



Pentahelix Collaboration in Enhancing Creative Economic Competitiveness Based on MDI Culture in West Sumatra Tourism Destinations

Irwan Irwan¹, Zusmelia Zusmelia², Ansofino Ansofino³, Abather Rahi Saadoon⁴, Kevin William Andri Siahaan⁵

¹Program Studi Studi Humanitas, Universitas PGRI Sumatera Barat, 25137, Padang, Indonesia

²Program Studi Studi Humanitas, Universitas PGRI Sumatera Barat, 25137, Padang, Indonesia

³Program Studi Studi Humanitas, Universitas PGRI Sumatera Barat, 25137, Padang, Indonesia

⁴Department of Archaeology, Al-Muthanna University, Iraq

⁵Kementerian Pendidikan Sains dan Teknologi, Jakarta, Indonesia, 10110

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CORRESPONDENCE

Name: Irwan Irwan

Email: irwan7001@gmail.com

A B S T R A C T

This study aims to analyze the pentahelix actors in developing the competitiveness of the culture-based Creative Economy and MDI in West Sumatran tourist destinations. This study uses the pentahelix theory proposed by Etzkowitz & Leydesdorff (2000). This study uses a qualitative approach with a descriptive type and informant collection techniques using purposive sampling. The data collection method begins with document studies, non-participant observation, in-depth interviews, and focus group discussions (FGD). Data analysis in this study uses the Milles and Huberman method (1992) and uses Mactor software (Matrix of Alliances and Conflicts Tactics, Objectives and Recommendations). The results of this study indicate that the development of the creative economy in the competitiveness of the Creative Economy involves actors ranging from the media, government, society, academics, communities, and businesses, as well as banks. Actors involved in the Creative Economy are classified as very strong, namely the media, government, society, and academics. In addition, the pentahelix in developing the competitiveness of the culture-based creative economy in West Sumatran tourist destinations can create an advanced, innovative, and sustainable environment. Collaboration between parties in the pentahelix model can strengthen innovation, increase the competitiveness of tourist destinations, encourage the preservation of local culture, and create a creative economy ecosystem that is sustainable, inclusive, adaptive, and competitive at the national and global levels.

INTRODUCTION

The development of the creative economy has become a major program in stimulating economic growth in various parts of the world (Wahyuni Adda, 2022). Especially in the era of globalization and advances in information technology, the creative economy has become one of the increasingly important sectors in driving a country's economic growth (Hastiyorini, 2018). In the midst of increasingly fierce global competition, the development of a creative economy based on media culture in tourist destinations is becoming increasingly relevant and strategic (Zusmelia, 2023). The creative economy is a provision of added value (Value Added) consisting of creativity, innovation and discovery of a product or service (Ichsan, 2022). In line with that, the creative economy is a program of increasing value brought to the world from human thought and imagination coordinated with science, social heritage and innovation (Irwan, 2023). The creative economy offers great potential to create jobs, increase income, and promote the cultural identity of a region (Syarif, 2021). The Government of the Republic of Indonesia through the Ministry of Tourism and Creative Economy has identified the scope of the creative economy (I. Zusmelia et al., 2020). Regulated in Presidential Regulation Number 72 of 2015 concerning Amendments to Presidential Regulation Number 6 of 2015 concerning the Creative Economy Agency, the government has formed 16 creative economy sectors including application and

game developers, architecture, product design, interior design, fashion, visual communication design, performing arts, film, animation, and video, photography, crafts, culinary, music, advertising, fine arts, publishing, applications, television and radio, research and development (Firdausy 2018). In Indonesia, tourism destinations are one of the sectors that have great potential for the development of a culture-based creative economy, one of which is in West Sumatra (Zusmelia, 2020). The development of a culture-based creative economy is the main focus in West Sumatra, which is known for its stunning natural beauty, unique Minangkabau cultural richness, and the friendliness of its people (Zusmelia, 2022). West Sumatra has its own appeal for both domestic and foreign tourists (Maturbongs, 2020). The wealth of its amazing culture and nature has great potential to become a leading tourist destination in Indonesia (Zusmelia, 2023). The number of tourist destinations based on districts and cities in West Sumatra is as follows:

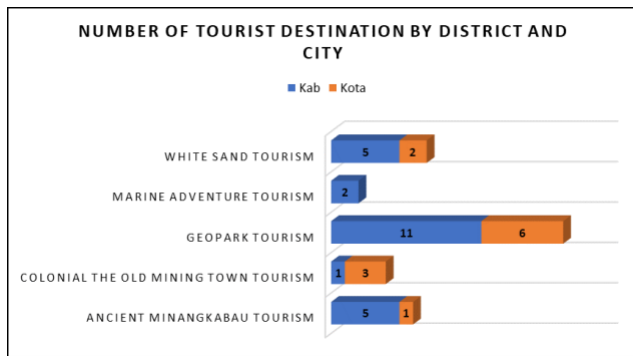


Figure 1. Number of Tourist Destinations Based on Regency and City in West Sumatra

Source. West Sumatra Provincial Tourism Office

As shown in Figure 1, there are five types of tourist destinations in West Sumatra, comprising a total of 36 tourist attractions. The tourist destinations currently developing the creative economy are the city of Padang, Tanah Datar, Pesisir Selatan, the city of Bukittinggi, and the city of Sawahlunto. (Pugra et al., 2021). In developing the creative economy, the government provides strong support to creative economy actors, this is one of the great opportunities for creative economy actors to maintain culture by providing new innovations for competitiveness (Irwan, 2023). In addition, to increase the competitiveness of the creative economy, there needs to be a role for pentahelix actors as a force in the development of the creative economy (Salsabila, 2024). The penta helix actors in the development of the creative economy in West Sumatra tourist destinations are as follows (Pramanik et al., 2019):



Figure 2. Actors involved in Creative Economy Development (Source. Amin, 2020)

Based on the image above, there are 7 actors involved in the development of the creative economy. In the development of the creative economy, it cannot be done separately from cross-sector and cross-institutional cooperation. Pentahelix actors. Pentahelix actors are actors who Multisectoral Collaboration for Innovation (Amin, 2020). Pentahelix actors are key to optimizing the potential of the MDI culture-based creative economy (Chamidah et al., 2021). The development of the MDI culture-based creative economy in West Sumatra tourist destinations, the role of pentahelix actors is very important. The government has a strategic role in creating policies that support the development of the creative economy, including in facilitating investment, providing tax incentives, and regulating conducive

regulations (Karunia, 2018). Meanwhile, academics play a role in producing knowledge and innovation that can increase the competitiveness of the creative economy (Irawan & Hartoyo, 2022). Business acts as an entity that carries out business processes in creating added value and maintaining sustainable growth, providing infrastructure (Guo et al., 2022). The community as consumers has a role in supporting and promoting local products, and plays a role as the main driver in creating market demand (Z. Zuzmelia et al., 2023). Meanwhile, the media has a strategic role in disseminating information about the potential and uniqueness of West Sumatra as a tourist destination (Septadiani et al., 2022).

Collaboration between pentahelix actors of government, academics, industry, society, and media forms a solid foundation for the development of MDI culture-based creative economy in West Sumatra tourist destinations (Nurhasanah & Van den Broeck, 2022). With various complementary roles, the potential of the creative economy and tourism in the region can be optimized to the maximum, creating a supportive environment for economic growth and the welfare of the local community (Karunia, 2020). In addition, by considering the contribution of each actor in the pentahelix framework, the development of culture-based creative economy competitiveness in West Sumatra tourist destinations can create an advanced, innovative, and sustainable environment (Bangsawan et al., 2025). Therefore, researchers are interested in researching and analyzing the role of pentahelix actors in the development of MDI culture-based creative economy competitiveness in West Sumatra Tourist Destinations (Huda et al., 2022). This study aims to analyze the pentahelix actors in developing the competitiveness of EKRAF based on culture and MDI in tourist destinations in West Sumatra. This study uses the pentahelix theory proposed by Etzkowitz & Leydesdorff (2000).

METHOD

This study uses a qualitative, descriptive approach to gain a deep understanding of the role of pentahelix actors in developing culture-based creative economy competitiveness (EKRAF) and MDI in West Sumatran tourist destinations. This approach was chosen because it allows for a comprehensive description of phenomena based on real-world conditions and reveals the relationships among stakeholders involved in creative economy development.

The informant selection technique used purposive sampling, which involves deliberately selecting informants based on specific criteria relevant to the research objectives. Informants comprised government officials, academics, business actors, communities, the media, the public, and banks who possess knowledge, experience, and direct involvement in the planning, implementation, and development of a culture-based creative economy in West Sumatra.

Data collection was conducted through document studies to obtain information on policies, regulations, reports, and various supporting documents related to creative economy development. Document studies served as a secondary data source used to strengthen the research findings and provide an overview of the conditions and policy direction of creative economy sector development. In addition to document studies, this study also utilized non-participant observation. Researchers directly observed creative economy development activities without participating in the activities being observed. Through these observations, information was obtained regarding field conditions, interaction patterns between actors, and the

implementation of various creative economy development programs at the tourist destinations used as research locations. Primary data was obtained through in-depth interviews and Focus Group Discussions (FGDs). The in-depth interviews were conducted in a semi-structured manner to explore the roles, interests, influence, and forms of collaboration of each pentahelix actor. Meanwhile, the FGDs were used to gain a shared perspective, identify problems, develop alternative solutions, and validate the interview results through discussions involving various stakeholders.

Data analysis was conducted using the Miles and Huberman model, which includes the stages of data reduction, data presentation, and drawing and verifying conclusions. To strengthen the analysis of inter-actor relationships, this study utilized Mactor (Matrix of Alliances and Conflicts: Tactics, Objectives, and Recommendations) software developed by Michel Godet (Suyadi et al., 2022). This software was used to map the level of influence, dependency, alliances, conflicts, and strategic positions of each actor, resulting in recommendations for more effective collaboration to enhance the competitiveness of the culture-based creative economy in West Sumatran tourist destinations.

RESULTS AND DISCUSSION

Actors Involved in Developing Creative Economic Competitiveness

1. Government

In the Penta Helix, the government plays the role of controller and regulator, with tasks and rules related to economic growth (Hidayatullah, Windhyastiti, Aristanto, Rachmawati, & Alvianna, 2022). Planning and implementation are just two examples of the many tasks involved in this situation. supervision, management, advertising, distribution, funding, authorization, initiatives, and local laws. Public innovation policy, development and knowledge, encouragement of innovative networks, and public-private collaboration. (Mukti, 2020). Coordination of various parties involved in the growth of the Creative Economy in the West Sumatra tourism area is also the responsibility of the government. The Regency/City Government through the tourism office, industry and employment office, cooperative and trade office, cooperative and micro-enterprise office, cultural office, and so on are tasked with overseeing the Creative Economy development program in West Sumatra tourist locations. As part of the strategy to encourage the growth of the Creative Economy in West Sumatra tourism hotspots, the government has taken a number of actions. One way is to utilize available infrastructure and resources, such as photo studios, regional film commissions, and exhibition spaces. Creative economy actors really feel the benefits of government assistance (Idris et al., 2022).

The creative economy of West Sumatra's tourism destinations grew thanks to the facilitation of stakeholder collaboration facilitated by the government. The Creative Economy development program has several functions for the government. Additional initiatives carried out by the government include creative economy education, how to increase the quantity and quality of products through innovation and manufacturing, and how to improve design. At that time, the government recruited national-level designers. Then many were also facilitated by BEKRAF. Therefore, the government does not only focus on increasing quantity but also quality. This can be seen

when the government brings in national-level designers. The goal is that Creative Economy actors can improve the quality of their products in accordance with current developments without eliminating cultural characteristics (Indra Jaya, 2022). For example, by making the products produced more varied and combining new products with existing cultures. Then BEKRAF also helped them a lot. Therefore, the government emphasizes increasing quantity and quality. This can be seen when national-level designers are employed by the government. This is done as an effort so that Creative Economy actors can improve the quality of their products while maintaining their cultural characteristics and following modern trends. For example, by increasing the variety of goods produced and combining new goods with existing cultures (Moento et al., 2023).

2. Academics

Penta Helix academics put together something, including validation of product and human resource competencies and standardization of company procedures (Siahaan, 2023). In this case, academics are the source. Understanding the latest ideas, theories, and concepts related to business created by Creative Economy participants in the West Sumatra tourism area to gain long-term competitive advantage. Therefore, the goal of academics here is to exchange knowledge with Creative Economy actors in order to innovate. Academics from Andalas University, Padang State University, Riau University, State Islamic University, West Sumatra PGRI University, and other universities play a role in the Creative Economy development initiative in the West Sumatra tourism hub (Islahuddin et al., 2021).

Cooperation between various universities and other stakeholders in internships, training, visits and research. In addition, the role of academic staff is as practitioners in the field of research and development of science. Role. The results of the research conducted are the basis for compiling a concept program for developing the Creative Economy after the existing obstacles are identified, providing encouragement to spur creative economy actors in a better direction (Emrizal & Primadona, 2020). One way is that creative economy actors are directed at regional competitiveness and economy according to appropriate indicators, namely ecosystems, government support, skills, products, processes, markets, and networks. Research and community service that have been carried out by various universities together with stakeholders can be implemented in the development of the creative economy in tourist destinations in West Sumatra (Hidayatullah, Windhyastiti, Aristanto, Rachmawati, & Roedjinandari, 2022).

Collaboration with other institutions and stakeholders in training, research, visits, and internships. Academic staff members also have a practical role in the field of research and scientific growth. Section. Once the challenges are identified, the findings of this study serve as the basis for conceptualizing a creative economy program, which encourages actors in this sector to move in a more positive direction. One approach is for creative economy participants to focus on the economy and competitiveness of the region based on relevant metrics, such as ecosystems, government support, skills, goods, processes, markets, and networks. The implementation of research and community service carried out by many institutions in collaboration with stakeholders can be utilized to grow the creative economy in popular tourist destinations in West Sumatra.

3. Business

In Penta Helix, business serves as an artistic medium. Business is an organization that provides infrastructure while running commercial operations to provide value and maintain development (Hakim, 2022). The emergence of the digital era has the potential to make Creative Economy actors in the Sumatra tourism area more successful, efficient, and productive. There are several young communities involved in creative economy development initiatives in popular tourist locations in Sumatra. Because of their important role in the creative economy, creative economy actors are considered a crucial factor in business development. These Creative Economy actors are Because they run businesses that drive the economy, creative economy actors are the main force behind its development. Entities in the Creative Economy rely heavily on their creativity as their main asset and differentiator in the market. In order for Creative Economy actors to meet consumer demand and compete on a global scale, their creativity must always be improved. The Penta Helix model can help Creative Economy participants improve their ideas, creativity, and skills by fostering collaboration with various stakeholders (Syahbudi, 2021). Program development faced several challenges when it first started. Actors continue to act on it. In order for the Creative Economy of Bojonegoro Regency to develop its business. Other factors, limited resources and availability (Kagungan et al., 2021).

4. Community

The Penta Helix Community functions as an accelerator. In this case, people who are important to a growing business and have the same interests form a community (Nur Aryanti, 2023). Acting as a liaison or intermediary between stakeholders to help the creative economy of Bojonegoro Regency throughout its process and facilitate the transition of business procedures to the digital era. Because the community is a strategic object in the expansion of the Creative Economy, the community also plays a role in marketing goods and services related to the Creative Economy. The main component of creative economy development is direct interaction between several program support units, such as the sale of handmade goods typical of West Sumatra in all tourist destinations (Hidayatullah, Windhyastiti, Aristanto, Rachmawati, & Roedjinandari, 2022).

In addition, the creative economy community also functions as a bridge between stakeholders. For example, the Multi-Business Cooperative functions as a liaison to remind Creative Economy actors of any training or support provided by the government, Bank Indonesia, UMK, or other stakeholders (Rozikin, 2019). Another example is when the Multi-Business Cooperative asks for help from Bank BPR in collecting information when there is a shortage of experts to improve product quality (Kim & Kim, 2021). By providing access to exchange between the business sector and the environment, and by promoting education and creative talent among its members, the community helps increase the industry's contribution.

5. Media

The media in the Penta Helix acts as an expander (Devi, 2017). Media plays a role in supporting publications in promotions and creating brand images. In the Creative Economy development program in West Sumatra tourist destinations that support the role of media are local media through websites, social media and YouTube as media for promotion and information. Media that

includes various platforms, such as mass media, social media, and online media, which play a role in disseminating information, promoting innovation, and shaping public opinion.

6. Public

Participation and Involvement Local communities are the holders of invaluable cultural heritage (Azari, 2022). Their participation and involvement in the creative economy development process is essential. Through their support and contribution, local traditions can be preserved and developed as an integral part of the tourism experience. The community is a key resource in the creative economy. They create, develop, and produce a variety of creative products and services, from visual arts, music, film, product design, to the fashion and culinary industries.

7. Bank

Media in Penta Helix acts as a Lender and Funder Banks provide an important source of funding for creative economy actors (Sutrisno, 2019). They provide loans and credit facilities that enable creative industry actors to develop their businesses, produce new products, and expand their markets. In addition, banks act as Financial Service Providers Banks provide various financial services, such as savings accounts, checking accounts, credit cards, and online payment services, which help creative industry actors manage their business finances more efficiently and professionally. Investment and Development Supporters: Banks also act as supporters of investment and development in the creative economy. They provide assistance and encouragement to creative industry actors who have the potential to grow and have a positive impact on the economy. Various types of banks have a role in providing capital assistance for creative economy actors to develop their businesses in the form of credit loans. For example, Bank BRI, Bank BRI has a role as a companion. Providing training and providing capital assistance.

The Role of Pentahelix Actors in Developing the Competitiveness of the Creative Economy Based on MDI Culture in West Sumatra Tourism Destinations

In an attempt increase Power competition economy creative in West Sumatra, the role actor Pentahelix becomes very important. The existence of actor Pentahelix become key in develop potential economy creative based MDI culture. Each actor has different roles and functions in development economy creative sub- sector of crafts. However, in implementation of each actor can to weave Work The same so that economy creative can developed optimally specifically based on MDI culture. This can understand that each actor own advantages and disadvantages in implementation role. However, work The same between each actor can overcome existing deficiencies with carry out coordination, integration, synchronization, and synergy source Power (Nur Aryanti, 2023). So this is This can make development economy creative MDI culture is implemented optimally according to purpose. Although thus, with all advantages and disadvantages, government area own a very strategic role, especially as a regulator, facilitator, and accelerator.

Analyze about actor one of software used that is application mactor. The result of analysis Mactor find involvement actor in development economy creative in the craft sub-sector that is seen with matrix beginning in the form of The results of the Direct

Influence Matrix and the Valued Position Matrix (2MAO) are that matrix beginning from analysis the first mactor is actors involved in development economy creative in the craft sub- sector based on Power competition can seen in the picture under This :

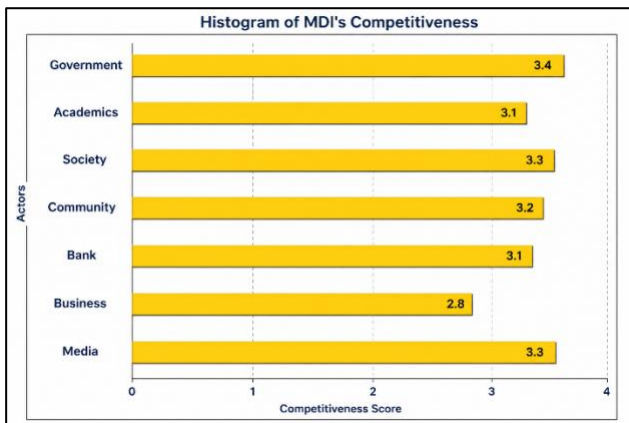


Figure 3. Actors Involved in Creative Economy Development
Source: Results By 2026 Data Using MACTOR

Based on Figure 3 shows actors involved in development economy creative based on Power competition that government, society and media are actors who have strong involvement, because role government as formulation policies and regulations, granting incentives and facilities, development infrastructure and facilities Supporter and education and training, while society and media play a role as participation in promote Local Wisdom, because the media is actor in expose, collect and disseminate information to development economy creative MDI based. While academics, society and banks as actor involvement direct in organization give stimulation, challenge and encouragement to innovation and creativity in development economy creative MDI culture (Sutrisno & Anitasari, 2019). Viewed from actor businessman is the actor whose involvement is the weakest, because his involvement No direct to development economy creative based on MDI culture because role from community No walk optimally while party private only to obtain profit for generate profit and increase prosperity of its owners. Then from the six actors involved there are several types of actors involved (Bangsawan et al., 2025). This can be seen from the types of actor involvement in the development of the creative economy in the craft sub-sector in the image below:

Based on the type of actor involvement, in the development of the creative economy there is interdependence between one and another. The actor's dependency can be seen in the following picture:

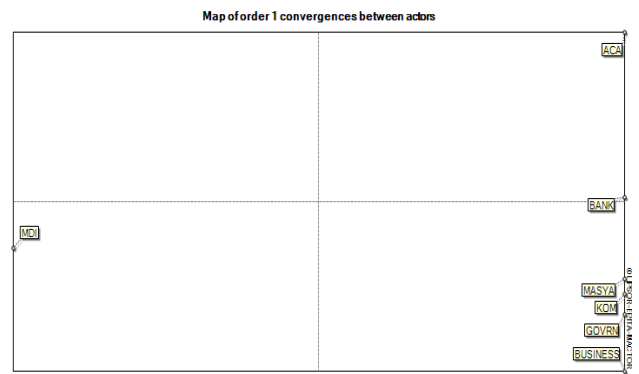


Figure 4. Dependence of Actors in Creative Economy Development in the Craft Subsector in Sawahlunto City.
Source: Results By 2026 Data Using MACTOR

Based on Figure 4, it shows that the government, society, community, business and bank are highly dependent or dominant actors. This is the position of the five actors which is very important in the development of the creative economy in the craft sub-sector in Sawahlunto City. The position of the four actors also shows their ability as the spearhead in determining the success of the development of the creative economy based on MDI culture. While academics are actors who are less dependent in the development of the creative economy in the craft sub-sector. Then on the private sector, their dependence is also small on other actors, so that the private sector and community become operators of the implementation in the development of the creative economy based on MDI culture. Therefore, academics and the media need to strengthen discussions on cooperation to strengthen limitations (Karunia et al., 2018). In addition, the involvement of actors in the development of the creative economy based on MDI culture can also be seen from the relationship between actor interactions in the development of the creative economy based on MDI culture can describe alliances/cooperation between actors who have different dependencies and competitiveness interactions that can be used to develop cooperation patterns. Interaction between actors in the development of the creative economy is essential to creating a dynamic and sustainable ecosystem. The interaction of actors in the development of the creative economy in the craft sub-sector interacts with each other to create added value and encourage the growth of the creative economy sector in the craft sub-sector. This can seen in the image below This:

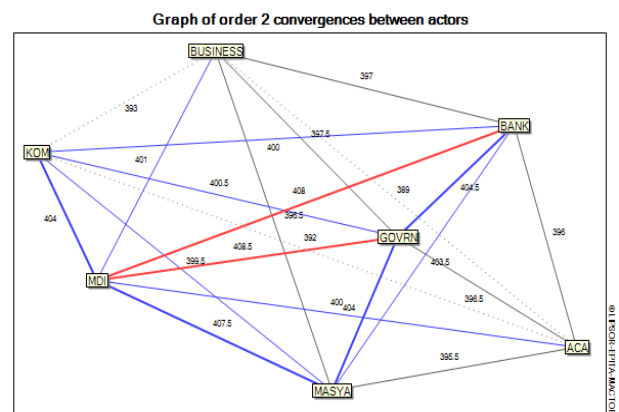


Figure 1. Actor Relationship Network
Source: Results By 2026 Data Using MACTOR
Caption:

BUSINESS → Business
 BANK → Bank
 MASYA → Community
 KOM → Community Organizations

GOVRN → Government
 ACA → Academia
 MDI → Media

Based on Figure 5. shows the relationship of actor networks (Hakim, 2022). This can be explained that the relationship between actors on the dotted line is a very short actor network relationship that is a temporary relationship, then the gray line is a short actor network relationship but still related, as well as the blue line shows that the actor network relationship has started to be strong but has not been implemented optimally, while the red line is the strongest actor network relationship, thus showing that the government, academics and media are groups of actors who can form a very strong relationship for the success of the development of the MDI culture based creative economy which is the strongest position among other actors (Nur Aryanti et al., 2023).

CONCLUSION

Actors play a very active role in the development of the creative economy in the craft sub-sector. Actors involved in the development of the creative economy in the craft sub-sector include the media, government, society, academics, communities and Business / Private, and Banks. Actors who are very strongly involved in the development of the MDI-based creative economy are the media, government, society and academics who are the drivers of the birth of creativity, ideas, science, and technology that are vital for the growth of the creative economy in the craft sub-sector. A close relationship, mutual support, and mutual symbiosis between these actors in their involvement with the foundations and pillars of the creative economy model greatly determines the development of the creative economy in the craft sub-sector that is strong and sustainable.

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CRedit authorship contribution statement

Irwan Irwan: Conceptualization, Funding acquisition, Investigation, Project administration, Writing – original draft, Writing – review & editing. Zusmelia Zusmelia: Conceptualization, Formal analysis, Investigation, Methodology, Writing – review & editing. Ansofino: Data curation, Investigation, Methodology, Resources. Kevin William Andri Siahaan and Abather Rahi Saadoon: Formal analysis, Resources, Software, Writing – review & editing.

Conflict of Interest

The authors declare that this research was conducted independently and without any conflict of interest. They have no financial interests, personal relationships, or other affiliations that could have influenced the research process, data analysis, interpretation of results, or preparation of the manuscript. The entire article was written objectively and transparently and based on the principles of scientific integrity.

Ethical Statement

This research protocol has been reviewed and approved by the Research and Community Service Institute (LPPM) of the University of PGRI of West Sumatra in accordance with applicable research ethics regulations within the university. The research was conducted based on SOP number: 034/SOP-01.02.02.01-LPPM-UPGRISBA/2023. All respondents received an explanation of the research objectives, benefits, procedures, rights, and data confidentiality, and provided voluntary informed consent before participating in the study.

Data Availability

The data supporting the findings of this study are available from the corresponding author and may be obtained upon reasonable request. Access to the data will be granted for academic purposes, validation of research results, or further research development, while adhering to applicable research ethics, information confidentiality, and data protection requirements. The author will provide relevant data after considering the intended use and compliance with institutional policies.

Declaration of Generative AI Use

During the preparation of this manuscript, the authors used QuillBot and Grammarly, generative artificial intelligence-based tools, to improve the clarity, grammar, consistency, and readability of the manuscript. All results generated by these two applications were thoroughly reviewed, verified, and edited by the authors before being included in the manuscript. The use of AI does not replace the scientific contributions of the authors. The entire process of conceptualizing the research, developing the methodology, analyzing and interpreting the data, developing the arguments, and drawing conclusions was carried out entirely by the authors. The authors are solely responsible for the accuracy, integrity, originality, and academic quality of the entire content of this article.

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