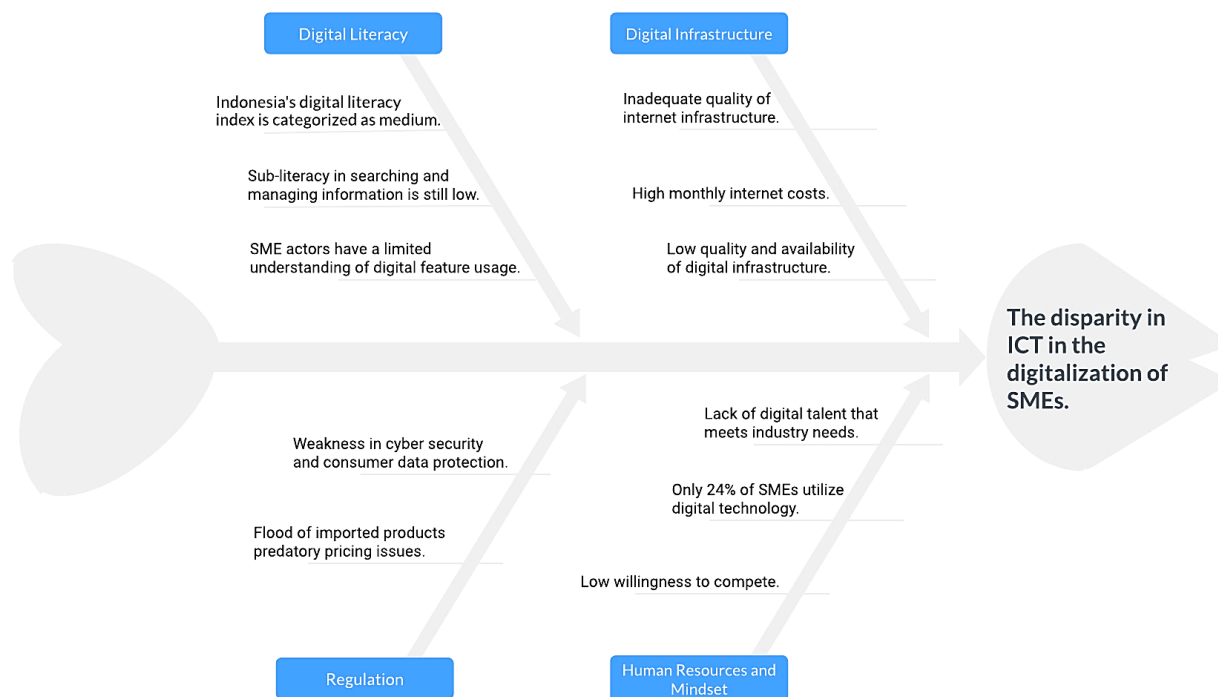
However, behind this growth surge, there are significant challenges that need to be addressed, especially at the level of Micro, Small, and Medium Enterprises (MSMEs) [5, 6]. Despite a significant increase in the number of MSMEs engaging in the digital ecosystem [7–9], there is still a lack of human resource capacity readiness as the main challenge for Indonesian MSMEs to enter the digital ecosystem [5, 6, 10]. Data from the Kata Data Insight Center survey shows

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that limited digital literacy and restricted adoption of digital technology are also hindrances in this digitalization process [10]. To overcome this, greater efforts are needed to enhance digital literacy and provide appropriate training for MSME stakeholders (see Figure 1) [6, 11–13].



**Figure 1. Illustrates the issues and challenges of digitalizing MSMEs [6]**

Furthermore, economic changes are not only occurring at the national level but also at the regional level [14, 15], such as in Yogyakarta Province. Here, MSMEs continue to be the main backbone of the provincial economy [16]. Data shows that MSMEs in Yogyakarta contributed approximately 98.4% to the provincial economy in 2019 and were able to absorb around 79% of the total workforce [4]. However, the COVID-19 pandemic has exerted significant pressure on MSMEs, especially those in the tourism sector and related sectors [17]. Many of them have experienced drastic income reductions and difficulties in marketing their products [18].

In addressing these challenges, innovations like SiBakul Jogja have played a crucial role in driving digital transformation in Indonesia [19, 20]. Data indicates that the SiBakul Jogja platform has recorded a total delivery value of IDR 2 billion as of December 2021, with more than 2,000 MSMEs registered on the SiBakul Markethub [20]. This highlights that innovations like SiBakul Jogja not only provide practical solutions for MSMEs to enter the digital market but also have a significant impact on economic growth [18, 20]. Furthermore, these innovations are also the result of collaboration between various parties, including the government, private sector, and society, which is key to accelerating the digital empowerment of MSMEs [13, 14]. This collaboration not only strengthens a unified database and improves human resource quality but also accelerates the achievement of shared goals in MSME digitalization. Innovations like SiBakul Jogja represent an effective form of collaboration to ensure the effectiveness and efficiency of MSME digital empowerment, as well as to support digital transformation in Indonesia [15, 16].

Considering these phenomena, this study presents a novel contribution to understanding the effectiveness and mechanisms of SiBakul Jogja, a digital platform initiated by the government of the Yogyakarta Province, in supporting and facilitating the growth of small businesses. In this context, previous research has highlighted the challenges faced by SMEs in the pandemic era, as well as the processes of innovation diffusion and adoption through similar platforms [17, 18, 20]. However, this study expands the scope by exploring in depth how SiBakul Jogja functions as a comprehensive resource for SMEs, and how collaboration among various stakeholders drives its impact. The aim of this research is to further understand the importance of digital empowerment of SMEs based on information technology in Indonesia. Additionally, we aim to explore effective collaboration models and the impact of public innovation in supporting this digitization effort. Thus, this study is expected to provide deeper insights into digital transformation in Indonesia and its benefits for economic growth and societal welfare. By emphasizing the collaborative approach of SiBakul Jogja in line with the principles of new public service, this research also enriches the understanding of the role of digital platforms in enhancing the performance of public organizations and strengthening the local economy.

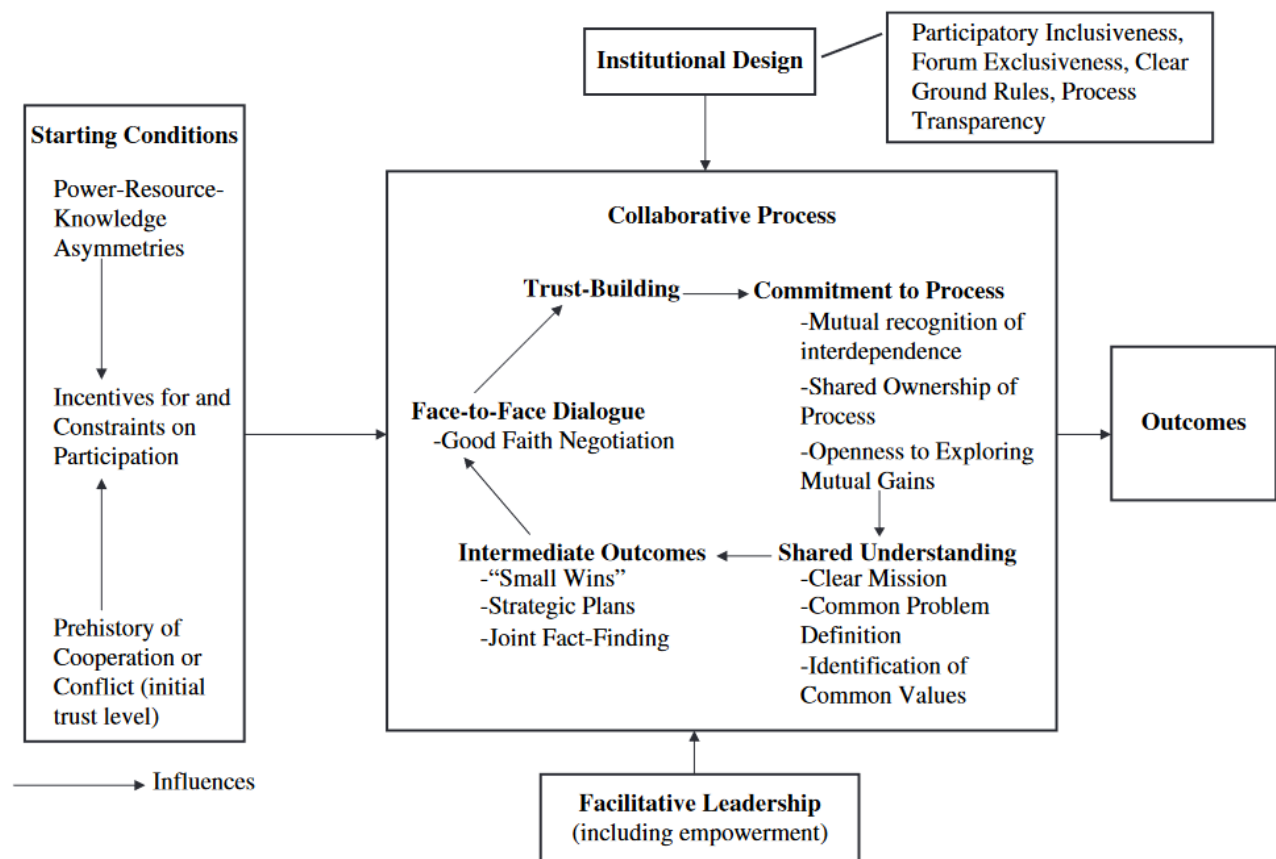
## 2- Literature Review

### 2-1- Collaboration in Digitalizing MSMEs

Collaboration in the digitalization of MSMEs is a fundamental cornerstone that enables cooperation among various parties to achieve complex goals in facing digitalization challenges. Collaboration is defined as the process of inter-organizational or actor cooperation to enhance potential and achieve results that cannot be independently attained [21, 22]. This approach allows the merging of resources, knowledge, and expertise needed to address various challenges encountered in the digitalization of MSMEs. In the literature, collaboration is often seen as a process involving dialogue, building trust, commitment, and shared understanding of the processes to be undertaken [23, 24]. Furthermore, collaborative governance concepts are also necessary to ensure the success of MSME digitalization. Collaborative governance is defined as a framework that governs how collaboration can be effectively and efficiently implemented [25, 26]. In this context, factors such as strong leadership, alignment of interests, resource availability, and effective communication play crucial roles in determining the success of collaboration [24]. Therefore, appropriate stages of collaborative governance design are needed, utilizing dimensions from the Ansell & Gash collaborative governance model, where these stages need to be qualitatively implemented based on literature studies of implementers and stakeholders in MSME digitalization in Indonesia.

### 2-2-Ansell & Gash Collaborative Governance Model

The most renowned collaborative governance model is the Ansell & Gash Model, which serves as a guide in research to assess the effectiveness of ongoing collaboration processes (Figure 2) [23, 24].



**Figure 2. Ansell & Gash collaborative governance model [23]**

This model employs four dimensions to measure the success of collaborative governance, namely: 1) Collaborative process as the core of collaborative governance, which encompasses (i) face-to-face dialogue; (ii) building trust; (iii) commitment to the process; (iv) mutual understanding. 2) There are three other influencing dimensions, namely (i) initial conditions, covering resource disparities, incentive availability, and past burdens; (ii) institutional design, including openness, procedure availability, and authority; (iii) facilitative leadership, involving facilitative leaders and organic leaders (see Table 1). These four dimensions of collaborative governance are analyzed and implemented to yield collaborative governance outcomes based on consensus-oriented and formal decisions [27].

**Table 1. Operationalization of the Ansell & Gash collaborative governance concept [24]**

Dimensions	Indicators
Initial Conditions	<ul style="list-style-type: none"> <li>• Imbalance among different stakeholders' resources or strengths</li> <li>• Incentives that need to be harmonized among stakeholders</li> <li>• History of conflicts or collaborations among stakeholders</li> </ul>
Collaborative Process	<ul style="list-style-type: none"> <li>• Dialogue among stakeholders</li> <li>• Mutual trust among stakeholders</li> <li>• Commitment among stakeholders in the collaboration process</li> <li>• Common understanding among stakeholders in the collaboration process</li> <li>• Temporary successes achieved in the collaborative process</li> </ul>
Institutional Design	<ul style="list-style-type: none"> <li>• Clear rules</li> <li>• Consistent rules</li> <li>• Transparency of the process provided to each stakeholder</li> <li>• Realistic deadline setting</li> </ul>
Leadership	<ul style="list-style-type: none"> <li>• Leader promotes broad and active participation</li> <li>• Leader ensures broad influence and control</li> <li>• Leader facilitates productive group dynamics</li> <li>• Leader expands the scope of the process</li> </ul>

### 2-3-Innovation Process in Public Organizations

The innovation process in public organizations is a crucial step that can be linked to collaborative models aimed at supporting the digitalization of SMEs [28]. According to Talke et al. [29], the stages of innovation implementation include initial understanding of the innovation, followed by a persuasion process involving a thorough assessment of the benefits and drawbacks of the innovation before decision-making. This process can be reinforced through collaboration among the government, SMEs, and other relevant stakeholders, aiming to facilitate the dissemination of information about innovation and enhance understanding and acceptance of change [30]. In line with this, Mulyono [31] highlights six essential components in efforts to develop innovation in the public sector, such as reducing government costs, improving government quality, and professional governance. Developing collaborative models among the government, academic institutions, and SMEs can optimize the utilization of available resources and expedite the innovation process in the public sector [30]. However, challenges in facing public administration innovation, as emphasized by Bekkers et al. [32], underscore the crucial role of the government in creating conditions supportive of knowledge-based economies and innovation. Collaboration among the government, SMEs, and educational institutions can help create a conducive environment for innovation, facilitate capacity building, and enhance the availability of resources needed to drive SME growth and development in the digital era [30]. Thus, cross-sector collaboration can be a key driver in accelerating the innovation process and advancing SMEs in facing global challenges.

### 3- Research Methodology

To understand the effectiveness of SiBakul Jogja in empowering small businesses, this research will employ a qualitative approach with a descriptive method conducted through literature review and in-depth interviews [33, 34]. The qualitative approach is chosen because it can provide a deeper understanding of the phenomenon under study [35, 36]. Additionally, the descriptive method will help in detailing specific cases related to the digitalization of MSMEs and collaboration in innovation development [29, 37]. In this study, literature review will also be conducted to search for data or research information through reading scholarly journals, reference books, and other publications relevant to the research topic [38, 39]. Moreover, in-depth interviews will be conducted with selectively chosen respondents, such as the Head of the Department of Cooperatives and MSMEs of the Yogyakarta Province, the manager of SiBakul Jogja, and MSME actors who are part of SiBakul Jogja's database.

The flowchart of the research methodology that was used to achieve the study's aims is shown in Figure 3.

**Figure 3. Flowchart of the methodology**

The first step in this research is to conduct a literature review to gain an in-depth understanding [39] of SMEs digitalization and collaboration in innovation development. This is followed by in-depth interviews with the Head of the Department of Cooperatives and SMEs of the Special Region of Yogyakarta, the manager of SiBakul Jogja, and SME actors who are members of the SiBakul Jogja database to identify and select respondents with relevant knowledge and experience on the research topic. Interview guidelines will be developed as a framework for conducting in-depth interviews with the selected respondents [36, 40]. In-depth interviews are conducted to obtain in-depth information and deeper insights [40, 41] into the respondents' experiences in SMEs digitalization and collaboration in innovation development.

Data obtained from literature review and in-depth interviews will be collected and analyzed qualitatively and descriptively to identify patterns, themes, and main findings [35]. The results of this analysis will be used to interpret the findings and relate them back to relevant theories [33, 42]. Subsequently, conclusions will be formulated based on the research findings, and recommendations will be provided for further development [41] in the context of SMEs digitalization and collaboration in innovation development.

## 4- Result and Discussion

### 4-1- SiBakul Jogja as a Model Platform for Digital Empowerment of MSMEs

SiBakul Jogja, short for “*Sistem Informasi Pembinaan Koperasi dan Pelaku Usaha*,” is a digital platform launched by the local government of the Special Region of Yogyakarta Province to support small and medium-sized businesses in the region in their digitalization efforts [20]. Recognized as one of the Top 45 Public Innovations in 2021, the platform offers services such as data collection and clustering of SMEs, mentoring programs for small businesses, and innovative facilities to strengthen SMEs, including an online marketplace for them to sell their products [20]. SiBakul Jogja also serves as a data center for cooperatives and SMEs in the DIY region due to its integrated system covering all activities related to the development of cooperatives and SMEs throughout Yogyakarta [20].

One of SiBakul Jogja's main features is comprehensive data collection, providing real-time data on SMEs. This allows the Yogyakarta Provincial Government to clearly understand the strengths of SMEs, enabling them to effectively direct their developmental activities. Additionally, SiBakul Jogja functions as a management system for cooperative and SME development activities, expected to effectively guide cooperatives and SMEs in strengthening their operations to become the backbone of the local economy, characterized by resilience, efficiency, and modernity. Furthermore, the platform provides easy and intuitive registration services, assisting entrepreneurs in creating business profiles with complete information, including business descriptions, offered products or services, address, contacts, and other relevant information. SiBakul Jogja provides e-commerce and online marketing services through SiBakul MarketHUB, allowing SMEs to sell products online with features such as uploading product photos, descriptions, prices, available stocks, as well as promotions and customer targeting to increase their reach and exposure.

Moreover, the platform also offers integrated payment and delivery services that facilitate transaction processes for both entrepreneurs and customers with a secure online payment system and various product delivery options. Furthermore, SiBakul Jogja provides access to digital education and training resources for SMEs, such as online tutorials, webinars, and educational content related to business management, digital marketing strategies, finance, and information technology, as well as digital consultation or mentoring services for those in need. Additionally, the platform assists SMEs in accessing financial resources by facilitating relationships with financial institutions and investors, and provides analytical data to understand business performance and make strategic decisions. With features and functionalities such as registration and data management, SiBakul Jogja provides easy, organized, and centralized access to relevant data, supporting effective SME development and mentoring.

Through SiBakul Jogja, the concept of community empowerment, which is fundamental in the context of development, can provide individuals with the ability to benefit from problem-solving processes and achieve development goals. In this regard, the government plays a crucial role as an initiator in guiding communities towards self-sufficiency and prosperity, acting as a policy maker, regulator, change driver, and facilitator. Government empowerment initiatives involve exploring community potential, identifying their needs, and formulating solutions. In Yogyakarta, the potential lies in the abundance of SMEs and cooperatives. However, the challenges faced by these entities indicate the need for improvement to achieve community welfare through empowerment. Community empowerment is not just about modernization and increased production, but also involves efforts to create a conducive environment for communities to utilize their potential and become productive contributors to the economy [43].

Through SiBakul Jogja provided by the Yogyakarta Office of Cooperatives and SMEs, communities gain access to product marketing facilities through its website, leveraging technology to reach a wider audience. Furthermore, the significant impact of SiBakul Jogja on the SME economy has been reported by Ivan, with economic activity increasing up to sevenfold or approximately 10.5 billion, thereby making a significant contribution to the economic turnover in the Special Region of Yogyakarta. This underscores the importance of commitment and collaboration between the



government, private sector, non-profit organizations, and local communities in advancing regional economies, creating partnership-based strategies that empower communities and support development initiatives, including funding, technology, and marketing assistance through SiBakul Jogja, which has played a role in supporting the digital transformation of SMEs in Yogyakarta by providing the necessary tools and resources to thrive in the digital economy through various features and functions such as easy registration, e-commerce capabilities, financial access, and data analysis, SiBakul Jogja empowers SMEs to adapt and succeed in an increasingly digital landscape.

#### 4-2- Stages of Collaboration in the Digital Empowerment of MSMEs

Considering the involvement of multiple parties in the digital empowerment of MSMEs in the Special Region of Yogyakarta, intensive collaboration and coordination among these parties are necessary. The Department of Cooperatives and MSMEs plays a leading role, supported by other stakeholders. Collaboration in the digital empowerment of MSMEs requires the implementation of collaborative governance efforts. However, based on previous research findings, it is evident that there is still a lack of collaborative governance that fully adheres to the concept and succeeds [24]. The reasons for this include the absence of strong leadership, challenges in reconciling differing interests, resource constraints, incomplete stakeholder support for collaboration, and insufficient communication.

The digital empowerment of MSMEs can serve as an opportunity for integrated learning among multiple stakeholders through the implementation of collaborative governance, where the key factor lies in successfully applying collaborative schemes to address the phenomenon of “working in silos” or working in isolation [24]. The stages of collaborative governance in this research are based on the dimensions of the Ansell and Gash Collaborative Governance Model. These stages are carried out qualitatively through literature review and interviews with implementers and stakeholders of MSME empowerment digitization in the Special Region of Yogyakarta Province, with the conclusions of these stages outlined in Table 2.

**Table 2. Stages of collaborative governance for digitalization of MSME empowerment using the Ansell & Gash Model**

No.	Dimensions
<i>Initial Conditions</i>	
A	<ul style="list-style-type: none"> <li>● <b>Governance:</b> In the Yogyakarta Provincial Government, there was previously no integration of data and programs for MSME empowerment, making it difficult to determine the criteria for upgrading MSMEs. There was no unified program and activities across departments or even at lower levels of government, including within their digitalization platform.</li> <li>● <b>Data Infrastructure:</b> A system and infrastructure are needed to integrate data from various sources. Further processes are required to analyze and process metadata for MSME empowerment, especially in integrating data and programs with each other.</li> <li>● <b>Human Resource Capacity:</b> The human resources capacity in the Yogyakarta Provincial Government through the Department of Cooperatives and SMEs was inadequate to manage and integrate MSME empowerment programs and databases. Personnel capacity needs to be enhanced to manage data effectively.</li> <li>● <b>Data Management:</b> There was inconsistency in the types and formats of data, including the synchronization of programs conducted by various parties. Data and programs held by each party were not uniform, and there were limitations in access, with not all data and programs being accessible to the public.</li> </ul>
<i>Leadership</i>	
B	<ul style="list-style-type: none"> <li>● Proactive, facilitative, appreciative, communicative, egalitarian leaders who frequently attend meetings foster respect from stakeholders, leading to improved collaboration quality.</li> <li>● The ability to develop networks and expand activities is an added value for a leader in coordinating MSME empowerment digitalization.</li> <li>● In addition to leadership from the Head of the Department of Cooperatives and SMEs, guidance from the Governor through issued regulations helps coordinate data and program owners to participate and hold meetings if necessary for MSME empowerment.</li> </ul>
<i>Institutional Framework</i>	
C	<ul style="list-style-type: none"> <li>● The Regional Regulation of the Special Region of Yogyakarta No. 1 of 2018 regarding the Institutional Government of the Special Region of Yogyakarta and the Circular Letter of the Governor of Yogyakarta No. 519/7669 concerning the Appeal for Purchasing MSME Products in the Yogyakarta Special Region are examples of formal and informal regulations that are mandatory as long as they are agreed upon. Flexibility is still maintained.</li> <li>● Coordination forums are formed, and formal meetings are regularly held and supported by informal meetings.</li> <li>● Activities are well-documented to maintain transparency and consistency.</li> <li>● Most activity agendas are well-planned with clear time frames, although implementation is adjusted according to needs and conditions. Sporadic activities also frequently occur.</li> <li>● Essentially, stakeholder forums are supported by secretarial functions, although only a few are permanent secretariats.</li> </ul>
<i>Collaborative Process</i>	
D	<ul style="list-style-type: none"> <li>● Involving diverse stakeholders who complement each other's strengths and weaknesses, including both central and local governments and private sectors.</li> <li>● Face-to-face meetings such as FGDs, workshops, training, and even intensive field visits encourage understanding, trust, shared motivation, and commitment.</li> <li>● Each stakeholder is involved in decision-making through consensus.</li> </ul>

### *Outputs and Impact*

- E
- The primary output is public policy, in the form of MSME empowerment digitalization policies managed through a technology-based information system where each party (central, regional, and private sector) is willing to integrate their data and programs and utilize the data in SiBakul Jogja as the basis for implementing MSME empowerment activities.
  - Collaborative governance is deemed successful based on several impacts such as: (i) coordination, synergy, and integration of activities/programs leading to improved quality (effectiveness and efficiency) of public policies; (ii) follow-up and monitoring of public policies resulting from collaboration; (iii) collaborative governance becoming the main stream in the process of formulating public policies; (iv) formation of networks and stakeholder forums on various strategic issues; (v) reduction of sectoral egos and the phenomenon of working in isolation; (vi) improved openness between government and non-government institutions leading to smoother communication and better relationships; (vii) broader coverage of programs/activities.
  - Key success factors of collaboration include: (i) shared motivation, understanding, and commitment; (ii) facilitative but firm leadership; (iii) egalitarian, open, communicative, and trusting environment; (iv) clear vision, mission, goals, targets, outputs, and benefits; (v) availability of networks and stakeholder forums with secretariats; (vi) pooling of resources including human resources, finances, data, information, and knowledge; (vii) availability of collaboration champions; (viii) decision-making based on consensus; (ix) regulatory support; (x) abundant knowledge exchange fostering innovation.
  - Significant obstacles in the collaboration process include: (i) relatively longer time required; (ii) excessive bureaucracy and reluctance to step out of comfort zones; (iii) working in isolation, lack of openness, and mutual suspicion; (iv) turnover of staff and leaders; (v) conflicting interests; (vi) involvement of many stakeholders with insufficient qualifications; (vii) inadequate and non-transparent data and information.
  - Some unexpected occurrences include: (i) changes in leadership policies and political dynamics; (ii) personnel turnover; (iii) lack of understanding about collaboration; (iv) sharp differences in opinions; (v) failure to fulfill commitments; (vi) competing resource pooling; (vii) stakeholder forums serving as informal platforms for aligning motivation and commitment; (viii) opportunities given to non-governmental entities to contribute to policy formulation.
  - Some perceived necessary actions to enhance the collaboration process include: (i) expanding the scope of substance and involving a more diverse range of stakeholders; (ii) requiring expert support; (iii) increasing understanding of collaboration and advocating to leaders; (iv) formalizing collaborative partnerships; (v) involving marginalized groups; (vi) leadership cadre development; (vii) strengthening monitoring and evaluation.

Strengthening collaborative governance in the digital empowerment of MSMEs also involves several strategic steps, namely:

#### *1) Stakeholder mapping and selection*

Although the data on the digital empowerment of MSMEs is distributed involving many parties, including district/city governments in the Special Region of Yogyakarta and the private sector, efforts to involve as many stakeholders as possible need to consider the suitability of the selected stakeholders. It's not just about quantity but also about ensuring coverage of all stakeholder categories. Stakeholder selection is done using open, testable criteria that have been proven to reach all stakeholder categories. The diversity and completeness of the range of stakeholders involved will determine the quality of collaboration. Thus, collaboration becomes meaningful.

Stakeholders themselves are categorized based on their level of influence and interest in 3 (three) categories: (i) core; (ii) supportive, and (iii) complementary. The core category consists of stakeholders who have significant influence either because they have authority or are close to power. On the other hand, stakeholders who have a significant interest because they may be affected or have an impact on the issue fall into this category. In the development of the digital empowerment of MSMEs in the Special Region of Yogyakarta, the core category includes the Department of Cooperatives and MSMEs of the Special Region of Yogyakarta (DIY Dept. of SMEC), the Department of Communication and Information (DCI), the Department of Industry and Trade (DIT), the Regional Development Planning Agency (RDPA), and the District/City Governments (D/R Gov.) throughout the Special Region of Yogyakarta through their respective Departments in charge of Cooperatives and MSMEs.

Meanwhile, the supportive category consists of stakeholders who have significant power but do not have significant interest or have significant interest but little authority. Stakeholders in this supportive category include universities, MSME associations, and the private sector. The complementary category consists of stakeholders with low levels of influence and interest but still have relevance to strategic issues and will be invited to public consultations as part of the general public.

#### *2) Stakeholder forum*

One of the principles of collaborative governance is face-to-face interaction, implying the need for a gathering space. This can take the form of a stakeholder forum, which serves as a platform for exchanging ideas, sharing knowledge, and making consensus-based decisions. Therefore, this forum needs to be formalized with secretariat functions and professional staff. However, hierarchical structures that diminish the quality of collaboration should be avoided as much as possible. Hence, the existence of a Coordination Forum initiated by the Department of Cooperatives and SMEs to evaluate SiBakul Jogja as a gathering space and face-to-face interaction is an essential element of collaborative governance.

### **3) *Partnership among stakeholders***

One fundamental reason for stakeholders to collaborate is to pool resources to address common issues more effectively and efficiently. Therefore, there is a need for joint efforts in the form of partnerships among stakeholders, which can take various forms, including government-to-government, government-to-non-government, and non-government-to-non-government partnerships. These partnerships should ideally commence even before the collaboration process begins, and non-government stakeholders can even be primary partners in overseeing activities from start to finish. Partnerships are built to integrate data and empowerment programs for SMEs through an integrated platform in SiBakul Jogja and can be utilized by each stakeholder.

In an effort to promote cooperation among stakeholders to support SMEs, SiBakul Jogja collaborates with relevant departments to develop policies that facilitate small business growth, such as providing digital infrastructure, entrepreneurship training, and incentives for small business owners using the SiBakul Jogja platform. Additionally, partnerships are formed with various businesses, both small and large scale, to support the promotion and distribution of products from registered small businesses on the platform, which can help expand market reach and increase sales for small business owners. SiBakul Jogja also partners with universities and research institutions to conduct training, workshops, and mentoring programs for small business owners. Collaboration with academics can also aid in the development of innovative products and more effective marketing strategies. SiBakul Jogja collaborates with local media for promotions and campaigns that support products from small businesses registered on the platform, which can help increase exposure and consumer awareness of local products. Through promoting collaboration among various stakeholders, SiBakul Jogja can create an ecosystem that supports the growth and sustainability of small businesses in the Yogyakarta Province. This cross-sector collaboration can also provide greater benefits for small business owners and drive overall local economic development.

### **4) *Development of communication strategy***

At the initial stage, the prevailing issue usually revolves around stakeholders' lack of understanding of the new program/activities. This is primarily due to the lack of exposure of the public to information. After the collaboration takes place, intensive communication efforts are needed to ensure that the collaboration process remains open and accountable. Therefore, a communication strategy is needed to guide all stakeholders in their communication efforts. This communication strategy serves as a reference not only for external public communication but also for advocacy to decision-makers and government stakeholders at large.

### **5) *Knowledge management***

A global and massive program/activity requires a database as the basis for decision-making. Moreover, this data needs to be developed into knowledge that can enhance the quality of collaboration process outcomes. Additionally, knowledge management can sustain the collaboration process. Distributed knowledge encourages innovation. Data, information, knowledge, and innovation supported by communication can incentivize the collaboration process. Furthermore, for effective knowledge management, the development of a database as the basis for public policy determination is necessary. All data, information, and knowledge should be made open, distributed, and easily accessible, thus forming a growing knowledge spiral. Stakeholders enhance their capacities, and simultaneously, the decision-making process becomes more qualitative.

### **6) *Facilitative leadership***

Several research findings, including interview results, highlight that leadership is key to the success of collaboration. A leader who is egalitarian, open to discussion, consistently present in meetings, and capable of maintaining collaboration dynamics is needed. Such abilities are referred to as facilitative leadership. While finding such leaders may not be easy, at least these criteria should be considered. There is a need for leadership skill enhancement, such as leading meetings and negotiating, to ensure the quality of the collaboration process. The Head of the Department of Cooperatives and SMEs can optimize the function of SiBakul Jogja in promoting the integration of SME empowerment services.

### **7) *Capacity building***

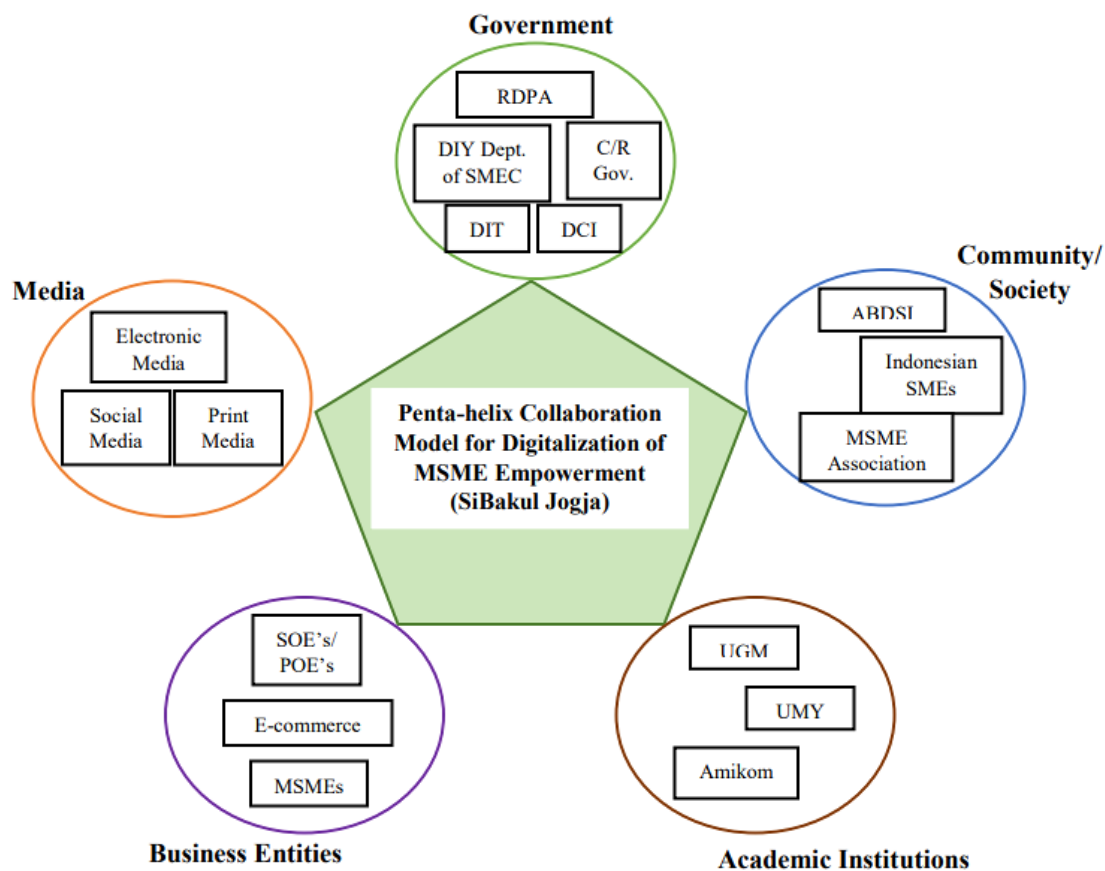
The success of a program/activity is always supported by adequate human resources, funding, and knowledge. Therefore, training, learning, knowledge management, sharing, and partnerships are crucial. Disparities in capacity between regions can also occur and affect the collaboration process. Thus, by using the dimensions of collaborative governance models, the capacity conditions of each region can be classified. It must be acknowledged that the limitation of human resources in data management in Indonesia poses a challenge, including in SME data scattered across ministries/agencies and local governments. Therefore, serious efforts are needed to enhance the capacity of human resources in managing SME data. The involvement of UGM, UMY, and Amikom Yogyakarta in developing human resources and infrastructure for managing SiBakul Jogja reflects the stages of collaboration undertaken.



#### 4-3- The Penta-Helix Model of Collaborative Governance for SME Empowerment Digitalization

In today's fast-paced world, governments, including local governments, are often required to have multiple skills and capabilities to perform various roles simultaneously to achieve significant outcomes. However, sometimes governments forget that ministries or departments as organizations/institutions also have limitations. With the multitude of demands, it is essential for governments to recognize their own capabilities from now on to synergize and complement each other from small to large scopes. In empowering SMEs, the Department of Cooperatives and SMEs of the DI Yogyakarta Province cannot do it alone. Hence, the importance of collaboration among stakeholders in achieving common goals by maximizing the concept of the penta-helix involving multiple roles. The penta-helix or multi-stakeholder concept combines various parties, including Academy, Business, Community, Government, and Media (ABCGM), including in the development of a single SME database (Figure 4).

The penta-helix concept, which combines the roles of academia, businesses, communities, government, and media, aims to integrate SME data and share it with other stakeholders. In essence, the penta-helix concept is one way to address issues and develop programs by involving cross-sector collaboration to share roles. The focus of the penta-helix is collaboration between the government and stakeholders down to the community level.



**Figure 4.** Illustrates the penta-helix model of SME empowerment digitalization

In the penta-helix model, the roles of each party in the collaboration for SME empowerment digitalization can be further elaborated as follows:

##### 1) *Government*

The government plays three roles in the penta-helix concept. Firstly, it acts as a regulator and controller with regulations and responsibilities in social change. In fulfilling this role, the government must involve in all its activities, such as planning, implementation, monitoring, control, promotion, financial allocation, licensing, and others. Additionally, the government serves as a coordinator for stakeholders contributing to social change. In this context, the government, under the Department of Cooperatives and SMEs of the DI Yogyakarta Province, is supported by other departments with roles and responsibilities in SME empowerment. The Department of Communication and Information Technology provides data infrastructure, the Regional Planning and Development Agency coordinates SME empowerment planning, and other departments, including local governments, act as data producers and owners of SME empowerment programs/activities.

## 2) *Community/Society*

The community is represented in the form of communities. In the penta-helix collaboration context, communities consist of a group of people with similar and relevant interests to the developing concept. Communities serve as accelerators, not only supporting by promoting products and services produced by the community but also acting as a connector between stakeholders to assist the community throughout the process of social change. Equally important are communities or associations of SME actors scattered across regions. These communities can encourage SME actors to actively engage in using and benefiting from SiBakul Jogja. Associations such as ABDSI, UKM Indonesia, and others can serve as a link between the government and its SME actors.

## 3) *Academic Institutions*

In the penta-helix concept, academic institutions serve as conceptualizers who conduct research, assist in identifying potential and development opportunities, and enhance knowledge and skills capacity. They are responsible for enhancing knowledge and skills capacity as they constitute a wellspring of knowledge encompassing a collection of relevant concepts, theories, and development models. Academics play a role in designing models and digital empowerment collaboration systems for SMEs while also enhancing the capacity to manage the SiBakul Jogja platform. Several universities have been and can be involved, such as UGM, UMY, and Amikom Yogyakarta.

## 4) *Business Entities*

Business entities, whether corporations or individual entrepreneurs, act as enablers that help achieve goals by conducting business processes to generate added value and sustain growth. In the context of penta-helix collaboration, businesses can provide technological infrastructure, capital, and business networks for Micro, Small, and Medium Enterprises (MSMEs) to benefit from. Relevant businesses in this regard include the presence of digital platforms (e-commerce), state-owned enterprises (SOEs), and private companies that are closely linked to SiBakul Jogja in facilitating MSMEs.

## 5) *Media*

Media acts as an expander in supporting the promotion of products and services produced by the community, including publicizing activities within SiBakul Jogja. Media also play a crucial role in building the brand image of the social change being fostered in society, making information easily accessible where active participation from MSMEs is expected to report their data. With easy access to information, it will attract and add new collaborators to collectively create social change that impacts society. Media that can be involved include social media, print media, and electronic media to support the development of a single database for MSMEs.

### **4-4- *Evaluation of MSME Empowerment Digitalization through SiBakul Jogja***

Based on the comprehensive explanation provided earlier regarding the collaboration in digitalization for MSME empowerment through the SiBakul Jogja System, which aims to foster and strengthen the local economy, particularly for cooperative and Small and Medium Enterprises (SMEs) entrepreneurs, it has been found that the implementation of the SiBakul Jogja System contributes to an increase in demand for products marketed by MSMEs in DI Yogyakarta. Furthermore, it opens up opportunities for job creation for individuals who are not accommodated by the formal sector or large-scale businesses, with up to 79% of total employment, thus establishing MSMEs as a cornerstone of the economy in Yogyakarta [20]. This is evidenced by the rise in sales of local products through the SiBakul Jogja platform, enabling small businesses to expand their operations and hire more workers to meet various market demands. Additionally, collaboration with financial institutions and the government has also assisted in improving access to financing for registered small businesses on SiBakul Jogja. With easier access to financing support, small business owners can develop their enterprises and scale up production.

The implementation of the SiBakul Jogja System, which is based on community empowerment and applies the concept of New Public Service, is an appropriate approach to address the issue of suboptimal utilization of resources and strategic potential held by the community, especially cooperative and Small and Medium Enterprises (SMEs) players in Yogyakarta City. The collaborative approach used in SiBakul Jogja is in line with the principles of New Public Service, emphasizing community participation, transparency, accountability, and innovation. SiBakul Jogja engages various stakeholders, including small business owners, academics, local media, and local governments, in developing an ecosystem that supports the growth of small businesses, ensuring that the needs and aspirations of the community are met in the provision of public services. By implementing transparency in every activity and decision made, SiBakul Jogja does so through cross-sector collaboration, openly providing information about programs, activities, and collaboration outcomes to the public, thus also impacting public trust and increasing accountability. In collaboration with various parties, SiBakul Jogja upholds the principle of accountability to ensure that every action and decision made

is responsible. By building a transparent and accountable system, SiBakul Jogja ensures that the public services provided are of high quality and meet the needs of the community. To encourage innovation in the provision of public services involving various parties in a collaborative process. This is done by combining knowledge, resources, and expertise from various sectors, SiBakul Jogja can create creative and effective solutions to improve public services for small business owners. Furthermore, the value of community empowerment in the SiBakul Jogja program encourages, motivates, and increases awareness among local communities, especially players in the creative industry such as cooperatives and SMEs, in developing and optimizing their potential and resources, with efforts in community empowerment through the SiBakul Jogja program being followed by strengthening the potential or strengths possessed by the community itself.

The acceleration of MSME development in the DI Yogyakarta Province through SiBakul Jogja is also supported by collaborative and synergistic partnerships involving partners such as Grab and GoJek, to assist MSMEs in distributing their products more easily to consumers. This innovation expands the target market for MSMEs, including cooperatives and SMEs in the city of Yogyakarta, particularly with policies such as offering free delivery to buyers of cooperative and SME products with a minimum purchase of Rp. 50,000. The SiBakul Jogja System also facilitates the provision of financial assistance for MSME business development through collaboration with State-Owned Enterprises (SOEs) such as Bank Mandiri, BNI, BPD DIY, Angkasa Pura, and PT Kereta Api Indonesia. The success and positive impact achieved from implementing SiBakul Jogja in empowering and developing cooperative and SME businesses can be attributed to the involvement of various multi-stakeholder actors, including the government, state-owned enterprises, private sector, and collaborating communities. They synergize efforts, utilizing digital marketing strategies leveraging social media platforms like Facebook, Instagram, YouTube, and e-commerce platforms such as GoJek and Grab, which further strengthen cooperatives and SMEs.

According to Faidati et al. [17], digital transformation in empowering cooperatives and SMEs through SiBakul Jogja helps change the techniques and methods of marketing and selling MSME products. The utilization of digital technology in the SiBakul Jogja system also helps transform the management of SMEs to be more organized because through the system, every aspect and business function can be managed and regulated digitally. Additionally, the strategy of developing SMEs through the SiBakul Jogja system also contributes to the development of product marketing techniques, innovation, and the utilization of information technology, as well as the absorption and empowerment of human resources, business development, and the development of competitive products. However, there are still several obstacles faced by SME players in developing their sectors through the SiBakul Jogja system. One of them is the suboptimal infrastructure of the SiBakul Jogja server, which often experiences disruptions, resulting in difficulties in access for cooperative business players and SME players, as well as consumers. Another issue is the low knowledge and mastery of the community regarding digitalization, especially among vulnerable groups such as SME players who are not ready to adapt to technological developments. Additionally, the lack of encouragement for innovation among SME players in developing their businesses also poses a challenge, so even though facilitated by the SiBakul Jogja System, the businesses run cannot last long. In response to these challenges, the SiBakul Jogja program offers solutions by providing training and workshops on the use of digital technology, as well as providing online tutorials and webinars accessible to SMEs anywhere. This allows them to learn at their own pace and reduce geographical barriers. Additionally, to address the issue of slow or unstable internet connectivity, cooperation with internet service providers and relevant agencies is conducted to improve internet infrastructure, especially in affected areas, so that access to the SiBakul Jogja platform can be easier for small business players.

## 5- Conclusion

Innovation in public services continues to be pursued across various government sectors, especially in the post-COVID-19 pandemic era. These innovations serve as improvements to public service delivery, guided by the principles of the new public service to ensure that services meet public needs and are transparent in their implementation. One key factor contributing to the success of implementing the new public service is the proliferation of digital-based service innovations, closely tied to e-government, which leverages advancements in information technology to provide more innovative, transparent, and integrated public services, one of which is through the SiBakul Jogja system.

To maximize the collaborative process in digitizing SME empowerment through SiBakul Jogja, it can be examined using the dimensions of the Collaborative Governance Model by Ansell and Gash. The first step involves conducting a gap analysis between the goals and objectives to be achieved and the current conditions faced. The digitalization collaboration for SME empowerment begins with establishing a baseline or initial target, which serves as a benchmark for measuring the progress or success of a program. Subsequently, it is essential to form working groups or forums involving stakeholders who can contribute their time and expertise. These working groups operate under the coordination of the Department of Cooperatives and SMEs of the Yogyakarta Province as the leading sector, assisted by other involved parties. Along the way, the utilization of SiBakul Jogja is reinforced with legal regulations to support the digitalization process of SME empowerment.

The penta-helix concept, which combines the roles of academia, businesses, communities, government, and media, aims to synergize data and SME empowerment programs from other stakeholders. In this concept, academia serves as the conceptualizer conducting research, assisting in identifying potentials and development opportunities. Businesses, in the form of organizations or business entities, act as enablers, helping achieve goals by conducting business processes to generate added value and maintain sustainable growth.

In the current digital era, the presence of digital platforms (e-commerce) needs to be extensively involved in supporting SME empowerment, as exemplified by SiBakul Jogja's implementation to provide free shipping facilities. The role of communities in the context of penta-helix collaboration consists of a group of people with similar and relevant interests in the concept being developed. The government acts as a regulator and controller with rules and responsibilities in social change, also serving as a coordinator for stakeholders contributing to social change. Meanwhile, the media acts as an expander in supporting publicity related to SME empowerment to promote SME products and the ease obtained from SME empowerment implementation. With easy access to information, new collaborators are invited and added to collectively create social changes that impact society.

This study presents a novel contribution to understanding the effectiveness and mechanisms of SiBakul Jogja in supporting and facilitating the growth of small businesses, particularly in the context of IT-based empowerment of SMEs in Indonesia. It goes beyond the scope of previous research by delving deeper into the role of SiBakul Jogja as a comprehensive resource for SMEs and the impact of collaboration among various stakeholders in enhancing its effectiveness. We also find that the collaborative approach of SiBakul Jogja, aligned with the principles of new public service, as previously studied, can enhance the performance of public organizations and support local economic growth. Utilizing the Collaborative Governance model and the penta-helix concept, this study demonstrates that cooperation among academia, business, community, government, and media is crucial in strengthening the positive effects of SME empowerment digitization. While previous research has highlighted the importance of digital innovation in improving access and services for SMEs, our findings contribute to understanding how collaborative models and stakeholder integration can amplify the positive impact of such innovation, thereby not only supporting local economic growth but also the overall welfare of society.

## **6- Declarations**

### ***6-1-Author Contributions***

Conceptualization, R.L.K. and E.Y.; methodology, J.H.P. and E.Y.; software, R.L.K., E.M., and M.A.P.S.; validation, E.Y., J.H.P., and L.H.; formal analysis, L.H. and E.M.; investigation, P.S., R.L.K., and J.H.P.; resources, R.L.K. and E.Y.; data curation, M.A.P.S., L.H., J.H.P., and E.M.; writing—review and editing, J.H.P. and R.L.K.; visualization, E.Y. and P.S. All authors have read and agreed to the published version of the manuscript.

### ***6-2-Data Availability Statement***

The data presented in this study are available on request from the corresponding author.

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### ***6-5-Institutional Review Board Statement***

Not applicable.

### ***6-6-Informed Consent Statement***

The Informed consent agreement regarding the provision of data and willingness to filled the survey had been approved by all participants.

### ***6-7-Conflicts of Interest***

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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